PAC Products Catalog

Vol. PAC 2.0.00

ICP DAS

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Introduction

PAC: Programmable Automation Controller

The PAC family of ICP DAS includes WinPAC, XPAC, LinPAC, iPAC, ViewPAC , Motion PAC and µPAC for different requirements in OS, CPU and development platform.

This new exciting PAC family offers a flexible, versatile and economical solution to a wide range of applications from Data-Acquisition, process control, test & measurement, Motion Control to energy & building management.

The PAC family comprises a central processor (CPU), power supply, I/O bus, communication interfaces, front panel control facilities and connectors to plug in various I/O modules.

PAC family

WinPAC/LinPAC

XPAC

iPAC

ViewPAC


µPAC

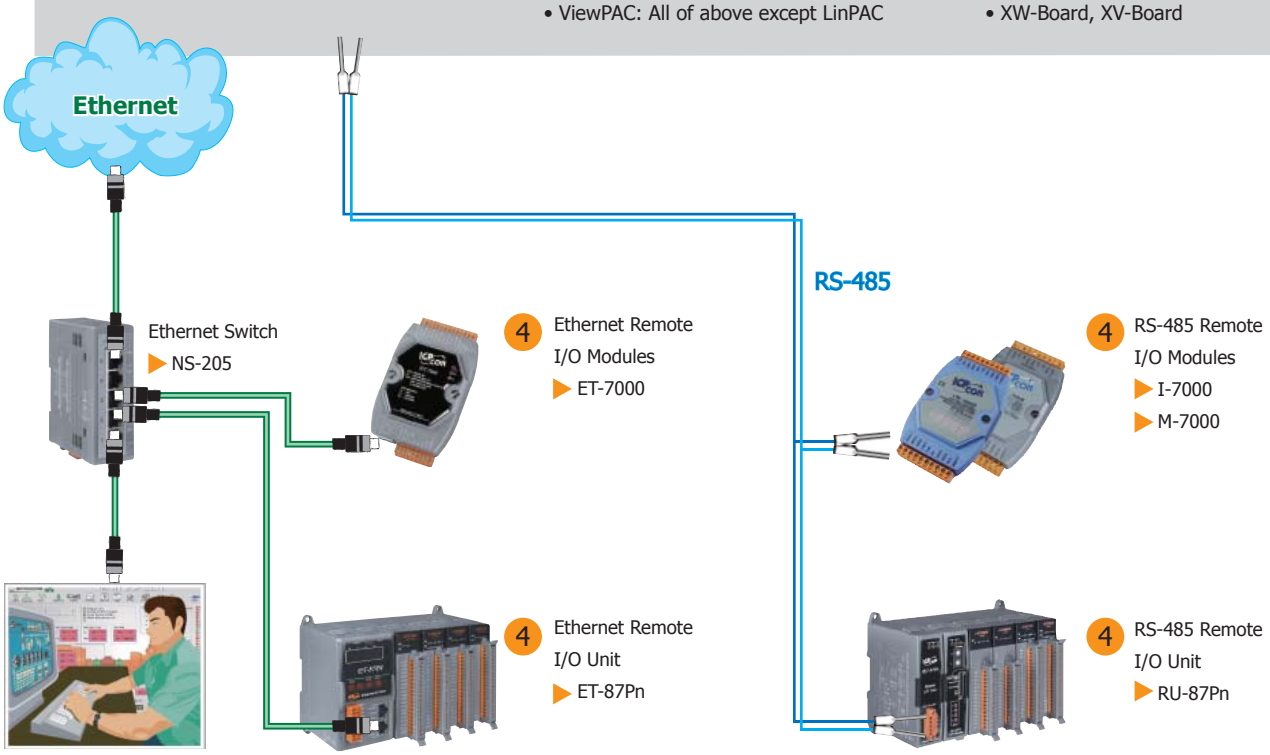
Four Basic Components of PAC

1 **Main Control Unit (MCU)**

2 **Embedded OS**
- WinPAC: WinCE 5.0
- XPAC:
  WES 2009
  WinCE 6.0
- LinPAC: Linux Kernel 2.6
- µPAC: MiniOS7
- ViewPAC: All of above except LinPAC

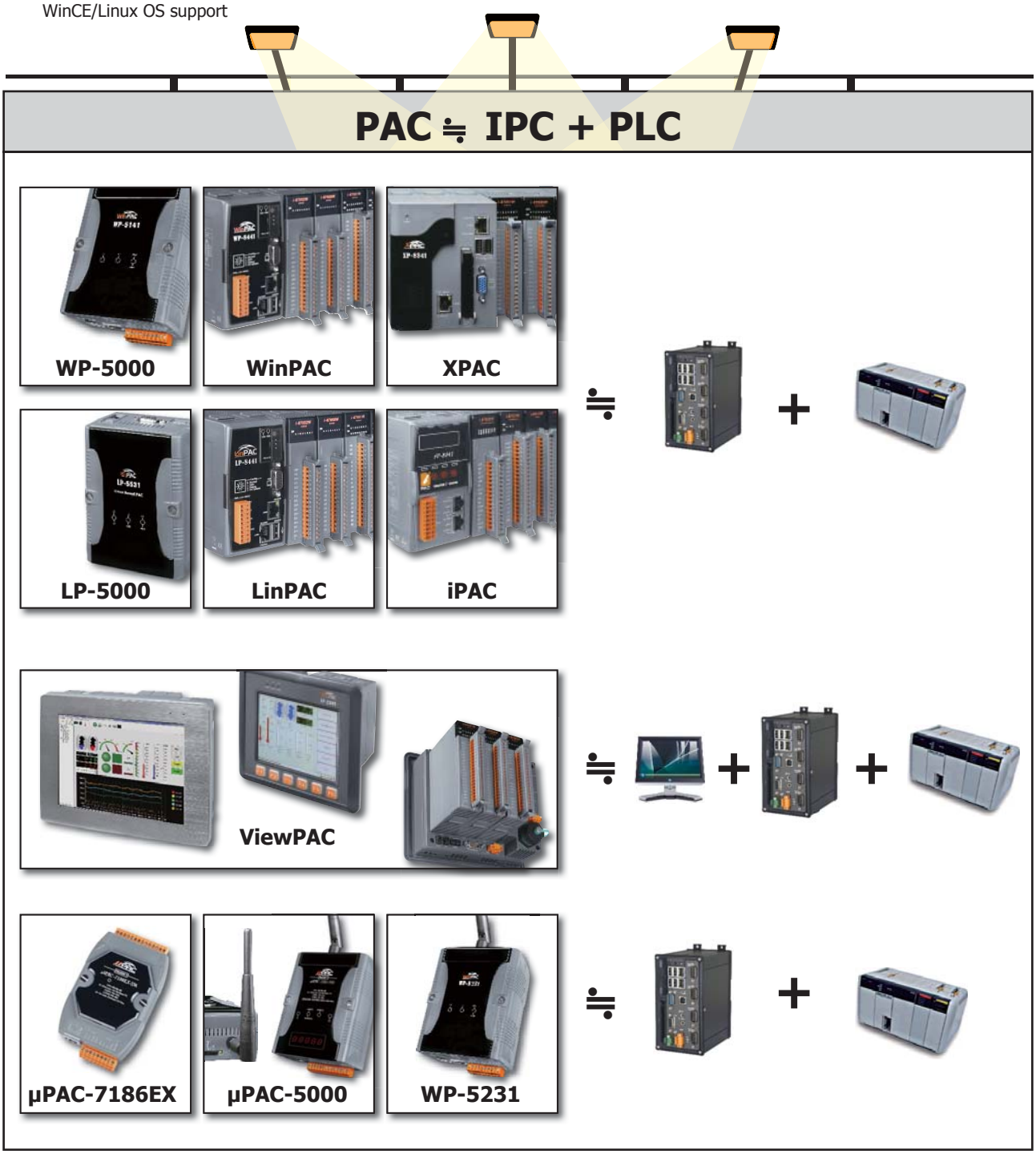
3 **I/O Modules**
- Parallel:
  I-8KW High speed
  High Profile I/O modules
- Serial :
  I-87KW Low speed
  High Profile I/O modules
- XW-Board, XV-Board

4 **Remote I/O Expansion**
- Remote I/O Modules
- Remote I/O Unit + I/O Modules



Advantages of the PAC

- PAC ≒ IPC+PLC, buy one get more
- Intelligent management controller
- Cost effective
- best price/ performance
- Versatile I/O expansion
- More reliable (VS. IPC)
  Fan-less design
  Wide temperature range
  WinCE/Linux OS support
- Compact size (VS. IPC)
  DIN-Rail support.
  PLC look-like
- More peripherals support (VS. PLC)
  Support Ethernet, USB, VGA
- Flexible programming support (VS. PLC)
  Support C/C++/C#, .Net, BASIC/VB,...etc.



• Features

1. Powerful embedded OS

OS	PAC	Software Development Tool
WES2009	XP-8000-Atom, XP-8000	VS .NET 2005/2008, VC6, CB6, Delphi, BCB
WinCE 5.0/6.0	XP-8000-Atom-CE6, XP-8000-CE6, WP-8000, WP-5000, VP-25W1	VS .NET 2005/2008, ISaGRAF, InduSoft
Linux kernel 2.6	LP-8000, LP-5000	C language
MiniOS7	iP-8000, I-7188, uPAC-7186, uPAC-5000, VP-2111	C language, ISaGRAF

2. Powerful Hardware Design

The PAC family of ICP DAS with powerful hardware design can operate in harsh, electrically noisy environments and provide faster & more professional performance. This has been achieved through attention to the following:

Built-in Dual Watchdog Timers

The integrated watchdog circuit will reset the CPU module if there is a failure in either the hardware or software.

Wide Operating Temperature

The PAC product is designed to operate under a very wide temperature range from -25 °C ~ +75 °C.

Easy-to-Install

The PAC family is easy-to-installed by either DIN-Rail mounting or Rack mounting. Input signals can be connected to the unit with easy using plug in signal connectors.

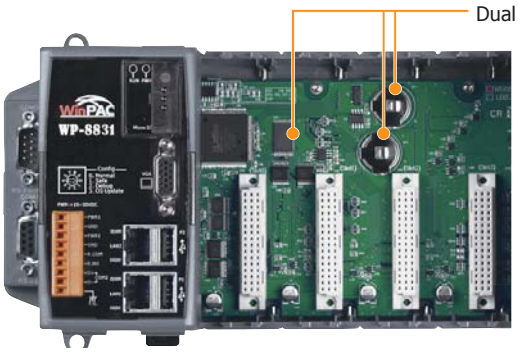
DIN-Rail Mounting

Input Protection circuitry

The protection circuitry on both the network and power supply protects the system from external signals such as main spikes and ambient electrical noise. In addition the central processing modules are isolated three ways from external signals. This is through I/O isolation of 3 kV, network isolation to 3 kV and power isolation to 1000 V.

Support Flash, SRAM/SDRAM/DDR SDRAM, Battery-backup SRAM or microSD

PAC family provides various memory storages, such as Flash, SRAM/SDRAM/DDR SDRAM, battery-backup SRAM disk or microSD.



Cost-effective Display Solution

The user chooses LCD monitor instead of the HMI

PAC family

3. Powerful Communication and Networking

The PAC family is featured with the powerful communication and networking ability to connect with other PAC, devices, I/O modules and other systems through RS-232, RS-485, Ethernet, CAN/CANopen/ DeviceNet or FRnet bus etc. The PAC family also supports the GPRS/GSM, GPS, ZigBee, Wi-Fi, 2G, 3G modules for wireless applications. In addition, the HART and PROFIBUS modules with PAC family can be applied in the high security environments.


WinPAC/LinPAC


XPAC


iPAC


ViewPAC


µPAC

RS-232/485 | Ethernet | CAN bus | FRnet | GPS/GSM | PROFIBUS | HART

The main control unit of PAC is equipped with RS-232/RS-485 communication interfaces. The PAC is easy to communicate with Serial remote I/O modules through RS-485 and PC/HMI through RS-232.


I-7000/M-7000


RU-87Pn

RS-232/485

The PAC can plug in a CAN communication module I-8120W or I-87120W to control CAN Bus I/O devices or our remote I/O unit, such as CAN-8x2x, CAN-2000.


I-8120W


CAN-8x23


CAN-2000

CAN bus

Remote I/O

Ethernet

ET-7000

ET-87Pn

The main control unit is designed for Internet/ Ethernet applications and supports the TCP/IP, Web-Server.

The TCP/IP library provides an easy way to connect these modules directly to the Internet through the Ethernet controller.

A built-in Web-server library provides directly link to a standard HTML browser, IE, Firefox or Chrome.

FRnet

I-8172W

FRnet I/O Module

FRnet Distributed I/O Module

FRnet is an innovative industrial field bus that has many special features, such as high-speed deterministic I/O control, real I/O synchronization capabilities, non-protocol communication, and easy programming.

Plugging a FRnet communication module (I-8172W), the PAC can link FRnet I/O modules to implement high-speed distributed I/O control.

GPRS/GSM, GPS, ZigBee, Wi-Fi, 2G, 3G

The PAC can plug a GSM/ GPRS communication module (I-8212W) or a GSM/GPRS/ GPS communication module (I-8213W) to access mobile network services. They expand the capability of PAC series into Machine to Machine, Mobile, Human communication applications.


I-8212W | I-8213W

PROFIBUS

PROFIBUS (Process Field Bus) is a standard for field bus communication in automation technology. The PAC can become a PROFIBUS DP Slave Station by plugging in a PROFIBUS DP Slave communication.

HART

HART technology offers a reliable and long-term solution for plant operating. The PAC can plug a HART AI or AO module to communicate with HART devices.

• Operating System

Microsoft Windows Embedded Standard 2009 / WES 2009

Advantages:
- Has same Win32 API as Windows XP Professional does.
- Enhanced Write Filter (WES) to protect the system disk (C:\) from write access and unpredictable power lost.

Features:
- FTP server
- HTTP server
- SQL express
- .NET framework 3.5
- Win32 APIs


XP-8000-Atom

Software development tools:
- Visual Studio 2005/2008
- VC++ 6.0
- VB 6.0
- Delphi
- BCB Builder
- and most development tools available on Windows XP

Note: ISaGRAF is not available on this platform.

Microsoft Windows CE.net / WinCE 5.0/6.0

Advantages:
- Hard real-time capability
- Small core size
- Short boot time
- Interrupt handling at a deeper level
- Achievable deterministic control
- Low cost


XP-8000-Atom-CE6

Features:
- FTP server
- HTTP server
- SQL server embedded
- .NET compact framework 2.0/3.5


WinPAC

Software development tools:
- Visual Studio 2005/2008
- ISaGARF (Soft PLC)
- InduSoft (SCADA)
- eLogger (HMI and data logger)


ViewPAC

Linux Kernel 2.6

Advantages:
- Stability
- Flexibility
- Low cost
- Powerful software and development tools
- Open and standard programming environments


LinPAC

Features:
- Open source
- Small core size
- Support for XWindows
- Support for service: Web, FTP, Telnet and SSH server
- GNU Toolchain for Windows and Linux operating systems

Support programming:
- GNU C
- GUI

MiniOS7

Advantages:
- Stability
- Short boot time period (<1 second)
- Less memory resource required
- Faster watchdog response time
- Free IDE development: MiniOS7 Studio


iPAC

Features:
- DOS-like embedded OS
- Antivirus ability
- Internet connectivity
- Rich libraries & demo programs


µPAC

Support Programming:
- C Language
- SoftPLC Logic (ISaGRAF)

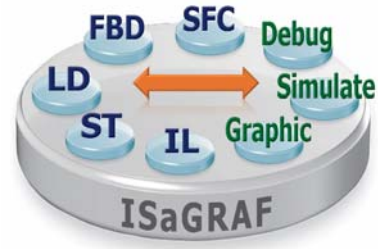

ViewPAC

• Software

1. ISaGRAF (SoftPLC Solution)

ISaGRAF is a powerful SoftLogic package on the industrial market. **ISaGRAF Workbench** is a PLC-like development software running on Windows 95/98/NT/2000/XP/Vista/7 and its **ISaGRAF Runtime** application programs can run on any **ISaGRAF PAC**s such as WP-8xx7, VP-2xx7, XP-8xx7-CE6, iP-8xx7, µPAC-7186(P)EG etc. Using ISaGRAF PACs, the control/monitor systems can easily implement industrial level of real-time data acquisition and data/devices control via wiring or wireless network in various industries.

Application area: data acquisition system, distributed control system, factory and building automation, motor control, remote I/O system, wireless control system...



ISaGRAF Workbench Features:

- Support IEC 61131-3 Standard Open PLC Languages
  + Flow Chart (FC) :
  1. Quick Ladder (LD)
  2. Function Block Diagram (FBD)
  3. Sequential Function Chart (SFC)
  4. Structured Text (ST)
  5. Instruction List (IL)
  6. Flow Chart (FC)
- On-line debugging/control/monitor
- Off-line simulation
- On-line change (For WP-8xx7, VP-2xW7, XP-8xx7 only)
- Spotlight: Simple graphic HMI
- Auto-Scan I/O
- Lock & unlock I/O
- Uploading the program in the PAC

ISaGRAF Solution Features:

- Support Soft-GRAF HMI
  - A free HMI software on the WinPAC, XPAC and ViewPAC
  - Soft-GRAF Studio: simplify HMI screen editing (Mouse drag & drop)
- Modbus Master Protocol
  - Modbus RTU, ASCII, RS-232/485/422 Master
  - Modbus TCP Master
  - For connecting other Modbus PLCs, meters, I/Os and devices
- Modbus Slave Protocol
  - Modbus RTU (RS-232/485/422) Slave
  - Modbus TCP/IP Slave
  - For connecting other PC/HMI/SCADA (Ex. InduSoft) and touch HMI (Ex. Touch-506T)
- Data-Recorder & Data-Logger
- Data Exchange
  - Ebus: Through Ethernet
  - Fbus: Through RS-485
  - PAC to PAC
- CAN/CANopen
  - Via I-7530 to connect CAN/CANopen devices
  - For connecting other CAN/CANopen meters, I/Os, devices
- FRnet I/O
- Motion Control
  - For controlling server motors (P-command)
- PAC can send e-mail to the internet
- SMS: Short Message Service: GSM modem
  - For reporting data and alarms to the operators
- Wireless Communication: GPS, ZigBee & Radio
- Auto-report Acquisition/Control Data
- Redundant Solution : Hot-swap/Ethernet
- Construction Stress Monitoring: VW sensor and Carlson strain gauge inputs solutions (Bridge/dam/building...)

Software Development: ISaGRAF V.S. C++ and VS.net 2008

Item	ISaGRAF Ver. 3.xx	C++	VS.net 2008
Programming	Easy	Hard	Middle hard
Debug	Easy	Hard	Middle hard
SoftLogic	Yes	No	No
Program I/O	Just connect and play	Hard coding	Hard coding
Communication	Already built-in Modbus TCP, Modbus RTU, Modbus ASCII, DCON, SMS, e-mail, TCP, UDP, ...	Hard coding	Hard coding

2. Soft-GRAF HMI

• Soft-GRAF Studio: Create a Colorful HMI by Graphical Drag-and-Drop Operation

Soft-GRAF Studio is an HMI (Human Machine Interface) software developed by ICP DAS which allows user to create his colorful HMI application running with the control logic in the same ISaGRAF WinCE series PAC: XP-8047-CE6/8347-CE6/8747-CE6, WP-8137/8437/8837, WP-8147/8447/8847 and VP-25W7/23W7 ISaGRAF PAC. User can edit the HMI screen by Soft-GRAF Studio using the graphical drag and drop operation. And use ISaGRAF to design the control logic by PLC Languages (Ladder, ST, FBD.....).

http://www.icpdas.com/products/Software/Soft-GRAF/soft-graf.htm

• Soft-GRAF Studio Features:

▶ Soft-GRAF Studio:
Easy HMI screen editing (Mouse drag and drop)
No programming is reguired to implement HMI editing.

▶ Support various and colorful HMI objects:
Page (Max. 200, support password security)
Numeric (Input, input security, display)
Text (Dynamic/static text display)
Picture (Animated/static picture display)
Moving Trace (1-axis or 2-axis)
Bar-meter (Vertical/horizontal dynamic display)
Buttons displayed as text
Buttons displayed as Picture
Built-in various objects (Will be more)

▶ Multi-language:
English, Traditional Chinese, Simplified Chinese, Russian, etc.

▶ HMI behaves smoothly

• Soft-GRAF Studio Online Tutorial:

The Soft-GRAF Studio website provides a tutorial video for online or downloaded learning. Through the seven and a half minutes, you will learn the software download, installation, HMI pages design and program downloading to the controller. Such a total tutoring will let you know that using the Soft-GRAF Studio is so easy!!

• My Sweet Home Demo Video:

"My Sweet Home" is a simple demo of an interesting animated application. The intuitive operating HMI looked like the screen of mobile phones or tablet PC and you can test it intuitively even without connecting to the I/O modules. The "My Sweet Home" video is this demo operation video. By watching this video, customers can feel how powerful and how colorful of the Soft-GRAF Studio will be even it is a free software.

3. InduSoft (SCADA Solution)

Introduction :

InduSoft Web Studio is a powerful, integrated collection of automation tools that includes all the building blocks needed to develop modern Human Machine Interfaces (HMI), Supervisory Control and Data Acquisition (SCADA) systems, and embedded instrumentation and control applications.

InduSoft Web Studio's application runs in native Windows NT, 2000, XP, CE and CE .NET environments and conforms to industry standards such as Microsoft .NET, OPC, DDE, ODBC, XML, and ActiveX. We provide the InduSoft bundled driver to integrate InduSoft software into ICP DAS products (IO Modules: I-7000, I-8000, I-87K ; PACs: WinPAC, WinPAC, XPAC) for SCADA system.

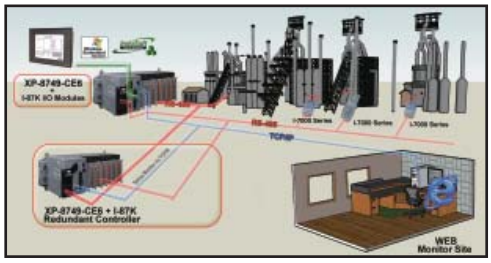
Integrated with ICP DAS PACs :

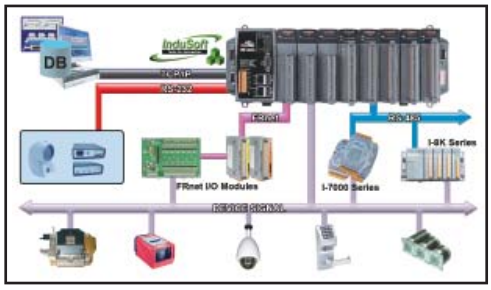
InduSoft has been integrated into ICP DAS various PACs including WinPAC, ViewPAC, XPAC and XPAC-CE6. The following is the advantages when using InduSoft with ICP DAS PACs.

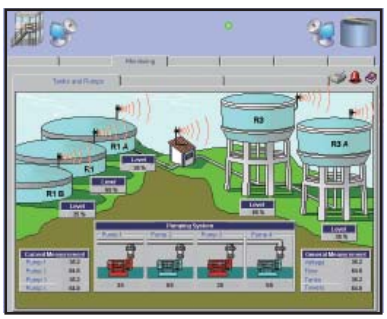
	Features
WinPAC	• Stable and high performance-to-price ratio small SCADA system • Rapidly and easily develop I/O integrated graphic supervisory control system
ViewPAC	• Provide integrated touch HMI/SCADA system solution • Suitable for spatial narrow and small machine control system
XPAC	• High performance and various Win32 API and Tool integrated SCADA system • Easily integrate third party software for multi-purpose application
XPAC-CE6	• Provide the best choice for high efficiency real time embedded system • Suitable for massive data acquisition and processing centralized system

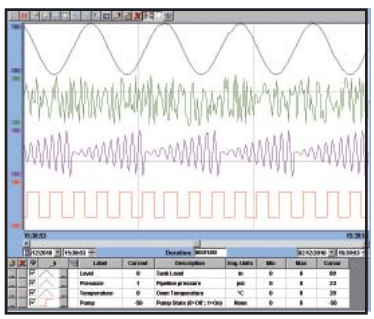
Features:

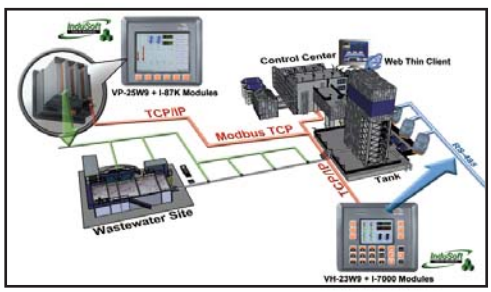
- Elegant Graphics
- Multi-Language
- Database (Access, Excel, SQL, Oracle…)
- Recipes and Reports
- Online and History Alarm / Trend
- Various Communication Driver
  (DCON, Modbus, OPC, DDE, TCP/IP…)
- Remote Web Client Control & Security
- ActiveX (GSM / SHM / COM /WEB provided by ICP DAS)
- System Redundancy
- Others (VBScript, E-mail, FTP, SNMP…)











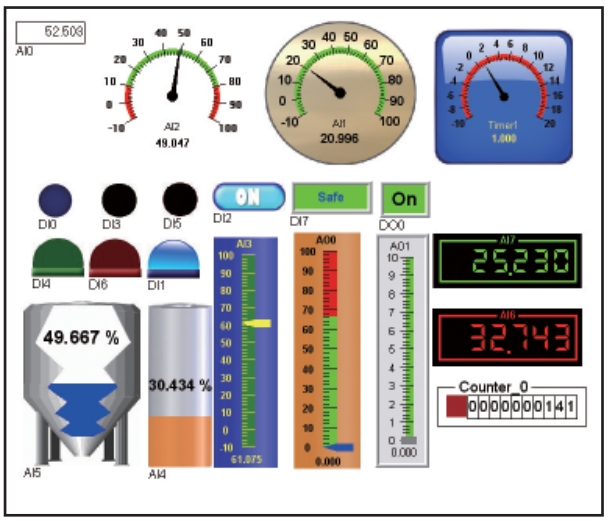
4. EZ Data Logger

EZ Data Logger is the software that ICP DAS provides for users to easily build a SCADA system on Windows 2000/XP/Vista. It comes with two versions, "Lite" & "Professional". The Lite version is not only full-functioned but free to all ICP DAS users!

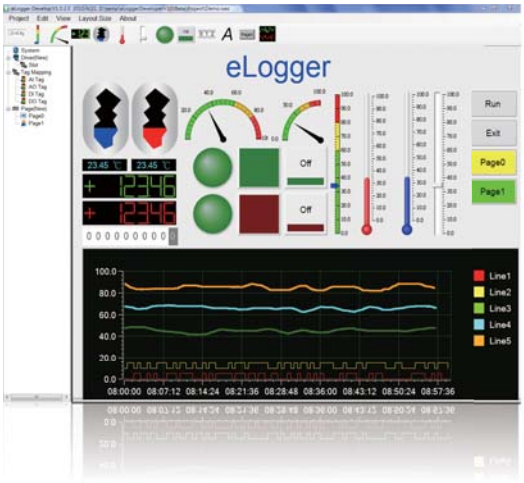
EZ Data Logger is a small data logger software. It can be applied to small remote I/O system. With its user-friendly interface, users can quickly and easily build a data logger software without any programming skill.

Features:

- Support DCON, Modbus RTU, Modbus ASCII, Modbus TCP protocols
- Support multiple COM Ports and TCP/IP connections
- Support Virtual Channel definition
- Support Control Logic (VB Script)
- Support Alarm Notifier (by sending SMS to cell phone or E-Mail)
- Flexible module configuration (different description and color)
- Flexible workgroup configuration
- Real time data trend (with zoom in and zoom out)
- Each trend line can store more than 86400 records.
- Provide Layout view
- Provide IP Camera Viewer
- Access database supported (can be exported to Excel file or CVS file)
- Provide Reporter to print trend line or data
- Provide High/Low alarm with audio warning
- Can search for DCON (I-7000/8000/87K) modules and Modbus (M-7000) serial modules
- Provide Value scaling
- All operations are done by click mouse and enter value.



5. eLogger



eLogger is an easy-to-use software to implement HMI and data logger on our Windows CE.NET 5.0/6.0 based PACs (XPAC, WinPAC and ViewPAC) for simple I/O monitoring and controlling systems. It can save your money and shorten time-to-market. eLogger can quickly and easily develop an application with flexible I/O configuration. The developing can be completed in just 5 simple steps:

Step 1: configuring I/O modules
Step 2: configuring data logger
Step 3: designing HMI layout pages,
Step 4: uploading the project to WinPAC/ViewPAC,
Step 5: running it.

In the simple steps, there is no need of software programming knowledge. And if you want to add more powerful functions, eLogger also provides a flexible "shared memory" interface to allow your VS.NET and ISaGRAF programs co-work with it. eLogger currently supports I-87K series I/O modules on local slots. In the future, it will support I-8K series I/O modules on local slots and remote I/O modules over RS-485, Ethernet with DCON and Modbus protocols. With the various I/O module series, you can find I/O modules to suit various configurations.

Features:

1. PAC Support:
   - Developer: Windows 2K,Windows XP, Windows Vista, Windows7
   - Run time target: Windows CE.NET 5.0/6.0 platform, such as XP-8x4x-CE6 series, WP-8x3x series, WP-8x4x series, VP-23W1, VP-25W1

2. I/O Module Support:
   - High speed local I/O (not available): I-8K series
   - Low speed local I/O: I-87K series
   - RS-485 remote I/O (not available): I-7000, M-7000, RU-87Pn, Modbus/RTU/ASCII devices
   - Ethernet remote I/O (not available): ET-7000, ET-87Pn, Modbus/TCP devices

3. Signal Type of I/O Modules:
   - DI, DO, AI, AO, counter, frequency, DI with latch function.

4. Communication (not available)
   - RS-485: DCON master, Modbus/RTU master, Modbus/ASCII master
   - Ethernet: DCON master, Modbus/TCP master

5. HMI
   - Elements: button, text box, linear gauge, angular gauge, LED numeral, LED indicator, tank, label, trend line.

6. Real Time Data Trend
   - Zoom in and zoom out
   - Max. of 5 trend lines in one page.

7. Value Scaling

8. Account Management

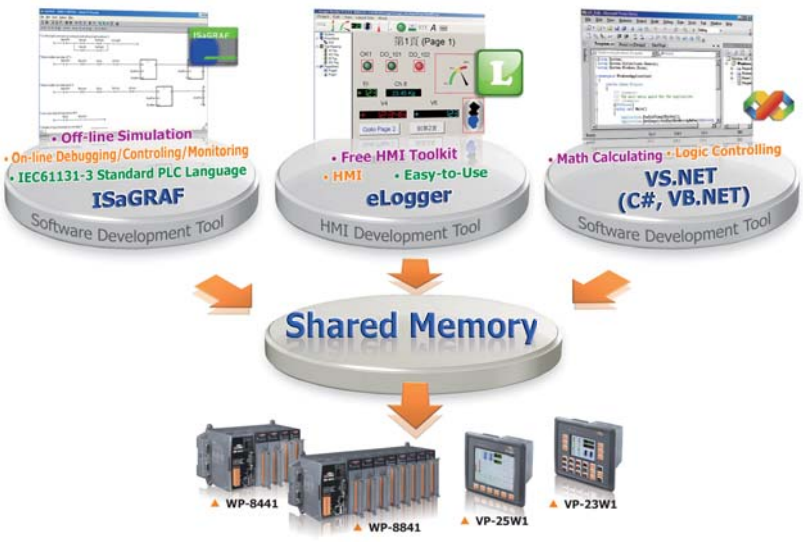
9. Remote Maintenance (not available)

10. Data Base
    - Local data base: SQL embedded.
    - Remote data base(not available): SQL 2005 on Windows platform.

11. Logic Control Programming

Via the " shared memory " , you can choose ISaGRAF or VS.Net to develop a logic control program and co-work with the elogger. Your programs can access the data of I/O module and exchange other temporary data through the "shared memory". You can focus on the logic control programming.

- ISaGRAF
  (IEC61131-3 standard PLC languages)
  (Refer to ISaGRAF FAQ-115)
- Visual Studio .NET (C#, VB.NET) for Window CE.NET 5.0/6.0



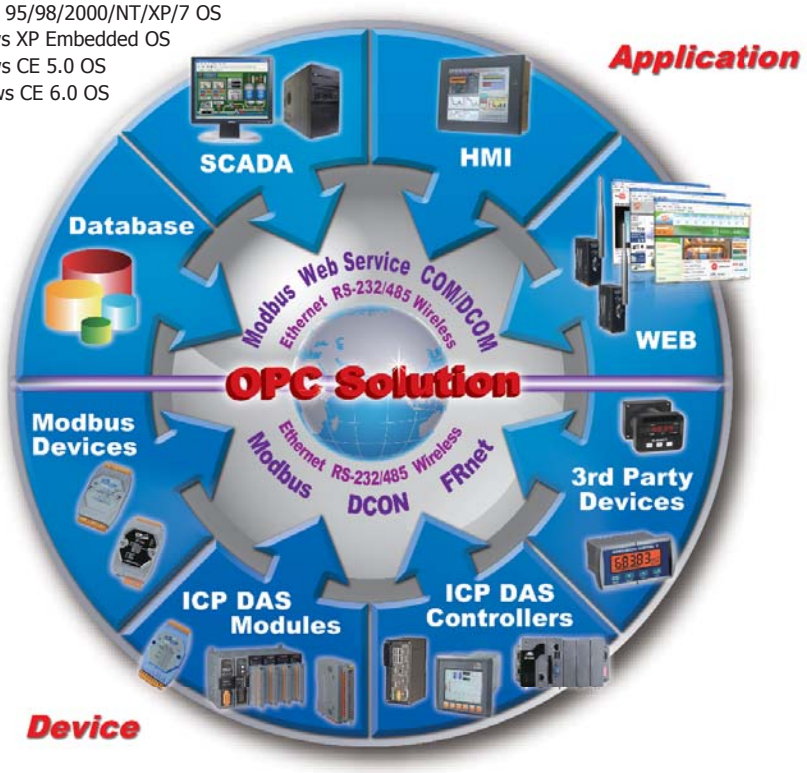
6. NAPOPC DA Server

NAPOPC DA Server is a **free** OPC DA Server **(The "OPC" stands for "OLE for Process Control" and the "DA" stands for " Data Access")** provided by ICP DAS running on WinPAC, ViewPAC, XPAC, WinCon and PC with Windows 95/98/ME/2000/NT/XP operating systems. **NAPOPC DA Server** provides many benefits to users such as reduce time through lower system integration costs, integrate easily with plug-and-play SCADA/HMI/Database, connect and interoperate easily to custom applications, access to data by anyone in the automation hierarchy, reduce troubleshooting and maintenance cost, write to devices synchronously and asynchronously (not possible before OPC).

Using SCADA/HMI/Database software program, system contacts and obtains data from NAPOPC DA Server either on the same computer or on another computer. SCADA/HMI/Database makes a request and NAPOPC DA Server fulfills the request by gathering the data of ICP DAS modules and third-party devices to SCADA/HMI/Database.

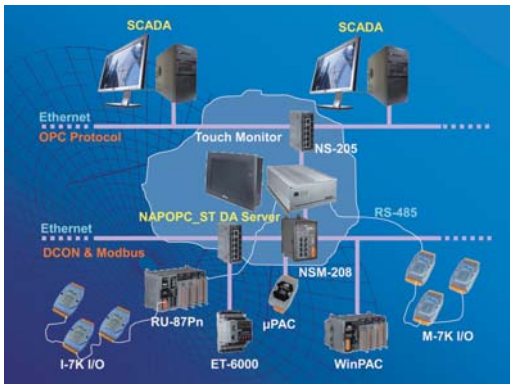
For different OS of PAC products, ICP DAS provides several professional DA Servers, such as:

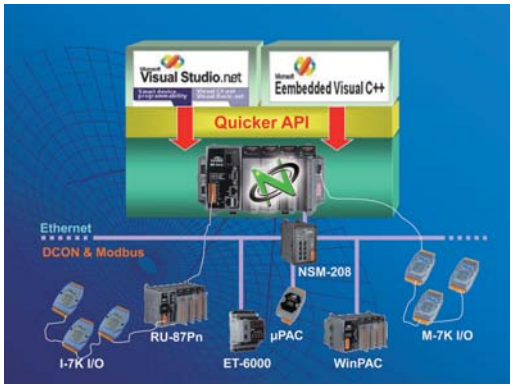
NAPOPC_ST DA Server : For Windows 95/98/2000/NT/XP/7 OS
NAPOPC_XPE DA Server : For Windows XP Embedded OS
NAPOPC_CE5 DA Server : For Windows CE 5.0 OS
NAPOPC_CE6 DA Server. : For Windows CE 6.0 OS



Features:

- Easy-to-use explorer-style user interface
- Multi-thread communication
- Auto search & Auto generate
- Support Modbus devices
- Provide "OPC to Modbus" service
- Support Host Watchdog
- Unique design:
  - Active data transmission mechanism
  - OPC Client can select the document in the DA Server during runtime
  - Open application programming interface





Support :

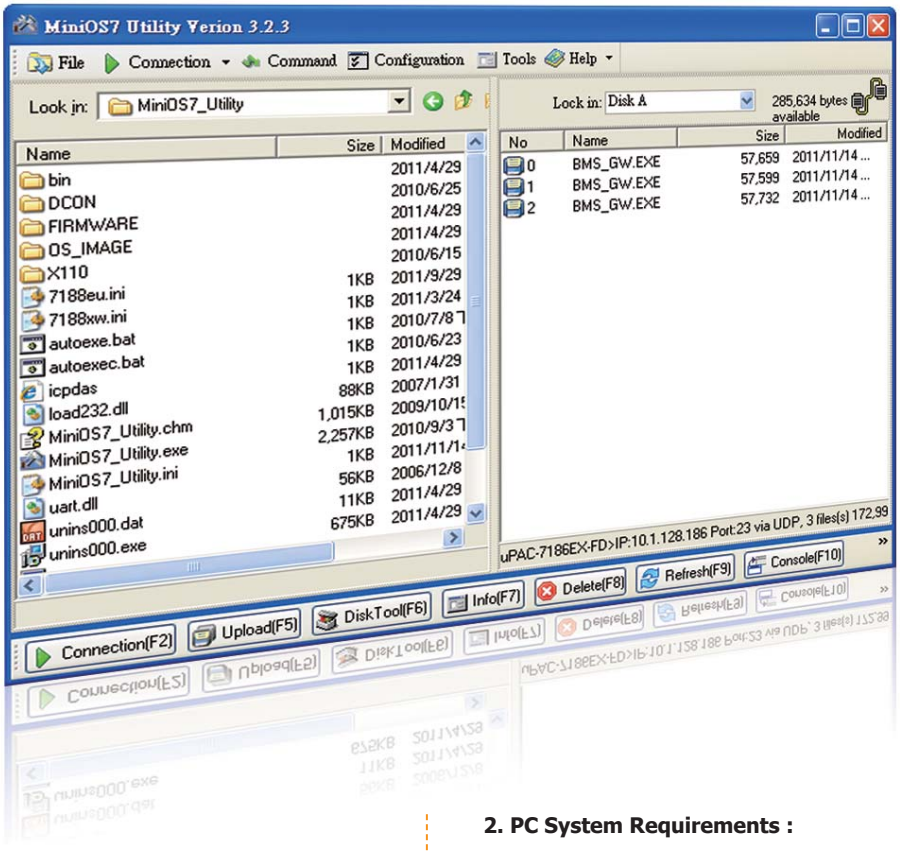
- ICP DAS I-7K/I-8K/I-87K/M-7K/tM Series I/O modules
- ICP DAS ZigBee I/O
- ICP DAS Ethernet I/O
- ICP DAS FRnet Remote I/O
- Support third party Modbus devices
- ICP DAS PACs which support Modbus protocol
- Compatible with most development platforms (Visual C++, Visual Studio .Net)
- Compatible with all local and remote OPC Client (Remote Accessing using DCOM technique)
- Compliant with OPC specification V2.0

Applications :

- Protocol Conversion Application
- VxComm Application
- Wireless I/O Application
- Active Server to Client Communication Application
- Direct Cross-Process I/O Access Application

7. MiniOS7 Utility

MiniOS7 Utility is a tool for configuring, uploading files to all products embedded with ICP DAS MiniOS7. It can allow users to remotely access the controllers (7188E,8000E, ...etc) through the RS-232 or Ethernet.



1. Features:

▶ Supported connection ways
1. COM port connection (RS-232)
2. Ethernet connection (TCP & UDP)

▶ Maintenance
1. Upload file(s)
2. Delete file(s)
3. Update MiniOS7 image

▶ Configuration
1. Date and Time
2. IP address
3. COM port
4. Disk size (Disk A, Disk B)

▶ Check product information
1. CPU type
2. Flash Size
3. SRAM Size
4. COM port number
etc.

▶ Including frequently used tools
a. 7188XW (console mode utility in RS-233 connection)
b. 7188EU (console mode utility in Ethernet connection)
c. 7188E (console mode TCP/IP client)
d. SendTCP (to test TCP/IP connection)
e. Send232 (to test RS-232 connection)
f. VxComm Utility

2. PC System Requirements :

Windows 95 /98/NT/2000/XP/Vista/7

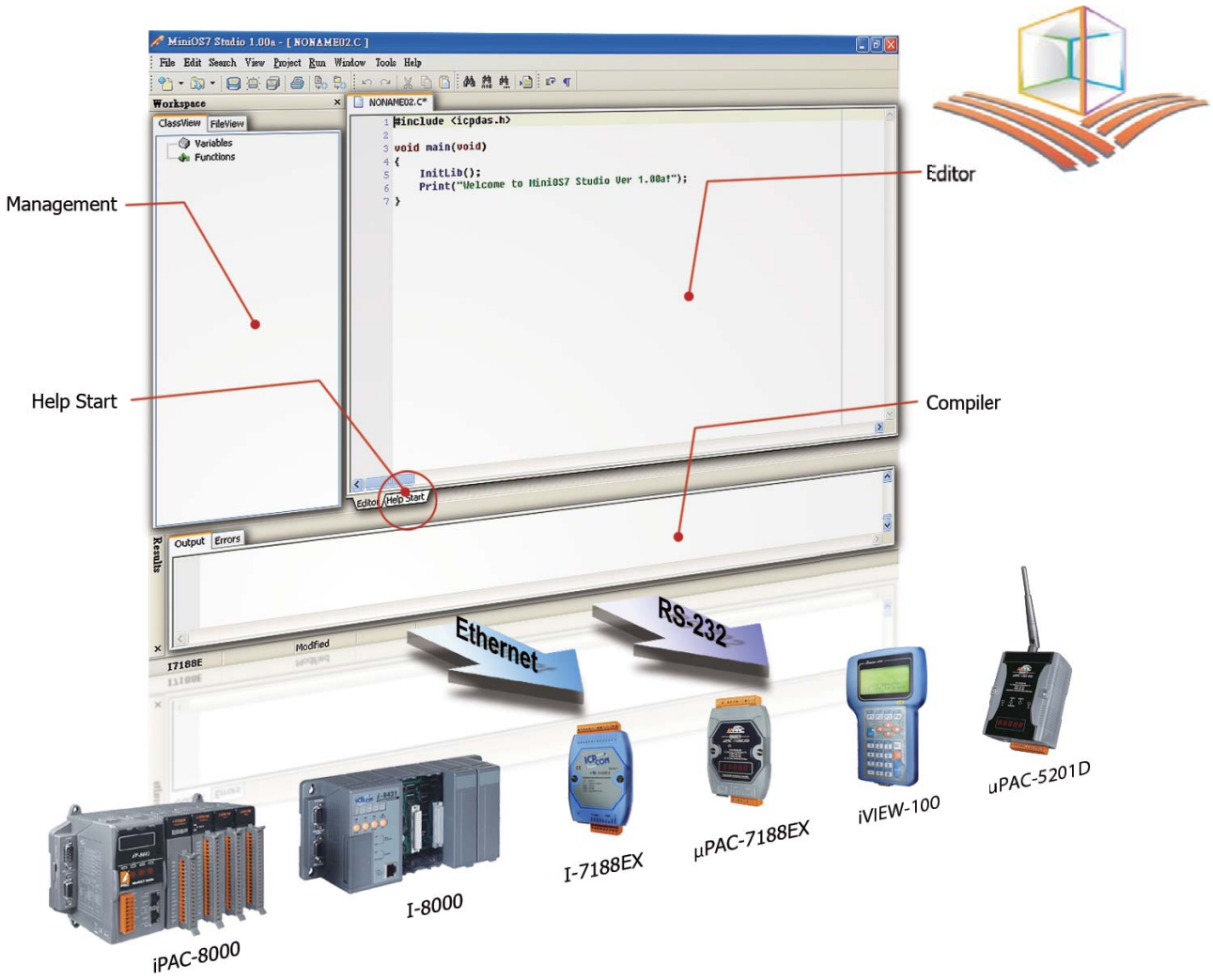
3. Supported Products:

1. 7188XA
2. 7188XB
3. 7188XC
4. 7188EX/7186EX series
5. All I-8000 series
6. iView100
7. ET-7000 series

8. MiniOS7 Studio (C language Solution)

MiniOS7 is an operating system specially designed for our PACs (Programmable Automation Controller). It has won worldwide praise and recognition for its stability, compactness, efficiency and cost-effectiveness. Now a latest cool MiniOS7 IDE tool is released to quickly and easily develop various projects for different purposes.

MiniOS7 Studio, the Integrated Development Environment (IDE) for MiniOS7, provides comprehensive set of features, such as customizable editor, integral debugging guide, online demo programs support, full source code analyzer, projects manager...etc. These features enable easy coding and execution of programs that will enhance your productivity and programming experience. You could create numerous innovative customized applications to help clients solve difficult problems and implement their new ideas.



Features:

1. Integrated platform for development.
2. Flexible and customizable plug-ins for rich and easy operating.
3. Full integration with MiniOS7 Utility, makes function coding, compiling, uploading and executing simultaneously.
4. Multi languages compatible.
5. Support several C compilers.
6. Support syntax highlighting for easily programming by C, C++ languages.
7. File view and class view supported for easy maintenance.
8. Web browser embedded to offer most practical solution of enterprise connectivity via the Internet.
9. Offer projects manager to easily manage huge projects.
10. Provide full libraries and support various controllers.

Compact PAC

2.1. XP-8000 and XP-8000-Atom Series

• Overview

Microsoft Windows Embedded Standard 2009

Microsoft Windows CE.net

intel Atom inside

The XP-8000-Atom combines the functionality and openness of PC, the reliability of a programmable logic controller (PLC), and the intelligence of I/O modules. Compared to PC and PLC, the price/performance of PAC is the best. Moreover, XP-8000-Atom can be widely used in Factory Automation, Building Automation, Machine Automation, Laboratory Automation, chemical industry, environmental monitoring, M2M…etc.

XP-8000-Atom is the new generation PAC of ICP DAS. It is equipped a Intel Atom CPU running a Windows Embedded Standard 2009(XPE) or Windows Embedded CE6 Operating System, various connectivity (VGA, USB, Ethernet, RS-232/RS-485) and 1/3/7 slots for high performance parallel I/O modules. Compared with the XP-8000 (AMD LX800), it not only improves the CPU performance (5~6 times faster than AMD LX800), but also adds many features, such as DDR2 memory, Dual Gigabits Ethernet, HD Audio, replaceable SSD (8G), etc.

With the Intel Hyper-Threading Technology of Atom CPU, the XP-8000-Atom can be used for deterministic operation. XP-8000-Atom supports Windows Embedded Standard 2009(XPE) and Windows CE6 R3.

Windows Embedded Standard 2009 has the same Win32 API as Windows XP Professional. Most popular applications on desktop can be easily ported to Windows Embedded Standard 2009. It's also compatible with rich Windows IDEs, such as Visual studio, Delphi, Borland C++ Builder, etc. These points effectively reduce the efforts of developments and shorten the time to market.

Windows Embedded CE is a componentized, real-time, high performance, and highly reliable operating system. Windows CE 6 R3 delivers rich user experiences and a unique connection to Windows PCs, servers, services, and devices. XP-8000-Atom also supports Soft PLC such as ISaGRAF and K.W..

XP-8000-Atom ≒ IPC+I/O Cards

Main Components:

1 Main Control Unit (MCU)

The MCU is the powerhouse of the XP-8000-Atom. Each MCU comprises a Central Processor Module (CPM), a power supply, and a 1, 3, 7-slot backplane for I/O modules. The CPM is powerful integrated processing engine comprising a CPU, RAM and ROM, and an option of communication interfaces including Ethernet, RS-485, RS-232, CAN bus and FRnet.

3 I/O Modules

I/O modules have two types, i.e., parallel bus and serial bus. The parallel bus type I/O modules (high profile I-8K series) are high speed ones used only in the PACs including XPAC, WinPAC, iPAC, ViewPAC, etc. And the serial bus type I/O modules (high profile I-87K series) are low speed ones used in both PACs including XPAC, WinPAC, iPAC, ViewPAC, etc., and I/O expansion units including RU-87Pn, ET-87Pn, USB-87Pn, etc.

4 Remote I/O Expansion

XP-8000-Atom uses built-in RS-485 and Ethernet ports to connect RS-485/Ethernet remote I/O units (RU-87Pn/ ET-87Pn) or modules (I-7000/M-7000/ET-7000). In this configuration, XP-8000-Atom expands the I/O very easily.
Using CAN or FRnet communication module, XP-8000-Atom can connect CAN bus devices, remote I/O units or FRnet I/O modules for deterministic control system.

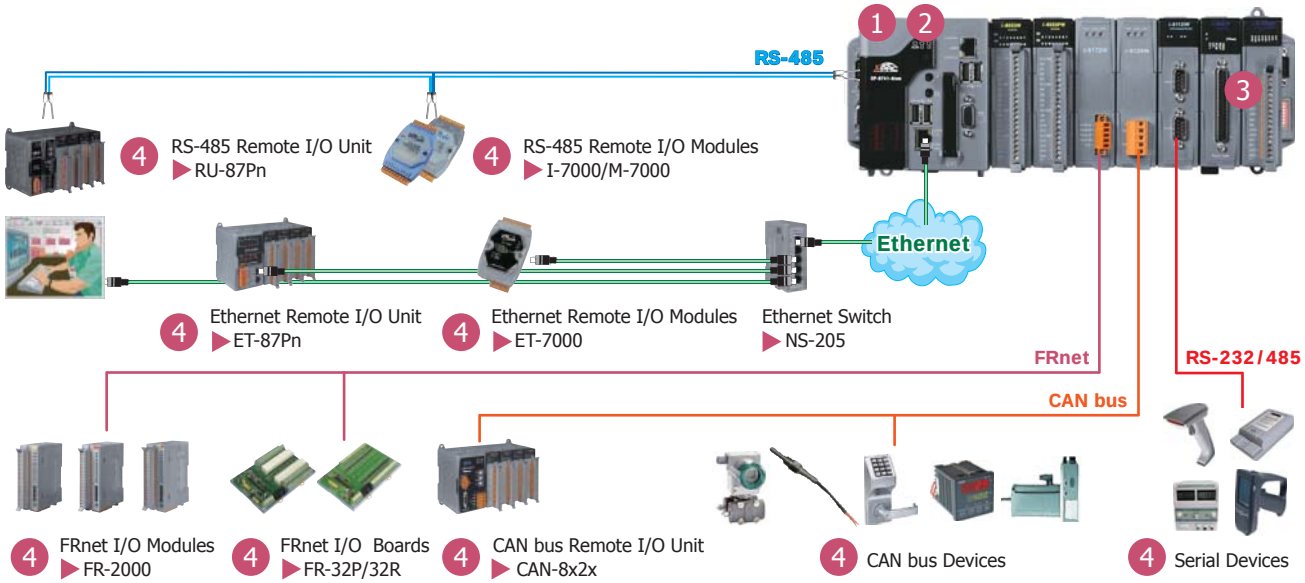
2 Embedded OS

• **Windows Embedded Standard 2009(XPE)**

Most of the popular features in Windows software are included, such as EWF(Enhanced Write Filter), Remote Desktop Connection, IIS, ASP/ASP.NET, SQL Server 2005 Express Edition, .NET Framework 3.5 and also supports rich development software solutions, such as VS 6.0, VS.NET 2005/2008, VB, Delphi, BCB, InduSoft, etc.

• **Windows CE6**

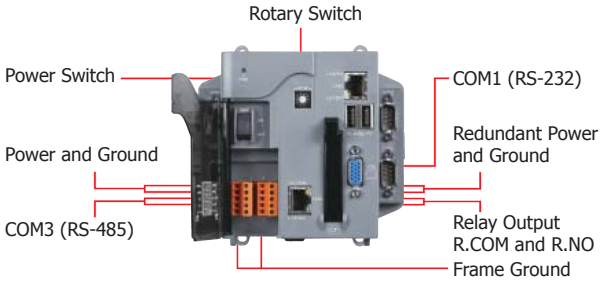
Windows CE 6 is a compact and real-time OS used to quickly create time critical and high performance applications. With Windows CE 6, users can use familiar tools (VS .NET 2005/2008) to develop software. Its kernel architecture supports significantly more simultaneously running processes, from 32 up to 32,000 simultaneous processes, each of which can run in a 2GB virtual memory address space. This allows developers to incorporate larger numbers of more complex applications into the XP-8000-Atom-CE6. Further more, the development tools of Soft PLC (ISaGRAF) and SCADA (InduSoft) are also available.



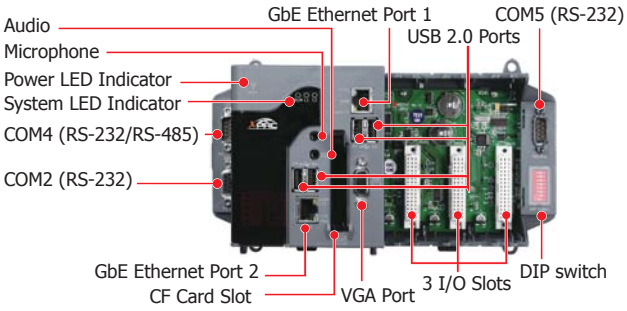
• Hardware

• Appearance

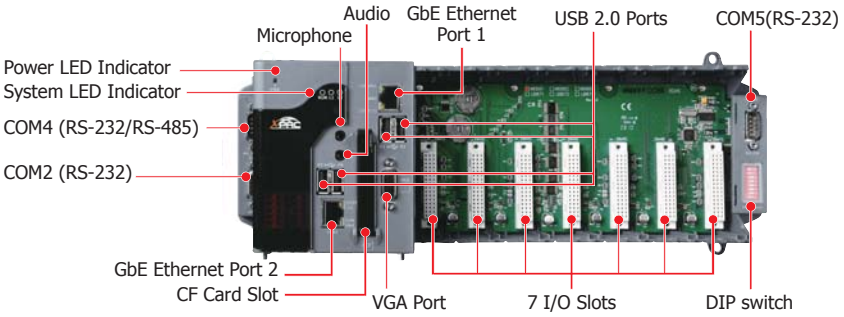
XP-8041



XP-8341-Atom



XP-8741-Atom



• Selection Guide

XP-8 X X X - Atom

- **NO. of I/O Slot**
- **Hardware**
  4: VGA 1600 x 1200
- **Software**
  1: Standard

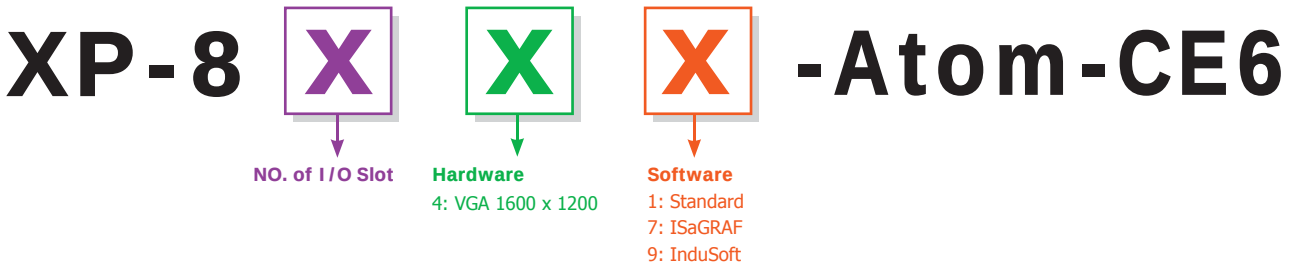
XP-8 X X X

- **NO. of I/O Slot**
- **Hardware**
  4: VGA 1600 x 1200
- **Software**
  1: Standard

Standard XPAC (Windows Embedded Standard 2009)

Model Name	OS	Pre-installed Software	CPU	Flash	SDRAM	VGA Resolution	Ethernet Port	RS-232/RS-485	I/O Slot
XP-8141-Atom	WES 2009	None	Atom Z520, 1.33 GHz	8 GB	DDR2 x 1 GB	1600 x 1200	2	4	1
XP-8341-Atom									3
XP-8741-Atom									7
XP-8041			LX800, 500 MHz	4 GB	DDR x 1 GB			5	0
XP-8341								4	3
XP-8741									7

The controller supports following software development tools:
1. DLLs of I/O modules for VS.NET 2005/2008
2. OPC server for SCADA softw



Standard XPAC (Windows CE .NET 6.0 Inside)

Model Name	OS	Pre-installed Software	CPU	Flash	SDRAM	VGA Resolution	Ethernet Port	RS-232/RS-485	I/O Slot
XP-8141-Atom-CE6	CE 6.0	None	Atom Z510, 1.10 GHz	2 GB	DDR2 x 512 MB	1024 x 768	2	4	1
XP-8341-Atom-CE6									3
XP-8741-Atom-CE6									7
XP-8041-CE6			LX800, 500 MHz	4 GB	DDR x 512 MB			5	0
XP-8341-CE6								4	3
XP-8741-CE6									7

The controller supports following software development tools:
1. DLLs of I/O modules for eVC, VS.Net 2005/2008
2. DLLs of Modbus/RTU and Modbus/TCP for eVC and VS.Net 2005/2008
3. OPC server (Quicker)

ISaGRAF Based XPAC (Windows CE .NET 6.0 Inside)

Model Name	OS	Pre-installed Software	CPU	Flash	SDRAM	VGA Resolution	Ethernet Port	RS-232/RS-485	I/O Slot
XP-8147-Atom-CE6	CE 6.0	ISaGRAF	Atom Z510 (1.10 GHz)	2 GB	DDR2 x 512 MB	1024 x 768	2	4	1
XP-8347-Atom-CE6									3
XP-8747-Atom-CE6									7
XP-8047-CE6			LX800, 500 MHz	4 GB	DDR x 512 MB			5	0
XP-8347-CE6								4	3
XP-8747-CE6									7

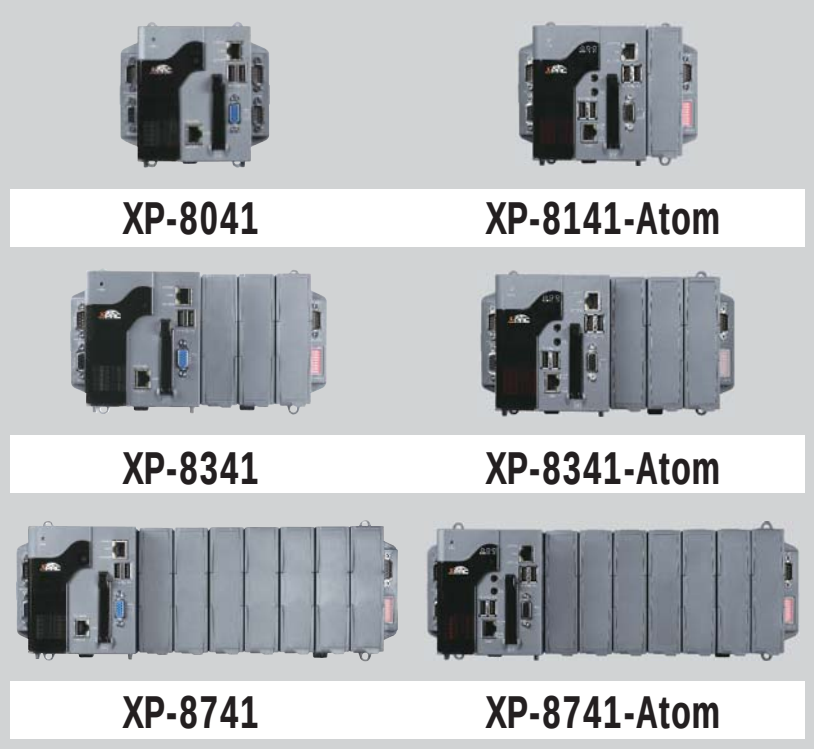
The controller fully supports all five of the IEC61131-3 standard PLC languages:
1. Ladder diagram,
2. Function block diagram,
3. Sequential function chart,
4. Structured text,
5. Instruction List plus flow chart.

It supports Modbus protocol and can link to distributed I/O modules with Modbus or DCON protocol via the RS-232/485 or Ethernet.

InduSoft Based XPAC (Windows CE .NET 6.0 Inside)

Model Name	OS	Pre-installed Software	CPU	Flash	SDRAM	VGA Resolution	Ethernet Port	RS-232/RS-485	I/O Slot
XP-8149-Atom-CE6	CE 6.0	InduSoft	Atom Z510 (1.10 GHz)	2 GB	DDR2 x 512 MB	1024 x 768	2	4	1
XP-8349-Atom-CE6									3
XP-8749-Atom-CE6									7
XP-8049-CE6			LX800, 500 MHz	4 GB	DDR x 512 MB			5	0
XP-8349-CE6								4	3
XP-8749-CE6									7

The controller can be used to develop following applications:
1. Human Machine Interfaces (HMI)
2. Supervisory Control and Data Acquisition System (SCADA)
3. Web server



Features

- LX800, 500 MHz CPU or Atom Z520, 1.33 GHz CPU
- Windows Embedded Standard 2009
- SQL Server 2005 Express Edition
- Audio with Microphone-In and Earphone-Out
- VGA Port Output
- Support eLogger HMI
- Redundant Power Inputs
- Operating Temperature: -25 ~ +75°C

Introduction

XP-8x41-Atom series is the new generation Windows Embedded Standard 2009 based PACs of XP-8x41. It is equipped with an Intel Atom Z520 Series CPU at 1.33GHz, while XP-8x41 is equipped with a LX800 CPU at 500 MHz. They provide various connectivity (VGA, USB, Ethernet, RS-232/485) and 0/1/3/7 I/O slots 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 2009 include

- Enhanced Write Filter (EWF): Protects disk against improper disk write operations.
- Same Win32 API: Makes developing applications just like Windows XP Professional developers do.

This makes almost every PC-based program can be easily ported to XPAC-Atom and effectively reduces the system development efforts and shortens the time to market.

For software copy protection, programmers can design software based on the 64-bit hardware serial number for making software copy protected.

Windows Embedded Standard 2009

Microsoft Windows Embedded Standard 2009

Windows Embedded Standard 2009 has the same Win32 API as Windows XP Professional. Most popular applications on desktop can be easily ported to Windows Embedded Standard 2009. It's also compatible with rich Windows IDEs, such as Visual studio, Delphi, Borland C++ Builder, etc. These points effectively reduce the efforts of developments and shorten the time to market.

The key features are

- Full Win32 API
- Remote Desktop Protocol 5.1
- Silverlight 4.0
- Enhanced Write Filter
- MS SQL Server 2008 R2 Express
- Microsoft .NET Framework 3.5

Specifications

Models	XP-8041	XP-8341	XP-8741	XP-8141-Atom	XP-8341-Atom	XP-8741-Atom
System Software						
OS	Microsoft Windows Embedded Standard 2009					
.Net Compact Framework	3.5					
Embedded Service	FTP Server, Internet Information Service 5.1, ASP (Java Script, VB Script), SQL Server 2005 Express					
SDK Provided	Dll for VC, VB, Delphi, BCB, Visual Studio .NET 2005/2008					
Multilanguage Support	English, German, French, Spanish, Russian, Italian, Czech, Japanese, Korean, Simplified Chinese, Traditional Chinese					
CPU Module						
CPU	LX800, 500 MHz			Atom Z520, 1.33 GHz		
System Memory	1 GB DDR SDRAM			1 GB DDR2 SDRAM		
Dual Battery Backup SRAM	512 KB; data valid up to 5 years					
Flash	4 GB as IDE Master			8 GB as IDE Master		
EEPROM	16 KB					
CF Card	8 GB (support up to 32 GB)					
RTC (Real Time Clock)	Provide second, minute, hour, date, day of week, month, year					
Programmable LED Indicator	-			2		
64-bit Hardware Serial Number	Yes, for Software Copy Protection					
Dual Watchdog Timers	Yes					
Rotary Switch	Yes (0 ~ 9)					
DIP Switch	-	Yes (8 bits)				
Audio	-			Microphone-In and Earphone-Out		
VGA & Communication Ports						
VGA	Yes, (resolution: 1600 x 1200, 1024 x 768, 800 x 600 , 640 x 480)					
Ethernet (Giga bit)	RJ-45 x 2, 10/100/1000 Base-T (Auto-negotiating, Auto MDI/MDI-X, LED indicators)					
USB 2.0	2			4		
COM 1	RS-232 (RxD, TxD and GND); non-isolated	Internal communication with the 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					
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 and GND); non-isolated					
I/O Expansion Slots						
Slot Number	0	3	7	1	3	7
Mechanical						
Dimensions (W x L x H)	137 x 132 x 125 mm	231 x 132 x 125 mm	355 x 132 x 125 mm	169 x 132 x 125 mm	231 x 132 x 125 mm	355 x 132 x 125 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 V_{DC}					
Isolation	1 kV					
Redundant Power Inputs	Yes, with one power relay (1 A @ 24 V_{DC}) for alarm					
Capacity	15 W	35 W	35 W	25 W	35 W	35 W
Consumption	14.4 W	14.4 W	16.8 W	16.6 W	16.8 W	18 W

Ordering Information

XP-8041 CR	Standard XP-8000 without I/O Slot (Multilingual Version of OS) (RoHS)
XP-8341 CR	Standard XP-8000 with 3 I/O Slots (Multilingual Version of OS) (RoHS)
XP-8741 CR	Standard XP-8000 with 7 I/O Slots (Multilingual Version of OS) (RoHS)
XP-8141-Atom CR	Standard XP-8000-Atom with 1 I/O Slot (Multilingual Version of OS) (RoHS)
XP-8341-Atom CR	Standard XP-8000-Atom with 3 I/O Slots (Multilingual Version of OS) (RoHS)
XP-8741-Atom CR	Standard XP-8000-Atom with 7 I/O Slots (Multilingual Version of OS) (RoHS)
Note: Call for customized XPAC-8000-Atom	

Accessories

DP-660	24 V_{DC}/2.5 A, 60 W and 5 V_{DC}/0.5 A, 2.5 W Power Supply with DIN-Rail Mounting
DP-1200 CR	24 V_{DC}/5.0 A, 120 W Power Supply with DIN-Rail Mounting (RoHS)
MDR-60-24 CR	24 V_{DC}/2.5 A, 60 W Power Supply with DIN-Rail Mounting (RoHS)
NS-205 CR	Unmanaged 5-port Industrial 10/100 Ethernet Switch with Plastic Case (RoHS)
NS-208 CR	Unmanaged 8-port Industrial 10/100 Ethernet Switch with Plastic Case (RoHS)

Features

- LX800, 500 MHz CPU or Atom Z510, 1.1 GHz CPU
- Windows CE 6.0 R3 Core
- Hard Real-Time Capability
- Audio with Microphone-In and Earphone-Out
- VGA Port Output
- Support eLogger HMI
- Redundant Power Inputs
- Operating Temperature: -25 ~ +75°C

Introduction

XP-8x41-Atom-CE6 Series is the new generation Windows CE 6.0 based PACs of XP-8x41-CE6. It is equipped with an Intel Atom Z510 Series CPU at 1.1GHz, while XP-8x41 is equipped with a LX800 at 500 MHz. They provide various connectivity (VGA, USB, Ethernet, RS-232/485) and 0/1/3/7 I/O slots 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 CE 6.0 on XPAC-Atom include hard real-time capability, small core size, fast boot speed, interrupt handling at a deeper level and achievable deterministic control. XPAC-Atom 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.

For software copy protection, programmers can design software based on the 64-bit hardware serial number for making software copy protected.

Windows CE6

Microsoft Windows CE.net

Windows CE 6 is a compact and real-time OS used to quickly create time critical and high performance applications. With Windows CE 6, users can use familiar tools (VS .NET 2005/2008) to develop software. Its kernel architecture supports significantly more simultaneously running processes, from 32 up to 32,000 simultaneous processes, each of which can run in a 2GB virtual memory address space. This allows developers to incorporate larger numbers of more complex applications into the XP-8000-Atom-CE6. Further more, the development tools of Soft PLC (ISaGRAF) and SCADA (InduSoft) are also available.

- FTP Server
- Web Server
- SQL Compact Edition 3.5
- .NET Compact Framework 3.5
- Virtual CE Pro (VCEP)
- Remote Display
- OPC Server (NAPOPC_CE6 DA Server)
- Soft PLC solution: XP-8xx7-CE6 and XP-8xx7-Atom-CE6 (ISaGRAF inside)
- SCADA solution: XP-8xx9-CE6 and XP-8xx9-Atom-CE6 (InduSoft inside)

Specifications

Models	XP-8041-CE6	XP-8341-CE6	XP-8741-CE6	XP-8141-Atom-CE6	XP-8341-Atom-CE6	XP-8741-Atom-CE6
System Software						
OS	Windows CE 6.0 R3 Core					
.Net Compact Framework	3.5					
Embedded Service	FTP Server, ASP (Java Script, VB Script), SQL Compact Edition 3.5					
SDK Provided	Dll for Visual Studio .Net 2005/2008					
Multilanguage Support	English, German, French, Spanish, Russian, Italian, Czech, Japanese, Korean, Simplified Chinese, Traditional Chinese					
CPU Module						
CPU	LX800, 500 MHz			Atom Z510, 1.1 GHz		
System Memory	512 MB DDR SDRAM			512 MB DDR2 SDRAM		
Dual Battery Backup SRAM	512 KB; data valid up to 5 years					
Flash	4 GB as IDE Master			2 GB as IDE Master		
EEPROM	16 KB					
CF Card	2 GB (support up to 32 GB)					
RTC (Real Time Clock)	Provide second, minute, hour, date, day of week, month, year					
Programmable LED Indicator	-			2		
64-bit Hardware Serial Number	Yes, for Software Copy Protection					
Dual Watchdog Timers	Yes					
Rotary Switch	Yes (0 ~ 9)					
DIP Switch	-	Yes (8 bits)				
Audio	-			Microphone-In and Earphone-Out		
VGA & Communication Ports						
VGA	Yes, (resolution: 1024 x 768, 800 x 600 , 640 x 480)					
Ethernet (Giga bit)	RJ-45 x 2, 10/100/1000 Base-T (Auto-negotiating, Auto MDI/MDI-X, LED indicators)					
USB 2.0	2			4		
COM 1	RS-232 (RxD, TxD and GND); non-isolated	Internal communication with the 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					
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 and GND); non-isolated					
I/O Expansion Slots						
Slot Number	0	3	7	1	3	7
Mechanical						
Dimensions (W x L x H)	137 x 132 x 125 mm	231 x 132 x 125 mm	355 x 132 x 125 mm	169 x 132 x 125 mm	231 x 132 x 125 mm	355 x 132 x 125 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 V_{DC}					
Isolation	1 kV					
Redundant Power Inputs	Yes, with one power relay (1 A @ 24 V_{DC}) for alarm					
Capacity	15 W	35 W	35 W	25 W	35 W	35 W
Consumption	14.4 W	14.4 W	16.8 W	16.6 W	16.8 W	18 W

Ordering Information

XP-8041-CE6 CR	0 I/O slot WinCE 6.0 Based Standard XPAC (OS: Multi-Language version) (RoHS)
XP-8341-CE6 CR	3 I/O slots WinCE 6.0 Based Standard XPAC (OS: Multi-Language version) (RoHS)
XP-8741-CE6 CR	7 I/O slots WinCE 6.0 Based Standard XPAC (OS: Multi-Language version) (RoHS)
XP-8141-Atom-CE6 CR	1 I/O slot WinCE 6.0 Based Standard XPAC (OS: Multi-Language version) (RoHS)
XP-8341-Atom-CE6 CR	3 I/O slots WinCE 6.0 Based Standard XPAC (OS: Multi-Language version) (RoHS)
XP-8741-Atom-CE6 CR	7 I/O slots WinCE 6.0 Based Standard XPAC (OS: Multi-Language version) (RoHS)

Accessories

DP-660	24 V_{DC}/2.5 A, 60 W and 5 V_{DC}/0.5 A, 2.5 W Power Supply with DIN-Rail Mounting
DP-1200 CR	24 V_{DC}/5.0 A, 120 W Power Supply with DIN-Rail Mounting (RoHS)
MDR-60-24 CR	24 V_{DC}/2.5 A, 60 W Power Supply with DIN-Rail Mounting (RoHS)
NS-205 CR	Unmanaged 5-port Industrial 10/100 Ethernet Switch with Plastic Case (RoHS)
NS-208 CR	Unmanaged 8-port Industrial 10/100 Ethernet Switch with Plastic Case (RoHS)

Features

- LX800, 500 MHz CPU or Atom Z510, 1.1 GHz CPU
- Windows CE 6.0 R3 Core
- ISaGRAF Ver.3 SoftLogic Inside (IEC 61131-3)
- Hard Real-Time Capability
- VGA Port Output
- Modbus RTU/TCP (Master, Slave)
- Support Soft-GRAF HMI
- Redundant Power Inputs
- Operating Temperature: -25 ~ +75°C

Introduction

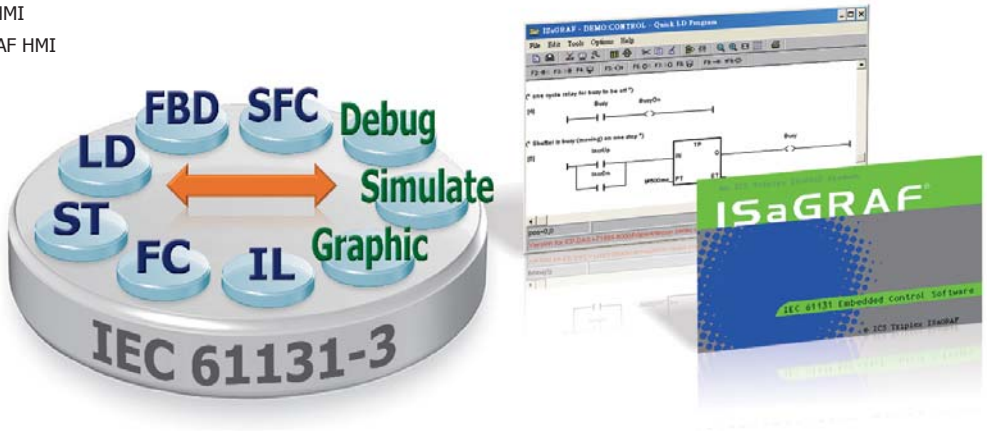
XP-8x47-CE6 Series is the new generation ISaGRAF based PACs of ICP DAS. It is equipped with an AMD LX800 CPU (500 MHz), various connectivity (VGA, USB, Ethernet, RS-232/485) and 0/3/7 I/O slots for high performance parallel I/O modules (high profi le I-8K Series) and serial I/O modules (high profi le I-87K series).

The benefi ts of running Windows CE 6.0 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 ISaGRAF and 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.

ISaGRAF Features

ISaGRAF is the most powerful SoftLogic package on the market. ISaGRAF is a PLC-like software and it supports IEC 61131-3 standard PLC programming languages (LD, FBD, SFC, ST, IL, FC), and can run the application generated by the workbench on any ISaGRAF PACs. The ISaGRAF workbench Ver. 3.x features.

- IEC 61131-3 Standard Open PLC Programming Languages (LD, FBD, SFC, ST, IL, FC) + Flow Chart (FC)
- Auto-Scan I/O
- On-Line Debug/Control/Monitor, Off-Line Simulation
- Simple Graphic HMI
- Support Soft-GRAF HMI

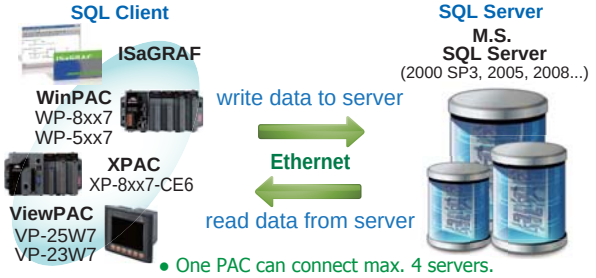


Soft-GRAF Studio Colorful HMI

Running HMI and Control Logic on the Same PAC

M2B Machine To Business Application

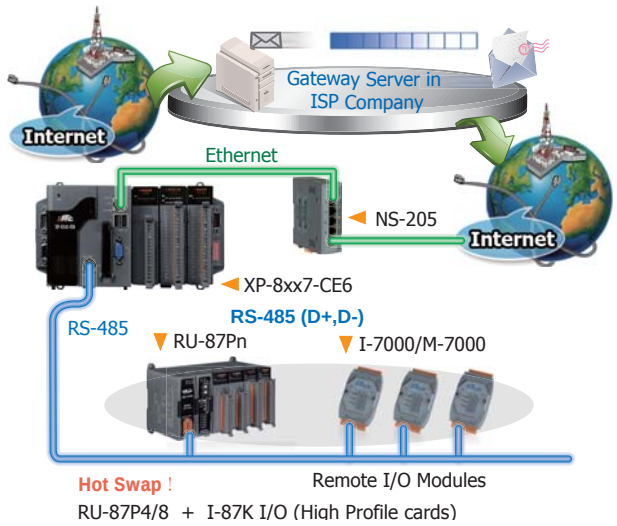
SQL Server Communication



- One PAC can connect max. 4 servers.

Motion Control: Using I-8094F/8092F/8094

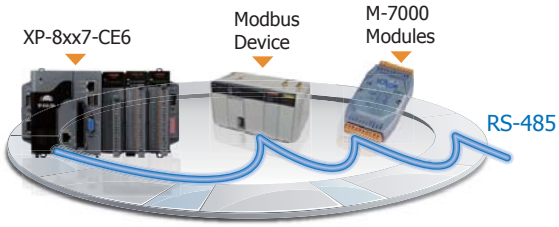
Send Email with one Attached File



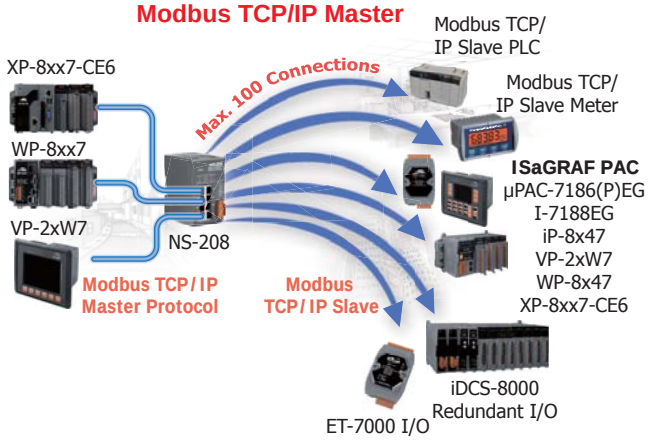
RU-87P4/8 + I-87K I/O (High Profile cards)

Modbus Master Ports

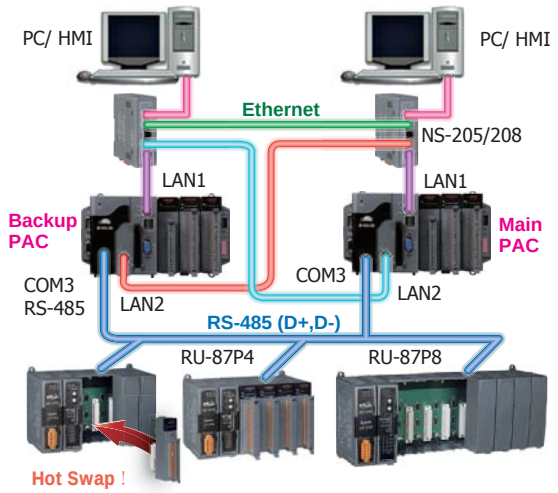
Modbus RTU/ASCII Master



Modbus TCP/IP Master



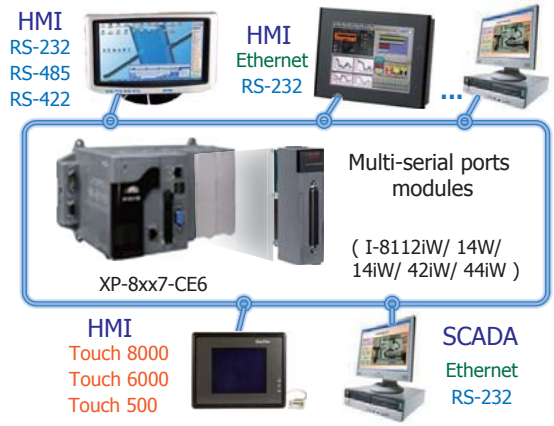
Hot-Swap Redundant System



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

Modbus Slave : RTU / TCP

- Modbus RTU (RS-232/485/422) Slave: max. 9 ports
- Modbus TCP/IP Slave: max. 64 connections



Specifications

Models		XP-8047-CE6	XP-8347-CE6	XP-8747-CE6	XP-8147-Atom-CE6	XP-8347-Atom-CE6	XP-8747-Atom-CE6
System Software							
OS		Windows CE 6.0 R3 Core					
.Net Compact Framework		3.5					
Embedded Service		FTP Server, ASP (Java Script, VB Script), SQL Compact Edition 3.5					
SDK Provided		Dll for Visual Studio .Net 2005/2008					
Multilanguage Support		English, German, French, Spanish, Russian, Italian, Czech, Japanese, Korean, Simplified Chinese, Traditional Chinese					
Development Software							
ISaGRAF Software	ISaGRAF Ver.3	IEC 61131-3 standard.					
	Languages	LD, ST, FBD, SFC, IL & FC Support Soft-GRAF HMI: XP-8xx7-CE6, WP-8xx7, VP-2xW7 and WP-5xx7 PAC					
	Max. Code Size	2 MB					
	Scan Time	3 ~ 15 ms for normal program 15 ~ 50 ms (or more) for complex or large program					
Non-ISaGRAF		Options: VS.NET 2005/2008 (VB.NET, C#.NET)					
Web Service							
Web HMI		PC running Internet Explorer can monitor/control PAC via Internet/modem					
Security		Web HMI supports three levels username and password protection. (high/middle/low)					
CPU Module							
CPU		LX800, 500 MHz			Atom Z510, 1.1 GHz		
System Memory		512 MB DDR SDRAM			512 MB DDR2 SDRAM		
Dual Battery Backup SRAM		512 KB; data valid up to 5 years (for retain variables)					
Flash		4 GB as IDE Master			2 GB as IDE Master		
EEPROM		16 KB					
CF Card		2 GB (support up to 32 GB)					
RTC (Real Time Clock)		Provide second, minute, hour, date, day of week, month, year					
Programmable LED Indicator		-			2		
64-bit Hardware Serial Number		Yes, for Software Copy Protection					
Dual Watchdog Timers		Yes					
Rotary Switch		Yes (0 ~ 9)					
DIP Switch		-	Yes (8 bits)				
Audio		-			Microphone-In and Earphone-Out		
VGA & Communication Ports							
VGA		Yes, (resolution: 1024 x 768, 800 x 600, 640 x480)					
Ethernet		RJ-45 x 2, 10/100 Base-TX (Auto-negotiating, Auto MDI/MDI-X, LED indicators).					
USB 2.0		2			4		
COM 1		RS-232 (RxD, TxD and GND); non-isolated	Internal communication with the 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					
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 and GND); non-isolated					
I/O Expansion Slots							
Slot Number		0	3	7	1	3	7
Mechanical							
Dimensions (W x L x H)		137 x 132 x 125 mm	231 x 132 x 125 mm	355 x 132 x 125 mm	169 x 132 x 125 mm	231 x 132 x 125 mm	355 x 132 x 125 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 V_{DC}					
Isolation		1 kV					
Redundant Power Inputs		Yes, with one power relay (1 A @ 24 V_{DC}) for alarm					
Capacity		15 W	35 W	35 W	25 W	35 W	35 W
Consumption		14.4 W	14.4 W	16.8 W	16.6 W	16.8 W	18 W

ISaGRAF Specifications

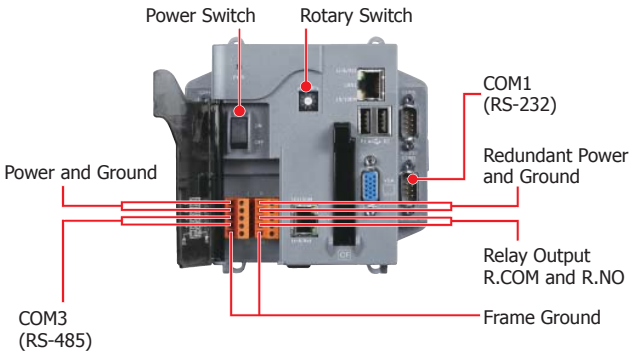
Protocols (some protocols need optional devices)		
Net ID		1 ~ 255, user-assigned by software
Modbus TCP/IP Master		Link to max. 100 devices that support Standard Modbus TCP/IP Slave protocol (FAQ-113)
Modbus RTU/ASCII Master		Max. 33 Ports : COM1 ~ 33 (To connect to other Modbus Slave devices). (*)
Modbus RTU Slave		Max. 9 Ports : COM1 ~ 33 (For connecting ISaGRAF, PC/HMI/OPC Server & HMI panels). (*)
Modbus TCP/IP Slave		2 Ethernet Ports all support Modbus TCP/IP Slave protocol for connecting ISaGRAF & PC/HMI. 2 Ports support up to 64 connections. Note: If PAC uses 1 connection to connect each PC/HMI, it can connect up to 64 PC/HMI; If PAC uses 2 connections to connect each PC/HMI, it can connect up to 32 PC/HMI; When one Ethernet port is broken, the other one can still connect to PC/HMI.
Web HMI Protocol		Ethernet Ports for connecting PC running Internet Explorer.
I-7000 & I-87K RS-485 Remote I/O		One of COM3~4 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. Max. 255 modules of I-7000/87K Remote I/O for one PAC.
M-7000 Series Modbus I/O		Max. 33 RS-485 ports. Each port can connect 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 is broken, it will switch to LAN1 automatically to continuously work. (This need LAN1 & LAN2's IP are set in the same IP domain) (FAQ-042)
FRnet I/O		Support max 7 pcs. I-8172W boards in slot 1 ~ 7 to connect to FRnet I/O modules, like FR-2053, FR-2057 FR-32R, FR-32P. (FAQ-048). Each I-8172W board can link max. 256 DI plus 256 DO ch.
Send Email		Supports mail_snd and mail_set functions to send email with one attached file via Ethernet port.
Ebus		To exchange data between ICP DAS's ISaGRAF Ethernet PACs via Ethernet port. (LAN2 Port only)
SMS: Short Message Service		COM4 or COM5 can link to a GSM Modem to support SMS. User can request data/control the controller by cellular phone. The controller can also send data & alarms to user's cellular phone. Optional GSM Modem: GTM-201-RS232 (850/900/1800/1900 GSM/GPRS External Modem)
User-Defined Protocol		User can write his own protocol applied at COM1~COM5 & COM6~COM33 by Serial communication function blocks. (*)
MMICON/LCD		COM4 or COM5 supports ICP DAS's MMICON.
UDP Server & UDP Client : Exchange Message & Auto-Report		LAN1 or LAN2 support UDP Server and UDP Client protocol to send/receive message to / from PC/HMI or other devices. For example, to automatically report data to InduSoft's RXTX driver.
TCP Client : Exchange Message & Auto-Report		LAN1 or LAN2 support TCP Client protocol to send / receive message to / from PC/HMI or other devices which support TCP server protocol.
GPRS/SMS		Support the I-8212W (2G/3G) card to receive/send a short message or to dial up to link the Internet by GPRS connection to send an email or communicate with remote stations by using "Ftp Client" (FAQ-151) and "TCP Client" / "UDP Server" / "UDP Client" (FAQ-143).
SQL Client		Support SQL Client function to write data to (or read data from) 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 PAC 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-138 and FAQ-125)
CAN/CANopen		COM1, 2, 4, 5 or COM6~COM33 to connect one I-7530 (converter: RS-232 to CAN) to support CAN/CANopen devices and sensors. One PAC supports max.32 RS-232 ports to connect max.32 I-7530. (*) (FAQ-086)
CANopen Master		Support the I-8123W CANopen Master card to connect other CANopen slave devices. (FAQ-145)
HART Solutions		Support I-87H17W modules in slot 1 to 7 to communicate with other HART devices.
FTP Client		Support FTP client to upload files in the PAC to a remote FTP server on PC. (FAQ-151)
Soft-GRAF HMI		Support the Soft-GRAF HMI . User can use the Soft-GRAF Studio on the PC to design the HMI screen and then download it to the PAC to display the HMI on the PAC. (FAQ-146)
Optional I/O Functions (Refer to 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	88-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-7000 & 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, 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	XP-8347-CE6 / XP-8747-CE6 : Integrate with one or several I-8092F (2-axis) or I-8094F/I-8094 (4-axis)

*** Note: COM6 ~ COM33 are resided at the expansion boards if they are plugged on slot 1~7 of XP-8xx7-CE6.**
XP-8347-CE6/8747-CE6's COM1 is for internal communication with I-87K modules in slots only.

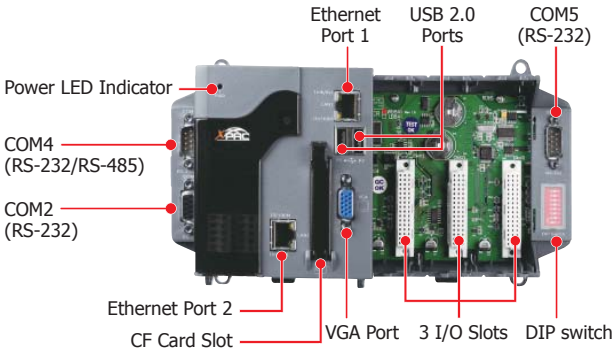
*** ISaGRAF FAQ: http://www.icpdas.com/faq/isagraf.htm**

Appearance

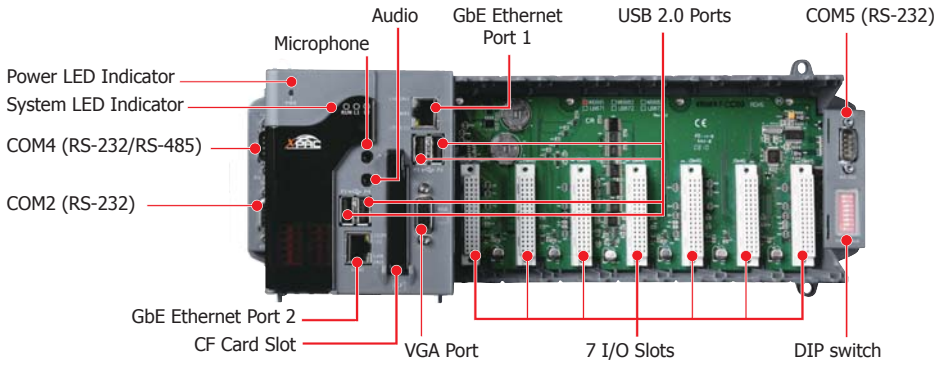
XP-8047-CE6



XP-8347-CE6



XP-8747-Atom-CE6



Ordering Information

XP-8047-CE6 CR	0 I/O slot WinCE 6.0 Based ISaGRAF PAC (OS: Multi-Language version) (RoHS)
XP-8347-CE6 CR	3 I/O slots WinCE 6.0 Based ISaGRAF PAC (OS: Multi-Language version) (RoHS)
XP-8747-CE6 CR	7 I/O slots WinCE 6.0 Based ISaGRAF PAC (OS: Multi-Language version) (RoHS)
XP-8147-Atom-CE6 CR	1 I/O slot WinCE 6.0 Based Standard XPAC (OS: Multi-Language version) (RoHS)
XP-8347-Atom-CE6 CR	3 I/O slots WinCE 6.0 Based Standard XPAC (OS: Multi-Language version) (RoHS)
XP-8747-Atom-CE6 CR	7 I/O slots WinCE 6.0 Based Standard XPAC (OS: Multi-Language version) (RoHS)
Note: Call for customized XPAC-8000-Atom-CE6	

Accessories

ISaGRAF Development Software	
ISaGRAF-256-E	ISaGRAF Workbench Software Ver.3 (256 I/O Tags) with One Application Book (English version) and one USB Dongle
ISaGRAF-256-C	ISaGRAF Workbench Software Ver.3 (256 I/O Tags) with One Application Book (Chinese version) and one USB Dongle
ISaGRAF-32-E	ISaGRAF Workbench Software Ver.3 (32 I/O Tags) with One Application Book (English version) Note: No upgrade service from ISaGRAF-32 to ISaGRAF-256. (Using ISaGRAF-32 can control more than 32 I/O tags. Please refer to ISaGRAF User's Manual Ch. 3.4)
ISaGRAF-32-C	ISaGRAF Workbench Software Ver.3 (32 I/O Tags) with One Application Book (Chinese version) Note: No upgrade service from ISaGRAF-32 to ISaGRAF-256. (Using ISaGRAF-32 can control more than 32 I/O tags. Please refer to ISaGRAF User's Manual Ch. 3.4)
DP-660	24 V_{DC}/2.5 A, 60 W and 5 V_{DC}/0.5 A, 2.5 W Power Supply with DIN-Rail Mounting
DP-1200 CR	24 V_{DC}/5.0 A, 120 W Power Supply with DIN-Rail Mounting (RoHS)
MDR-60-24 CR	24 V_{DC}/2.5 A, 60 W Power Supply with DIN-Rail Mounting (RoHS)
NS-205 CR	Unmanaged 5-port Industrial 10/100 Ethernet Switch with Plastic Case (RoHS)
NS-208 CR	Unmanaged 8-port Industrial 10/100 Ethernet Switch with Plastic Case (RoHS)

XP-8049-CE6

XP-8149-Atom-CE6

XP-8349-CE6

XP-8349-Atom-CE6

XP-8749-CE6

XP-8749-Atom-CE6

Features

- LX800, 500 MHz CPU or Atom Z510, 1.1 GHz CPU
- Windows CE 6.0 R3 Core
- InduSoft Web Studio v6.1
- Hard Real-Time Capability
- VGA Port Output
- Redundant Power Inputs
- Operating Temperature: -25 ~ +75°C

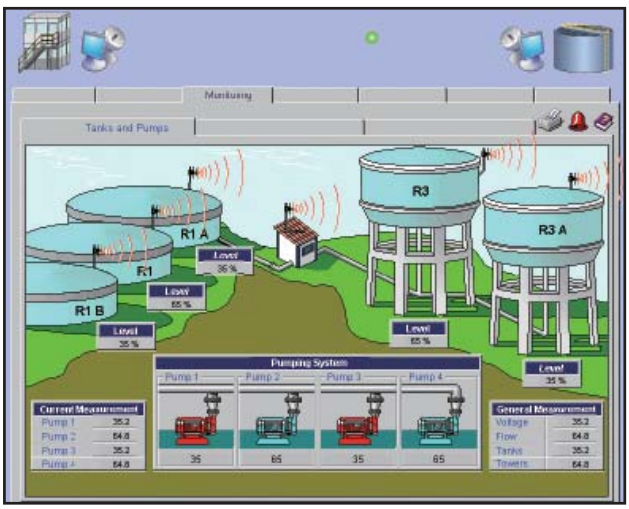
Introduction

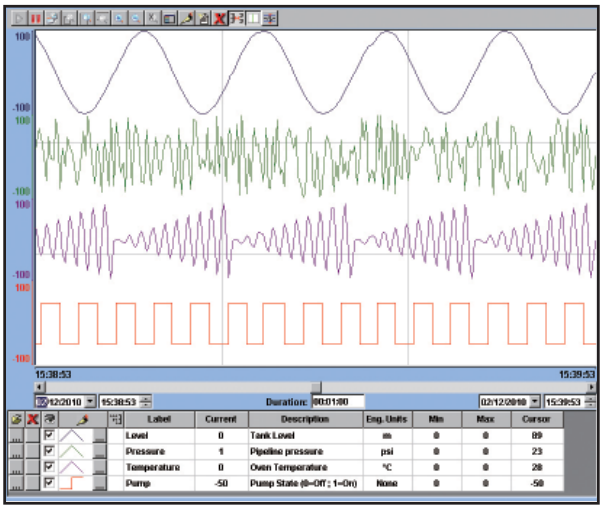
XP-8x49-CE6 Series is the new generation InduSoft based PACs of ICP DAS. It is equipped with an AMD LX800 CPU (500 MHz), various connectivity (VGA, USB, Ethernet, RS-232/485) and 0/3/7 I/O slots for high performance parallel I/O modules (high profile I-8K Series) and serial I/O modules (high profile I-87K series). The benefits of running Windows CE 6.0 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 InduSoft and 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.

InduSoft Features

InduSoft Web Studio is a powerful, integrated collection of automation tools that includes all the building blocks needed to develop modern Human Machine Interfaces (HMI), Supervisory Control and Data Acquisition (SCADA) systems, and ViewPAC applications. InduSoft Web Studio's application runs in native Windows NT, 2000, XP, CE and CE .NET environments and conforms to industry standards such as Microsoft .NET, OPC, DDE, ODBC, XML, and ActiveX.

- Elegant Graphics
- Multi-Language
- Database (Access, Excel, SQL, Oracle…)
- Recipes and Reports
- Online and History Alarm / Event / Trend
- Remote Web Client Control & Security
- Various Communication Driver (DCON, Modbus, OPC, DDE, TCP/IP…)
- ActiveX (GSM / SHM / COM /WEB provided by ICP DAS)
- System Redundancy
- Online Configuration and debugging
- Others (VBScript, E-mail, FTP, SNMP...)

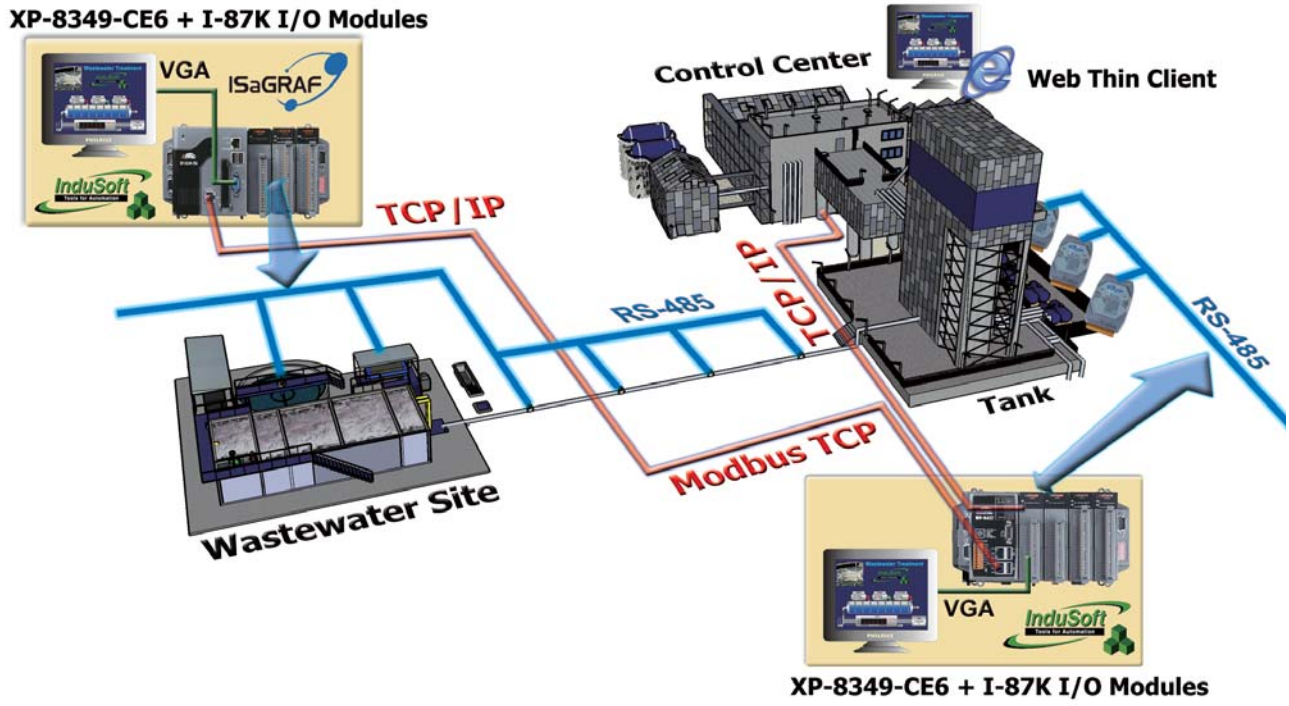




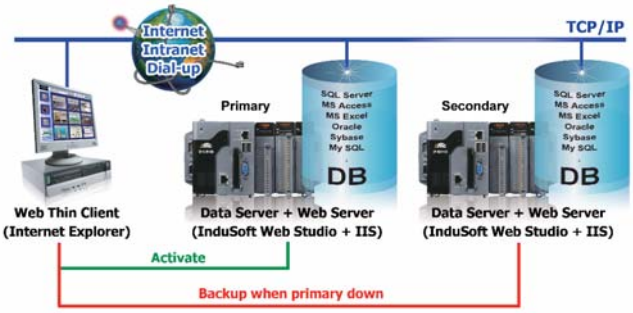
Specifications

Models	XP-8049-CE6	XP-8349-CE6	XP-8749-CE6	XP-8149-Atom-CE6	XP-8349-Atom-CE6	XP-8749-Atom-CE6
System Software						
OS	Windows CE 6.0 R3 Core					
.Net Compact Framework	3.5					
Embedded Service	FTP Server, ASP (Java Script, VB Script), SQL Compact Edition 3.5					
SDK Provided	Dll for Visual Studio .Net 2005/2008					
Multilanguage Support	English, German, French, Spanish, Russian, Italian, Czech, Japanese, Korean, Simplified Chinese, Traditional Chinese					
Development Software						
InduSoft Software	InduSoft Web Studio v6.1 Service Pack 6					
Non-ISaGRAF	Options: .NET 2005/2008 (VB .NET 2005/2008, C# .NET 2005/2008)					
Web Service						
Web HMI	Support Web HMI function, PC running Internet Explorer can access to the XP-8x49 via Local Ethernet or Internet or dial Modem, monitoring and control.					
Security	Web HMI supports three levels user name and password protection					
CPU Module						
CPU	LX800, 500 MHz			Atom Z510, 1.1 GHz		
System Memory	512 MB DDR SDRAM			512 MB DDR2 SDRAM		
Dual Battery Backup SRAM	512 KB; data valid up to 5 years					
Flash	4 GB as IDE Master			2 GB as IDE Master		
EEPROM	16 KB					
CF Card	2 GB (support up to 32 GB)					
RTC (Real Time Clock)	Provide second, minute, hour, date, day of week, month, year					
Programmable LED Indicator	-			2		
64-bit Hardware Serial Number	Yes, for Software Copy Protection					
Dual Watchdog Timers	Yes					
Rotary Switch	Yes (0 ~ 9)					
DIP Switch	-	Yes (8 bits)				
Audio	-			Microphone-In and Earphone-Out		
VGA & Communication Ports						
VGA	Yes, (resolution: 1024 x 768, 800 x 600 , 640 x 480)					
Ethernet (Giga bit)	RJ-45 x 2, 10/100/1000 Base-T (Auto-negotiating, Auto MDI/MDI-X, LED indicators)					
USB 2.0	2			4		
COM 1	RS-232 (RxD, TxD and GND); non-isolated	Internal communication with the 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					
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 and GND); non-isolated					
I/O Expansion Slots						
Slot Number	0	3	7	1	3	7
Mechanical						
Dimensions (W x L x H)	137 x 132 x 125 mm	231 x 132 x 125 mm	355 x 132 x 125 mm	169 x 132 x 125 mm	231 x 132 x 125 mm	355 x 132 x 125 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 V_{DC}					
Isolation	1 kV					
Redundant Power Inputs	Yes, with one power relay (1 A @ 24 V_{DC}) for alarm					
Capacity	15 W	35 W	35 W	25 W	35 W	35 W
Consumption	14.4 W	14.4 W	16.8 W	16.6 W	16.8 W	18 W

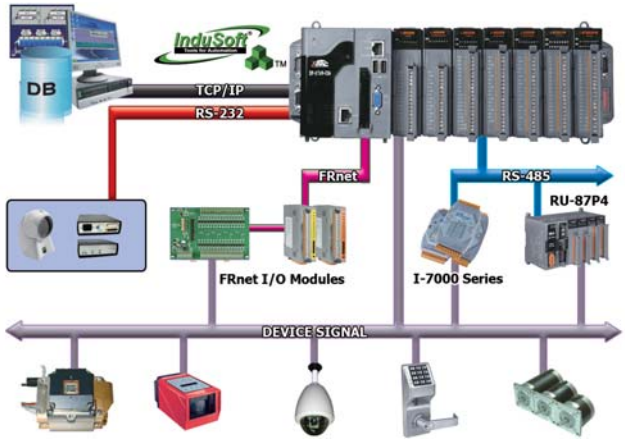
WP-8xx9 Total Solution



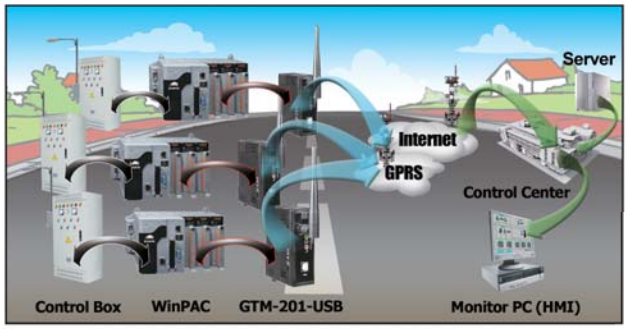
Database & Redundancy



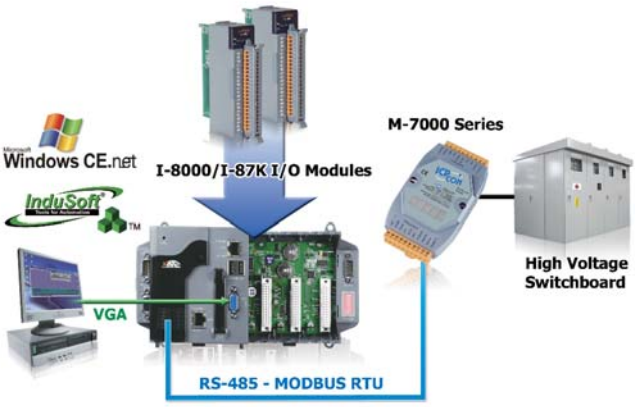
Variety of I/O supported



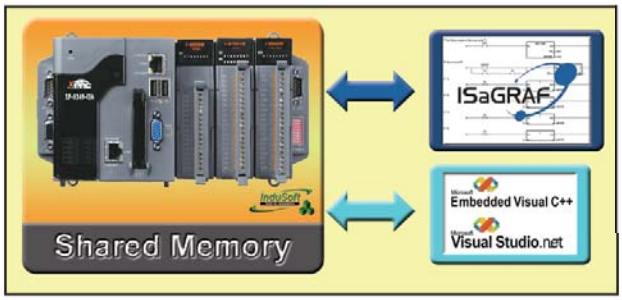
Street lamp monitor and control system



Variety of communication drivers

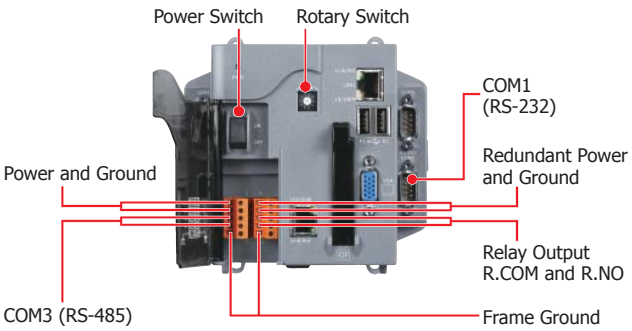


Share data with 3rd. party application

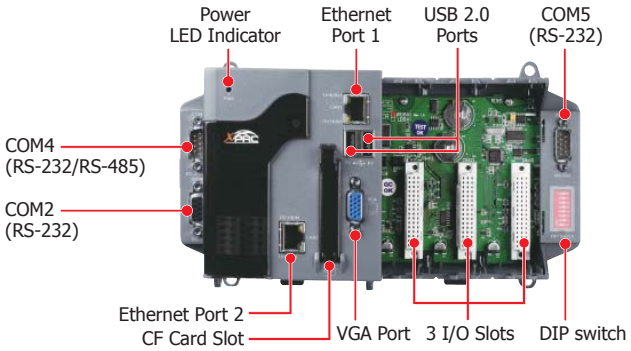


Appearance

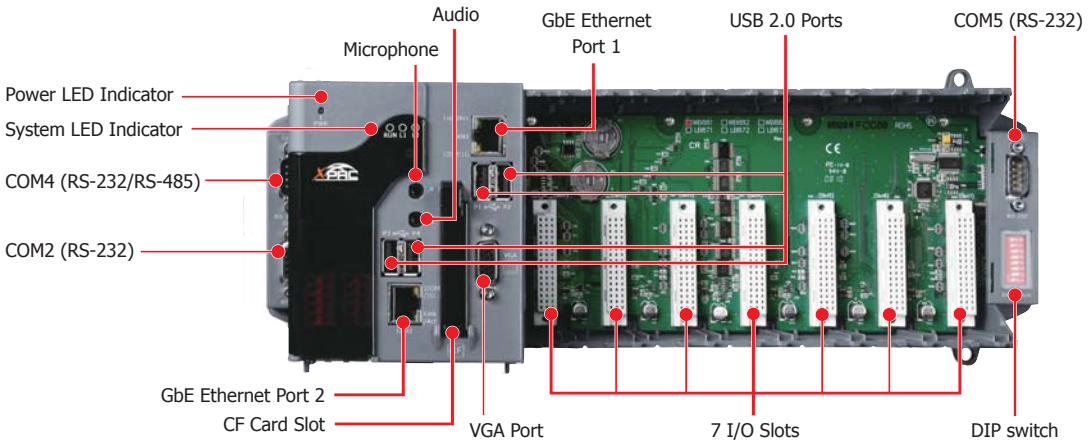
XP-8049-CE6



XP-8349-CE6



XP-8749-Atom-CE6



Ordering Information

XP-8049-CE6 CR	0 I/O slot WinCE 6.0 Based InduSoft PAC (OS: Multi-Language version) (RoHS)
XP-8349-CE6 CR	3 I/O slots WinCE 6.0 Based InduSoft PAC (OS: Multi-Language version) (RoHS)
XP-8749-CE6 CR	7 I/O slots WinCE 6.0 Based InduSoft PAC (OS: Multi-Language version) (RoHS)
Note: The default runtime license (CEView Lite Plus - 300 tags and 3 driver) is installed.	
XP-8149-Atom-CE6 CR	1 I/O slot WinCE 6.0 Based Standard XPAC (OS: Multi-Language version) (RoHS)
XP-8349-Atom-CE6 CR	3 I/O slots WinCE 6.0 Based Standard XPAC (OS: Multi-Language version) (RoHS)
XP-8749-Atom-CE6 CR	7 I/O slots WinCE 6.0 Based Standard XPAC (OS: Multi-Language version) (RoHS)
Note: Call for customized XPAC-8000-Atom-CE6	

Accessories

InduSoft Development Software	
InduSoft-NT512000D	Advanced Server for Windows NT/2000/XP (512,000 Tags, unlimited drivers)
InduSoft-NT64000D	Control Room for Windows NT/2000/XP (64,000 Tags, 8 drivers)
InduSoft-NT4000D	Operator Workstation for Windows NT/2000/XP (4,000 Tags, 5 drivers)
InduSoft-NT1500D	Local Interface for Windows NT/2000/XP (1500 Tags, 3 drivers)
InduSoft-NT300D	NTView PRO for Windows NT/2000/XP (300 Tags, 3 drivers)
InduSoft Runtime License	
InduSoft-CE1500R	CEView standard for Windows CE Run-time (CE View)(1500 Tags, 3 drivers)
InduSoft-CE300R	CEView Lite Plus for Windows CE Run-time (300 Tags, 3 drivers)
Power Supply	
DP-660	24 V_{DC}/2.5 A, 60 W and 5 V_{DC}/0.5 A, 2.5 W Power Supply with DIN-Rail Mounting
DP-1200 CR	24 V_{DC}/5.0 A, 120 W Power Supply with DIN-Rail Mounting (RoHS)
MDR-60-24 CR	24 V_{DC}/2.5 A, 60 W Power Supply with DIN-Rail Mounting (RoHS)

2.2. WinPAC-8000 Series

• Overview

WinPAC-8000 is the new generation PAC of ICP DAS. It is equipped a PXA270 CPU (520 MHz) running a Windows CE.NET 5.0 operating system, various connectivities (VGA, USB, Ethernet, RS-232/485) and 1/4/8 slots for high performance Parallel I/O modules (high profile I-8K series) and serial I/O modules (high profile I-87K I/O modules).

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

WinPAC ≒ IPC+PLC

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

Main Components:

1 Main Control Unit (MCU)

The MCU is the powerhouse of the WinPAC-8000. Each MCU comprises a Central Processor Module (CPM), a power supply, and a 1, 4, 8-slot backplane for 1, 4, 8 I/O modules. The CPM is powerful integrated processing engine comprising a CPU, RAM and ROM, and an option of communication interfaces including Ethernet, RS-485, CAN bus and FRnet.

2 Embedded OS

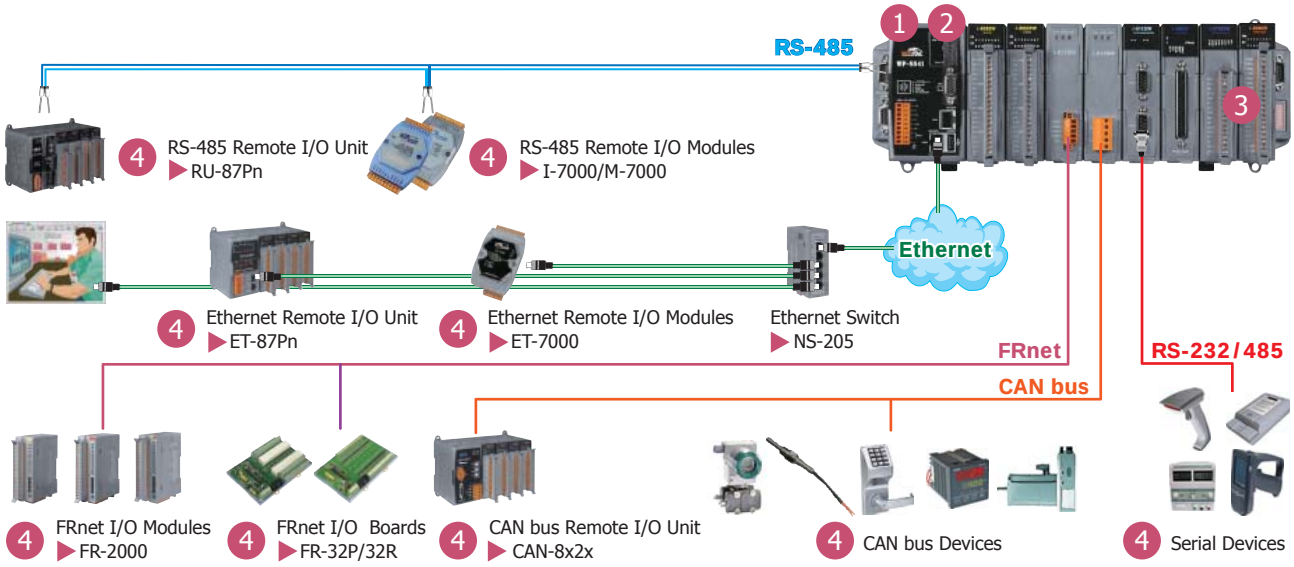
All WinPAC have Windows CE OS inside, and most of the popular features in MS software are included, such as FTP Server, HTTP Server, ASP (Java/VB script), SQL Server embedded 3.5 and compact .NET Framework 3.5. WinPAC supports rich software & development solutions: VB.Net 2005/2008, Visual C#.NET 2005/2008, eVC++ 4.0, ISaGRAF, InduSoft etc.

3 I/O Modules

I/O modules have two types, i.e., parallel bus and serial bus. The parallel bus type I/O modules (high profile I-8K series) are high speed ones used only in the PACs including XPAC, WinPAC, iPAC, ViewPAC, etc. And the serial bus type I/O modules (high profile I-87K series) are low speed ones used in both PACs including XPAC, WinPAC, iPAC, ViewPAC, etc., and I/O expansion units including RU-87Pn, ET-87Pn, USB-87Pn, etc.

4 Remote I/O Expansion

WinPAC uses built-in RS-485 and Ethernet ports to connect RS-485/Ethernet remote I/O units (Ru-87Pn/ET-87Pn) or modules (I-7000/M-7000/ET-7000). In this configuration, WinPAC expands the I/O very easily. Using CAN or FRnet communication module, WinPAC can connect CAN bus devices, remote I/O units or FRnet I/O modules for deterministic control system.



Selection Guide

WP-8 X X X - XX

- **NO. of I/O Slot**
- **Hardware**
  - 3: PXA270 CPU & VGA 1024 x 768
  - 4: PXA270 CPU & VGA 800 x 600
  - 5: PXA270 CPU & VGA 800 x 600
- **Software**
  - 1: Standard
  - 7: ISaGRAF
  - 9: InduSoft
- **Language**
  - EN: English
  - TC: Traditional Chinese
  - SC: Simplified Chinese

Standard WinPAC

Model Name	OS	Pre-installed Software	CPU	Flash	SDRAM	VGA Resolution	USB	RS-232/RS-485	I/O Slot	Memory Expansion	Audio
WP-8131	CE 5.0	None	PXA270, 520 MHz	128 MB	128 MB	1024 x 768	2	2	1	microSD	-
WP-8431								4	4		
WP-8831									8		
WP-8141	CE 5.0	None	PXA270, 520 MHz	96 MB	128 MB	800 x 600	1	2	1	microSD	-
WP-8441								4	4		
WP-8841									8		
WP-8051	CE 5.0	None	PXA270, 520 MHz	128 MB	128 MB	800 x 600	2	5	0	CF	Yes
WP-8351								4	3		
WP-8751									7		

The controller supports the following software development tools:
1. DLLs of I/O modules for eVC, VS.Net 2005/2008
2. DLLs of Modbus/RTU and Modbus/TCP for eVC and VS.Net 2005/2008
3. OPC server (Quicker)

ISaGRAF Based WinPAC

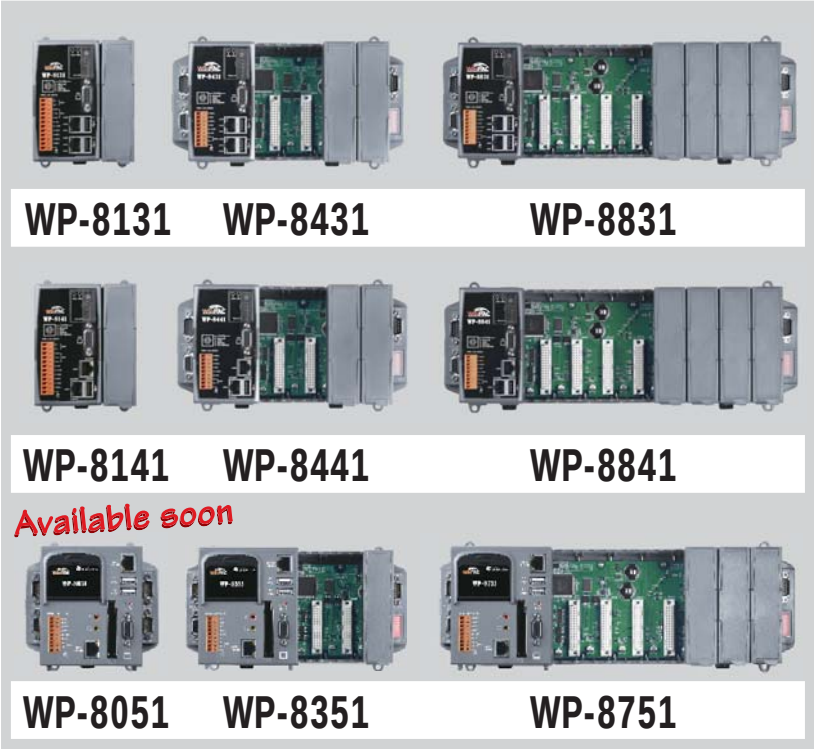
Model Name	OS	Pre-installed Software	CPU	Flash	SDRAM	VGA Resolution	USB	RS-232/RS-485	I/O Slot	Memory Expansion	Audio
WP-8137	CE 5.0	ISaGRAF	PXA270, 520 MHz	128 MB	128 MB	1024 x 768	2	2	1	microSD	-
WP-8437								4	4		
WP-8837									8		
WP-8147	CE 5.0	ISaGRAF	PXA270, 520 MHz	96 MB	128 MB	800 x 600	1	2	1	microSD	-
WP-8447								4	4		
WP-8847									8		
WP-8057	CE 5.0	ISaGRAF	PXA270, 520 MHz	128 MB	128 MB	800 x 600	2	5	0	CF	Yes
WP-8357								4	3		
WP-8757									7		

The controller fully supports all five of the IEC61131-3 standard PLC languages:
1. Ladder diagram 2. Function block diagram 3. Sequential function chart 4. Structured text 5. Instruction List plus flow chart
It supports Modbus protocol and can link to distributed I/O modules with Modbus or DCON protocol via the RS-232/485 or Ethernet.

InduSoft Based WinPAC

Model Name	OS	Pre-installed Software	CPU	Flash	SDRAM	VGA Resolution	USB	RS-232/RS-485	I/O Slot	Memory Expansion	Audio
WP-8139	CE 5.0	InduSoft	PXA270, 520 MHz	128 MB	128 MB	1024 x 768	2	2	1	microSD	-
WP-8439								4	4		
WP-8839									8		
WP-8149	CE 5.0	InduSoft	PXA270, 520 MHz	96 MB	128 MB	800 x 600	1	2	1	microSD	-
WP-8449								4	4		
WP-8849									8		
WP-8059	CE 5.0	InduSoft	PXA270, 520 MHz	128 MB	128 MB	800 x 600	2	5	0	CF	Yes
WP-8359								4	3		
WP-8759									7		

The controller supports the following software development tools:
1. DLLs of I/O modules for eVC, VS.Net 2005/2008
2. DLLs of Modbus/RTU and Modbus/TCP for eVC and VS.Net 2005/2008
3. OPC server (Quicker)



Features

- PXA270, 520 MHz CPU
- Windows CE 5.0
- Hard Real-Time Capability
- VGA Port Output
- Support eLogger HMI
- Redundant Power Inputs
- Operating Temperature: -25 ~ +75°C

Introduction

WP-8x31, WP-8x41 and WP-8x51 Series are the new generation Windows CE 5.0 based PACs of ICP DAS. It is equipped with a PXA270 CPU (520 MHz), various connectivity (VGA, USB, Ethernet, RS-232/485) and I/O slots 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 CE 5.0 on WinPAC include hard real-time capability, small core size, fast boot speed, interrupt handling at a deeper level and achievable deterministic control. WinPAC is also capable of running PC-based control software such as Visual Basic .NET, Visual C#, SCADA software, SoftPLC.... etc. It has all of the best features of both traditional PLCs and Windows capable PCs.

For software copy protection, programmers can design software based on the 64-bit hardware serial number for making software copy protected.

Windows CE5

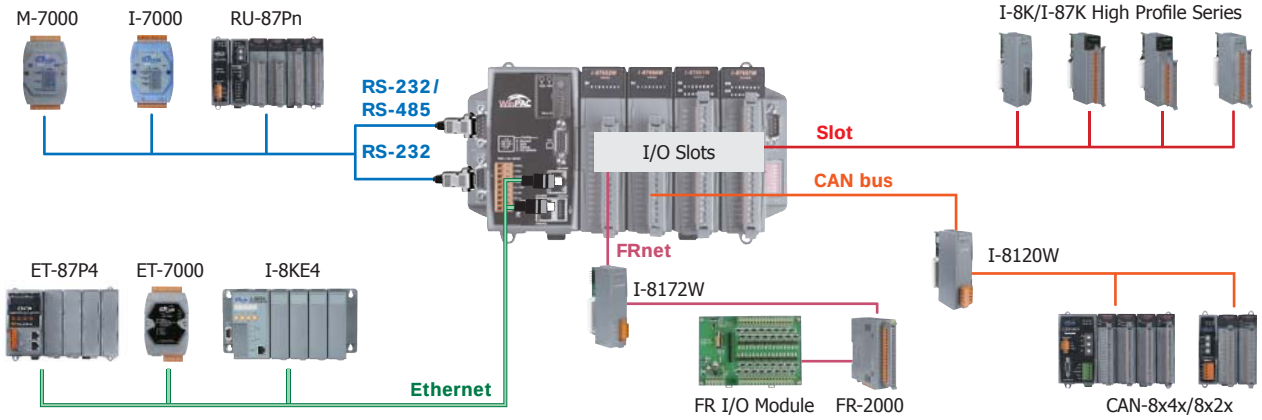
Microsoft Windows CE.net

Windows CE 5 is a compact and real-time OS used to quickly create time critical and high performance applications. Using Windows CE 5 gives an ability to run PC-based control software such as Visual Basic .NET, Virtual C#, SCADA software, SoftPLC... etc.

- ★ FTP Server
- ★ Web Server
- ★ SQL Compact Edition 3.5
- ★ .NET Compact Framework 3.5
- ★ Virtual CE Pro (VCEP)
- ★ OPC Server (NAPOPC_CE5 DA Server)
- ★ Soft PLC solution: WP-8xx7, WP-5xx7 and VP-25W7 (ISaGRAF inside)
- ★ SCADA solution: WP-8xx9, WP-5xx9 and VP-25W9 (InduSoft inside)

Applications

Rich I/O Expansion Ability

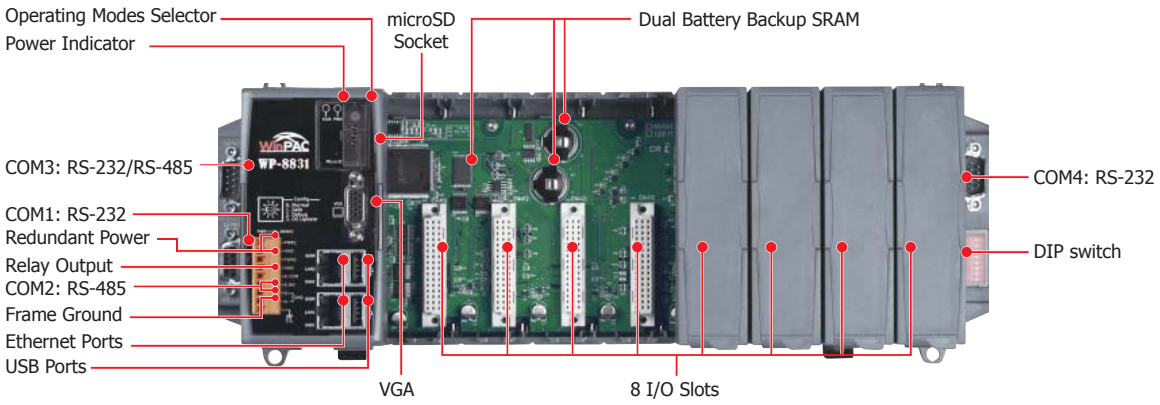


Specifications

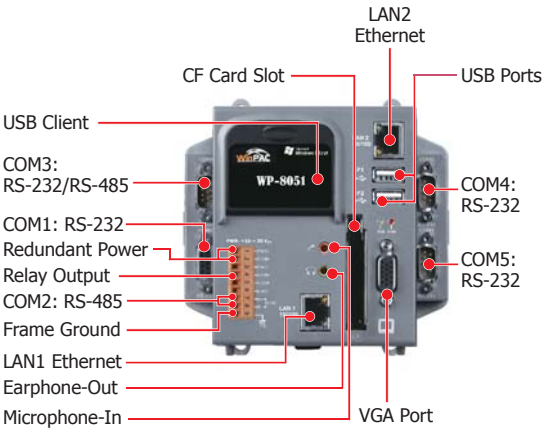
Models	WP-8131	WP-8431	WP-8831	WP-8141	WP-8441	WP-8841	WP-8051	WP-8351	WP-8751
System Software									
OS	Windows CE 5.0								
.Net Compact Framework	3.5								
Embedded Service	FTP server, Web server (supports VB script, JAVA script), Embedded SQL server								
SDK Provided	Dll for eVC, Dll for Visual Studio.Net 2005/2008								
Multilanguage Support	English, German, French, Spanish, Russian, Italian, Korean, Simplified Chinese, Traditional Chinese								
CPU Module									
CPU	PXA270, 520 MHz								
SDRAM	128 MB								
Dual Battery Backup SRAM	512 KB; data valid up to 5 years								
Flash	128 MB			96 MB			128 MB		
EEPROM	16 KB								
Memory Expansion	microSD socket with one 2 GB microSD card (support up to 32 GB microSDHC card)						CF slot with 2 GB 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 Protection								
Dual Watchdog Timers	Yes								
Programmable LED Indicator	1								
Rotary Switch	Yes (0 ~ 9)								
DIP Switch	-	Yes (8 bits)		-	Yes (8 bits)		-	Yes (8 bits)	
Audio	-						Microphone-In and Earphone-Out		
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, Auto MDI/MDI-X, LED indicators)								
USB 1.1 (host)	2			1			2		
USB 1.1 (client)	-						1		
COM 0	Internal communication with the high profile I-87K series modules in slots								
COM 1	RS-232 (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	-						Yes	-	
	RS-232 (RxD, TxD, and GND); non-isolated								
I/O Expansion Slots									
Slot Number	1	4	8	1	4	8	0	3	7
	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-8131, WP-8141 137 mm x 132 mm x 111 mm: WP-8051 231 mm x 132 mm x 111 mm: WP-8431, WP-8441, WP-8351 355 mm x 132 mm x 111 mm: WP-8831, WP-8841, WP-8751								
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	15 W	30 W	30 W
Consumption	7.3 W	9.1 W	9.1 W	7.3 W	9.1 W	9.1 W	8.4 W	9.6 W	10 W

Appearance

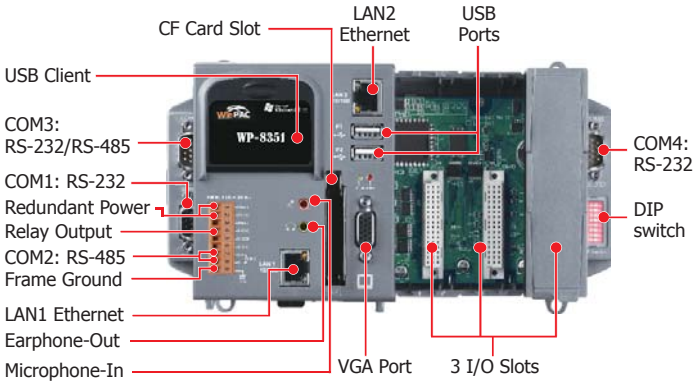
WP-8831



WP-8051



WP-8351

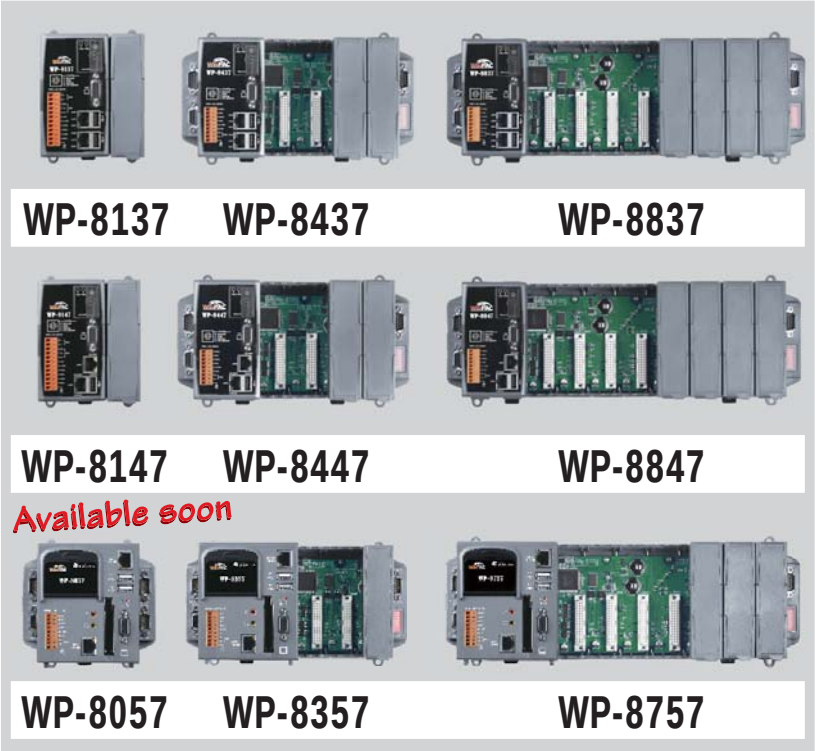


Ordering Information

WP-8131-EN	WP-8141-EN	Standard WinPAC-8000 with 1 I/O Slot (Multilanguage Version of OS)
WP-8431-EN	WP-8441-EN	Standard WinPAC-8000 with 4 I/O Slots (Multilanguage Version of OS)
WP-8831-EN	WP-8841-EN	Standard WinPAC-8000 with 8 I/O Slots (Multilanguage Version of OS)
WP-8131-TC	WP-8141-TC	Standard WinPAC-8000 with 1 I/O Slot (Traditional Chinese Version of OS)
WP-8431-TC	WP-8441-TC	Standard WinPAC-8000 with 4 I/O Slots (Traditional Chinese Version of OS)
WP-8831-TC	WP-8841-TC	Standard WinPAC-8000 with 8 I/O Slots (Traditional Chinese Version of OS)
WP-8131-SC	WP-8141-SC	Standard WinPAC-8000 with 1 I/O Slot (Simplified Chinese Version of OS)
WP-8431-SC	WP-8441-SC	Standard WinPAC-8000 with 4 I/O Slots (Simplified Chinese Version of OS)
WP-8831-SC	WP-8841-SC	Standard WinPAC-8000 with 8 I/O Slots (Simplified Chinese Version of OS)
WP-8051		Standard WinPAC-8000 without I/O Slot (Multilanguage Version of OS)
WP-8351		Standard WinPAC-8000 with 3 I/O Slots (Multilanguage Version of OS)
WP-8751		Standard WinPAC-8000 with 7 I/O Slots (Multilanguage Version of OS)

Accessories

DP-660	24 V_{DC}/2.5 A, 60 W and 5 V_{DC}/0.5 A, 2.5 W Power Supply with DIN-Rail Mounting
DP-1200 CR	24 V_{DC}/5.0 A, 120 W Power Supply with DIN-Rail Mounting (RoHS)
MDR-60-24 CR	24 V_{DC}/2.5 A, 60 W Power Supply with DIN-Rail Mounting (RoHS)



Features

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

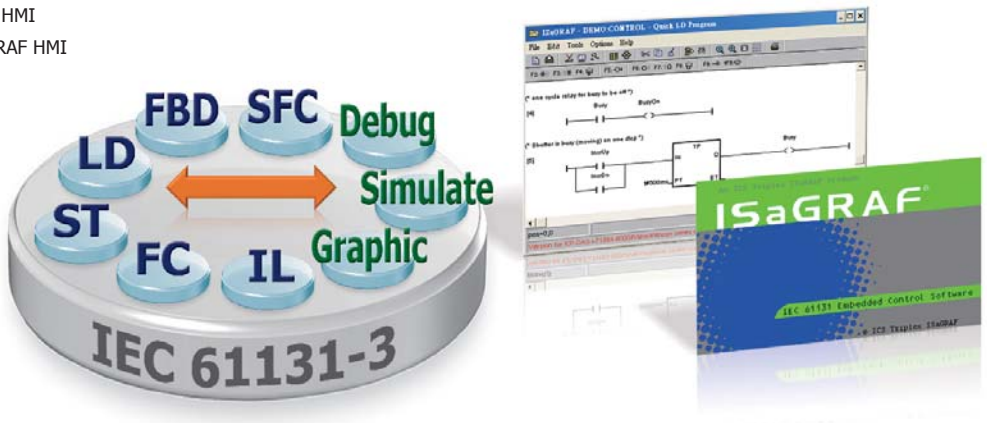
Introduction

WP-8x37, WP-8x47 and WP-8x57 Series are the new generation ISaGRAF based PACs of ICP DAS. It is equipped with a PXA270 CPU (520 MHz), various connectivity (VGA, USB, Ethernet, RS-232/485) and I/O slots 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 CE 5.0 on WinPAC include hard real-time capability, small core size, fast boot speed, interrupt handling at a deeper level and achievable deterministic control. WinPAC is also capable of running ISaGRAF and 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.

ISaGRAF Features

ISaGRAF is the most powerful SoftLogic package on the market. ISaGRAF is a PLC-like software and it supports IEC 61131-3 standard PLC programming languages (LD, FBD, SFC, ST, IL, FC), and can run the application generated by the workbench on any ISaGRAF PACs. The ISaGRAF workbench Ver. 3.x features.

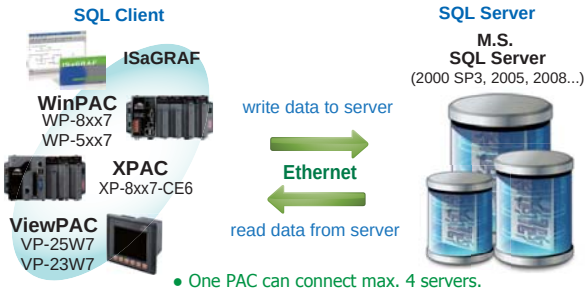
- IEC 61131-3 Standard Open PLC Programming Languages (LD, FBD, SFC, ST, IL, FC) + Flow Chart (FC)
- Auto-Scan I/O
- On-Line Debug/Control/Monitor, Off-Line Simulation
- Simple Graphic HMI
- Support Soft-GRAF HMI



Soft-GRAF Studio Colorful HMI

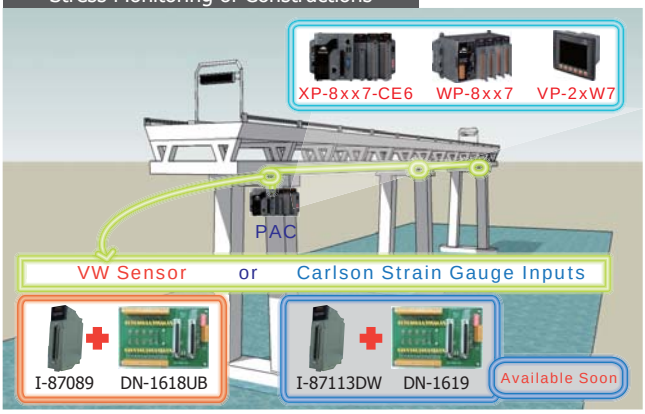
M2B Machine To Business Application

SQL Server Communication

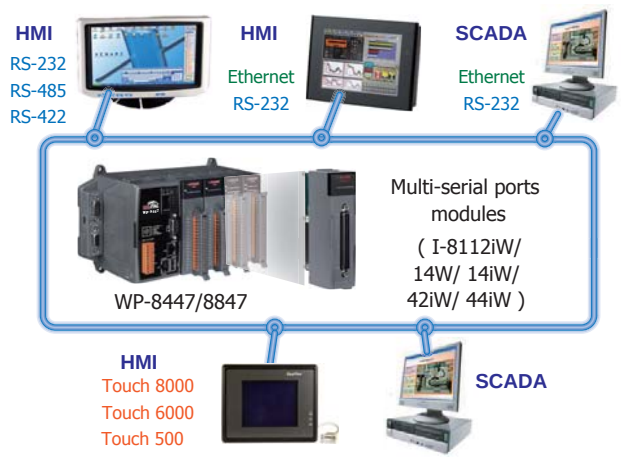


• One PAC can connect max. 4 servers.

Stress Monitoring of Constructions

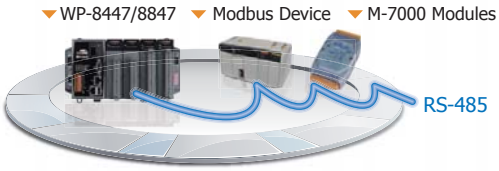


Modbus RTU/TCP Slave Ports

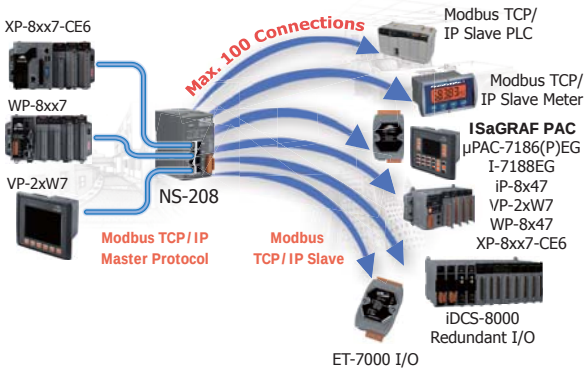


Modbus Master Ports

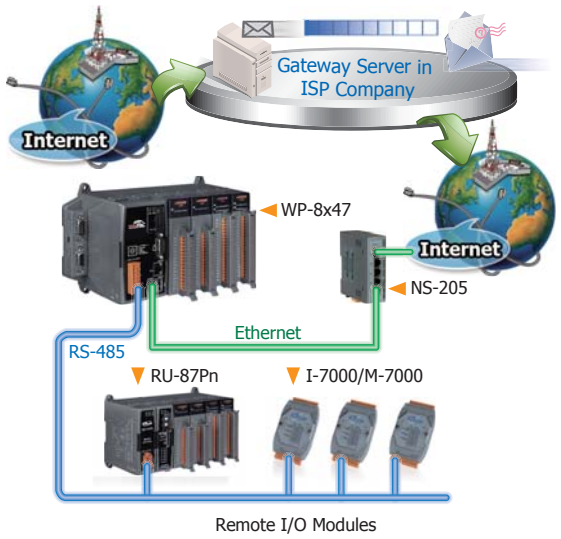
Modbus RTU/ASCII Master



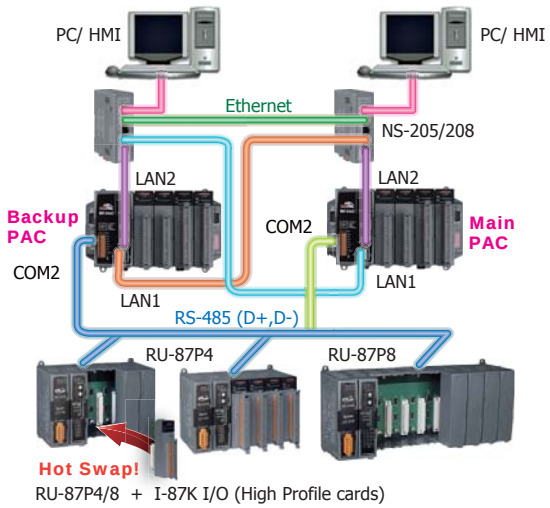
Modbus TCP/IP Master



Send Email with one Attached File



New 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	WP-8057	WP-8357	WP-8757
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 Soft-GRAF HMI: XP-8xx7-CE6, WP-8xx7, VP-2xW7 and WP-5xx7 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			128 MB		
EEPROM		16 KB								
Memory Expansion		microSD socket with one 2 GB microSD card (support up to 32 GB microSDHC card)						CF slot with 2 GB 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 Protection								
Dual Watchdog Timers		Yes								
Programmable LED Indicator		1								
Rotary Switch		Yes (0 ~ 9)								
DIP Switch		-	Yes (8 bits)		-	Yes (8 bits)		-	Yes (8 bits)	
Audio		-						Microphone-In and Earphone-Out		
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, Auto MDI/MDI-X, LED indicators)								
USB 1.1 (host)		2			1			2		
USB 1.1 (client)		-						1		
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		-						Yes	-	
		RS-232 (RxD, TxD, and GND); non-isolated								
I/O Expansion Slots										
Slot Number		1	4	8	1	4	8	0	3	7
		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 137 mm x 132 mm x 111 mm: WP-8057 231 mm x 132 mm x 111 mm: WP-8437, WP-8447, WP-8357 355 mm x 132 mm x 111 mm: WP-8837, WP-8847, WP-8757								
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	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	7.3 W	9.1 W	9.6 W

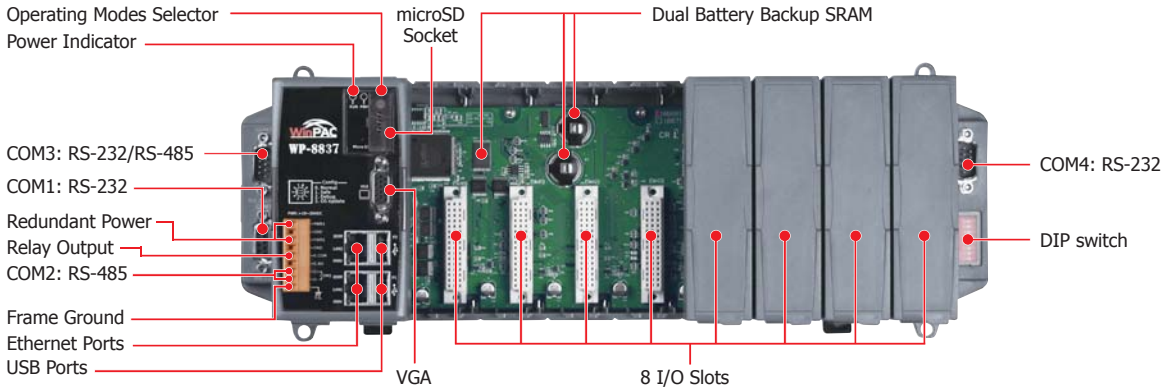
ISaGRAF Specifications

Protocols (some protocols need optional devices)		
NET ID		1~255, user-assigned by software
Modbus TCP/IP Master		Link to max. 100 devices that support Standard Modbus TCP/IP Slave protocol (FAQ-113)
Modbus RTU/ASCII Master		Max. 10 ports: COM1 ~ 14 (To connect to other Modbus Slave devices). Support Multi-ports. (*)
Modbus RTU Slave		Max. 5 ports: COM1, one of COM2/3, COM4 ~ 8 (For connecting ISaGRAF, PC/HMI/OPC Server & HMI panels). (*)
Modbus TCP/IP Slave		Ethernet LAN1 & LAN2 support total up to 32 connections. (If WP-8xx7 uses 1 connection to connect each PC/HMI, it can connect up to 32 PC/HMI; If WP-8xx7 uses 2 connections to connect each PC/HMI, it can connect up to 16 PC/HMI; ...) When one Ethernet port is broken, the other one can still connect to PC/HMI.
Web HMI Protocol		Ethernet Ports for connecting PC running Internet Explorer
I-7000 & I-87K RS-485 Remote I/O		One of COM2, COM3 supports I-7000 I/O modules, I-87K base + I-87K Serial I/O boards and RU-87Pn + I-87K High Profile I/O boards as Remote I/O. Max. 255 modules for one controller. (*)
M-7000 Series Modbus I/O		Max. 10 RS-485 ports (COM1 ~ 14) can support M-7000 I/O. Each port can connect 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 is broken, it will switch to LAN1 automatically to continuously work. (LAN1 & LAN2's IP are requested set in the same IP domain) (FAQ-042)
FRnet I/O		Support max 8 pcs. I-8172W boards in slot 0 to 7 to connect to FRnet I/O modules, like FR-2053, FR-2057 FR-32R, FR-32P (FAQ-048). Each I-8172W board can connect up to 256 DI plus 256 DO channels.
Send Email		Supports functions to send email with one attached file via Ethernet port.
Ebus		LAN2 to exchange data between ISaGRAF Ethernet PAC via Ethernet port.
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. User can request data/control the controller by cellular phone. The controller can also send data & alarms to user's cellular phone. (*) Optional GSM Modem: GTM-201-RS232 (850/900/1800/1900 GSM/GPRS External Modem)
User-Defined Protocol		COM1 ~ COM14 by Serial communication function blocks (*)
MMICON/LCD		COM4 or COM5 and supports ICP DAS's MMICON. (*)
UDP Server & UDP Client : Exchange Message & Auto-Report		LAN1 or LAN2 support UDP Server and UDP Client protocol to send/receive message to/from PC/HMI or other devices. For example, to automatically report data to InduSoft's RXTX driver.
TCP Client : Exchange Message & Auto-Report		LAN1 or LAN2 (To send/receive message to/from PC/HMI or other devices which support TCP server protocol.) Ex: automatically report data to InduSoft's RXTX driver, or to connect a location camera.
GPRS/SMS		Support the I-8212W (2G/3G) card to receive / send a short message or to dial up to link the Internet by GPRS connection to send an email or communicate with remote stations by using "Ftp Client" (FAQ-151) and "TCP Client" / "UDP Server" / "UDP Client" (FAQ-143).
SQL Client		Support SQL Client function to write data to (or read data from) 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 ~ COM14 can connect one I-7530 (converter: RS-232 to CAN) to support CAN/CANopen devices and sensors. One WP-8xx7 supports max.10 RS-232 ports to connect max.10 I-7530. (*) (FAQ-086)
CANopen Master		Support the I-8123W CANopen Master card to connect other CANopen slave devices. (FAQ-145)
HART Solutions		Support I-87H17W modules in slot 0 to 7 to communicate with other HART devices.
FTP Client		Support FTP client to upload files in the PAC to a remote FTP server on PC. (FAQ-151)
Soft-GRAF HMI		Support the Soft-GRAF HMI . User can use the Soft-GRAF Studio on the PC to design the HMI screen and then download it to the PAC to display the HMI on the PAC. (FAQ-146)
Optional I/O Functions (Refer to 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 1Hz~100KHz (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 I-7K/I-87K DI modules support counters. 100 Hz max. value: 0 ~ 65535
	High Speed Counter	I-87082W: 100 kHz max.; I-8084W: 250 kHz max.
	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	Integrate with one I-8091W (2-axis) or two I-8091W (4-axis)

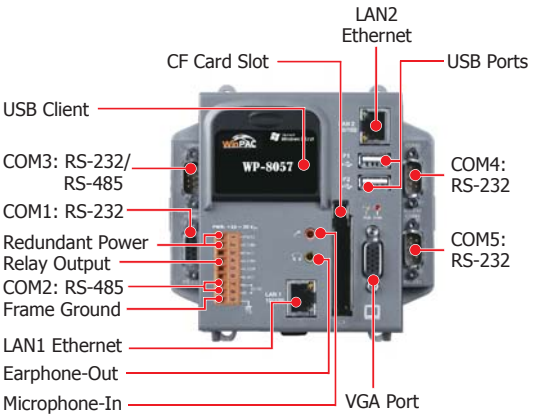
*** Note: COM5 ~ COM14 are resided at the expansion boards if they are plugged on slot 0~7 of WP-8xx7. WP-8137/8147 has no COM3 & COM4.**
*** ISaGRAF FAQ: http://www.icpdas.com/faq/isagraf.htm**

Appearance

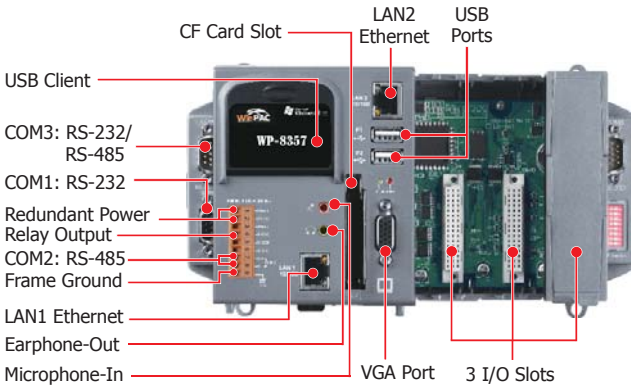
WP-8837



WP-8057



WP-8357

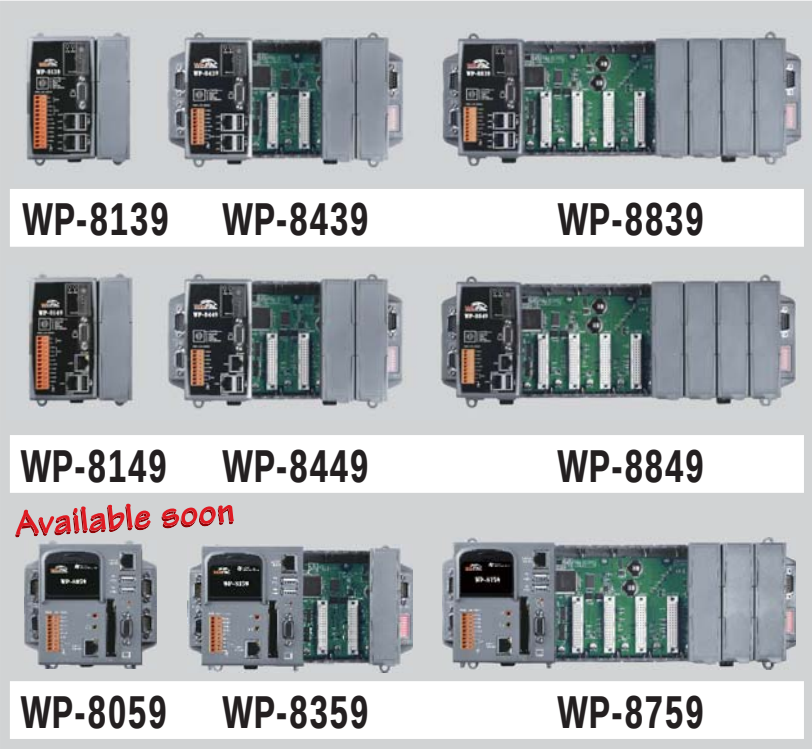


Ordering Information

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)
WP-8057		ISaGRAF based WinPAC-8000 without I/O Slot (Multilanguage Version of OS)
WP-8357		ISaGRAF based WinPAC-8000 with 3 I/O Slots (Multilanguage Version of OS)
WP-8757		ISaGRAF based WinPAC-8000 with 7 I/O Slots (Multilanguage Version of OS)

Accessories

ISaGRAF Development Software	
ISaGRAF-256-E	ISaGRAF Workbench Software Ver.3 (256 I/O Tags) with One Application Book (English version) and one USB Dongle
ISaGRAF-256-C	ISaGRAF Workbench Software Ver.3 (256 I/O Tags) with One Application Book (Chinese version) and one USB Dongle
ISaGRAF-32-E	ISaGRAF Workbench Software Ver.3 (32 I/O Tags) with One Application Book (English version) Note: No upgrade service from ISaGRAF-32 to ISaGRAF-256. (Using ISaGRAF-32 can control more than 32 I/O tags. Please refer to ISaGRAF User's Manual Ch. 3.4)
ISaGRAF-32-C	ISaGRAF Workbench Software Ver.3 (32 I/O Tags) with One Application Book (Chinese version) Note: No upgrade service from ISaGRAF-32 to ISaGRAF-256. (Using ISaGRAF-32 can control more than 32 I/O tags. Please refer to ISaGRAF User's Manual Ch. 3.4)
Power Supply	
DP-660	24 V_{DC}/2.5 A, 60 W and 5 V_{DC}/0.5 A, 2.5 W Power Supply with DIN-Rail Mounting
DP-1200 CR	24 V_{DC}/5.0 A, 120 W Power Supply with DIN-Rail Mounting (RoHS)
MDR-60-24 CR	24 V_{DC}/2.5 A, 60 W Power Supply with DIN-Rail Mounting (RoHS)



Features

- PXA270, 520 MHz CPU
- Windows CE 5.0
- InduSoft Web Studio v6.1
- Hard Real-Time Capability
- VGA Port Output
- Redundant Power Inputs
- Operating Temperature: -25 ~ +75°C

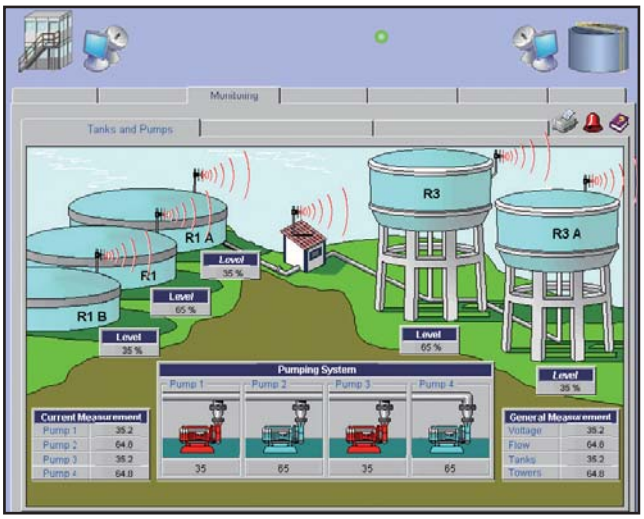
Introduction

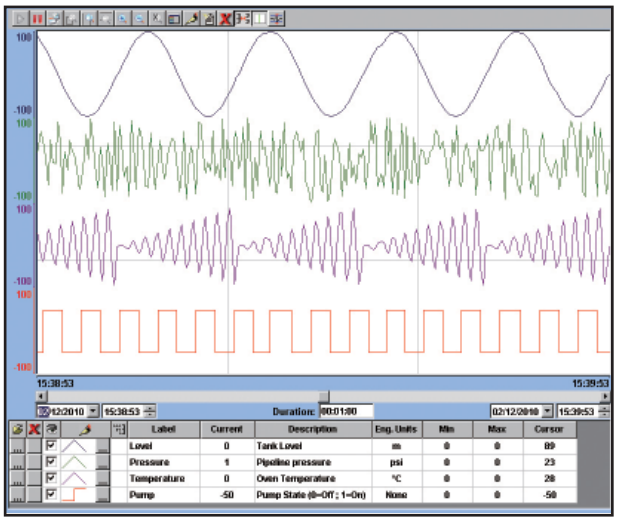
WP-8x39, WP-8x49 and WP-8x59 Series are the new generation InduSoft based PACs of ICP DAS. It is equipped with a PXA270 CPU (520 MHz), various connectivity (VGA, USB, Ethernet, RS-232/485) and 1/4/8 I/O slots for high performance parallel I/O modules (high profile I-8K Series) and serial I/O modules (high profile I-87K series). The benefits of running Windows CE 5.0 on WinPAC include hard real-time capability, small core size, fast boot speed, interrupt handling at a deeper level and achievable deterministic control. WinPAC is also capable of running InduSoft and 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.

InduSoft Features

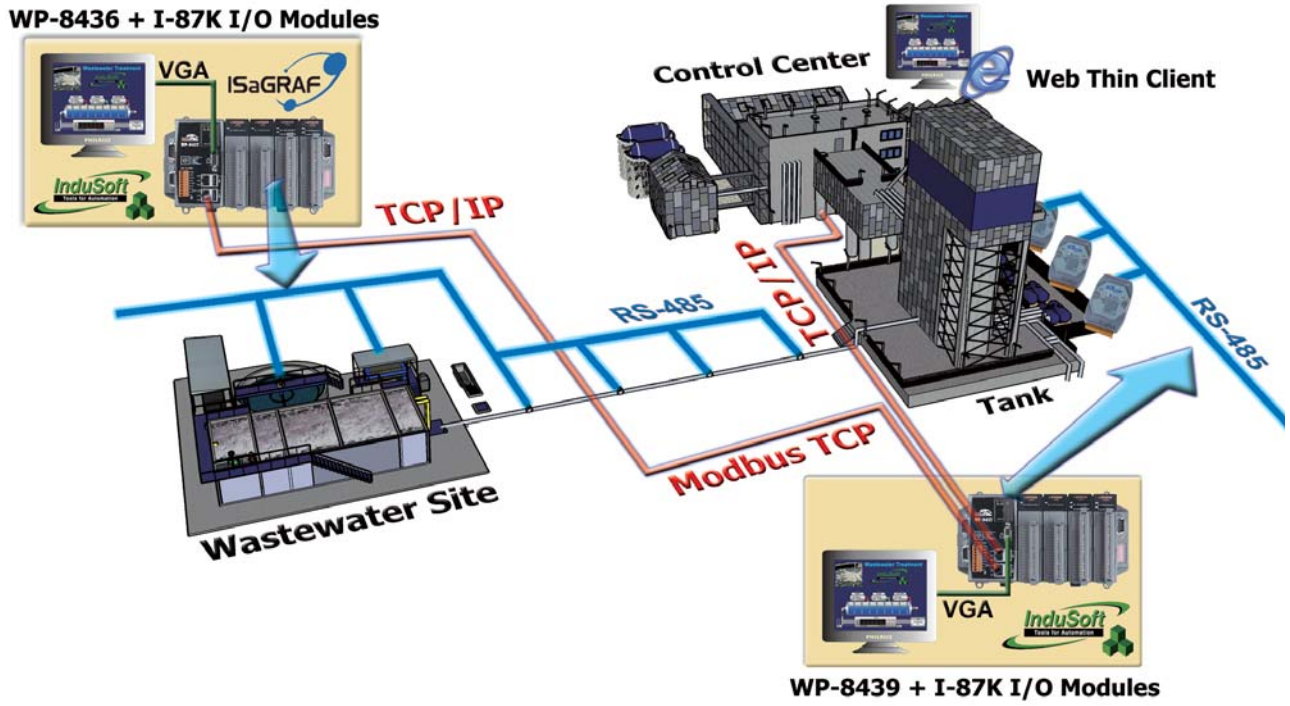
InduSoft Web Studio is a powerful, integrated collection of automation tools that includes all the building blocks needed to develop modern Human Machine Interfaces (HMI), Supervisory Control and Data Acquisition (SCADA) systems, and ViewPAC applications. InduSoft Web Studio's application runs in native Windows NT, 2000, XP, CE and CE .NET environments and conforms to industry standards such as Microsoft .NET, OPC, DDE, ODBC, XML, and ActiveX.

- Elegant Graphics
- Multi-Language
- Database (Access, Excel, SQL, Oracle…)
- Recipes and Reports
- Online and History Alarm / Event / Trend
- Remote Web Client Control & Security
- Various Communication Driver (DCON, Modbus, OPC, DDE, TCP/IP…)
- ActiveX (GSM / SHM / COM /WEB provided by ICP DAS)
- System Redundancy
- Online Configuration and debugging
- Others (VBScript, E-mail, FTP, SNMP...)

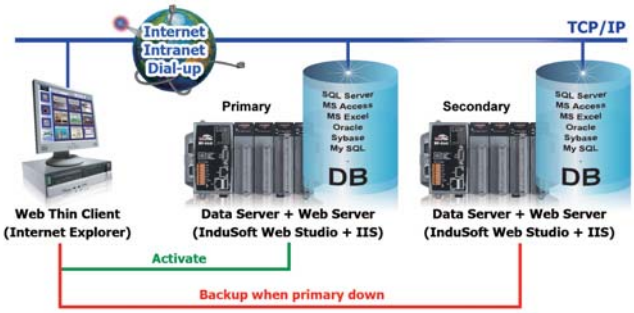




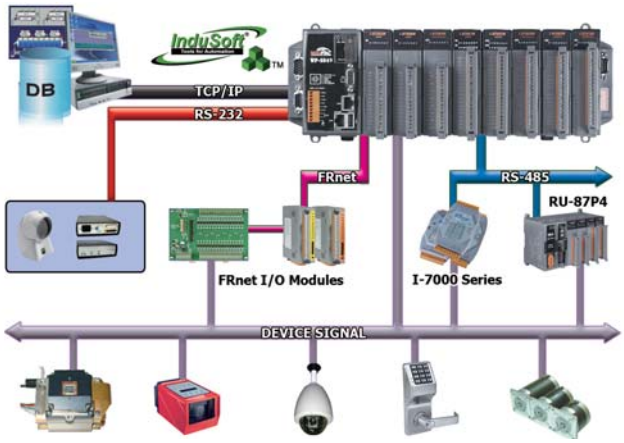
WP-8xx9 Total Solution



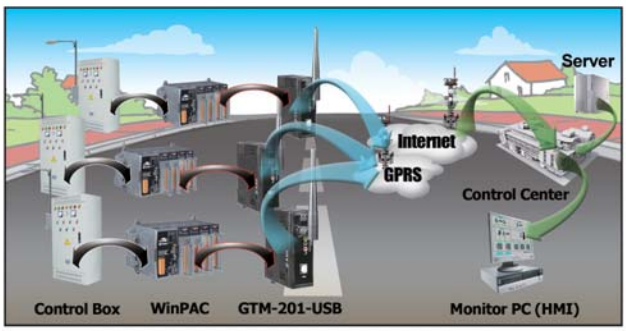
Database & Redundancy



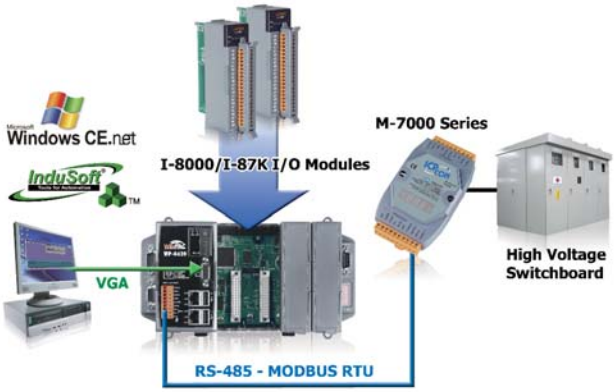
Variety of I/O supported



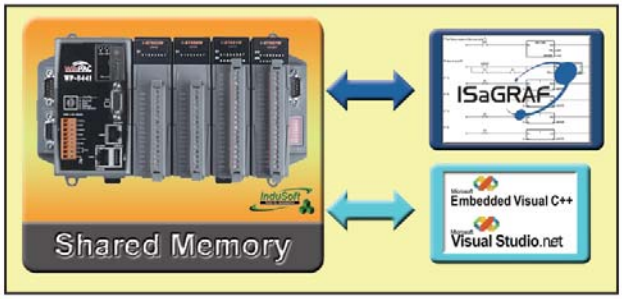
Street lamp monitor and control system



Variety of communication drivers



Share data with 3rd. party application

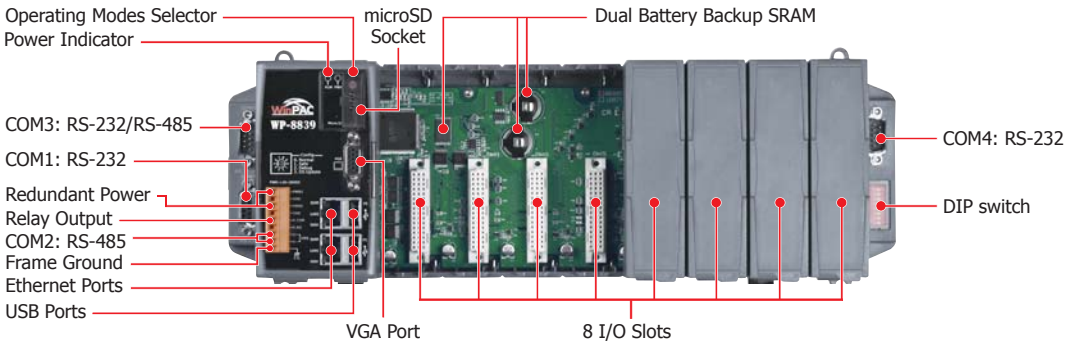


Specifications

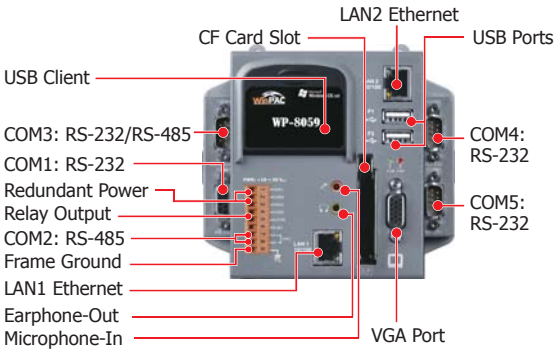
Models	WP-8139	WP-8439	WP-8839	WP-8149	WP-8449	WP-8849	WP-8059	WP-8359	WP-8759
System Software									
OS	Windows CE 5.0								
.Net Compact Framework	3.5								
Embedded Service	FTP server, Web server (supports VB script, JAVA script), Embedded SQL server								
Multilanguage Support	English, German, French, Spanish, Russian, Italian, Korean, Simplified Chinese, Traditional Chinese								
Development Software									
InduSoft Software	InduSoft Web Studio v6.1 Service Pack 6								
Non-ISaGRAF	Options: Microsoft EVC++4.0 or VS .NET 2005/2008 (VB .NET 2005/2008, C# .NET 2005/2008)								
Web Service									
Web HMI	Support Web HMI function, PC running Internet Explorer can access to the WP-8x39 via Local Ethernet or Internet or dial Modem, monitoring and control.								
Security	Web HMI supports three levels user name and password protection								
CPU Module									
CPU	PXA270, 520 MHz								
SDRAM	128 MB								
Dual Battery Backup SRAM	512 KB; data valid up to 5 years								
Flash	128 MB			96 MB			128 MB		
EEPROM	16 KB								
Memory Expansion	microSD socket with one 2 GB microSD card (support up to 32 GB microSDHC card)						CF slot with 2 GB 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 Protection								
Dual Watchdog Timers	Yes								
Programmable LED Indicator	1								
Rotary Switch	Yes (0 ~ 9)								
DIP Switch	-	Yes (8 bits)		-	Yes (8 bits)		-	Yes (8 bits)	
Audio	-						Microphone-In and Earphone-Out		
VGA & Communication Ports									
VGA	Yes 640 x 480, 800 x 600, 1024 x 768			Yes 640 x 800, 800 x 600					
Ethernet	RJ-45 x 2, 10/100 Base-TX (Auto-negotiating, Auto MDI/MDI-X, LED indicators)								
USB 1.1 (host)	2			1			2		
USB 1.1 (client)	-						1		
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-8131 and WP-8141; 3000 VDC 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	-						Yes	-	
	RS-232 (RxD, TxD, and GND); non-isolated								
I/O Expansion Slots									
Slot Number	1	4	8	1	4	8	0	3	7
	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-8139, WP-8149 137 mm x 132 mm x 111 mm: WP-8059 231 mm x 132 mm x 111 mm: WP-8439, WP-8449, WP-8359 355 mm x 132 mm x 111 mm: WP-8839, WP-8849, WP-8759								
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	25 W	25 W	8 W	30 W	30 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	7.3 W	9.1 W	9.6 W

Appearance

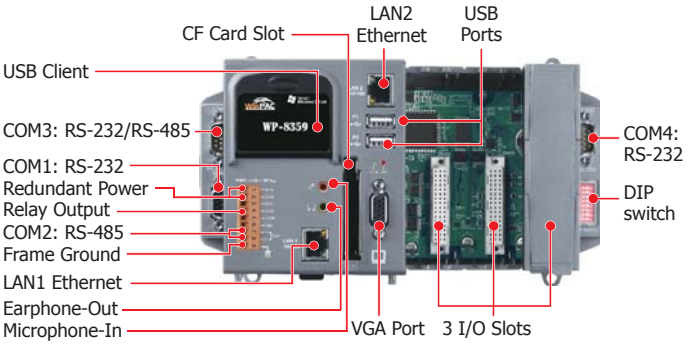
WP-8839



WP-8059



WP-8359



Ordering Information

WP-8139-EN	**WP-8149-EN**	InduSoft based WinPAC-8000 with 1 I/O Slot (Multilanguage Version of OS)
WP-8439-EN	**WP-8449-EN**	InduSoft based WinPAC-8000 with 4 I/O Slots (Multilanguage Version of OS)
WP-8839-EN	**WP-8849-EN**	InduSoft based WinPAC-8000 with 8 I/O Slots (Multilanguage Version of OS)
WP-8139-TC	**WP-8149-TC**	InduSoft based WinPAC-8000 with 1 I/O Slot (Traditional Chinese Version of OS)
WP-8439-TC	**WP-8449-TC**	InduSoft based WinPAC-8000 with 4 I/O Slots (Traditional Chinese Version of OS)
WP-8839-TC	**WP-8847-TC**	InduSoft based WinPAC-8000 with 8 I/O Slots (Traditional Chinese Version of OS)
WP-8139-SC	**WP-8149-SC**	InduSoft based WinPAC-8000 with 1 I/O Slot (Simplified Chinese Version of OS)
WP-8439-SC	**WP-8449-SC**	InduSoft based WinPAC-8000 with 4 I/O Slots (Simplified Chinese Version of OS)
WP-8839-SC	**WP-8849-SC**	InduSoft based WinPAC-8000 with 8 I/O Slots (Simplified Chinese Version of OS)
WP-8059		InduSoft based WinPAC-8000 without I/O Slot (Multilanguage Version of OS)
WP-8359		InduSoft based WinPAC-8000 with 3 I/O Slots (Multilanguage Version of OS)
WP-8759		InduSoft based inPAC-8000 with 7 I/O Slots (Multilanguage Version of OS)
Note: The default runtime license (CEView Lite Plus - 300 tags and 3 driver) is installed.		

Accessories

InduSoft Development Software	
InduSoft-NT512000D	Advanced Server for Windows NT/2000/XP (512,000 Tags, unlimited drivers)
InduSoft-NT64000D	Control Room for Windows NT/2000/XP (64,000 Tags, 8 drivers)
InduSoft-NT4000D	Operator Workstation for Windows NT/2000/XP (4,000 Tags, 5 drivers)
InduSoft-NT1500D	Local Interface for Windows NT/2000/XP (1500 Tags, 3 drivers)
InduSoft-NT300D	NTView PRO for Windows NT/2000/XP (300 Tags, 3 drivers)
InduSoft Runtime License	
InduSoft-CE1500R	CEView standard for Windows CE Run-time (CE View)(1500 Tags, 3 drivers)
InduSoft-CE300R	CEView Lite Plus for Windows CE Run-time (300 Tags, 3 drivers)
Power Supply	
DP-660	24 V_{DC}/2.5 A, 60 W and 5 V_{DC}/0.5 A, 2.5 W Power Supply with DIN-Rail Mounting
DP-1200 CR	24 V_{DC}/5.0 A, 120 W Power Supply with DIN-Rail Mounting (RoHS)
MDR-60-24 CR	24 V_{DC}/2.5 A, 60 W Power Supply with DIN-Rail Mounting (RoHS)

2.3. LinPAC-8000 Series

• Overview

The LinPAC-8000 is a second generation Linux-based PAC from ICP DAS and is equipped with a PXA270 CPU (520 MHz) or Atom Z520 CPU (1.33 GHz) running a Linux kernel 2.6 operating system, multiple communication interfaces (VGA, USB, Ethernet and RS-232/485) and 1/4/8-slot or 0/3/7-slot backplane for both high performance Parallel I/O modules (high profile I-8K series) and Serial I/O modules (high profile I-87K series).

Compared with the first generation LinCon-8000, not only is the CPU performance improved have been added (from 206 MHz to 520 MHz or 1.33 GHz) and uses an upgraded OS from Linux kernel 2.4 to Linux kernel 2.6, but many reliability features, such as dual LAN, redundant power inputs, and dual battery backup SRAM, etc. That's the powerful and flexible embedded control systems available.

LinPAC ≒ IPC+PLC

The LinPAC-8000 gives users all of the best features of both traditional PLCs and Windows capable PCs. The LinPAC-8000 includes a VGA port allowing users to choose a regular LCD monitor for display of HMI application, USB port to connect with Keyboard, Mouse, USB device for storage or touch monitor, microSD/ microSDHC memory for storage of program and data.

Main Components:

1 Main Control Unit (MCU)

The MCU is the powerhouse of the LinPAC Series. Each MCU comprises a Central Processor Module (CPM), a power supply, and a 1, 4, 8-slot or 0, 3, 7-slot backplane for I/O modules. The CPM is powerful integrated processing engine comprising a CPU, RAM and ROM, and an option of communication interfaces including Ethernet, RS-485, CAN bus and FRnet.

2 Embedded OS

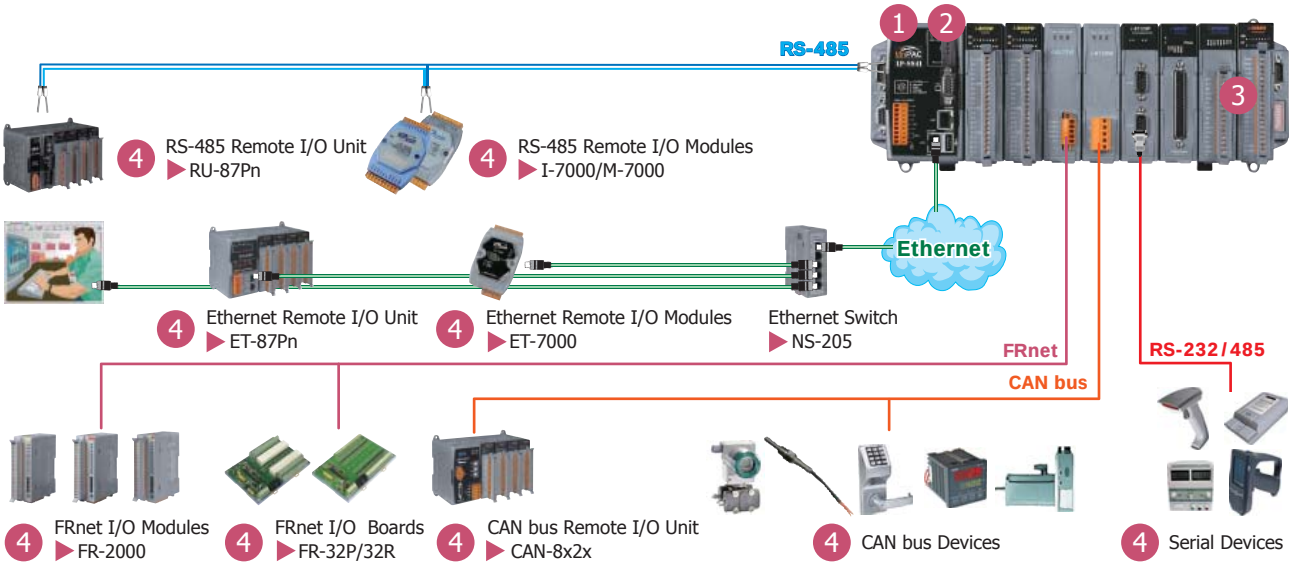
All LinPAC have Linux kernel 2.6 OS inside, most of the popular features in Linux are included, such as open source, stability. LinPAC supports for rich software & development solutions: LinPAC SDK, GNU C Language, GUI software, etc.

3 I/O Modules

I/O modules have two types, i.e., parallel bus and serial bus. The parallel bus type I/O modules (high profile I-8K series) are high speed ones used only in the PACs including XPAC, WinPAC, iPAC, ViewPAC, etc. And the serial bus type I/O modules (high profile I-87K series) are low speed ones used in both PACs including XPAC, WinPAC, iPAC, ViewPAC, etc., and I/O expansion units including RU-87Pn, ET-87Pn, USB-87Pn, etc.

4 Remote I/O Expansion

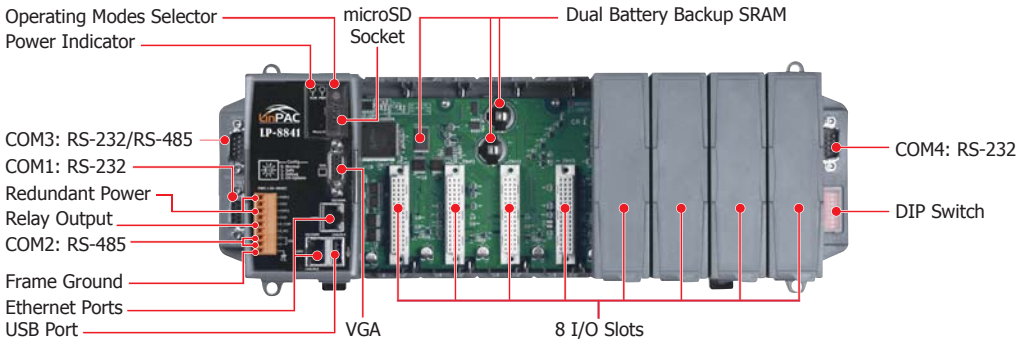
LinPAC uses built-in RS-485 and Ethernet ports to connect RS-485/Ethernet remote I/O units (RU-87Pn/ET-87Pn) or modules (I-7000/M-7000/ET-7000). In this configuration, LinPAC expands the I/O very easily.
Using CAN or FRnet communication module, LinPAC can connect to CAN bus devices, remote I/O units or FRnet I/O modules for deterministic control system.



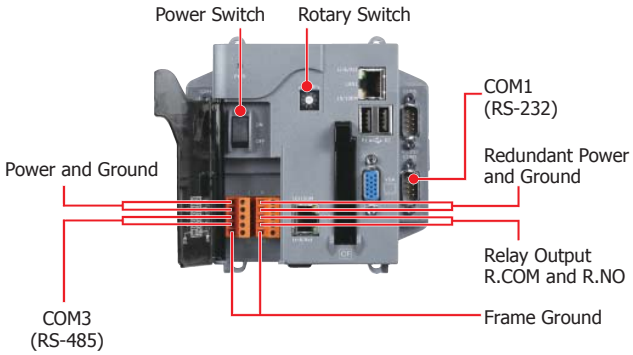
• Hardware

• Appearance

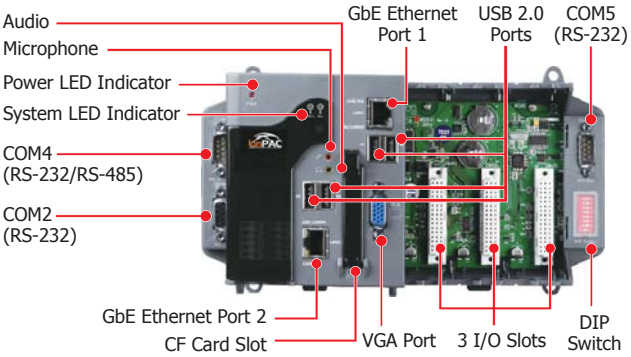
LP-8841



LP-8081



LP-8381-Atom



• Selection Guide

LP-8 X X X - XX

NO. of I/O Slot

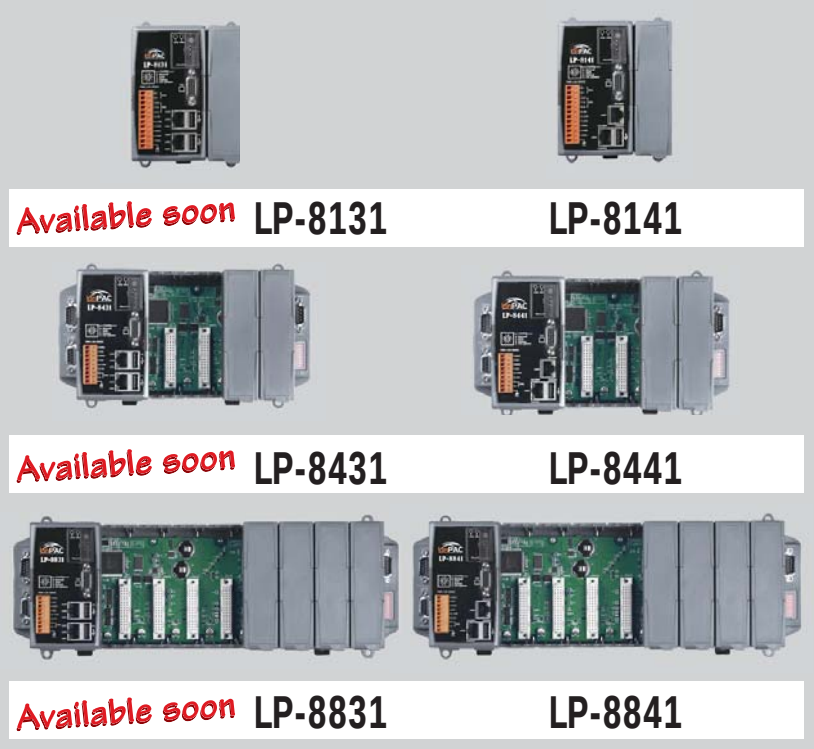
Hardware
3: PXA270 CPU & VGA 1024 x 768
4: PXA270 CPU & VGA 800 x 600
8: X86 CPU (LX800, Atom) & VGA 1024 x 768

Software
1: Standard

Language
EN: English

Standard LinPAC

Model Name	OS	Software	CPU	Flash	SDRAM	Ethernet	VGA Resolution	RS-232/ RS-485	I/O Slot	Audio Port
LP-8131	Linux kernel 2.6	None	PXA270, 520 MHz	128 MB	128 MB	2	1024 x 768	2	1	None
LP-8431								4	4	
LP-8831									8	
LP-8141	Linux kernel 2.6	None	PXA270, 520 MHz	48 MB	128 MB	2	800 x 600	2	1	None
LP-8441								4	4	
LP-8841									8	
LP-8081	Linux kernel 2.6	None	LX800, 500 MHz	4 GB	1 GB DDR SDRAM	2	1024 x 768	5	0	None
LP-8381								4	3	
LP-8781									7	
LP-8181-Atom	Linux kernel 2.6	None	Atom Z520, 1.33 GHz	8 GB	1 GB DDR2 SDRAM	2	1024 x 768	4	1	Yes
LP-8381-Atom									3	
LP-8781-Atom									7	



Features

- PXA270, 520 MHz CPU
- Linux kernel 2.6 Inside
- Embedded Service: Web Server, FTP Server, Telnet Server, SSH Server
- 1/4/8 Slots for High Profile I/O Modules
- Dual 10/100M Ethernet Ports
- 2/4 Serial Ports (RS-232/485)
- Redundant Power Inputs
- Operating Temperature: -25 ~ +75°C

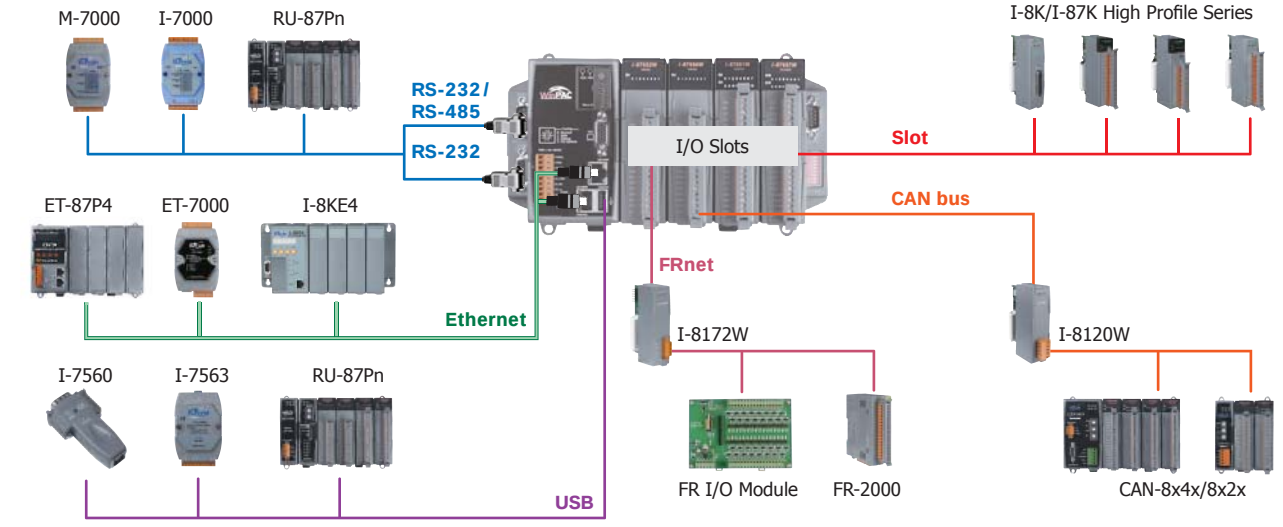
Introduction

LinPAC-8000 is the new generation Linux-based PAC (Programmable Automation Controller) from ICP DAS and is equipped with a PXA270 CPU (520 MHz) running a Linux kernel 2.6 operation system, multiple communication interfaces (VGA, USB, Ethernet and RS-232/485) and 1/4/8 slots for high performance parallel I/O modules (high profile I-8K series) and serial I/O modules (high profile I-87K series).

Main advantage of the LinPAC-8000 is its high quality control system, including its stably properties, open source and the standard LinPAC SDK for Windows and Linux using the GNU C language, GUI software. The main purpose of LinPAC-8000 is to allow the numerous enthusiastic Linux users to control their own embedded system easily within the Linux environment.

Applications

Rich I/O Expansion Ability



Specifications

Models	LP-8131	LP-8431	LP-8831	LP-8141	LP-8441	LP-8841
System Software						
OS	Linux kernel 2.6					
Embedded Service	Web Server, FTP Server, Telnet Server, SSH Server					
SDK Provided	Standard LinPAC SDK for Windows and Linux by GNU C language					
CPU Module						
CPU	PXA270, 520 MHz					
SDRAM	128 MB					
Dual Battery Backup SRAM	512 KB; data valid up to 5 years					
Flash	128 MB			48 MB		
EEPROM	16 KB					
Expansion Flash Memory	microSD socket with one 2 GB microSD card (support up to 16 GB microSDHC card)					
RTC (Real Time Clock)	Provide second, minute, hour, date, day of week, month, year					
64-bit Hardware Serial Number	Yes, for Software Copy Protection					
Dual Watchdog Timers	Yes					
Programmable LED Indicator	1					
Rotary Switch	Yes (0 ~ 9)					
DIP Switch	-	Yes (8 bits)		-	Yes (8 bits)	
VGA & Communication Ports						
VGA: VGA	Yes			Yes		
VGA: Resolution	1024 x 768, 800 x 600, 640 x 480			800 x 600, 640 x 480		
Ethernet	RJ-45 x 2, 10/100 Base-TX (Auto-negotiating, Auto MDI/MDI-X, LED indicators)					
USB 1.1 (host)	2			1		
COM 1	RS-232 (RxD, TxD and GND); non-isolated					
COM 2	RS-485 (Data+, Data); 2500 V_{DC} isolated	RS-485 (Data+, Data-); 3000 V_{DC} isolated		RS-485 (Data+, Data); 2500 V_{DC} isolated	RS-485 (Data+, Data-); 3000 V_{DC} isolated	
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					
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)	91 mm x 132 mm x 52 mm: LP-8131, LP-8141 231 mm x 132 mm x 111 mm: LP-8431, LP-8441 355 mm x 132 mm x 111 mm: LP-8831, LP-8841					
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	30 W	30 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

Ordering Information

LP-8131-EN	LP-8141-EN	Standard LinPAC-8000 with 1 I/O Slot (English Version of OS)
LP-8431-EN	LP-8441-EN	Standard LinPAC-8000 with 4 I/O Slots (English Version of OS)
LP-8831-EN	LP-8841-EN	Standard LinPAC-8000 with 8 I/O Slots (English Version of OS)

Accessories

DP-660	24 V_{DC}/2.5 A, 60 W and 5 V_{DC}/0.5 A, 2.5 W Power Supply with DIN-Rail Mounting
DP-1200 CR	24 V_{DC}/5.0 A, 120 W Power Supply with DIN-Rail Mounting (RoHS)
MDR-60-24 CR	24 V_{DC}/2.5 A, 60 W Power Supply with DIN-Rail Mounting (RoHS)

LP-8081 LP-8181-Atom

LP-8381 LP-8381-Atom

LP-8781 LP-8781-Atom

Features

- LX800, 500 MHz CPU or Atom Z520, 1.33 GHz CPU
- Linux kernel 2.6 Inside
- Embedded Service: Web Server, Telnet Server, SSH Server
- 0/1/3/7 Slots for High Profile I/O Modules
- 2/4 USB and 1 VGA Ports
- Dual Ethernet Ports (10/100 M)
- 4/5 Serial Ports (RS-232/RS-485)
- Operating Temperature: -25 ~ +75°C

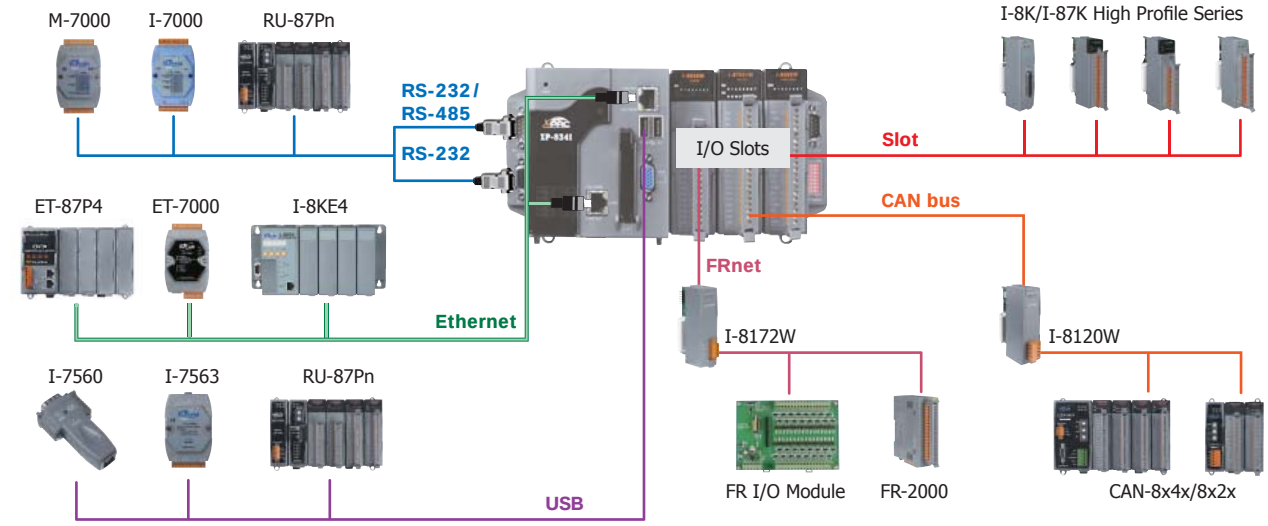
Introduction

LP-8x81-Atom series is the new generation Linux-based PAC of LP-8x81. It is equipped with an Intel Atom Z520 Series CPU at 1.33GHz, while LP-8x81 is equipped with a LX800 CPU at 500 MHz. They provide various connectivity (VGA, USB, Ethernet, RS-232/485) and 0/1/3/7 I/O slots for high performance parallel I/O modules (high profi le I-8K Series) and serial I/O modules (high profile I-87K series).

User's programs can be saved in external storage device, such as CF Card, USB device or RAM via Ethernet. LinPAC SDK is provided for users to develop LinPAC I/O applications rapidly and easily when I-7000/8000/87K series I/O modules are used in the LinPAC. Users can develop LinPAC applications using the GNU C Language. In the meanwhile, all kinds of servers and functions built-in make the LinPAC more powerful and users will be able to operate LinPAC to achieve their own project smoothly. With LP-8x81 Serial, users can achieve the redundancy function and it will make the whole control system safer.

Applications

Rich I/O Expansion Ability



Specifications

Models	LP-8081	LP-8381	LP-8781	LP-8181-Atom	LP-8381-Atom	LP-8781-Atom
System Software						
OS	Linux kernel 2.6.18			Linux kernel 2.6.33		
Embedded Service	Web Server, Telnet Server, SSH Server					
SDK Provided	Standard LinPAC SDK for Linux by GNU C language					
Multilanguage Support	No (Only for English)			Yes		
CPU Module						
CPU	LX800, 500 MHz			Atom Z520, 1.33 GHz		
System Memory	1 GB DDR SDRAM			1 GB DDR2 SDRAM		
Dual Battery Backup SRAM	512 KB; data valid up to 5 years					
Flash	4 GB as IDE Master			8 GB as IDE Master		
EEPROM	16 KB					
CF Card	8 GB (support up to 32 GB)					
RTC (Real Time Clock)	Provide second, minute, hour, date, day of week, month, yea					
Programmable LED Indicator	-			2		
64-bit Hardware Serial Number	Yes, for Software Copy Protection					
Dual Watchdog Timers	Yes					
Rotary Switch	Yes (0 ~ 9)					
DIP Switch	-	Yes (8 bits)				
Audio	-			Microphone-In and Earphone-Out		
VGA & Communication Ports						
VGA	Yes, (resolution: 1024 x 768, 800 x 600)					
Ethernet	RJ-45 x 2, 10/100 Base-TX (Auto-negotiating, Auto MDI/MDI-X, LED indicators)					
USB 2.0	2			4		
COM 1	RS-232 (RxD, TxD and GND); non-isolated	Internal communication with the 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					
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 and GND); non-isolated					
I/O Expansion Slots						
Slot Number	0	3	7	1	3	7
Mechanical						
Dimensions (W x L x H)	137 x 132 x 125 mm	231 x 132 x 111 mm	355 x 132 x 111 mm	169 x 132 x 125 mm	231 x 132 x 125 mm	355 x 132 x 125 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 V_{DC}					
Isolation	1 kV					
Redundant Power Inputs	Yes, with one power relay (1 A @ 24 V_{DC}) for alarm					
Capacity	15 W	35 W	35 W	25 W	35 W	35 W
Consumption	14.4 W	14.4 W	16.8 W	16.6 W	16.8 W	18 W

Ordering Information

LP-8081-EN CR	Standard LinPAC-8000 without I/O Slot (English Version of OS) (RoHS)
LP-8381-EN CR	Standard LinPAC-8000 with 3 I/O Slots (English Version of OS) (RoHS)
LP-8781-EN CR	Standard LinPAC-8000 with 7 I/O Slots (English Version of OS) (RoHS)
LP-8181-Atom CR	Standard LinPAC-8000-Atom with 1 I/O Slot (Multilingual Version of OS) (RoHS)
LP-8381-Atom CR	Standard LinPAC-8000-Atom with 3 I/O Slots (Multilingual Version of OS) (RoHS)
LP-8781-Atom CR	Standard LinPAC-8000-Atom with 7 I/O Slots (Multilingual Version of OS) (RoHS)

Accessories

NS-208 CR	8-Port Unmanaged Industrial 10/100 Base-TX Ethernet Switch (RoHS)
USB-2560 CR	4-Port Industrial USB 2.0 Hub (RoHS)
DP-1200 CR	24 V_{DC}/5.0 A, 120 W Power Supply with DIN-Rail Mounting (RoHS)
MDR-60-24 CR	24 V_{DC}/2.5 A, 60 W Power Supply with DIN-Rail Mounting (RoHS)

2.4. iPAC-8000 Series

• Overview

The iPAC-8000 is a family of compact, modular, intelligent and rugged, distributed PAC designed for data acquisition and control in manufacturing, research and education.

The iPAC-8000 is a modular network-based PAC with the capability of connecting I/O either through its own dual backplane bus or alternatively through remote I/O units and remote I/O modules. The unit comprises a main control unit with a range of standard communication interfaces, and a dual backplane bus permitting I/O expansion.

The dual backplane bus is hybrid in nature providing the facility to connect either serial or parallel I/O modules. The parallel bus is used for high speed data transfer.

The unit can communicate using serial communications (RS-232, RS-485), Ethernet, CAN bus or FRnet. The Ethernet version of the product supports an integrated web server permitting Internet and Intranet applications.

The iPAC-8000 can be used as an intelligent distributed data acquisition front end connected to a host machine running a standard SCADA package, or alternatively. It can be programmed as an autonomous controller running an embedded software application. Significant non-volatile memory is available for data and program storage.

Main Components:

1 Main Control Unit (MCU)

The MCU is the power house of the iPAC-8000. Each MCU comprises a central processor module (CPM), a power supply, a four (4) or eight (8) slot backplane for either 4 or 8 Parallel I/O modules. The CPM is a powerful integrated processing engine comprising a CPU, RAM and ROM, and an option of communication interfaces including RS-485, Ethernet, FRnet and CAN bus.

2 I/O Modules

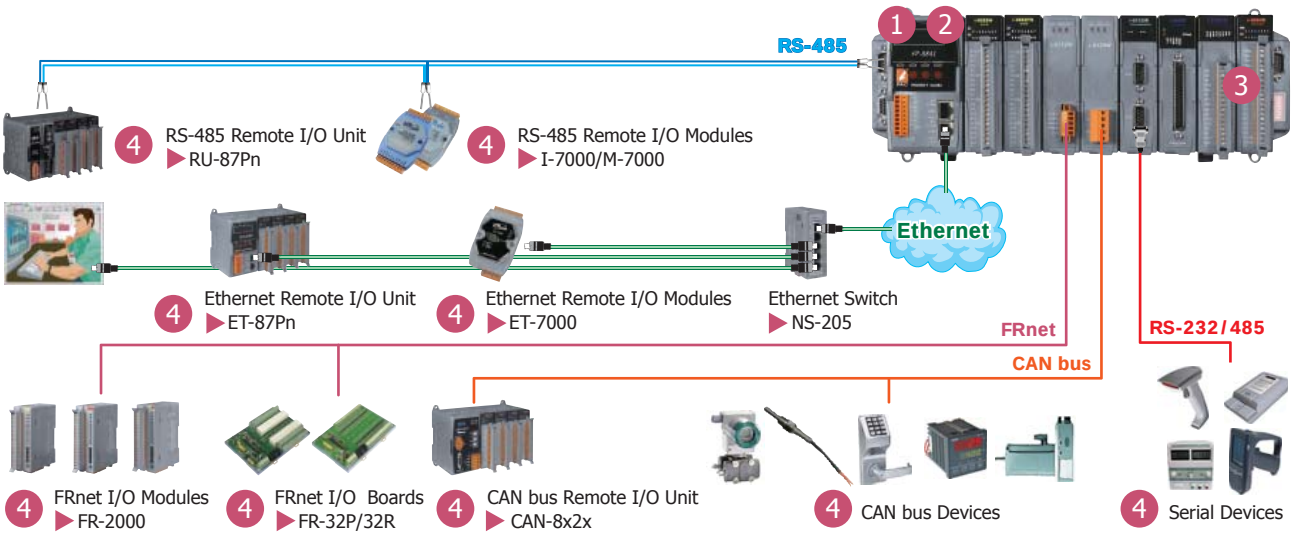
I/O modules have two types, i.e., parallel bus and serial bus. The parallel bus type I/O modules (high profile I-8K series) are high speed ones used only in the PACs including XPAC, WinPAC, iPAC, ViewPAC, etc. And the serial bus type I/O modules (high profile I-87K series) are low speed ones used in both PACs including XPAC, WinPAC, iPAC, ViewPAC, etc., and I/O expansion units including RU-87Pn, ET-87Pn, USB-87Pn, etc.

3 Embedded OS

All iPAC is equipped MiniOS7 embedded OS. It is developed by ICP DAS Co., ltd and compatible to DOS. MiniOS7 has more features than regular DOS in embedded applications, such as shorter boot time, built-in hardware diagnostic function, directly support I-8000 and I-7000 modules without library, and directly support Micro SD and Flash disk.

4 Remote I/O Expansion

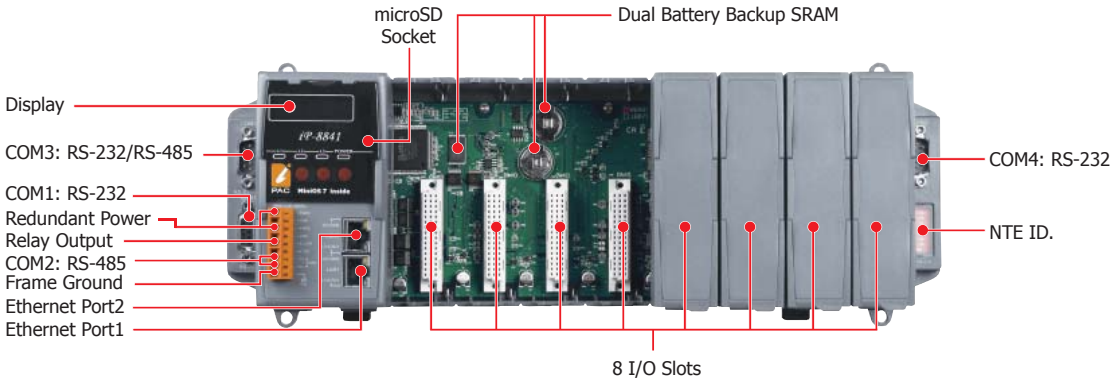
The iPAC-8000 uses built-in RS-485 and Ethernet ports to connect RS-485/Ethernet remote I/O units (Ru-87Pn/ET-87Pn) or modules (I-7000/M-7000/ET-7000). In this configuration, iPAC expands the I/O very easily. Using CAN or FRnet communication module, iPAC can connect CAN bus devices, remote I/O units or FRnet I/O modules for deterministic control system.



• Hardware

• Appearance

iP-8841/iP-8841-FD/iP-8847



• Selection Guide

iP-8 X X X - XX

NO. of I/O Slot

Hardware
1: Without Ethernet
3: Ethernet x 1
4: Ethernet x 2

Software
1: Standard
7: ISaGRAF

Flash Disk
FD: 256 MB Flash Disk

Standard iPAC

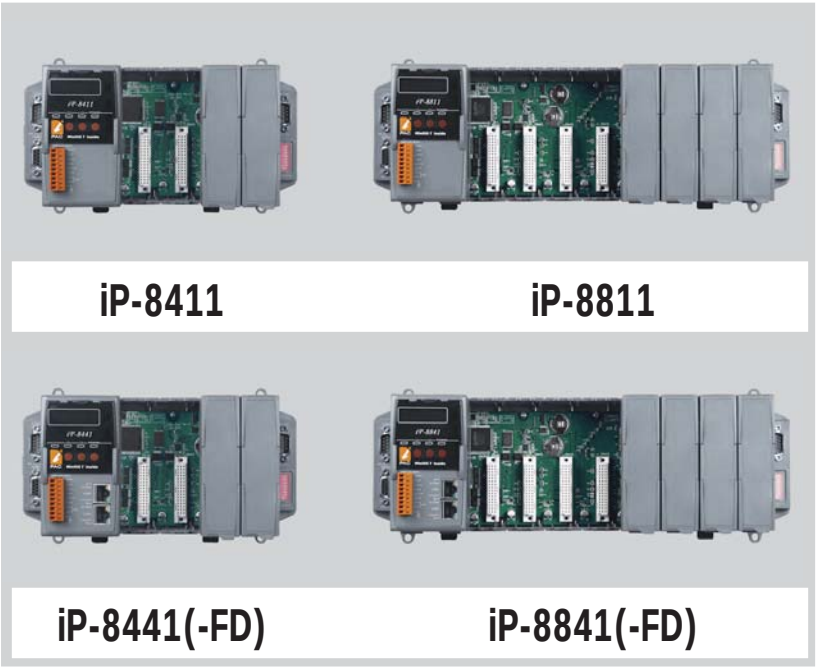
Model Name	Pre-installed Software	CPU	Flash	256 MB Flash Disk	SRAM	Ethernet Port	RS-232/RS-485	I/O Slot	Power Consumption
iP-8411	None	80 MHz	512 KB	-	512 KB	-	4	4	6.7 W
iP-8811								8	7.2 W
iP-8441					768 KB	2 (10/100 BaseTx)	4	4	6.7 W
iP-8841								8	7.2 W
iP-8441-FD				Yes				4	6.7 W
iP-8841-FD								8	7.2 W

The controller is equipped with a DOS-like OS, i.e. MiniOS7. Users can use C compilers to develop a program in 16 bit executable file (*.exe), then download it to the controller. There are many demo programs. For TCP/IP programming, ICP DAS provides a TCP/IP server template XServer which is a very powerful, easy-to-use and flexible tool saving 90% development time.

ISaGRAF Based iPAC

Model Name	Pre-installed Software	CPU	Flash	256 MB Flash Disk	SRAM	Ethernet Port	RS-232/RS-485	I/O Slot	Power Consumption
iP-8417	ISaGRAF	80 MHz	512 KB	-	512 KB	-	4	4	6.7 W
iP-8817								8	7.2 W
iP-8447					768 KB	2 (10/100 BaseTx)		4	6.7 W
iP-8847								8	7.2 W

The controller fully supports all five of the IEC61131-3 standard PLC languages:
1. Ladder diagram,
2. Function block diagram,
3. Sequential function chart,
4. Structured text,
5. Instruction List plus flow chart.
It supports Modbus protocol and can link to distributed I/O modules with Modbus or DCON protocol via the RS-232/485 or Ethernet.



Features

- 80186, 80 MHz CPU
- C Language Based and MiniOS7 Inside
- Compact and Rugged PAC
- 64-bit Hardware Serial Number
- 4/8 Slots for High Profile I/O Modules
- Dual 10/100M Ethernet Ports
- 4 Serial Ports (RS-232/485)
- Operating Temperature: -25 ~ +75°C

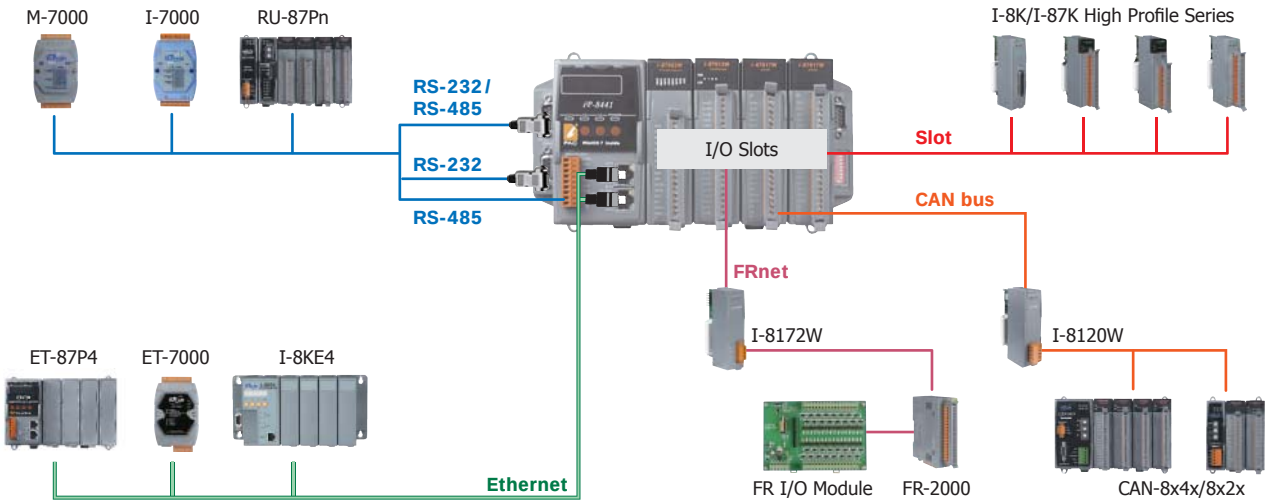
Introduction

The iPAC-8000 is the compact size PAC(Programmable Automation Controller). It supports various connectivity including Dual 10/100 Base-TX Ethernet ports, one RS-232/485 port, one RS-485 port and two RS-232 ports , and 4/8 slots for high performance Parallel I/O modules (high profile I-8K series) and Serial I/O modules (high profile I-87K series), etc.

The iPAC-8000 is designed for industrial monitoring, measurement and controlling. It has redundant power inputs with 1 kV isolation from noise and surges, and a wide range of operating temperature (-25 ~ +75°C). It can work in the harsh and rough environment.

Applications

Rich I/O Expansion Ability



Specifications

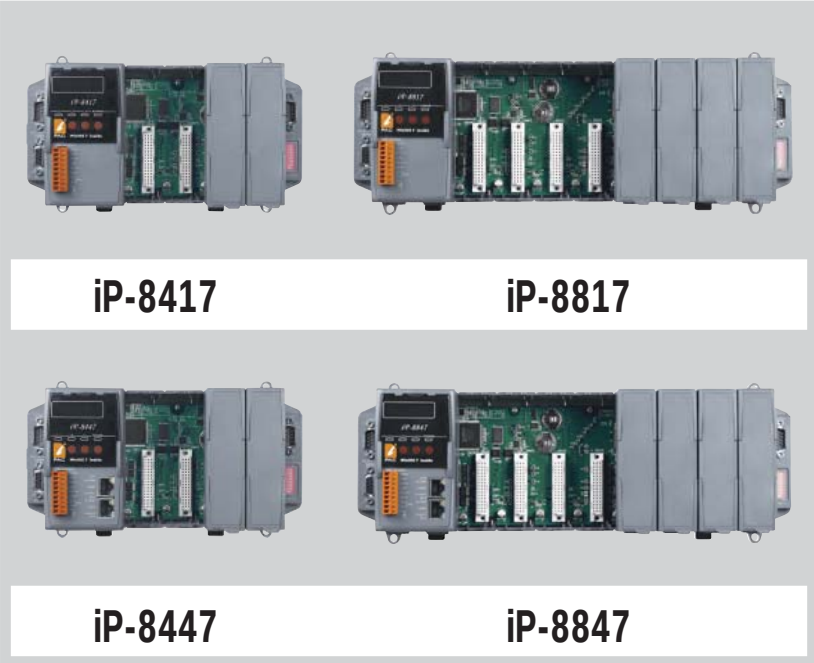
Models	iP-8411	iP-8811	iP-8441	iP-8841	iP-8441-FD	iP-8841-FD
System Software						
OS	MiniOS7 (DOS-like embedded operating system)					
Program Download Interface	RS-232 (COM1) or Ethernet					
Programming Language	C language					
Compilers to create.exe Files	TC++ 1.01 TC 2.01 BC++3.1 ~ 5.2x MSC 6.0 MSVC++ (before version 1.5.2)					
CPU Module						
CPU	80186, 80 MHz					
SRAM	512 KB		768 KB			
Flash	512 KB; with Write Protect Switch					
Expansion Flash Memory	microSD socket (can support 1/2 GB microSD)					
NAND Flash Disk	-				256 MB	
Dual Battery Backup SRAM	512 KB; data valid up to 5 years					
EEPROM	16 KB					
NVRAM	31 bytes (battery backup, data valid up to 5 years)					
RTC (Real Time Clock)	Provide second, minute, hour, date, day of week, month, year					
64-bit Hardware Serial Number	Yes, for Software Copy Protection					
Watchdog Timers	Yes (0.8 second)					
DIP Switch	Yes (8 bits)					
Communication Ports						
Ethernet	-		RJ-45 x 2, 10/100 Base-TX (Auto negotiating, Auto MDI/MDI-X, LED indicators)			
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; 3000 V_{DC} isolated					
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					
SMMI						
LED Display	Yes, 5-Digit					
Programmable LED Indicators	3					
Push Buttons	4					
Buzzer	-		Yes			
I/O Expansion Slots						
Slot Number	4	8	4	8	4	8
	Note: For High Profile I-8K and I-87K Modules Only					
Data Bus	8/16 bits					
Address Bus Range	2 K for each slot					
Mechanical						
Dimensions (W x L x H)	231 x 132 x 111 mm	355 x 132 x 111 mm	231 x 132 x 111 mm	355 x 132 x 111 mm	231 x 132 x 111 mm	355 x 132 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 V_{DC}					
Isolation	1 kV					
Redundant Power Inputs	Yes, with one power relay (1 A @ 24 V_{DC}) for alarm					
Capacity	30 W	30 W	30 W	30 W	30 W	30 W
Consumption	6.7 W	7.2 W	6.7 W	7.2 W	6.7 W	7.2 W

Ordering Information

iP-8411 CR	Standard iPAC-8000 without Ethernet ports (RoHS)
iP-8811 CR	Standard iPAC-8000 without Ethernet ports (RoHS)
iP-8441 CR	Standard iPAC-8000 with 4 I/O Slots (RoHS)
iP-8841 CR	Standard iPAC-8000 with 8 I/O Slots (RoHS)
iP-8441-FD CR	Standard iPAC-8000 with 256 MB Flash (RoHS)
iP-8841-FD CR	Standard iPAC-8000 with 256 MB Flash (RoHS)

Accessories

DP-660	24 V_{DC}/2.5 A, 60 W and 5 V_{DC}/0.5 A, 2.5 W Power Supply with DIN-Rail Mounting
DP-665	24 V_{DC}/2.7 A, 65 W Power Supply with DIN-Rail Mounting
I-7560 CR	USB to RS-232 Converter (RoHS)
3LMSD-2000 CR	2 GB microSD card (RoHS)



Features

- 80186, 80 MHz CPU
- ISaGRAF Ver.3 SoftLogic: Five IEC 61131-3 Standard Open PLC Languages + Flow Chart
- 512 KB Battery Backup SRAM to Retain Data
- 64-bit Hardware Serial Number
- 4/8 Hot-Swap Slots for I-87K High Profile I/O Modules
- Dual 10/100M Ethernet Ports (for iP-8447/8847)
- 4 Serial Ports (RS-232/485)
- Redundant Power Inputs
- Operating Temperature: -25 ~ +75°C

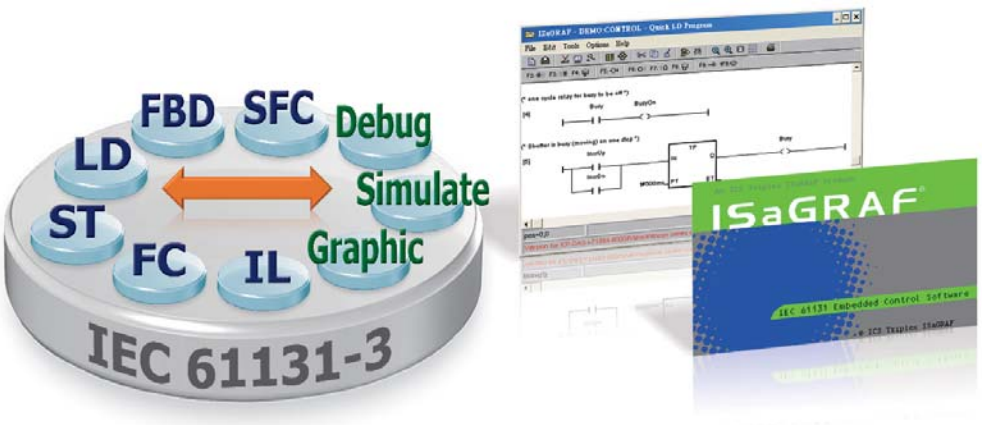
Introduction

iPAC-8xx7 Series (iP-8417/8817/8447/8847) is the ISaGRAF SoftLogic PAC of ICP DAS iPAC-8000 series. It is equipped an 80186, 80 MHz CPU running a MiniOS7 operating system, various connectivity (Dual 10/100 Base-TX Ethernet Ports for iP-8x47, one RS-232/485 port, one RS-485 port and two RS-232 ports) and 4/8 slots for high performance Parallel I/O modules (high profile I-8K series) and high performance Serial I/O modules (Hot-Swap high profile I-87K I/O modules). Users can also choose RS-485 Remote I/O modules (I-7000 series) or expansion units (RU-87Pn or I-87Kn) plugged with high profile I-87K serial I/O modules. Compared to I-8xx7, iPAC-8xx7 series is 2 ~ 4 times faster!

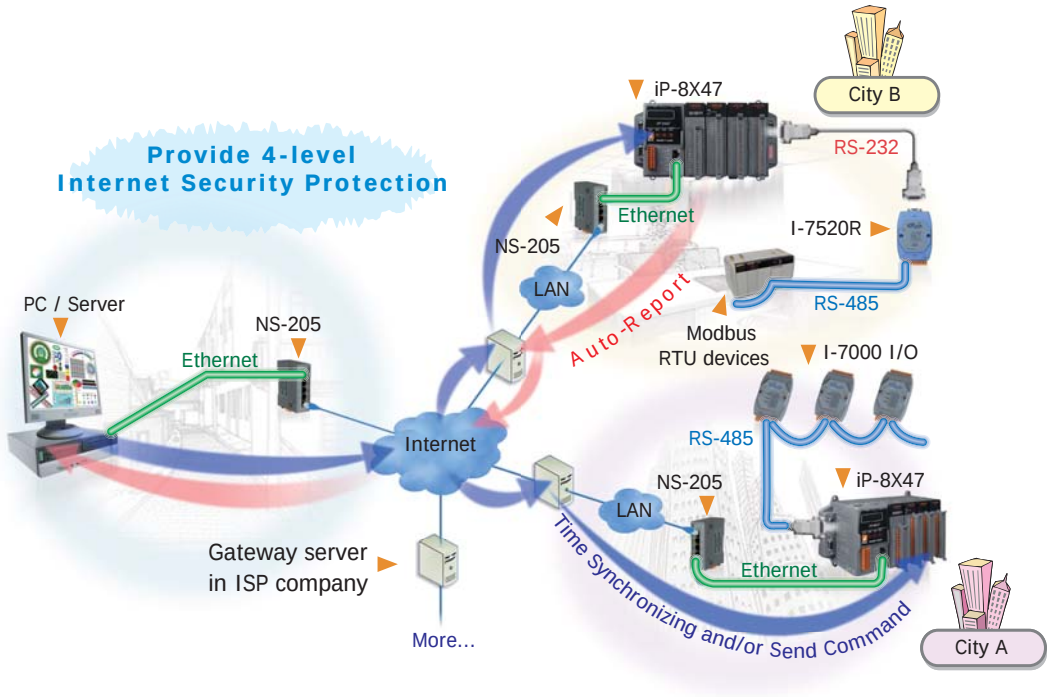
ISaGRAF Features

ISaGRAF is the most powerful SoftLogic package on the market. ISaGRAF is a PLC-like software and it supports IEC 61131-3 standard PLC programming languages (LD, FBD, SFC, ST, IL, FC), and can run the application generated by the workbench on any ISaGRAF PACs. The ISaGRAF workbench Ver. 3.x features.

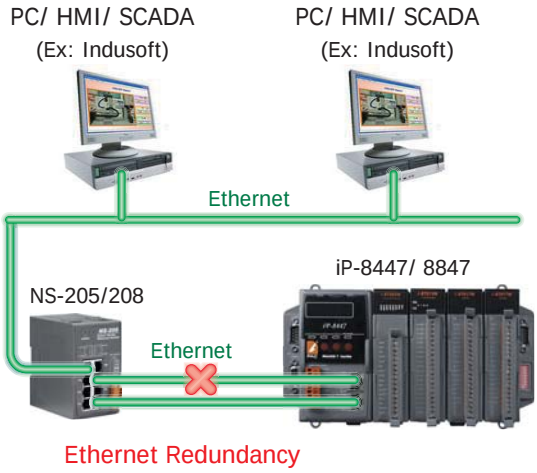
- IEC 61131-3 Standard Open PLC Programming Languages (LD, FBD, SFC, ST, IL, FC) + Flow Chart (FC)
- Auto-Scan I/O
- On-Line Debug/Control/Monitor, Off-Line Simulation
- Simple Graphic HMI



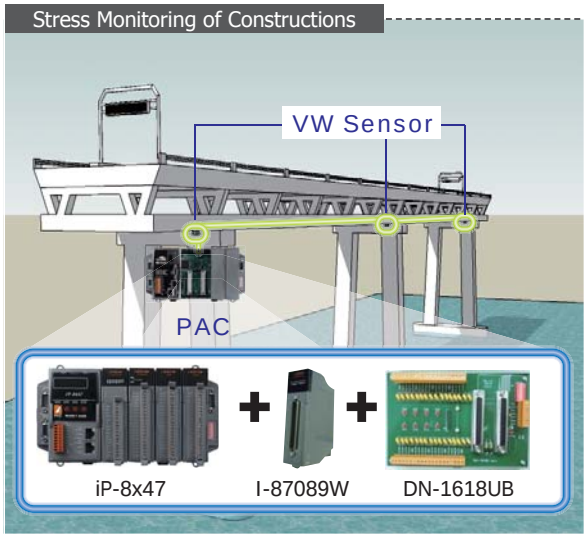
Cost-effective Auto-Report Data Acquisition/Control System



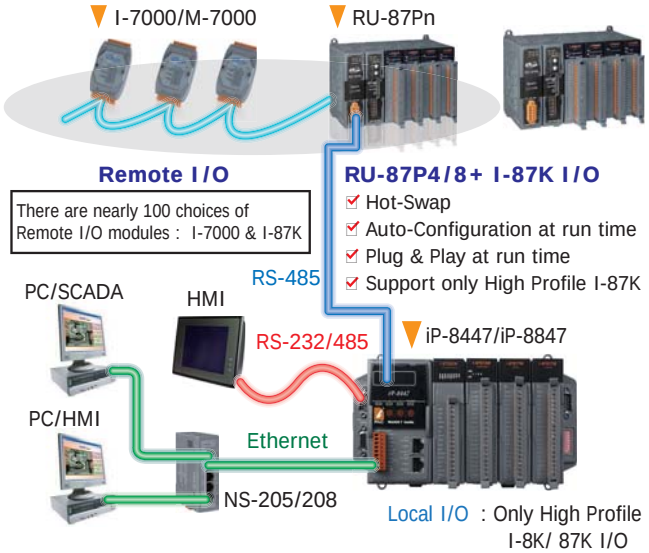
Ethernet Redundancy for HMI/PC/SCADA



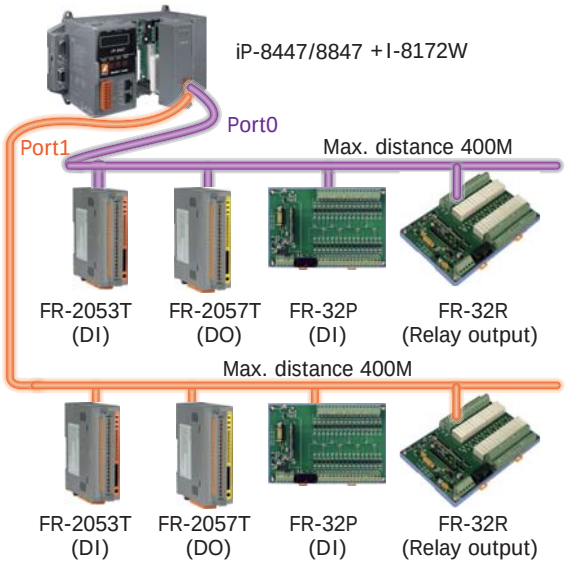
Stress Monitoring of Constructions



Local/Remote I/O Expansion & Multi-HMI



Fast FRnet Remote I/O



PAC Specifications

Models		iP-8417	iP-8817	iP-8447	iP-8847
System Software					
OS		MiniOS7 (DOS-like embedded operating system)			
Development Software					
ISaGRAF Software	ISaGRAF Version 3	IEC 61131-3 standard			
	Languages	LD, ST, FBD, SFC, IL & FC			
	Max. Code Size	64 KB			
	Scan Time	2 ~ 25 ms ms for normal program 10 ~ 125 ms (or more) for complex or large program			
CPU Module					
CPU		80186, 80 MHz			
SRAM		512 KB		768 KB	
Flash		512 KB; with Write Protect Switch			
microSD Expansion		Yes (but ISaGRAF doesn't support)			
Dual Battery Backup SRAM		512 KB; data valid up to 5 years (for retain variables)			
EEPROM		16 KB			
NVRAM		31 bytes (battery backup, data valid up to 5 years)			
RTC (Real Time Clock)		Provide second, minute, hour, date, day of week, month, year			
64-bit Hardware Serial Number		Yes, for Software Copy Protection			
Watchdog Timers		Yes (0.8 second)			
DIP Switch		Yes (8 bits)			
Communication Ports					
Ethernet		-		RJ-45 x 2, 10/100 Base-TX (Auto-negotiating, Auto MDI/MDI-X, LED indicators)	
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; 3000 V_{DC} isolated			
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			
SMMI					
LED Display		Yes, 5-Digit			
Programmable LED Indicators		3			
Push Buttons		4			
Buzzer		-	-	Yes	
I/O Expansion Slots					
Slot Number		4	8	4	8
		Note: For High Profile I-8K and I-87K Modules Only			
Data Bus		8/16 bits			
Address Bus Range		2 K for each slot			
Mechanical					
Dimensions (W x L x H)		231 mm x 132 mm x 111 mm	355 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 V_{DC}			
Isolation		1 kV			
Redundant Power Inputs		Yes, with one power relay (1 A @ 24 V_{DC}) for alarm			
Capacity		30 W	30 W	30 W	30 W
Consumption		6.7 W	7.2 W	6.7 W	7.2 W

ISaGRAF Specifications

Protocols (some protocols need optional devices)		
NET ID		8 bits DIP switch to assign NET ID as 1 ~ 255
Modbus RTU/ASCII Master		Max. 2 COM Ports, COM1 ~ COM5 can support Modbus RTU Master or ASCII Master protocol to connect to other Modbus Slave devices. Max. Modbus_xxx Function Block amount for 2 ports: 128. (*)
Modbus RTU Slave		Max. 2 COM Ports, COM1 and one of (COM2, COM3) can support Modbus RTU Slave protocol for connecting ISaGRAF, PC/HMI/OPC Server & MMI panels.
Modbus TCP/IP Slave		2 Ethernet ports support Modbus TCP/IP Slave Protocol for connecting ISaGRAF & PC/HMI. (Max. 6 connections) (for iP-8x47)
Remote I/O		One of COM2 or COM3 or COM4 supports I-7000 I/O modules & (I-87Kn or RU-87Pn + I-87K High Profile I/O boards) as Remote I/O. Max. 64 Remote I/O module for one PAC
Fbus		Built-in COM3 Port to exchange data between ICP DAS's ISaGRAF PACs.
Ebus		To exchange data between ICP DAS's ISaGRAF Ethernet PACs via Ethernet port. (The LAN2: upper port ONLY) (for iP-8x47)
SMS: Short Message Service		One of COM4/5 can link to a GSM Modem to support SMS. User can request data/control the controller by cellular phone. (*) The controller can also send data & alarms to user's cellular phone. Optional GSM/GPRS modem: GTM-201-RS232 (850/900/1800/1900 GSM/GPRS External Modem)
User-Defined Protocol		COM1 ~ COM20 by serial communication function blocks (*)
Modem_Link		COM4 can connect a general Modem. Supports PC to remotely download & monitor the controller.
MMICON/LCD		One of COM3 or COM4 supports ICP DAS's MMICON. The MMICON is featured with a 240 x 64 dot LCD and a 4 x 4 Keyboard. User can use it to display picture, string, integer, float, and input a character, string, integer and float.
Redundant Bus7000		Two ISaGRAF PACs can link to remote I-7000 & I-87K High profile I/O modules at the same time. Only one controller is active to control these Remote I/Os. If one is dead, the other one will take over the control of Remote I/Os.
CAN/CANopen		COM1, 3, 4 or COM5 ~ COM12 can connect one I-7530 (converter: RS-232 to CAN) to support CAN/CANopen devices and sensors. One iP-8xx7 supports max. 3 RS-232 ports to connect max. 3 I-7530. (*) (FAQ-086)
FRnet I/O		Support max. 4 I-8172W FRnet Master cards to connect FRnet I/O modules (Max. 1024-ch. DI + 1024-ch. DO)
Send E-mail		Actively or passively sending E-mail via Ethernet port through internet. Max.10 receivers for each sending and can send E-mail with an attached file. (Max. file size is about 488 KB) (for iP-8x47)
FTP Client		Support FTP client to upload files in the PAC to a remote FTP server on PC. (FAQ-151)
Optional I/O Functions (Refer to ISaGRAF PAC I/O Selection Guide for I/O Module list)		
PWM Output	High Speed PWM Module	I-8088W, 8-ch PWM outputs, software support 1 Hz ~ 100 kHz (non-continuous), duty: 0.1 ~ 99.9%
	DO Module as PWM	8-ch max. for one controller. 500 Hz max. For Off=1 & On=1 ms Output Square Curve: Off: 1 ~ 32767 ms, On: 1 ~ 32767 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)
Counters, Encoder, Frequency	Parallel DI Counter	8-ch. max. for 1 controller. Counter Val: 32-bit.; 500 Hz max. Min. ON & OFF width must >1 ms Optional DI boards: I-8040W, 8040PW, 8042W, 8046W, 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 I-7000/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. 4M Hz 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, 1 Hz ~ 100 kHz; I-8084W: 8-ch, 1 Hz ~ 250 kHz;
Motion	Motion Control	Can integrate with one I-8091W (2-axis) or two I-8091W (4-axis) to do motion control. Ethernet communication is also available when doing motion control.

*** Note: COM5 ~ COM20 are resided at the expansion boards if they are plugged on slot 0~7 of iP-8xx7.**
*** ISaGRAF FAQ: http://www.icpdas.com/faq/isagraf.htm**

Ordering Information

iP-8417 CR	ISaGRAF based iPAC-8000 with 4 I/O Slots (RoHS)
iP-8817 CR	ISaGRAF based iPAC-8000 with 8 I/O Slots (RoHS)
iP-8447 CR	ISaGRAF based iPAC-8000 with 4 I/O Slots (RoHS)
iP-8847 CR	ISaGRAF based iPAC-8000 with 8 I/O Slots (RoHS)

Accessories

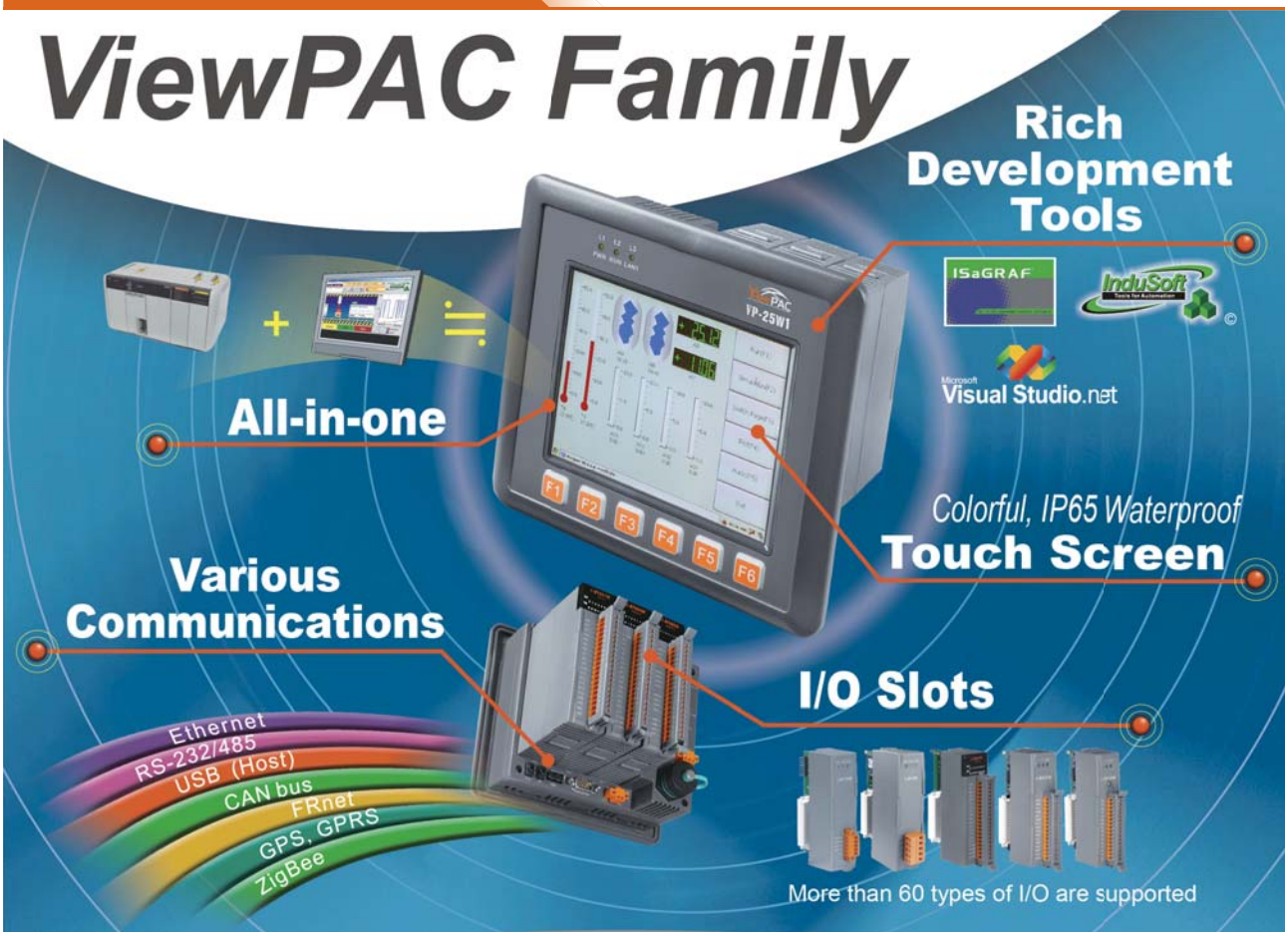
ISaGRAF Development Software	
ISaGRAF-256-E	ISaGRAF Workbench Software Ver.3 (256 I/O Tags) with One Application Book (English version) and one USB Dongle
ISaGRAF-256-C	ISaGRAF Workbench Software Ver.3 (256 I/O Tags) with One Application Book (Chinese version) and one USB Dongle
ISaGRAF-32-E	ISaGRAF Workbench Software Ver.3 (32 I/O Tags) with One Application Book (English version) Note: No upgrade service from ISaGRAF-32 to ISaGRAF-256.
ISaGRAF-32-C	ISaGRAF Workbench Software Ver.3 (32 I/O Tags) with One Application Book (Chinese version) Note: No upgrade service from ISaGRAF-32 to ISaGRAF-256.
*** Using ISaGRAF-32 can control more than 32 I/O tags. Please refer to ISaGRAF User's Manual Ch. 3.4**	
Power Supply	
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-665	24 VDC/2.7 A, 65 W Power Supply with DIN-Rail Mounting
DP-1200 CR	24 VDC/5.0 A, 120 W Power Supply with DIN-Rail Mounting (RoHS)
Converter	
I-7560 CR	USB to RS-232 Converter (RoHS)

ViewPAC

3

3.1. ViewPAC Overview

• Overview



ViewPAC is an innovative PAC that combines a display, an I/O module and control in a single unit, and provide the perfect solution for integrating HMI, data acquisition and control in an individual PAC. Normally, HMIs and controllers operate separately.

ViewPAC ≒ **WinPAC/iPAC + Display** ≒ **IPC + Display** + **PLC**

The ViewPAC family includes two CPU teyps (80186, PXA270), two OS options (WinCE 5.0, MiniOS7) and a range of software development toolkits (C, Visual Studio .NET, ISaGRAF, InduSoft), each of which feature the same stability and flexibility as the standard PAC family produced by ICP DAS. ViewPAC is the ideal choice for a variety of applications, including factory automation, buliding automation, machine automation, manufacturing management , and environment monitoring, etc.

• Features

1. A variety of CPU and OS options for selection

MiniOS7
80186 CPU
VP-211x
VH-2110

- DOS-like
- Boot up in 0.4 ~ 0.8 seconds
- Built-in hardware diagnostics
- Standard version for C language programming
- ISaGRAF version for IEC 61131-3 programming

WinCE
PXA270 CPU
VP-2xWx
VP-413x

- Supports PC based software: eVC and Visual Studio .NET 2005/2008
- Web server, FTP server, Telnet server
- ISaGRAF version for IEC 61131-3 programming
- InduSoft version for SCADA solution

2. LCD Display & Rubber Keypad

1. 128 x 64 dot matrix STN LCD
2. 3.5" TFT LCD
3. 5.7" TFT LCD with touch panel
4. 10.4" TFT LCD with touch panel

The rubber keypad provides the following benefits:
1. Easy to dial
2. Long operation life up to 500k cycles
3. Function key characters are customizable

3. I/O Slots

The I/O slots support parallel bus (high profile I-8K series) and serial bus (high profile I-87K series) type I/O modules, and there are more than 60 kinds of module avalible for AI, AO, DI, DO, counter input, frequency input, PWM output, motion control, memory, and communication, etc.

4. Multiple Communication Interfaces

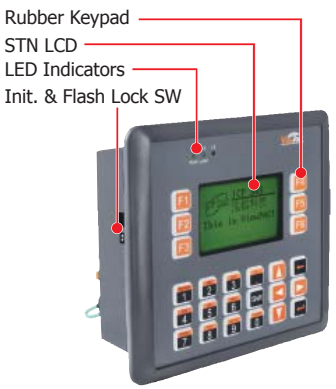
Several different types of communication interface are avalible that enable I/O modules to be expanded and connected to external devices:

1. Ethernet
2. RS-232/485
3. USB host
4. CAN bus
5. FRnet
6. GSM/GPRS/GPS
7. ZigBee

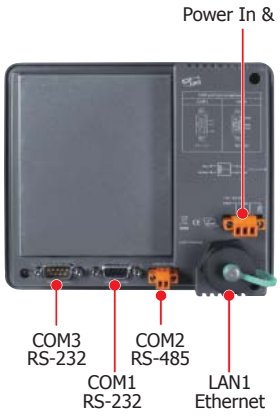
• Hardware

1. Appearance

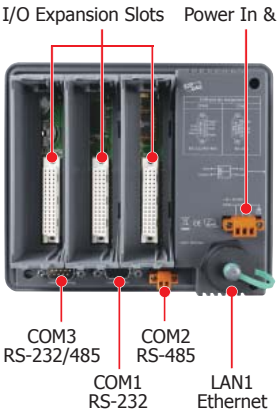
VP-2111/VP-2117/VH-2110



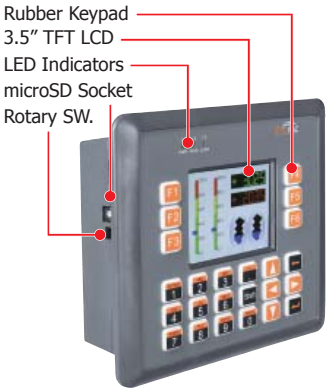
VH-2110



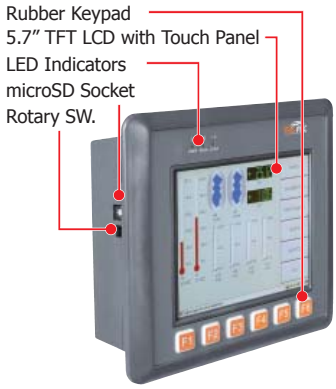
VP-2111/VP-2117



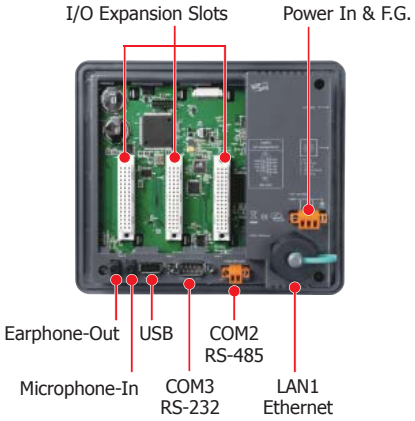
VP-23W1/VP-23W7/VP-23W9



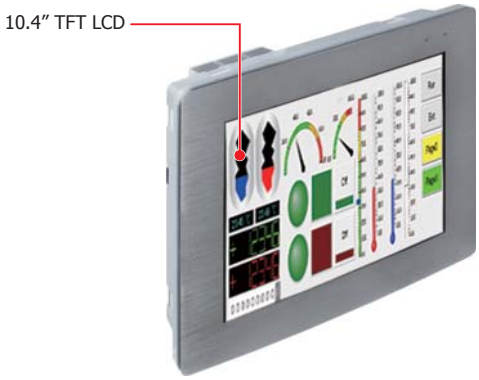
VP-25W1/VP-25W7/VP-25W9



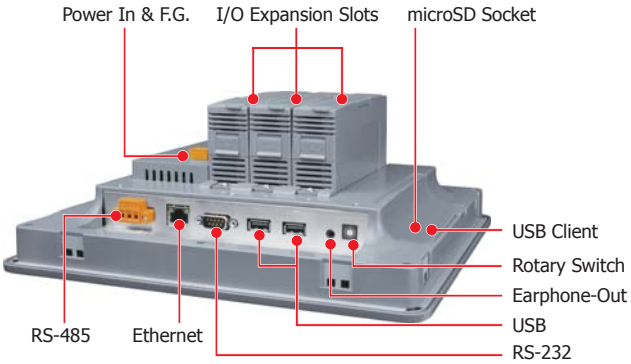
VP-23Wx/VP-25Wx



VP-4131/VP-4137/VP-4139



VP-4131/VP-4137/VP-4139



2. Installation

IP 66 Industrial Enclosure: I-3625-ENC

Panel Mounting-1

Panel Mounting-2

Panel Mounting-3

• Selection Guide

VP - 2 1 1 X - XX

Display
1: 128 x 64 STN dot matrix LCD

Operating System
1: MiniOS7

Software
1: Standard
7: ISaGRAF

Language
☐: English and Simplified Chinese
TC: Traditional Chinese

MiniOS7 Inside

C Language Based ViewPAC

Model Name	Special Feature	OS	CPU	Flash	SRAM	Dual Battery Backup SRAM	Flash Disk	STN LCD Resolution	Ethernet Port	RS-232 / RS-485	I/O Slot
VP-2111	-	MiniOS7	80 MHz	512 KB	768 KB	512 KB	64 MB	128 x 64	1	3	3
VH-2110	-	MiniOS7	80 MHz	512 KB	512 KB	-	-	128 x 64	1	3	-

The ViewPAC VP-2111/VH-2110 series has a 16-bit CPU, a 128 x 64 resolution graphic display, a silicon rubber keypad, Ethernet, RS-232, RS-485 communication ports, and three I/O expansion slots. Each is also equipped with a DOS-like OS, called MiniOS7. Users can develop their custom programs in C and use a compiler such as Turbo C 2.0 or Turbo C++ 1.01 (recommended) to create a 16-bit executable file that can then be uploaded to the VP-211/VH-2110 controller via the RS-232 or Ethernet port.

ICP DAS provides a variety of demo programs for your reference. In addition, for TCP/IP programming, ICP DAS provides a TCP/IP server template, called Xserver, that is a very powerful, easy to use and flexible tool that can reduce your development time by up to 90%.

ISaGRAF Based ViewPAC

Model Name	Special Feature	OS	CPU	Flash	SRAM	Dual Battery Backup SRAM	Flash Disk	STN LCD Resolution	Ethernet Port	RS-232 / RS-485	I/O Slot
VP-2117	-	MiniOS7	80 MHz	512 KB	768 KB	512 KB	64 MB	128 x 64	1	3	3

The controller fully supports all five of the IEC61131-3 standard PLC languages:
1. Ladder diagram
2. Function block diagram
3. Sequential function chart
4. Structured text
5. Instruction List plus flow chart

It supports the Modbus protocol and can link to distributed I/O modules using either the Modbus or DCON protocol via the RS-232/485 or Ethernet port.

VP - 2 X W X - XX

Display
3: 3.5" TFT LCD without touch
5: 5.7" TFT LCD touch

Operating System
W: Windows CE

Software
1: Standard
7: ISaGRAF
9: InduSoft

Language
EN: English
TC: Traditional Chinese
SC: Simplified Chinese

VP - 4 1 X X - XX

Display
4: 10.4" TFT LCD touch

CPU
1: PXA270

Communication
2: CAN Bus
3: Ethernet × 1
4: Ethernet × 2

Software
1: Standard
7: ISaGRAF
9: InduSoft

Language
EN: English
TC: Traditional Chinese
SC: Simplified Chinese

Windows CE .NET 5.0 Inside

Standard ViewPAC

Model Name	OS	Pre-Installed Software	CPU	Flash	SDRAM	Dual Battery Backup SRAM	TFT LCD (Resolution)	Ethernet Port	RS-232/RS-485	USB	I/O Slot
VP-23W1	CE 5.0	None	PXA270, 520 MHz	96 MB	128 MB	512 KB	3.5" (320 x 240)	1	2	1	3
VP-25W1							5.7" (640 x 480)				
VP-4131				128 MB			10.4" (800 x 600)			2	

The controller supports the following software development tools:
1. DLLs of I/O modules for eVC, VS.Net 2005/2008
2. DLLs of Modbus/RTU and Modbus/TCP for eVC and VS.Net 2005/2008
3. OPC server (Quicker)

ISaGRAF Based ViewPAC

Model Name	OS	Pre-Installed Software	CPU	Flash	SDRAM	Dual Battery Backup SRAM	TFT LCD (Resolution)	Ethernet Port	RS-232/RS-485	USB	I/O Slot
VP-23W7	CE 5.0	ISaGRAF	PXA270, 520 MHz	96 MB	128 MB	512 KB	3.5" (320 x 240)	1	2	1	3
VP-25W7							5.7" (640 x 480)				
VP-4137				128 MB			10.4" (800 x 600)			2	

The controller fully supports all five of the IEC61131-3 standard PLC languages:
1. Ladder diagram
2. Function block diagram
3. Sequential function chart
4. Structured text
5. Instruction List plus flow chart
It supports the Modbus protocol and can link to distributed I/O modules using either the Modbus or DCON protocol via the RS-232/485 or Ethernet port.

InduSoft Based ViewPAC

Model Name	OS	Pre-Installed Software	CPU	Flash	SDRAM	Dual Battery Backup SRAM	TFT LCD (Resolution)	Ethernet Port	RS-232/RS-485	USB	I/O Slot
VP-23W9	CE 5.0	InduSoft	PXA270, 520 MHz	96 MB	128 MB	512 KB	3.5" (320 x 240)	1	2	1	3
VP-25W9							5.7" (640 x 480)				
VP-4139				128 MB			10.4" (800 x 600)			2	

The controller can be used to develop following applications:
1. Human Machine Interfaces (HMI)
2. Supervisory Control and Data Acquisition System (SCADA)
3. Web server

VP-2111 VH-2110

Features

- 80186, 80 MHz CPU
- C Language Based and MiniOS7 Inside
- 3 I/O Slots
- IP65 Compliant Front Panel
- STN LCD with English and Chinese Fonts
- Rubber Keypad with 24 Keys
- Operating Temperature: -15 ~ +55°C

Introduction

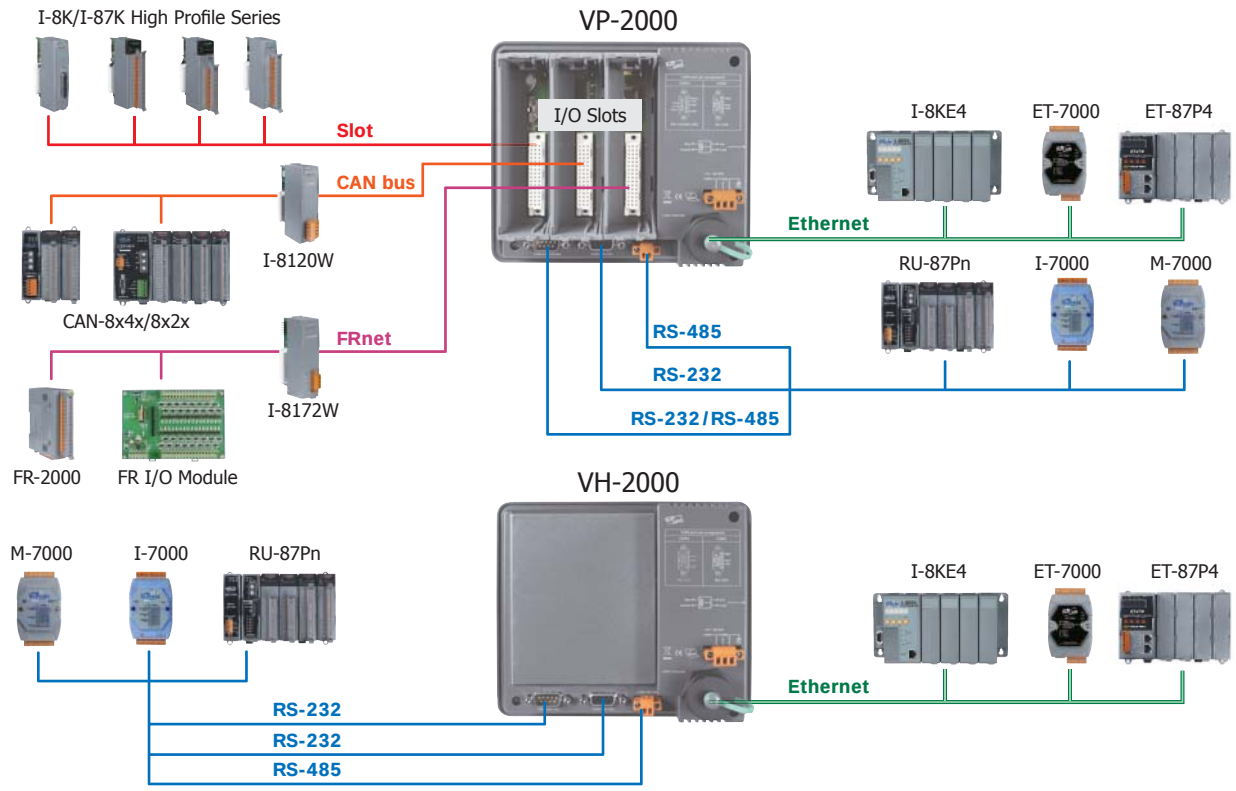
The VP-2111/VH-2110 are MiniOS7 based PACs that combine a graphic display and a keypad into a single unit. They are equipped with an 80186 CPU (16-bit, 80 MHz) running a MiniOS7 operating system, several communication interfaces (Ethernet, RS-232/485), three I/O slots (VP-2111), a STN LCD and a rubber keypad.

The MiniOS7 operating system boots up within a very short time (0.4 ~ 0.8 seconds). VP-2111/VH-2110 has a built-in hardware diagnostic function, and supports the full range of functions required to access all high profi le I-8K and I-87K series I/O modules, such as DI, DO, DI/DO, AI, AO, Counter/Frequency, motion control modules, etc.

Compared to regular HMI + PLC solutions, VP-2111 and VH-2110 reduce overall system cost and space, and provide all the best features of HMIs and PLCs.

Applications

Rich I/O Expansion Ability



Specifications

Models	VP-2111	VH-2110
System Software		
OS	MiniOS7 (DOS-like embedded operating system)	
Program Download Interface	RS-232 (COM1) or Ethernet	
Programming Language	C language	
Compilers to create.exe Files	TC++ 1.01; TC 2.01; BC++ 3.1 ~ 5.2x; MSC 6.0; MSVC++ (before version 1.5.2)	
CPU Module		
CPU	80186, 80 MHz	
SRAM	768 KB	512 KB
Dual Battery Backup SRAM	512 KB; data valid up to 5 years	-
Flash	512 KB	
Flash Disk	64 MB NAND Flash	-
EEPROM	16 KB	
NVRAM	31 bytes (battery backup, data valid up to 5 years)	
RTC (Real Time Clock)	Provide second, minute, hour, date, day of week, month, year	
64-bit Hardware Serial Number	Yes, for Software Copy Protection	
Watchdog Timers	Yes (0.8 second)	
Communication Ports		
Ethernet	RJ-45 x 1, 10/100 Base-TX (Auto-negotiating, Auto MDI/MDI-X, LED indicators)	
COM 0	Internal communication with the high profile I-87K series modules in slots	
COM 1	RS-232 (RxD, TxD and GND) Program download port; non-isolated	
COM 2	RS-485 (Data+, Data-) with internal self-tuner ASIC; 2500 V_{DC} isolated	
COM 3	RRS-232/RS-485 (RxD, TxD, CTS, RTS and GND for RS-232, Data+ and Data- for RS-485); non-isolated	RS-232 (RxD, TxD, CTS, RTS and GND for RS-232); non-isolated
MMI (Man Machine Interface)		
LCD	STN, 128 x 64 Dot Matrix LCD	
Display Mode	Text + Graphics	
Text Font	English + Simplified Chinese/Traditional Chinese	
Rubber Keypad	24 keys	
Buzzer	Yes	
LED Indicators	3 Dual-Color LEDs (PWR, RUN, LAN1, L1, L2, L3; L1~L3 for User Programmable)	2 Dual-Color LEDs (RUN, LAN1, L1, L2; L1~L2 for User Programmable)
I/O Expansion Slots		
Slot Number	3 (For High Profile I-8K and I-87K Modules Only)	-
Data Bus	8/16 bits	-
Address Bus Range	2 K for each slot	-
Mechanical		
Dimensions (W x H x D)	182 mm x 158 mm x 125 mm	
Installation	Panel Mounting	
Ingress Protection	Front panel: IP65	
Environmental		
Operating Temperature	-15 ~ +55°C	
Storage Temperature	-30 ~ +80°C	
Ambient Relative Humidity	10 ~ 90% RH (non-condensing)	
Power		
Input Range	+10 ~ +30 V_{DC}	+12 ~ +48 V_{DC}
Isolation	1 kV	-
Capacity	15 W	-
Consumption	6 W	3.6 W

Ordering Information

VP-2111 CR	C Language Based ViewPAC with 3 I/O Slots (English + Simplified Chinese Font) (RoHS)
VP-2111-TC CR	C Language Based ViewPAC with 3 I/O Slots (English + Traditional Chinese Font) (RoHS)
VH-2110 CR	C Language Based ViewPAC without I/O Slot (English + Simplified Chinese Font) (RoHS)
VH-2110-TC CR	C Language Based ViewPAC without I/O Slot (English + Traditional Chinese Font) (RoHS)

Accessories

DP-660	24 V_{DC}/2.5 A, 60 W and 5 V_{DC}/0.5 A, 2.5 W Power Supply with DIN-Rail Mounting
MDR-60-24 CR	24 V_{DC}/2.5 A, 60 W Power Supply with DIN-Rail Mounting (RoHS)

VP-2117

Features

- 80186, 80 MHz CPU
- ISaGRAF Ver.3 SoftLogic Inside (IEC 61131-3)
- 3 I/O Slots
- IP65 Compliant Front Panel
- STN LCD with English and Chinese Fonts
- Rubber Keypad with 24 Keys
- Operating Temperature: -15 ~ +55°C

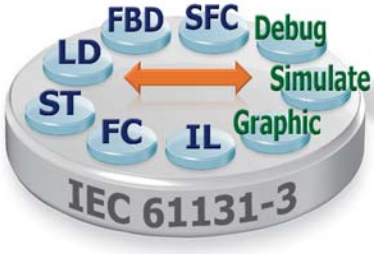
Introduction

VP-2117 is a ISaGARF based PAC which integrates a graphic display and a keypad into a single unit. It is equipped with an 80186 CPU (16-bit, 80 MHz) running a MiniOS7 operating system, a STN LCD, a rubber keypad, three I/O slots, and a variety of connectivities including Ethernet and RS-232/485, etc. MiniOS7 operating system boots up within a very short time (0.4 ~ 0.8 seconds). VP-2117 has a built-in hardware diagnostic function, and supports the full range of functions required to access all high profile I-8K and I-87K series I/O modules, such as DI, DO, DI/DO, AI, AO, Counter/Frequency, motion control modules, etc. Users can also choose RS-485 remote I/O modules (I-7000 series) or expansion units (RU-87Pn or I-87Kn) plugged with high profi le I-87K serial I/O modules. Compared to regular HMI + PLC solutions, VP-2117 reduces overall system cost and space, and provide all the best features of HMIs and PLCs.

ISaGRAF Features

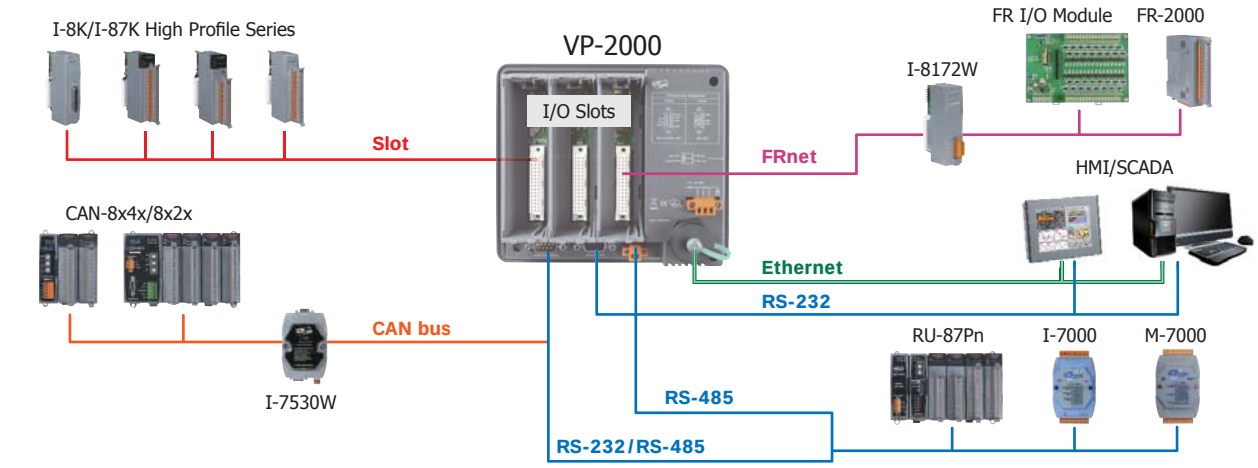
The ISaGRAF workbench Ver. 3.x features:

- IEC 61131-3 Standard Open PLC Programming Languages (LD, FBD, SFC, ST, IL, FC) + Flow Chart (FC)
- Auto-Scan I/O
- On-Line Debug/Control/Monitor, Off-Line Simulation
- Simple Graphic HMI

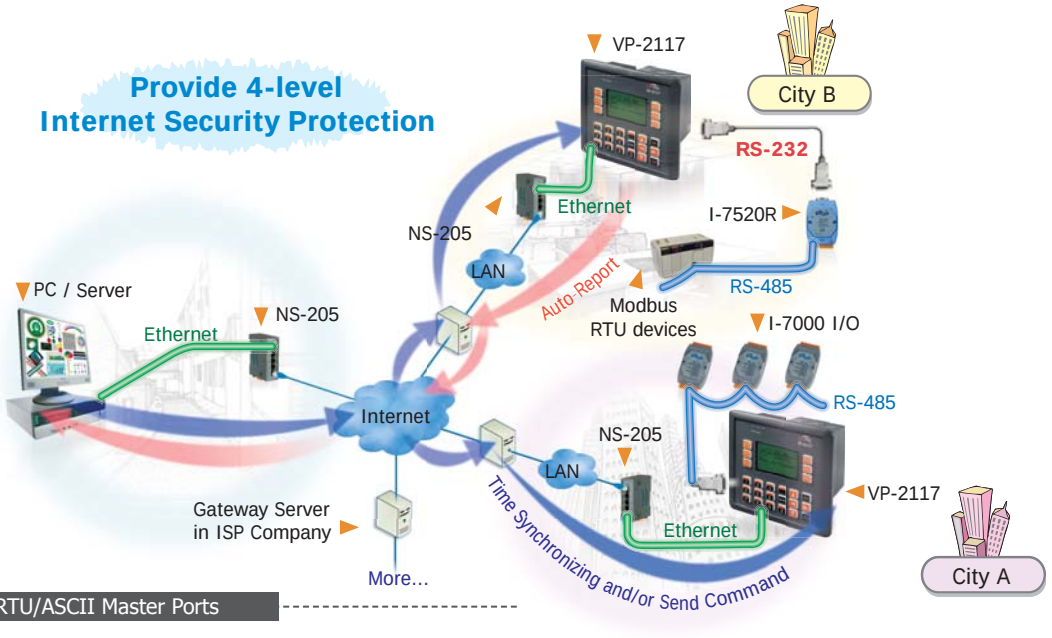


Applications

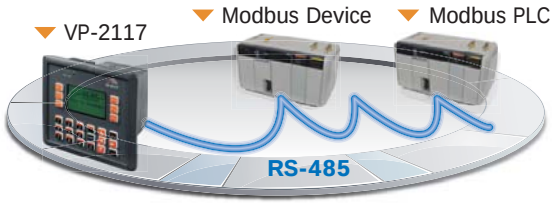
Rich I/O Expansion Ability



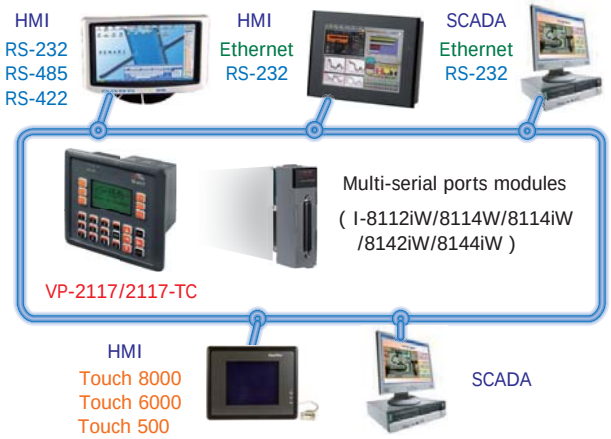
Cost-effective Auto-ReportData Acquisition/Control System



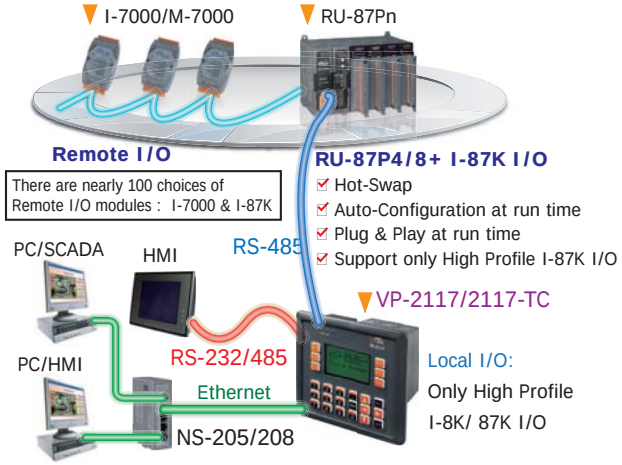
Modbus RTU/ASCII Master Ports



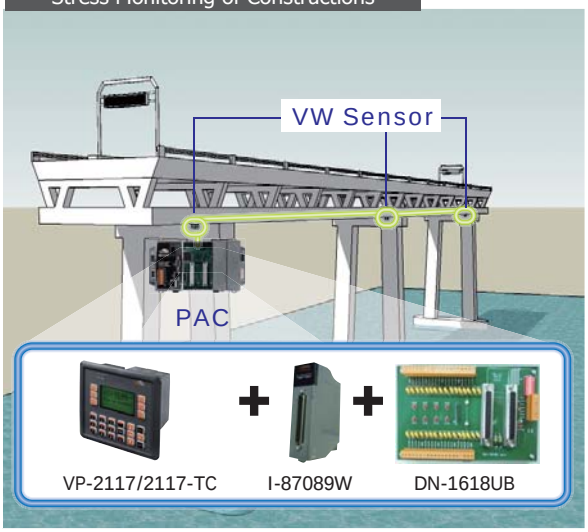
Modbus RTU/TCP Slave Ports



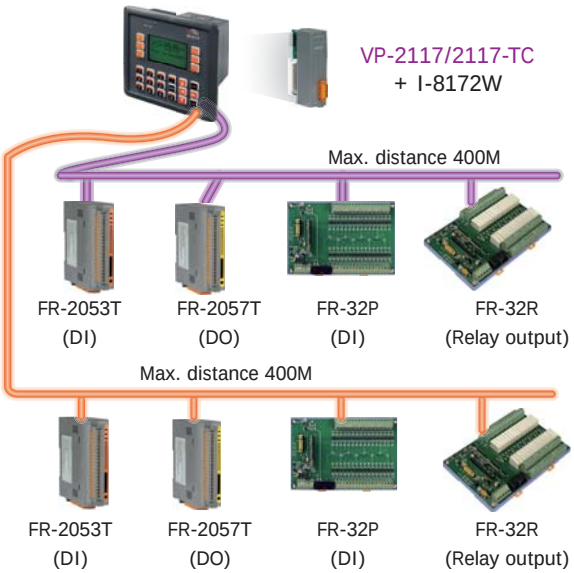
Local/Remote I/O Expansion & Multi-HMI



Stress Monitoring of Constructions



FRnet I/O Application



Specifications

Models		VP-2117
System Software		
OS		MiniOS7 (DOS-like embedded operating system)
Development Software		
ISaGRAF Software	ISaGRAF Version 3	IEC 61131-3 standard
	Languages	LD, ST, FBD, SFC, IL & FC
	Max. Code Size	64 KB
	Scan Time	2 ~ 25 ms for normal program 10 ~ 125 ms (or more) for complex or large program
CPU Module		
CPU		80186, 80 MHz
SRAM		768 KB
Flash		512 KB
Flash Disk		64 MB NAND Flash
Dual Battery Backup SRAM		512 KB; data valid up to 5 years (for retain variables)
EEPROM		16 KB
NVRAM		31 bytes (battery backup, data valid up to 5 years)
RTC (Real Time Clock)		Provide second, minute, hour, date, day of week, month, year
64-bit Hardware Serial Number		Yes, for Software Copy Protection
Watchdog Timers		Yes (0.8 second)
Communication Ports		
Ethernet		RJ-45 x 1, 10/100 Base-TX (Auto-negotiating, LED indicators)
COM 0		Internal communication with the I-87K High Profi le modules in slot 0 ~ 2
COM 1		RS-232 (RxD, TxD and GND) Program download port; Non-isolated
COM 2		RS-485 (Data+, Data-) with internal self-tuner ASIC; 2500 V_{DC} isolated
COM 3		RS-232/RS-485 (RxD, TxD, CTS, RTS and GND for RS-232, Data+ and Data- for RS-485); Non-isolated
MMI (Man Machine Interface)		
LCD		STN, 128 x 64 Dot Matrix LCD
Display Mode		Text + Graphics
Text Font		English + Simplified Chinese/Traditional Chinese
Rubber Keypad		24 keys
Buzzer		Yes
LED Indicators		3 Dual-Color LEDs (PWR, RUN, LAN1, L1,L2, L3; L1~L3 for User Programmable)
I/O Expansion Slots		
Slot Number		3 (For High Profile I-8K and I-87K Modules only)
Mechanical		
Dimensions (W x L x H)		182 mm x 158 mm x 125 mm
Installation		Panel Mounting
Ingress Protection		Front panel: IP65
Environmental		
Operating Temperature		-15 ~ +55°C
Storage Temperature		-30 ~ +80°C
Ambient Relative Humidity		10 ~ 90% RH (non-condensing)
Power		
Input Range		+10 ~ +30 V_{DC}
Isolation		1 kV
Capacity		15 W
Consumption		6 W

ISaGRAF Specifications

Protocols (some protocols need optional devices)		
NET ID		1 ~ 255, user-assigned by software
Modbus RTU/ASCII Master		Max. 2 COM Ports: COM1 ~ COM3 and COM5. (To connect to other Modbus Slave devices.) (*) Max. Modbus_xxx Function Block amount for 2 ports: 128.
Modbus RTU Slave		Max. 2 COM Ports, COM1 and one of COM2 or COM3. (For connecting ISaGRAF, PC/HMI/OPC Server & MMI panels.)
Modbus TCP/IP Slave		Max. 6 connections. For connecting ISaGRAF & PC/HMI.
Remote I/O		One of COM2 or 3 supports I-7000 I/O modules, and I-87Kn base or RU-87P1/2/4/8 + I-87K High Profile I/O boards as Remote I/O. Max. 64 Remote I/O module for one PAC.
Fbus		Built-in COM3 Port to exchange data between ICP DAS's ISaGRAF PACs.
Ebus		To exchange data between ICP DAS's ISaGRAF Ethernet PACs via Ethernet port.
SMS:Short Message Service		One of COM3 or COM5 can link to a GSM modem to support SMS. User can request data/control the controller by cellular phone. The controller can also send data & alarms to user's cellular phone. (*) Optional GSM/GPRS modem: GTM-201-RS232 (850/900/1800/1900 GSM/GPRS External Modem) or visit to the web site for recommended GSM/GPRS modem.
User-Defined Protocol		COM1 ~ COM3, COM5 ~ COM16 by serial communication function blocks (*)
CAN/CANopen		Max. 3 COM Ports: COM1, 3 or COM5 ~ COM12 (*) can connect one I-7530 (RS-232 to CAN converter) to support CAN/CANopen devices and sensors. One VP-2117 supports max. 3 RS-232 Ports to connect max. 3 I-7530. (FAQ-086)
FRnet I/O		Support Max. 3 I-8172W FRnet Master cards to connect FRnet I/O modules (Max. 768-ch. DI + 768-ch. DO)
Sending E-mail		Actively or passively sending E-mail via Ethernet port through internet. Max. 10 receivers for each sending and can send E-mail with an attached file. (Max. file size is about 488 KB)
Optional I/O Functions (Refer to ISaGRAF PAC I/O Selection Guide for I/O Module list)		
PWM Output	High Speed PWM Module	I-8088W, 8-ch PWM outputs, software support 1 Hz ~ 100 kHz (non-continuous), duty: 0.1 ~ 99.9%
	DO Module as PWM	8-ch. max. 500 Hz max. For Off=1 & On=1 ms. Output square wave: Off: 1 ~ 32766 ms, On: 1 ~ 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)
Counters, Encoder, Frequency	Parallel DI Counter	8 ch. max. for 1 controller. Counter Val: 32-bit.; 500 Hz max. Min. ON & OFF width must >1ms 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-7000 & 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. 4M Hz 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 integrate with one I-8091W (2-axis) or two I-8091W (4-axis) to do motion control. Ethernet communication is also available when doing motion control.

*** Note: COM5 ~ COM16 are resided at the expansion boards if they are plugged on slot0~2 of VP-2117.**
*** ISaGRAF FAQ: http://www.icpdas.com/faq/isagraf.htm**

Ordering Information

VP-2117 CR	ISaGRAF based ViewPAC with 3 I/O Slots (English + Simplified Chinese Font) (RoHS)
VP-2117-TC CR	ISaGRAF based ViewPAC with 3 I/O Slots (English + Traditional Chinese Font) (RoHS)

Accessories

ISaGRAF Development Software	
ISaGRAF-256-E	ISaGRAF Workbench Software Ver.3 (256 I/O Tags) with One Application Book (English version) and one USB Dongle
ISaGRAF-256-C	ISaGRAF Workbench Software Ver.3 (256 I/O Tags) with One Application Book (Chinese version) and one USB Dongle
ISaGRAF-32-E	ISaGRAF Workbench Software Ver.3 (32 I/O Tags) with One Application Book (English version)
ISaGRAF-32-C	ISaGRAF Workbench Software Ver.3 (32 I/O Tags) with One Application Book (Chinese version)
Note: No upgrade service from ISaGRAF-32 to ISaGRAF-256 **(Using ISaGRAF-32 can control more than 32 I/O tags. Please refer to ISaGRAF User's Manual Ch. 3.4)**	
Power Supply	
DP-660	24 VDC/2.5 A, 60 W and 5 VDC/0.5 A, 2.5 W Power Supply with DIN-Rail Mounting
MDR-60-24 CR	24 VDC/2.5 A, 60 W Power Supply with DIN-Rail Mounting (RoHS)

VP-23W1 VP-25W1

Features

- PXA270, 520 MHz CPU
- Windows CE 5.0
- Hard Real-Time Capability
- 3 I/O Slots
- IP65 Compliant Front Panel
- 3.5"/5.7" TFT LCD
- Support eLogger HMI
- Audio with Microphone-In and Earphone-Out
- Operating Temperature: -20 ~ +70°C

Introduction

The VP-23W1 and VP-25W1 are Windows CE 5.0 based PACs that combines a color graphic display and I/O expansion slots into a single unit. It is equipped with a PXA270 CPU (520 MHz), a variety of connectivities (USB, Ethernet, RS-232/485), three I/O slots, 3.5" or 5.7" TFT LCD and a rubber keypad. The benefits of running Windows CE 5.0 on ViewPAC include hard real-time capability, small core size, fast boot speed, interrupt handling at a deeper level and achievable deterministic control. The VP23W1 and VP-25W1 are also capable of running PC-based control software such as Visual Basic .NET and Visual C#,etc.

Compared to regular HMI + PLC solutions, VP-23W1 and VP-25W1 reduce overall system cost and space, and provide all the best features of HMIs and PLCs.

Windows CE5

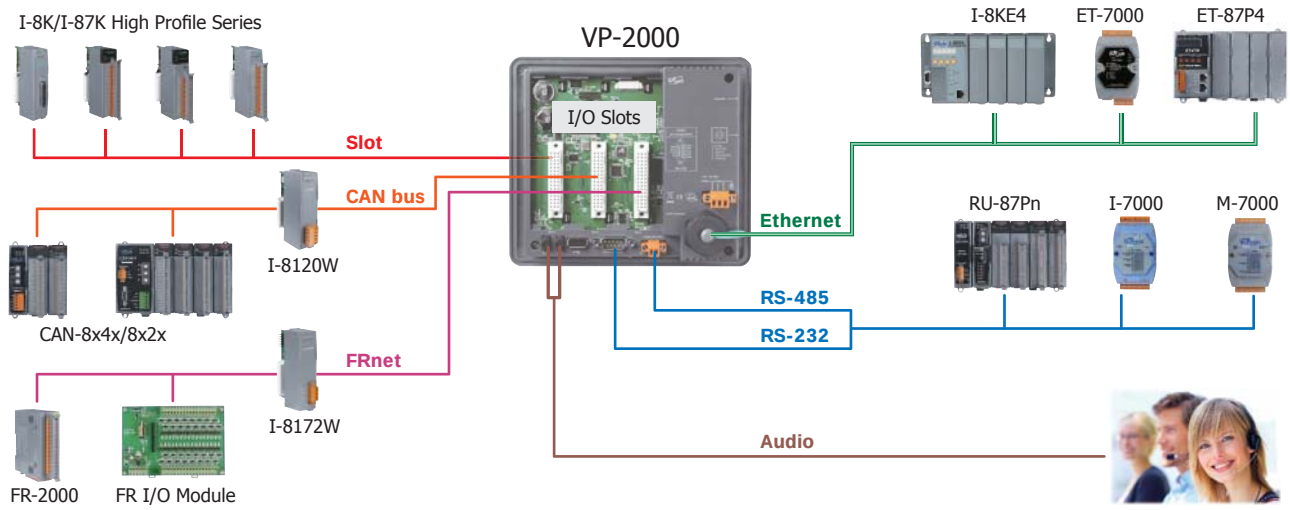
Microsoft Windows CE.net

Windows CE 5 is a compact and real-time OS used to quickly create time critical and high performance applications. Using Windows CE 5 gives an ability to run PC-based control software such as Visual Basic .NET, Virtual C#, SCADA software, SoftPLC... etc.

- ★ FTP Server
- ★ Web Server
- ★ SQL Compact Edition 3.5
- ★ .NET Compact Framework 3.5
- ★ Virtual CE Pro (VCEP)
- ★ OPC Server (NAPOPC_CE5 DA Server)
- ★ Soft PLC solution: WP-8xx7, WP-5xx7 and VP-25W7 (ISaGRAF inside)
- ★ SCADA solution: WP-8xx9, WP-5xx9 and VP-25W9 (InduSoft inside)

Applications

Rich I/O Expansion Ability



Specifications

Models	VP-23W1	VP-25W1
System Software		
OS	Windows CE 5.0	
.Net Compact Framework	3.5	
Embedded Service	FTP server, Web server (supports VB script, JAVA script), Embedded SQL server	
SDK Provided	Dll for eVC, Dll for Visual Studio.Net 2005/2008	
Multilanguage Support	English, German, French, Spanish, Russian, Italian, Korean, Simplified Chinese, Traditional Chinese	
CPU Module		
CPU	PXA270, 520 MHz	
SDRAM	128 MB	
Dual Battery Backup SRAM	512 KB; data valid up to 5 years	
Flash	96 MB	
EEPROM	16 KB	
Expansion Flash Memory	microSD socket with one 2 GB microSD card (support up to 32 GB microSDHC card)	
RTC (Real Time Clock)	Provide second, minute, hour, date, day of week, month, year	
64-bit Hardware Serial Number	Yes, for Software Copy Protection	
Dual Watchdog Timers	Yes (0.8 second)	
Rotary Switch	Yes (0 ~ 9)	
VGA & Communication Ports		
Ethernet	RJ-45 x 1, 10/100 Base-TX (Auto-negotiating, Auto MDI/MDI-X, 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	-	
COM 2	RS-485 (Data+, Data-) with internal self-tuner ASIC; 2500 V_{DC} isolated	
COM 3	RS-232 (RxD, TxD, CTS, RTS, DSR, DTR, CD, RI and GND); Non-isolated	
MMI (Man Machine Interface)		
LCD	3.5" TFT (Resolution 320 x 240)	5.7" TFT (Resolution 640 x 480)
Touch Panel	-	Yes
Rubber Keypad	24 keys	6 Keys
Audio	Microphone-In and Earphone-Out	
LED Indicators	3 Dual-Color LEDs (PWR, RUN, LAN1, L1, L2, L3; L1 ~ L3 for User Programmable)	
I/O Expansion Slots		
Slot Number	3	
Mechanical		
Dimensions (W x H x D)	182 mm x 158 mm x 125 mm	
Installation	Panel Mounting	
Ingress Protection	Front panel: IP65	
Environmental		
Operating Temperature	-20 ~ +70°C	
Storage Temperature	-30 ~ +80°C	
Ambient Relative Humidity	10 ~ 90% RH (non-condensing)	
Power		
Input Range	+10 ~ +30 V_{DC}	
Isolation	1 kV	
Capacity	12.5 W	
Consumption	7.2 W	

Ordering Information

VP-23W1-EN CR	Standard ViewPAC with 3.5" LCD and 3 I/O slots (Multilanguage Version of OS) (RoHS)
VP-25W1-EN CR	Standard ViewPAC with 5.7" LCD and 3 I/O slots (Multilanguage Version of OS) (RoHS)
VP-23W1-TC CR	Standard ViewPAC with 3.5" LCD and 3 I/O slots (Traditional Chinese of OS) (RoHS)
VP-25W1-TC CR	Standard ViewPAC with 5.7" LCD and 3 I/O slots (Traditional Chinese of OS) (RoHS)
VP-23W1-SC CR	Standard ViewPAC with 3.5" LCD and 3 I/O slots (Simplified Chinese of OS) (RoHS)
VP-25W1-SC CR	Standard ViewPAC with 5.7" LCD and 3 I/O slots (Simplified Chinese of OS) (RoHS)

Accessories

DP-660	24 V_{DC}/2.5 A, 60 W and 5 V_{DC}/0.5 A, 2.5 W Power Supply with DIN-Rail Mounting
MDR-60-24 CR	24 V_{DC}/2.5 A, 60 W Power Supply with DIN-Rail Mounting (RoHS)

Available soon **VP-4131**

Features

- PXA270, 520 MHz CPU
- Windows CE 5.0
- Hard Real-Time Capability
- 3 I/O Slots
- IP65 Compliant Front Panel
- 10.4" TFT LCD
- Support eLogger HMI
- Audio with Earphone-Out
- Operating Temperature: -20 ~ +70°C

Introduction

The VP-4131 is a Windows CE 5.0 based PAC that combines a color graphic display and I/O expansion slots into a single unit. It is equipped with a PXA270 CPU (520 MHz), a variety of connectivities (USB, Ethernet, RS-232/485), 3 I/O slots, 10.4" TFT LCD and a rubber keypad. The benefits of running Windows CE 5.0 on ViewPAC include hard real-time capability, small core size, fast boot speed, interrupt handling at a deeper level and achievable deterministic control. The VP-4131 is also capable of running PC-based control software such as Visual Basic .NET and Visual C#,etc.

Compared to regular HMI + PLC solutions, VP-4131 reduces overall system cost and space, and provide all the best features of HMIs and PLCs.

Windows CE5

Microsoft Windows CE.net

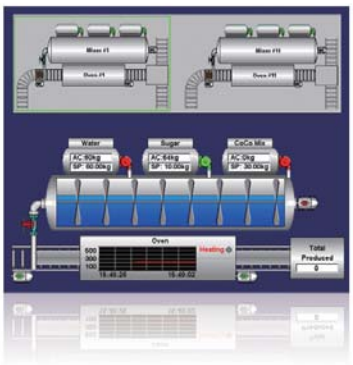
Windows CE 5 is a compact and real-time OS used to quickly create time critical and high performance applications. Using Windows CE 5 gives an ability to run PC-based control software such as Visual Basic .NET, Virtual C#, SCADA software, SoftPLC… etc.

★ FTP Server
★ Web Server
★ SQL Compact Edition 3.5
★ .NET Compact Framework 3.5
★ Virtual CE Pro (VCEP)
★ OPC Server (NAPOPC_CE5 DA Server)
★ Soft PLC solution: WP-8xx7, WP-5xx7 and VP-25W7 (ISaGRAF inside)
★ SCADA solution: WP-8xx9, WP-5xx9 and VP-25W9 (InduSoft inside)

Applications

Machine Automation

SCADA System



Factory Automation

Specifications

Models	VP-4131
System Software	
OS	Windows CE 5.0
.Net Compact Framework	3.5
Embedded Service	FTP server, Web server (supports VB script, JAVA script), Embedded SQL server
SDK Provided	Dll for eVC, Dll for Visual Studio.Net 2005/2008
Multilanguage Support	English, German, French, Spanish, Russian, Italian, Korean, Simplified Chinese, Traditional Chinese
CPU Module	
CPU	PXA270, 520 MHz
SDRAM	128 MB
Dual Battery Backup SRAM	512 KB; data valid up to 5 years
Flash	128 MB
EEPROM	16 KB
Expansion Flash Memory	microSD socket with one 2 GB microSD card (support up to 32 GB microSDHC card)
RTC (Real Time Clock)	Provide second, minute, hour, date, day of week, month, year
64-bit Hardware Serial Number	Yes, for Software Copy Protection
Dual Watchdog Timers	Yes (0.8 second)
Rotary Switch	Yes (0 ~ 9)
VGA & Communication Ports	
Ethernet	RJ-45 x 1, 10/100 Base-TX (Auto-negotiating, Auto MDI/MDI-X, LED indicators)
USB 1.1 (host)	2
USB 1.1 (client)	1
COM 0	Internal communication with the high profile I-87K series modules in slots
COM 1	-
COM 2	RS-485 (Data+, Data-) with internal self-tuner ASIC; 2500 V_{DC} isolated
COM 3	RS-232 (RxD, TxD, CTS, RTS, DSR, DTR, CD, RI and GND); Non-isolated
MMI (Man Machine Interface)	
LCD	10.4" TFT (Resolution 800 x 600)
Touch Panel	Yes
Rubber Keypad	-
Audio	Earphone-Out
LED Indicators	2 LEDs (PWR, RUN)
I/O Expansion Slots	
Slot Number	3
Mechanical	
Dimensions (W x H x D)	293 mm x 231 mm x 129 mm
Installation	Panel Mounting
Ingress Protection	Front panel: IP65
Environmental	
Operating Temperature	-20 ~ +70°C
Storage Temperature	-30 ~ +80°C
Ambient Relative Humidity	10 ~ 90% RH (non-condensing)
Power	
Input Range	+10 ~ +30 V_{DC}
Isolation	1 kV
Capacity	12.5 W
Consumption	8.5 W

Ordering Information

VP-4131-EN CR	Standard ViewPAC with 10.4" LCD and 3 I/O slots (Multilanguage Version of OS) (RoHS)
VP-4131-TC CR	Standard ViewPAC with 10.4" LCD and 3 I/O slots (Traditional Chinese of OS) (RoHS)
VP-4131-SC CR	Standard ViewPAC with 10.4" LCD and 3 I/O slots (Simplified Chinese of OS) (RoHS)

Accessories

DP-660	24 V_{DC}/2.5 A, 60 W and 5 V_{DC}/0.5 A, 2.5 W Power Supply with DIN-Rail Mounting
MDR-60-24 CR	24 V_{DC}/2.5 A, 60 W Power Supply with DIN-Rail Mounting (RoHS)

Features

- PXA270, 520 MHz CPU
- Windows CE 5.0
- ISaGRAF Ver.3 SoftLogic Inside (IEC 61131-3)
- Hard Real-Time Capability
- 3 I/O Slots
- IP65 Compliant Front Panel
- 3.5"/5.7"/10.4" TFT LCD
- Modbus RTU/TCP (Master, Slave)
- Support Soft-GRAF HMI
- Audio with Microphone-In and Earphone-Out
- Operating Temperature: -20 ~ +70°C

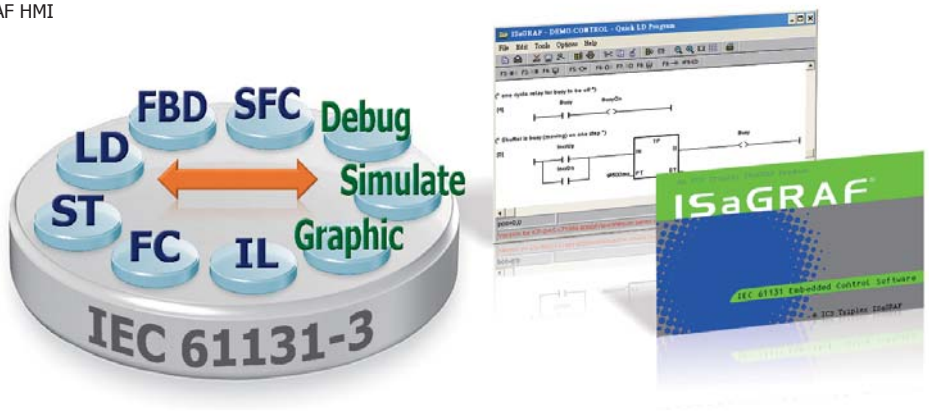
Introduction

VP-23W7/25W7/4137 are ISaGRAF based PACs which integarte a color graphic display and I/O expansion slots into a single unit. It is equipped with a PXA270 CPU (520 MHz), various connectivity (USB, Ethernet, RS-232/485), three I/O slots, a 3.5"/5.7"/10.4" TFT LCD and a rubber keypad. The benefits of running Windows CE 5.0 on VP-23W7/25W7/4137 include hard real-time capability, small core size, fast boot speed, interrupt handling at a deeper level and achievable deterministic control. VP-23W7/25W7/4137 is also capable of running ISaGRAF and PC-based control software such as Visual Basic .NET, Visual C#, ... etc.

ISaGRAF Features

ISaGRAF is the most powerful SoftLogic package on the market. ISaGRAF is a PLC-like software and it supports IEC 61131-3 standard PLC programming languages (LD, FBD, SFC, ST, IL, FC), and can run the application generated by the workbench on any ISaGRAF PACs. The ISaGRAF workbench Ver. 3.x features.

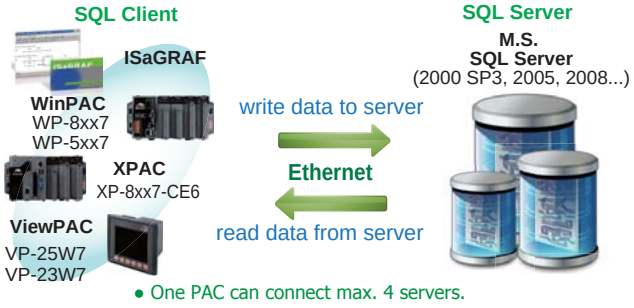
- IEC 61131-3 Standard Open PLC Programming Languages (LD, FBD, SFC, ST, IL, FC) + Flow Chart (FC)
- Auto-Scan I/O
- On-Line Debug/Control/Monitor, Off-Line Simulation
- Simple Graphic HMI
- Support Soft-GRAF HMI



Soft-GRAF Studio Colorful HMI

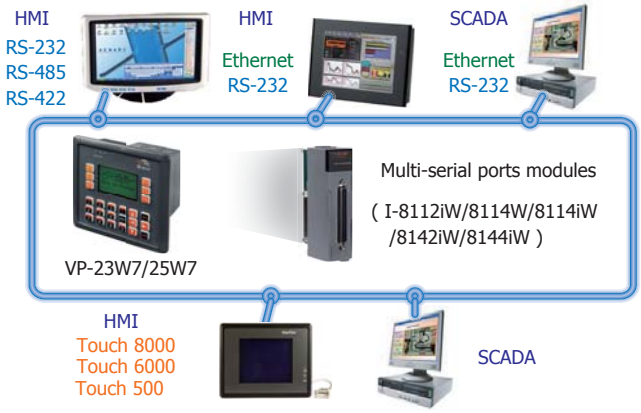
M2B Machine To Business Application

SQL Server Communication

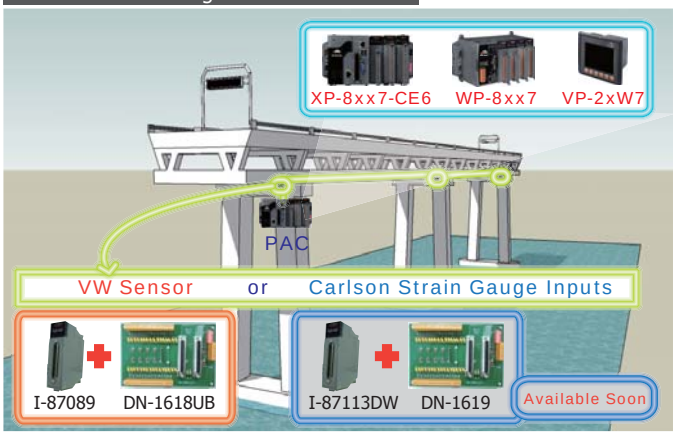


• One PAC can connect max. 4 servers.

Modbus RTU/TCP Slave Ports

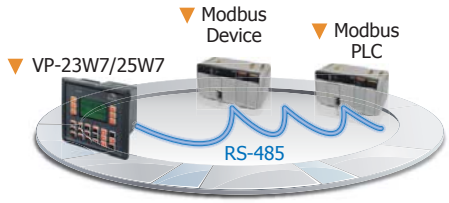


Stress Monitoring of Constructions

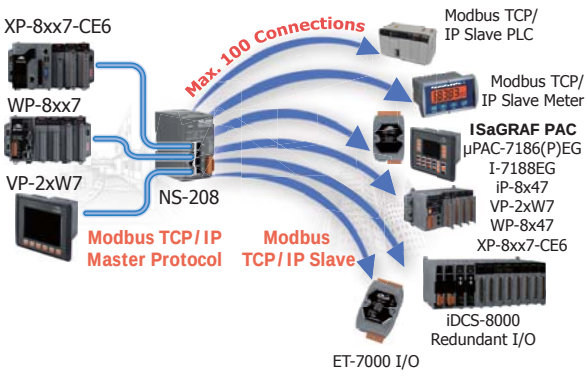


Modbus Master Ports

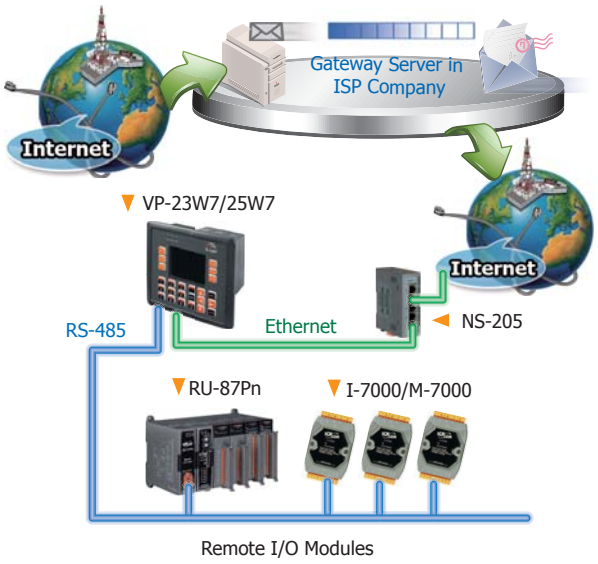
Modbus RTU/ASCII Master



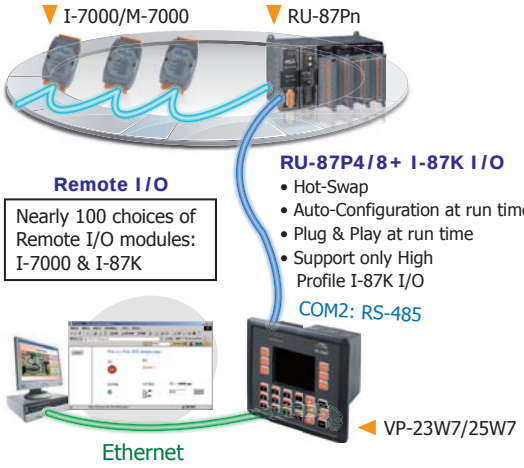
Modbus TCP/IP Master



Send Email with one Attached File



Remote I/O Application



Specifications

Models		VP-23W7	VP-25W7	VP-4137
System Software				
OS		Windows CE 5.0		
.Net Compact Framework		3.5		
Embedded Service		FTP server, Web server (supports VB script, JAVA script), Embedded SQL server		
SDK Provided		Dll for eVC, Dll for Visual Studio.Net 2005/2008		
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 Soft-GRAF HMI: XP-8xx7-CE6, WP-8xx7, VP-2xW7 and WP-5xx7 PAC		
	Max. Code Size	1 MB		
	Scan Time	3 ~ 15 ms for normal program 15 ~ 50 ms (or more)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-level username and password protection. (high/middle/low)		
CPU Module				
CPU		PXA270, 520 MHz		
SDRAM		128 MB		
Flash		96 MB		128 MB
Expansion Flash Memory		microSD socket with one 2 GB microSD card (support up to 32 GB microSDHC card)		
Dual Battery Backup SRAM		512 KB; data valid up to 5 years (for retain variables)		
EEPROM		16 KB		
RTC (Real Time Clock)		Provide second, minute, hour, date, day of week, month, year		
64-bit Hardware Serial Number		Yes, for Software Copy Protection		
Dual Watchdog Timers		Yes (0.8 second)		
Rotary Switch		Yes (0 ~ 9)		
Communication Interface				
Ethernet		RJ-45 x 1, 10/100 Base-TX (Auto-negotiating, Auto MDI/MDI-X, LED indicators)		
USB 1.1 (host)		1		
USB 1.1 (client)		-		1
COM 0		Internal communication with the high profile I-87K series modules in slots		
COM 1		-		
COM 2		RS-485 (Data+, Data-) with internal self-tuner ASIC; 2500 VDC isolated		
COM 3		RS-232 (RxD, TxD, CTS, RTS, DSR, DTR, CD, RI and GND); Non-isolated		
MMI (Man Machine Interface)				
LCD		3.5" TFT (Resolution 320 x 240)	5.7" TFT (Resolution 640 x 480)	10.4" TFT (Resolution 800 x 600)
Touch Panel		-	Yes	
Rubber Keypad		24 keys	6 Keys	-
Audio		Microphone-In and Earphone-Out		Earphone-Out
LED Indicators		3 Dual-Color LEDs (PWR, RUN, LAN1, L1, L2, L3; L1 ~ L3 for User Programmable)		2 LEDs (PWR, RUN)
I/O Expansion Slots				
Slot Number		3		
		Note: For High Profile I-8K and I-87K Modules Only		
Mechanical				
Dimensions (W x L x H)		182 mm x 158 mm x 125 mm		293 mm x 231 mm x 129 mm
Installation		Panel Mounting		
Ingress Protection		Front panel: IP65		
Environmental				
Operating Temperature		-20 ~ +70°C		
Storage Temperature		-30 ~ +80°C		
Ambient Relative Humidity		10 ~ 90% RH (non-condensing)		
Power				
Input Range		+10 ~ +30 VDC		
Isolation		1 kV		
Capacity		12.5 W		
Consumption		7.2 W		8.5 W

ISaGRAF Specifications

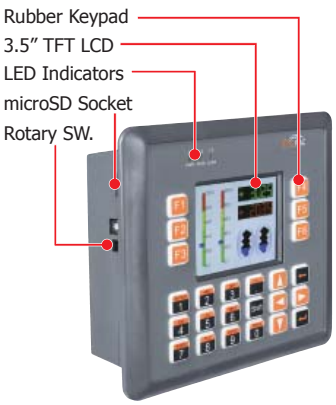
Protocols (some protocols need optional devices)	
NET ID	1 ~ 255, user-assigned by software
Modbus TCP/IP Master	Link to max. 100 devices that support Standard Modbus TCP/IP Slave protocol (FAQ-113)
Modbus RTU/ASCII Master	Max. 10 ports: COM2, 3 and COM5 ~ 14. (To connect to other Modbus Slave devices). Support Multi-port. (*)
Modbus RTU Slave	Max. 5 Ports: one of COM2/3, COM5 ~ 8. (For connecting ISaGRAF, PC/ HMI/ OPC Server & HMI panels.) (*)
Modbus TCP/IP Slave	Yes, LAN1 and optional 2nd Ethernet Port in I-8135W support total up to 32 connections (for connecting ISaGRAF & PC / HMI). When one Ethernet port is broken, the other one can still connect to PC/HMI.
Web HMI Protocol	Ethernet Ports for connecting PC running Internet Explorer
I-7000 & I-87K RS-485 Remote I/O	One of COM2 or COM3 supports I-7000 I/O modules, I-87K base + I-87K Serial I/O boards and RU-87Pn + I-87K High Profile I/O boards as Remote I/O. Max. 255 modules for one controller.
M-7000 Series Modbus I/O	Max. 10 RS-485 ports: COM2, 3, 5 ~ 14. Each port can connect up to 32 M-7000 Modules. (with optional I-7510 repeater connected can connect up to more than 32 M-7000 Modules) (*)
Modbus TCP/IP I/O	Supports ICP DAS Ethernet I/O : I-8KE4-MTCP and I-8KE8-MTCP (FAQ-042). If LAN1 is broken, it will switch to the 2nd Ethernet port (in optional I-8135W card) automatically to continuously work. (This need LAN1 & the 2nd Ethernet's IP are set in the same IP domain)
FRnet I/O	Support max 3 pcs. I-8172W boards in slot 0 ~ 2 to connect to FRnet I/O modules, like FR-2053, FR-2057, FR-32R, FR-32P (FAQ-048). Each I-8172W board can connect up to 256 DI plus 256 DO channels.
Send Email	Support functions to send email with one attached file via Ethernet port.
Ebus	To exchange data between ISaGRAF Ethernet PAC via Ethernet port. (LAN1 Port only)
SMS: Short Message Service	COM3 or COM5 can link to a GSM Modem to support SMS. User can request data/control the controller by cellular phone. (*) The controller can also send data & alarms to user's cellular phone. Optional GSM Modems: GTM-201-RS232 (850/900/1800/1900 GSM/GPRS External Modem)
User-Defined Protocol	User can write his own protocol applied at COM2, 3 and COM5 ~ COM14 by Serial communication function blocks (*).
MMICON/LCD	COM3 or COM5 supports ICP DAS's MMICON. (*) The MMICON is featured with a 240 x 64 dot LCD & a 4 x 4 Keyboard to display picture, string, integer, fl oat, & input a char, string, integer & fl oat.
UDP Server & UDP Client : Exchange Message & Auto-Report	LAN1 or the 2nd Ethernet (in optional I-8135W card) support UDP Server and UDP Client protocol to send/receive message to/from PC/HMI or other devices. Ex: to automatically report data to InduSoft's RXTX driver.
TCP Client : Exchange Message & Auto-Report	LAN1 or the 2nd Ethernet (in optional I-8135W card) ca send/receive message to/from PC/HMI or other devices which support TCP server protocol. Ex: automatically report data to InduSoft's RXTX driver, or to connect a location camera.
GPRS/SMS	Support the I-8212W (2G/3G) card to receive/send a short message or to dial up to link the Internet by GPRS connection to send an email or communicate with remote stations by using "Ftp Client" (FAQ-151) and "TCP Client" / "UDP Server" / "UDP Client" (FAQ-143).
SQL Client	Support SQL Client function to write data to (or read data from) Microsoft SQL Server (2000 SP3, 2005, 2008).
Hot-Swap and Redundant System	Must enable the 2nd Ethernet port in the optional I-8135W card. This redundant system has setup two "Active IP" address point to the active VP-2xW7/2xW6 's LAN1 and 2nd Ethernet ports always. One or two 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 VP-2xW7/2xW6 is currently active. Moreover, the new redundant system can integrate with the RU-87P4 and RU-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	COM3 or COM5 ~ COM14 can connect one I-7530 (Converter: RS-232 to CAN) to support CAN/CANopen devices and sensors. One PAC supports max.10 RS-232 ports to connect max.10 I-7530. (*)
CANopen Master	Support the I-8123W CANopen Master card to connect other CANopen slave devices. (FAQ-145)
HART Solutions	Support I-87H17W modules in slot 0 to 2 to communicate with other HART devices.
FTP Client	Support FTP client to upload files in the PAC to a remote FTP server on PC. (FAQ-151)
Soft-GRAF HMI	Support the Soft-GRAF HMI . User can use the Soft-GRAF Studio on the PC to design the HMI screen and then download it to the PAC to display the HMI on the PAC. (FAQ-146)

Optional I/O Functions (Refer to 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 curve: 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 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, 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	one I-8091W (2-axis) or two I-8091W (4-axis) can do motion control. only one I-8091W can do X-Y dependent motion.
Port	Second Ethernet	VP-2xW7 / VP-2xW6 can add one optional I-8135W card in its slot 0 ~ 2 to expand the second Ethernet port.

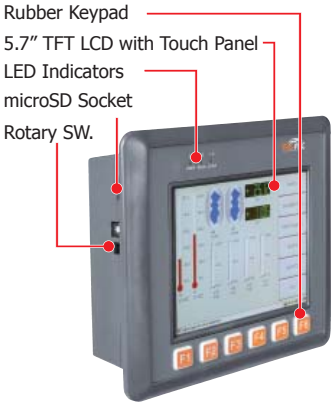
*** Note: COM5 ~ COM14 are resided at the expansion boards if they are plugged on slot0~2 of VP-2xW7.**
*** ISaGRAF FAQ: http://www.icpdas.com/faq/isagraf.htm**

Appearance

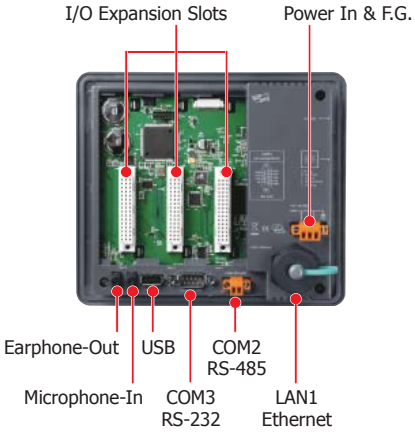
VP-23W7



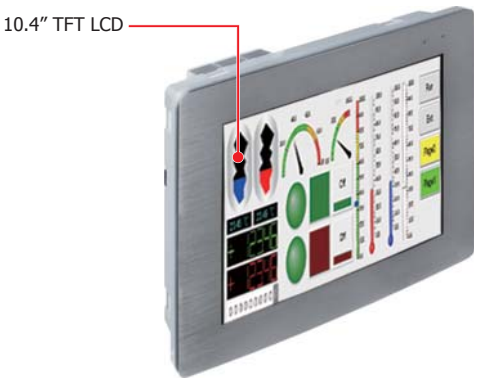
VP-25W7

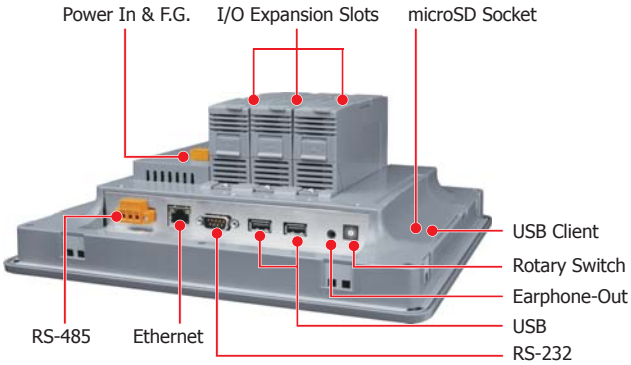


VP-23W7/VP-25W7



VP-4137





Ordering Information

VP-23W7-EN CR	ISaGRAF based ViewPAC with 3.5" LCD and 3 I/O slots (Multilanguage Version of OS) (RoHS)
VP-25W7-EN CR	ISaGRAF based ViewPAC with 5.7" LCD and 3 I/O slots (Multilanguage Version of OS) (RoHS)
VP-23W7-TC CR	ISaGRAF based ViewPAC with 3.5" LCD and 3 I/O slots (Traditional Chinese of OS) (RoHS)
VP-25W7-TC CR	ISaGRAF based ViewPAC with 5.7" LCD and 3 I/O slots (Traditional Chinese of OS) (RoHS)
VP-23W7-SC CR	ISaGRAF based ViewPAC with 3.5" LCD and 3 I/O slots (Simplified Chinese of OS) (RoHS)
VP-25W7-SC CR	ISaGRAF based ViewPAC with 5.7" LCD and 3 I/O slots (Simplified Chinese of OS) (RoHS)
VP-4137-EN CR	ISaGRAF based ViewPAC with 10.4" LCD and 3 I/O slots (Multilanguage Version of OS) (RoHS)
VP-4137-TC CR	ISaGRAF based ViewPAC with 10.4" LCD and 3 I/O slots (Traditional Chinese of OS) (RoHS)
VP-4137-SC CR	ISaGRAF based ViewPAC with 10.4" LCD and 3 I/O slots (Simplified Chinese of OS) (RoHS)

Accessories

ISaGRAF Development Software	
ISaGRAF-256-E	ISaGRAF Workbench Software Ver.3 (256 I/O Tags) with One Application Book (English version) and one USB Dongle
ISaGRAF-256-C	ISaGRAF Workbench Software Ver.3 (256 I/O Tags) with One Application Book (Chinese version) and one USB Dongle
ISaGRAF-32-E	ISaGRAF Workbench Software Ver.3 (32 I/O Tags) with One Application Book (English version) Note: No upgrade service from ISaGRAF-32 to ISaGRAF-256. (Using ISaGRAF-32 can control more than 32 I/O tags. Please refer to ISaGRAF User's Manual Ch. 3.4)
ISaGRAF-32-C	ISaGRAF Workbench Software Ver.3 (32 I/O Tags) with One Application Book (Chinese version) Note: No upgrade service from ISaGRAF-32 to ISaGRAF-256. (Using ISaGRAF-32 can control more than 32 I/O tags. Please refer to ISaGRAF User's Manual Ch. 3.4)
Power Supply	
DP-660	24 V_{DC}/2.5 A, 60 W and 5 V_{DC}/0.5 A, 2.5 W Power Supply with DIN-Rail Mounting
MDR-60-24 CR	24 V_{DC}/2.5 A, 60 W Power Supply with DIN-Rail Mounting (RoHS)

Features

- PXA270, 520 MHz CPU
- Windows CE 5.0
- InduSoft Web Studio v6.1
- Hard Real-Time Capability
- 3 I/O Slots
- IP65 Compliant Front Panel
- 3.5"/5.7"/10.4" TFT LCD
- Audio with Microphone-In and Earphone-Out
- Operating Temperature: -20 ~ +70°C

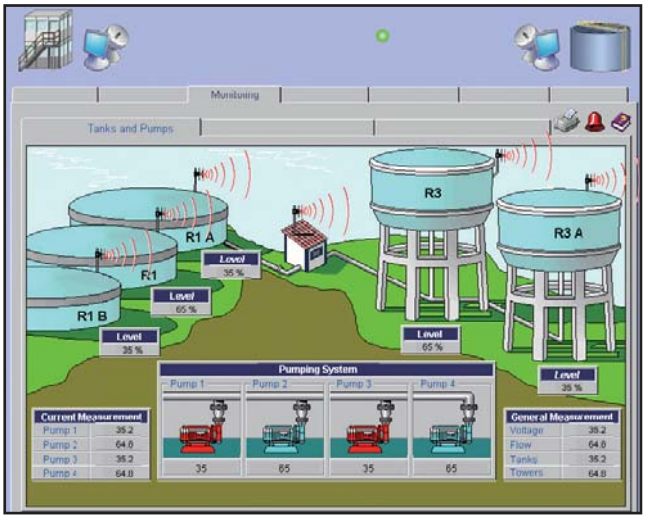
Introduction

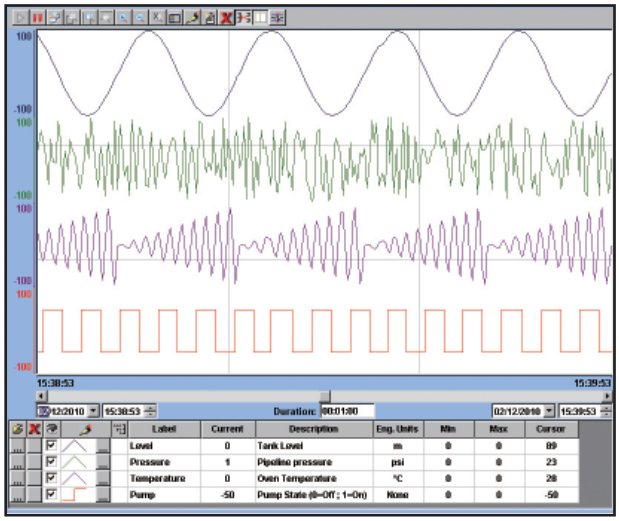
VP-23W9/25W9/4139 are InduSoft based PACs which integarte a color graphic display and I/O expansion slots into a single unit. It is equipped with a PXA270 CPU (520 MHz), various connectivity (USB, Ethernet, RS-232/485), three I/O slots, a 3.5"/5.7"/10.4" TFT LCD and a rubber keypad. The benefits of running Windows CE 5.0 on VP-23W9/25W9/4139 include hard real-time capability, small core size, fast boot speed, interrupt handling at a deeper level and achievable deterministic control. VP-23W9/25W9/4139 is also capable of running InduSoft and PC-based control software such as Visual Basic .NET, Visual C#, ... etc.

InduSoft Features

InduSoft Web Studio is a powerful, integrated collection of automation tools that includes all the building blocks needed to develop modern Human Machine Interfaces (HMI), Supervisory Control and Data Acquisition (SCADA) systems, and ViewPAC applications. InduSoft Web Studio's application runs in native Windows NT, 2000, XP, CE and CE .NET environments and conforms to industry standards such as Microsoft .NET, OPC, DDE, ODBC, XML, and ActiveX.

- Elegant Graphics
- Multi-Language
- Database (Access, Excel, SQL, Oracle...)
- Recipes and Reports
- Online and History Alarm / Event / Trend
- Remote Web Client Control & Security
- Various Communication Driver (DCON, Modbus, OPC, DDE, TCP/IP...)
- ActiveX (GSM / SHM / COM /WEB provided by ICP DAS)
- System Redundancy
- Online Configuration and debugging
- Others (VBScript, E-mail, FTP, SNMP...)





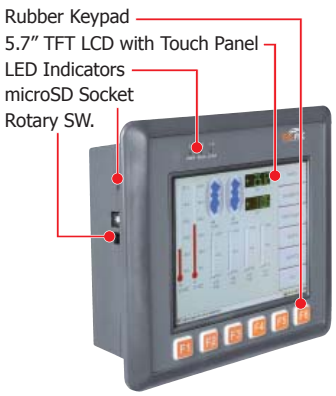
Specifications

Models	VP-23W9	VP-25W9	VP-4139
System Software			
OS	Windows CE 5.0		
.Net Compact Framework	3.5		
Embedded Service	FTP server, Web server (supports VB script, JAVA script), Embedded SQL server		
SDK Provided	Dll for eVC, Dll for Visual Studio.Net 2005/2008		
Multilanguage Support	English, German, French, Spanish, Russian, Italian, Korean, Simplified Chinese, Traditional Chinese		
Development Software			
InduSoft Software	InduSoft Web Studio v6.1 Service Pack 6		
Others	Options: Microsoft EVC++4.0 or VS .NET 2005/2008 (VB .NET 2005/2008, C# .NET 2005/2008)		
Web Service			
Web HMI	Support Web HMI function, PC running Internet Explorer can access to the VP-2XW9 via Local Ethernet or Internet or dial Modem, monitoring and control.		
Security	Web HMI supports three levels user name and password protection		
CPU Module			
CPU	PXA270, 520 MHz		
SDRAM	128 MB		
Dual Battery Backup SRAM	512 KB; data valid up to 5 years		
Flash	96 MB		128 MB
EEPROM	16 KB		
Expansion Flash Memory	microSD socket with one 2 GB microSD card (support up to 32 GB microSDHC card)		
RTC (Real Time Clock)	Provide second, minute, hour, date, day of week, month, year		
64-bit Hardware Serial Number	Yes, for Software Copy Protection		
Dual Watchdog Timers	Yes (0.8 second)		
Rotary Switch	Yes (0 ~ 9)		
VGA & Communication Ports			
Ethernet	RJ-45 x 1, 10/100 Base-TX (Auto-negotiating, Auto MDI/MDI-X, LED indicators)		
USB 1.1 (host)	1		
USB 1.1 (client)	-		1
COM 0	Internal communication with the high profile I-87K series modules in slots		
COM 1	-		
COM 2	RS-485 (Data+, Data-) with internal self-tuner ASIC; 2500 V_{DC} isolated		
COM 3	RS-232 (RxD, TxD, CTS, RTS, DSR, DTR, CD, RI and GND); Non-isolated		
MMI (Man Machine Interface)			
LCD	3.5" TFT (Resolution 320 x 240)	5.7" TFT (Resolution 640 x 480)	10.4" TFT (Resolution 800 x 600)
Touch Panel	-	Yes	
Rubber Keypad	24 keys	6 Keys	-
Audio	Microphone-In and Earphone-Out		Earphone-Out
LED Indicators	3 Dual-Color LEDs (PWR, RUN, LAN1, L1, L2, L3; L1 ~ L3 for User Programmable)		2 LEDs (PWR, RUN)
I/O Expansion Slots			
Slot Number	3		
	Note: For High Profile I-8K and I-87K Modules Only		
Mechanical			
Dimensions (W x H x D)	182 mm x 158 mm x 125 mm		293 mm x 231 mm x 129 mm
Installation	Panel Mounting		
Ingress Protection	Front panel: IP65		
Environmental			
Operating Temperature	-20 ~ +70°C		
Storage Temperature	-30 ~ +80°C		
Ambient Relative Humidity	10 ~ 90% RH (non-condensing)		
Power			
Input Range	+10 ~ +30 V_{DC}		
Isolation	1 kV		
Capacity	12.5 W		
Consumption	7.2 W		8.5 W

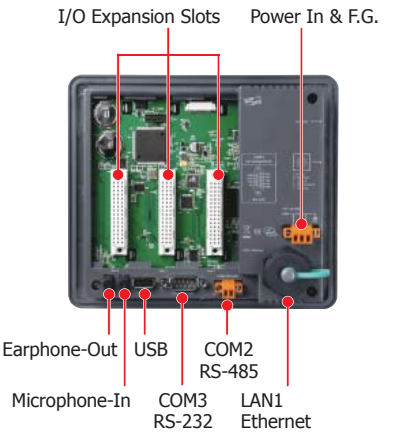
Appearance

VP-23W9

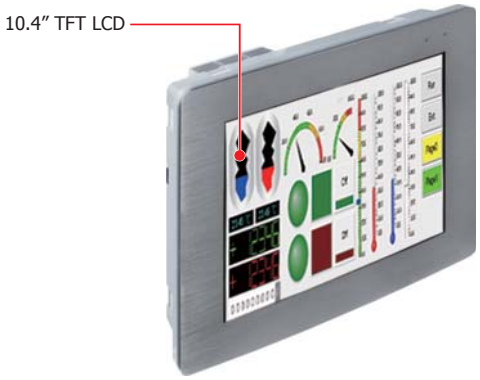
VP-25W9

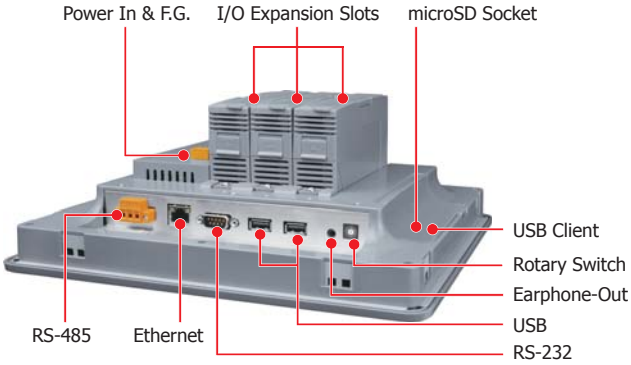


VP-23W9/VP-25W9



VP-4139





Ordering Information

VP-23W9-EN CR	InduSoft based ViewPAC with 3.5" LCD and 3 I/O slots (Multilanguage Version of OS) (RoHS)
VP-25W9-EN CR	InduSoft based ViewPAC with 5.7" LCD and 3 I/O slots (Multilanguage Version of OS) (RoHS)
VP-23W9-TC CR	InduSoft based ViewPAC with 3.5" LCD and 3 I/O slots (Traditional Chinese of OS) (RoHS)
VP-25W9-TC CR	InduSoft based ViewPAC with 5.7" LCD and 3 I/O slots (Traditional Chinese of OS) (RoHS)
VP-23W9-SC CR	InduSoft based ViewPAC with 3.5" LCD and 3 I/O slots (Simplified Chinese of OS) (RoHS)
VP-25W9-SC CR	InduSoft based ViewPAC with 5.7" LCD and 3 I/O slots (Simplified Chinese of OS) (RoHS)
VP-4139-EN CR	InduSoft based ViewPAC with 10.4" LCD and 3 I/O slots (Multilanguage Version of OS) (RoHS)
VP-4139-TC CR	InduSoft based ViewPAC with 10.4" LCD and 3 I/O slots (Traditional Chinese of OS) (RoHS)
VP-4139-SC CR	InduSoft based ViewPAC with 10.4" LCD and 3 I/O slots (Simplified Chinese of OS) (RoHS)
Note: The default runtime license (CEView Lite Plus - 300 tags and 3 driver) is installed.	

Accessories

InduSoft Development Software	
InduSoft-NT512000D	Advanced Server for Windows NT/2000/XP (512,000 Tags, unlimited drivers)
InduSoft-NT64000D	Control Room for Windows NT/2000/XP (64,000 Tags, 8 drivers)
InduSoft-NT4000D	Operator Workstation for Windows NT/2000/XP (4,000 Tags, 5 drivers)
InduSoft-NT1500D	Local Interface for Windows NT/2000/XP (1500 Tags, 3 drivers)
InduSoft-NT300D	NTView PRO for Windows NT/2000/XP (300 Tags, 3 drivers)
InduSoft Development Software	
InduSoft-CE1500R	CEView standard for Windows CE Run-time (CE View)(1500 Tags, 3 drivers)
InduSoft-CE300R	CEView Lite Plus for Windows CE Run-time (300 Tags, 3 drivers)
Power Supply	
DP-660	24 VDC/2.5 A, 60 W and 5 VDC/0.5 A, 2.5 W Power Supply with DIN-Rail Mounting
MDR-60-24 CR	24 VDC/2.5 A, 60 W Power Supply with DIN-Rail Mounting (RoHS)

MotionPAC

4

4.1. MP-8000 Series P4-1-1

4.1. MP-8000 Series

• Overview

The MP-8000 is a motion programmable automation controller (MPAC) combining the functionality and openness of a PC with the reliability and simplicity of a programmable logic controller (PLC). The price-performance of the MPAC is unbeatable as compared with a PC, PLC, and DCS. The MP-8000 is designed for time critical and deterministic operations. Its field of application is unlimited: Factory automation, building automation, machine automation, laboratory automation, chemical industry, environmental monitoring, M2M, etc.

The MP-8000 is the new generation of programmable automation controller from ICP DAS. It is equipped with an AMD LX800 CPU (500 MHz) or Atom Z500 serial, a Windows Embedded CE6 Operating System, various ports (VGA, USB, Ethernet, RS-232/ RS-485) and 3 or 7 slots for high performance parallel-type I/ O modules. Compared with the first generation of WinCon-8000 of ICP DAS, it not only improves the CPU performance but also has many additional reliability features, such as dual LAN, redundant power input, dual battery backup SRAM, etc.

MP-8000 ≒ IPC+I/O Cards

Windows Embedded CE is a componentized, real-time, high performance, and highly reliable operating system. Windows CE 6 R3 delivers rich user experiences and a unique connection to Windows PCs, servers, services, and devices. The MP-8000 also supports the EzProg-I software development package offered by ICP DAS.

Main Components:

1 Main Control Unit (MCU)

The MCU is the powerhouse of the MP-8000. Each MCU comprises a Central Processor Module (CPM), a power supply, and a 3 or 7-slot backplane for I/O modules. The CPM is a powerful integrated processing engine comprising a CPU, RAM and ROM, and communication interfaces for Ethernet, RS-485, RS-232 and FRnet.

2 Embedded OS

Windows CE6

Windows CE 6 is the next generation of real-time OS offered by Microsoft. Windows CE 6 provides the software engineer with familiar tools and innovative technologies to reduce the development time of application software. The high performance and high reliability of the MP-8000 together with the Windows CE, makes the MP-8000 an ideal controller in the environment where time critical performance is required. Windows CE6 operating system kernel architecture supports up to 32,000 simultaneous processes, each of which runs in a 2GB virtual memory address space. This allows developers to incorporate larger number of complex applications into the MP-8000.

3 I/O Modules

There are two types of I/O modules: parallel and serial. The parallel modules (I-8K high profile series and motion series) are high-speed modules and have to be installed in the slots of the MP-8000. The serial I/O modules (I-87K high profiles series) can be installed in slots of the MP-8000 or expansion units (RU-87Pn).

4 Remote I/O Expansion

The MP-8000 has built-in RS-485 and Ethernet ports to connect to remote I/O units (RU-87Pn/ET-87Pn) or I/O modules (I-7000/M-7000/ET-7000). Installing CAN or FRnet communication modules, the MP-8000 can exchange data with CAN bus devices, remote I/O units or FRnet I/O modules for deterministic control system.

• Software

The PAC Automation Solution EzProg-I:

The EzProg-I is a total software solution for manufacturers or control system designers for system configuration, logic programming and HMI design. By using EzProg-I, engineers who are familiar with PLC systems can easily transfer their programming experience to ICP DAS's programmable automation control (PAC) solutions. The EzProg-I makes it much easier for customers to integrate PLCs and IT technologies into PAC.

The EzProg-I package contains many kinds of development tools and libraries, such as EzConfig, EzGo, EzMake, EzHMI, EzLib and EzCore. Based on these development resources, customers can directly configure and test the PAC channels and motion control modules without additional programming efforts. Moreover, the EzProg-I simplifies the I/O instruction and provides a PLC like I/O mapping table. It assists the system designers to develop and test the control system application.

Development Structure:

The EzProg-I structure is divided into three main parts:

1. Upper layer: EzHMI

EzHMI provides a number of ActiveX controls which allows the programmer to create a graphic interface on a WinCE system. The EzHMI object can be directly linked to an I/O mapping table which makes reading and writing of digital and analog I/O values very easy. The EzCore engine running in the background is responsible for updating the I/O table in real time.

2. Intermediate layer: API

The EzProg-I provides common APIs for accessing different I/O modules types. In the past, each module type could only be accessed via its own APIs, therefore different APIs had to be called for communicating with different modules. Now, the EzProg-I solves this problem and unifies all APIs. No matter with what I/O module you like to exchange data, only one API needs to be called. The EzProg-I enables PLC like programming by providing APIs for accessing EzCore registers which consists of the I/O mapping table and non-hardware related tables.

3. Lower level: Logic control design

The control software provides three different design methods:

- 3.1 8 Users thread procedures:
  The user thread only executes once. User threads have a lower priority than the other routines.
- 3.2 8 Executive routines with fixed interval time:
  Like a PLC scan method, after the system starts, it will create a thread that execute the user defined routine in a fixed time interval (minimum 2ms).
- 3.3 Hardware interrupt routine:
  The EzProg-I processes DI signal interrupt and Motion interrupt to execute the code added to the interrupt service routine.

Other features of EzProg-I:

Public System Variable Type:	D (long), DW (Double WORD), W (Word), F (Float), B (Byte), M (Flag), S (Step), MSG (Message).
Retain Variable:	Most variable types have half retain variable blocks.
Timer Function:	Millisecond based timer.
Counter Function:	System counter (retain variable block is also available).
Multi-language Message:	Provide MLn file to edit UNICODE 1000 messages.

Tools Support Guide: EzConfig, EzGo, EzMake

Module\Tool	EzConfig	EzGo	EzMake
I-8092F-G	Yes (Note 1)	Yes	-
I-8094-G	-	Yes	-
I-8094F-G	Yes (Note 1)	Yes	-
I-8094A-G	-	Yes	Yes
I-8094H-G	-	Yes	Yes
I-8K Serial Modules	Yes	-	-
FRnet Remote Modules	Yes	-	-
Note 1: Only for FRnet			

The EzProg-I Tools

EzConfig

The EzConfig is an I/O configuration tool to configure and test digital I/O, analog I/O, FRnet remote I/O and virtual I/O (M/D/F/DB/C/T/MSG etc.) for the I-8000 series modules and virtual I/O used in the EzProg-I.

Functions of EzConfig:

- Auto scan of I/O modules
- Load and save configuration data
- Retain data management
- Set initial virtual value
- Edit note
- Read/Write XML file
- Generate AES code

EzGo

ICP DAS provides a motion testing tool named EzGo for i-8094, i-8094F, i-8094A, i-8094H and i-8092F modules used in PACs for machine automation.

EzMake

The EzMake, the tool provided by ICP DAS for building motion systems, is designed for i-8094A and i-8094H modules used in the PACs for machine automation. The EzMake is a Macro editor for writing and testing motion commands sequence for the i-8094A and i-8094H modules.

EzHMI

The EzProg-I also provides many useful HMI ActiveX components for manufacturers and control system designers. It allows the programmer to create a graphic interface on a WinCE system without any additional programming efforts. It greatly improves the software programming productivity.

- EzHMI for application
- Easy properties setting
- Easy GUI color setting
- UNICODE Multi-Language
- Auto alarm flashing
- Dynamic BMP images
- Direct I/O register value setting
- Support Windows text fonts
- Displays I/O register data

EzLib

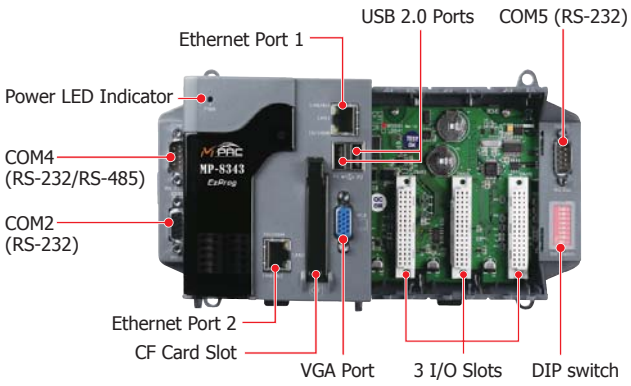
EzLib is a collection of reusable software components and assists software developers to write application programs for the Window CE platform.

- Data format transformation
- Date time function
- File I/O function
- BMP file drawing library
- FTP connection library
- TCP/IP library
- Context drawing library
- Trend graph library

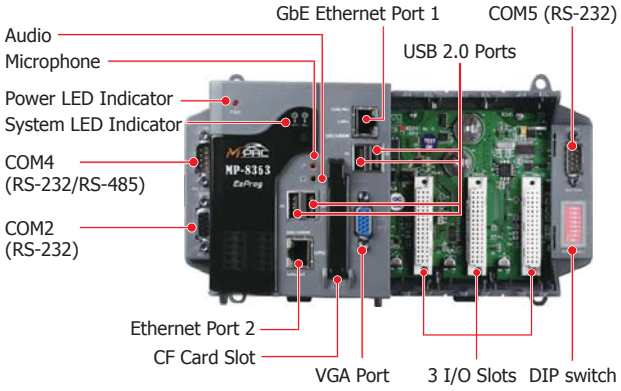
• Hardware

1. Appearance

MP-8343



MP-8353

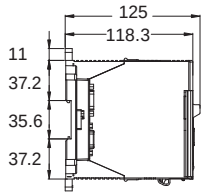


2. Installation

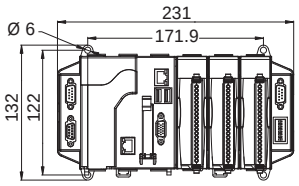
DIN-Rail Mounting

3. Mechanical

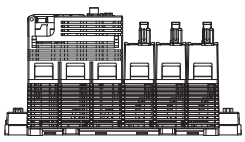
MP-83x3



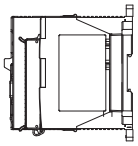
Left Side View



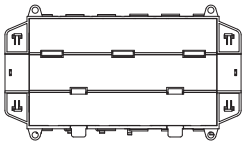
Front View



Bottom View

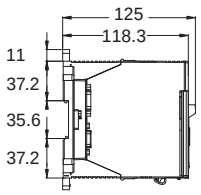


Right Side View

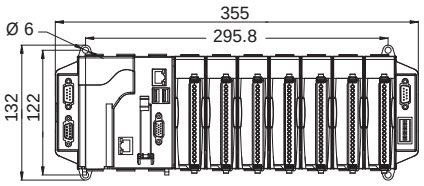


Rear View

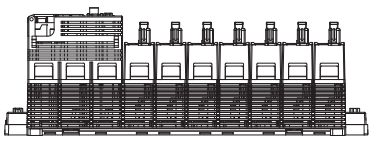
MP-87x3



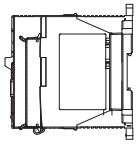
Left Side View



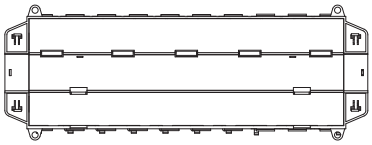
Front View



Bottom View



Right Side View



Rear View

Features

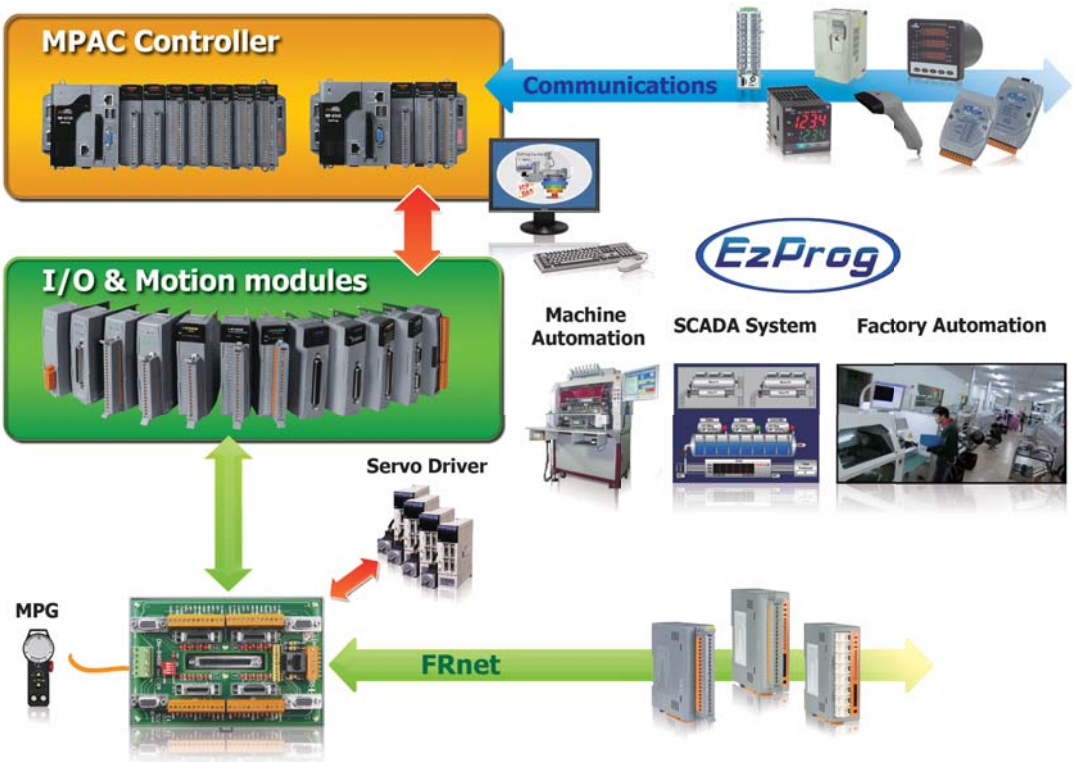
- LX800, 500MHz CPU or Atom Z510, 1.1 GHz CPU
- Windows CE 6.0
- SQL Compact Edition 3.5
- Hard Real-Time Capability
- EzProg-I development tools
- VGA Port Output
- Redundant Power Input
- Operating Temperature: -25 ~ +75°C

Introduction

The MP-8xx3 is the new generation programmable automation controller of ICP DAS. It is equipped with a Windows Embedded CE 6.0 operating system running on an AMD LX800 CPU (500 MHz) or an Intel Atom Z510 CPU (1.1 GHz), has got a wide range of ports (VGA, USB, Ethernet, RS-232/RS-485) and 3 or 7 slots for high performance parallel I/O modules (high profile I-8K series) and serial-type I/O modules (high profile I-87K I/O modules). Windows Embedded CE 6.0 has many advantages including hard real-time capability, small core size, interrupt handling at a deeper level, achievable deterministic control and low cost. Windows Embedded CE6.0, compared with CE5.0, updates its virtual memory architecture to increase system robustness and security.

Applications

Rich I/O Expansion Ability



Specifications

Models	MP-8343	MP-8743	MP-8353	MP-8753
System Software				
OS	Windows CE 6.0 core version			
.Net Compact Framework	3.5			
Embedded Service	FTP Server, ASP (Java Script, VB Script), SQL Compact Edition 3.5			
SDK Provided	Dll for Visual Studio .Net 2005/2008			
Multilanguage Support	English, German, French, Spanish, Russian, Italian, Japanese, Simplified Chinese, Traditional Chinese			
CPU Module				
CPU	LX800, 500 MHz		Atom Z510, 1.1 GHz	
System Memory	512 MB DDR SDRAM		512 MB DDR2 SDRAM	
Dual Battery Backup SRAM	512 KB; data valid up to 5 years			
Flash	4 GB as IDE Master		2 GB as IDE Master	
EEPROM	16 KB			
CF Card	Minimum 1 GB (support up to 32 GB)			
64-bit Hardware Serial Number	Yes, for Software Copy Protection			
Dual Watchdog Timers	Yes			
Rotary Switch	Yes (0 ~ 9)			
DIP Switch	Yes (8 bits)			
Audio	-		Microphone-In and Earphone-Out	
VGA & Communication Ports				
VGA	Yes (resolution: 1024 x 768, 800 x 600, 640 x480)			
Ethernet (Giga bit)	RJ-45 x 2, 10/100 Base-TX (Auto-negotiating, Auto MDI/MDI-X, LED indicators)			
USB 2.0	2		4	
COM 1	Internal communication with I-87K 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			
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 and GND); non-isolated			
I/O Expansion Slots				
Slot Number	3	7	3	7
Support modules type	High profile modules only			
Mechanical				
Dimensions (W x L x H)	231 mm x 132 mm x 125 mm	355 mm x 132 mm x 125 mm	231 mm x 132 mm x 125 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 V_{DC}			
Isolation	1 kV			
Redundant Power Inputs	Yes, with one power relay (1 A @ 24 V_{DC}) for alarm			
Capacity	35 W			
Consumption	14.4 W	16.8 W	14.4 W	16.8 W

Ordering Information

MP-8343 CR	Standard MP-8343 with 3 I/O Slots (Multilingual Version of OS) (RoHS)
MP-8743 CR	Standard MP-8743 with 7 I/O Slots (Multilingual Version of OS) (RoHS)
MP-8353 CR	Standard MP-8353-Atom with 3 I/O Slots (Multilingual Version of OS) (RoHS)
MP-8753 CR	Standard MP-8753-Atom with 7 I/O Slots (Multilingual Version of OS) (RoHS)

Accessories

USB-2020 CR	USB Audio Device (RoHS)
USB-2560 CR	4-Port Industrial USB 2.0 Hub (RoHS)
NS-208 CR	8-Port Unmanaged Industrial 10/100 Base-TX Ethernet Switch (RoHS)
MDR-20-24 CR	24 V_{DC}/1.0 A, 24 W Power Supply with DIN-Rail Mounting (RoHS)
MDR-60-24 CR	24 V_{DC}/2.5 A, 60 W Power Supply with DIN-Rail Mounting (RoHS)

Industrial I/O Modules for 8000 Series PAC and ViewPAC

5

5.1. I/O Modules Overview

• Overview

There are two types of I/O modules, parallel and serial. Both type of the modules can be plugged into the slots of PAC series. But only the serial module can be used in remote I/O units, such as RU-87Pn and ET-87Pn. Up to now, over 100 I/O, communication and motion control modules are available. For the new generation PACs, only the high profile I-8KW and I-87KW I/O modules can be used.

1. Parallel I/O Modules (I-8KW Series) Includes

- High speed A/D: 100 k samples/second
- High speed D/A: 30 k (-10 ~ +10 V)
- High speed DI & DO: All Digital I/O modules provide visual indication of status via LED indicators
- High speed stepping/Servo motion control modules
- High speed encoder modules
- High performance Counter/Frequency modules
- High speed multi-channel RS-232/422/485 modules
- CAN bus communication modules
- FRnet communication modules

2. Serial I/O modules (I-87KW Series) Includes

- RTD Input modules
- Thermocouple Input modules
- Strain Gauge Input modules
- VW Input modules
- High resolution multi-channel Analog Input modules
- Isolated multi-channel D/A modules
- Digital Input and Digital Output modules with Latch and counter function
- Counter/Frequency modules

3. Comparison Table of I-8KW Series and I-87KW Series

Item	I-8KW Series	I-8KRW Series	I-87KW Series
Communication Interface	Parallel bus	Parallel bus	Serial bus
Protocol	-	-	DCON
DI with latched function	-	-	Y
DI with counter input	-	-	Y (100 Hz)
Power on value	-	Y	Y
Safe value	-	Y	Y
Programmable slew-rate for AO module	-	-	Y

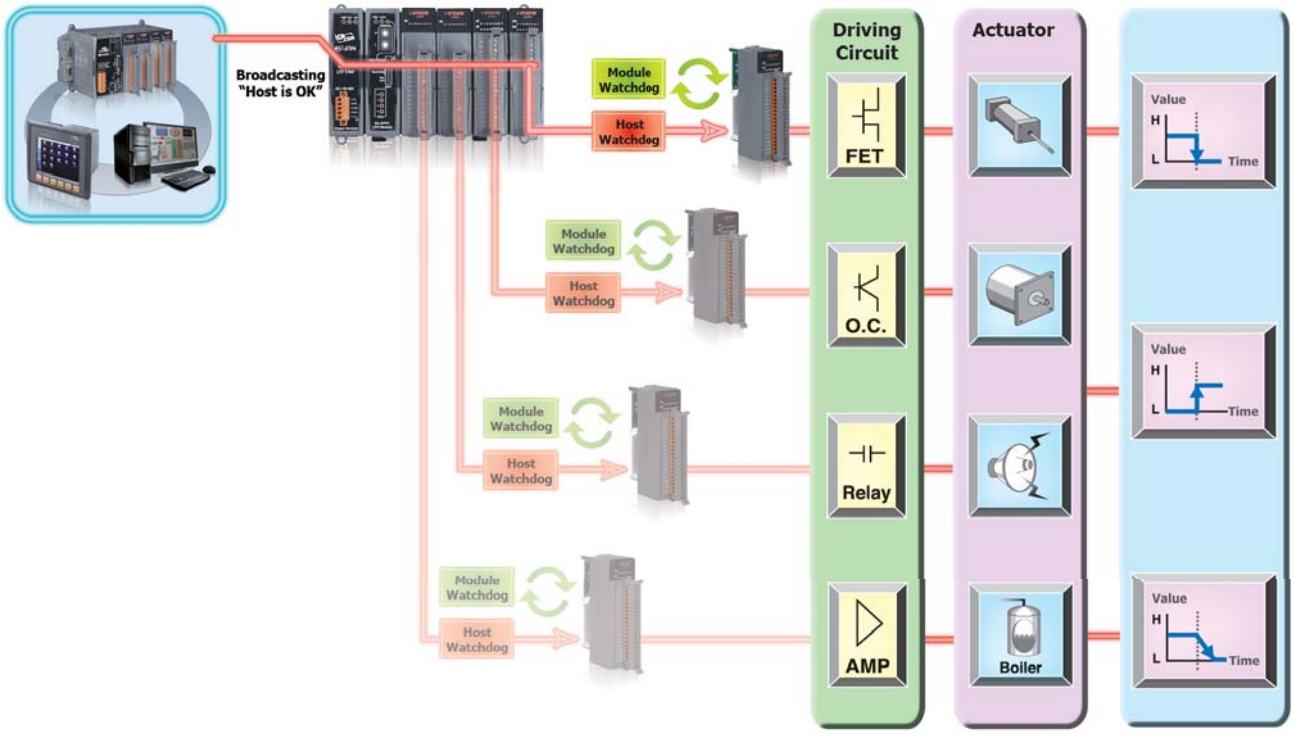
4. Supporting I/O Module list of MCU (Main Control Unit) and I/O expansion unit:

Item	I-8K Series		I-87K Series	
	High Profile	Low Profile	High Profile	Low Profile
XPAC	Y	-	Y	-
WinPAC	Y	-	Y	-
LinPAC	Y	-	Y	-
iPAC	Y	-	Y	-
ViewPAC	Y	-	Y	-
RU-87P1/2/4/8	-	-	Y	-
USB-87P1/2/4/8	-	-	Y	-
ET-87P4/8	-	-	Y	-
I-8KE4/8	Y	Y	Y	Y
I-8KE4/8-MTCP	Y	Y	Y	Y
I-87K4/5/8/9	-	-	Y	Y

5. Hot features

Dual Watchdog Operation

The I-87K I/O modules include an internal Dual Watchdog. It is the combination of module watchdog and host watchdog. The module watchdog is a hardware watchdog designed to reset the micro-controller of the module when the module fails. This mechanism can keep the module work continuously without disruption. The host watchdog is a software watchdog that monitors the operating status of the PAC. When the PAC fails, the outputs of the module will be set to the safe values to prevent any erroneous operations. With Dual Watchdog, the control system is more reliable and stable.



Power On Value and Safe Value of Digital / Analog Output

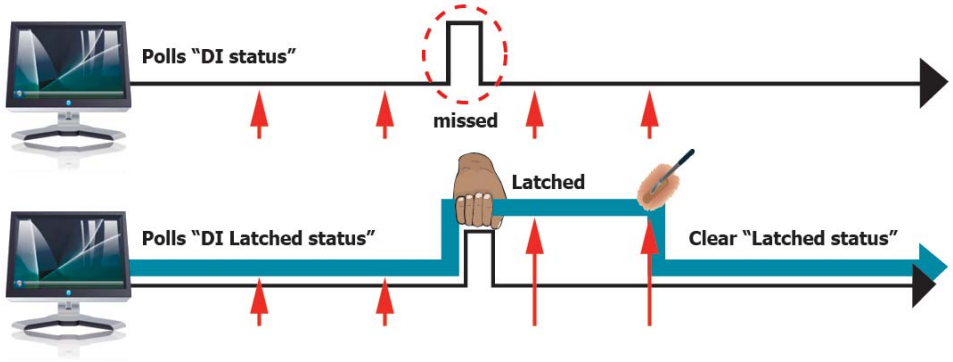
Besides setting by the set digital/analog output commands, the digital/analog outputs can be set under two other conditions. When the host watchdog is enabled and a host watchdog timeout occurs, the "safe value" is loaded into the digital/analog output ports. The set digital/analog output commands have no effect on the digital/analog output ports until the host watchdog timeout status is cleared. The host watchdog timeout status is saved in the EEPROM. The status is not changed even after power-on reset. It can be cleared only by the reset host watchdog timeout status command ~AA1. See Section A.2 for host watchdog details.
When the module is powered on and the host watchdog timeout status is cleared, the "power-on value" is loaded into the digital/analog output ports. If the host watchdog timeout status is not cleared on power-on, then the safe value is loaded into the digital/analog output ports. Both the safe value and power-on value are set by the ~AA5V command.

Advanced DI Functions of I-87K Series I/O Modules

DI channel is not only for reading digital input status but also provides several advanced functions in the meanwhile.

• DI Latch Function

All DI channels provide Latch function to keep the high/low events in the internal registers of the module. In general, the host controller polls modules one by one to get all DI status. Because RS-485 is a low speed field bus, the polling will take time and probably miss a short duration signal. With the DI latch function, the short duration (>=5ms) signal will not be lost any more.

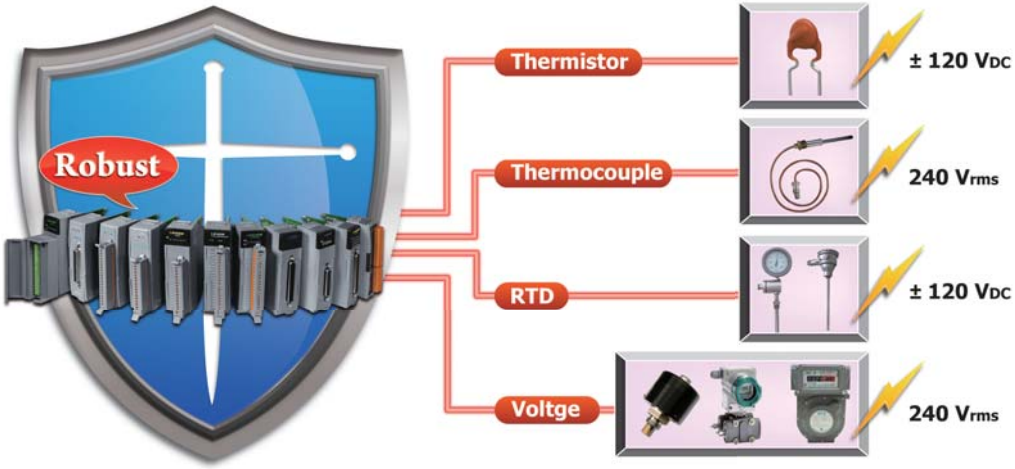


• Low Speed Counter

The DI module automatically counts the DI signal in the background. The signal under 100Hz can be detected and counted.

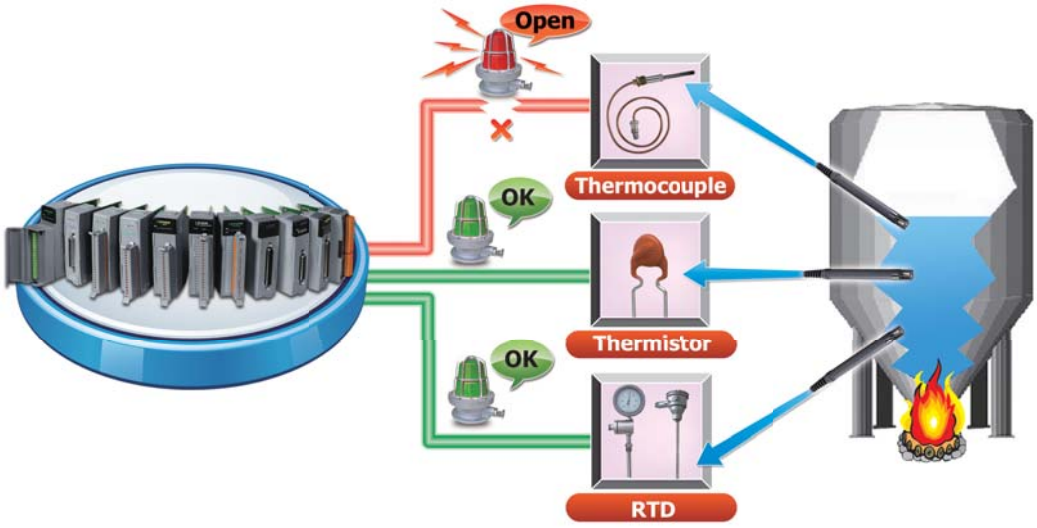
Overvoltage Protection

Many of our analog input modules provide high overvoltage protection for the analog input channels. When user picks wrong line accidentally or high voltage spike is applied to the analog input terminals, the module will not be broken and can still get the correct readings. This feature improves the reliability, reduces maintenance frequency, and makes the whole system more robust.



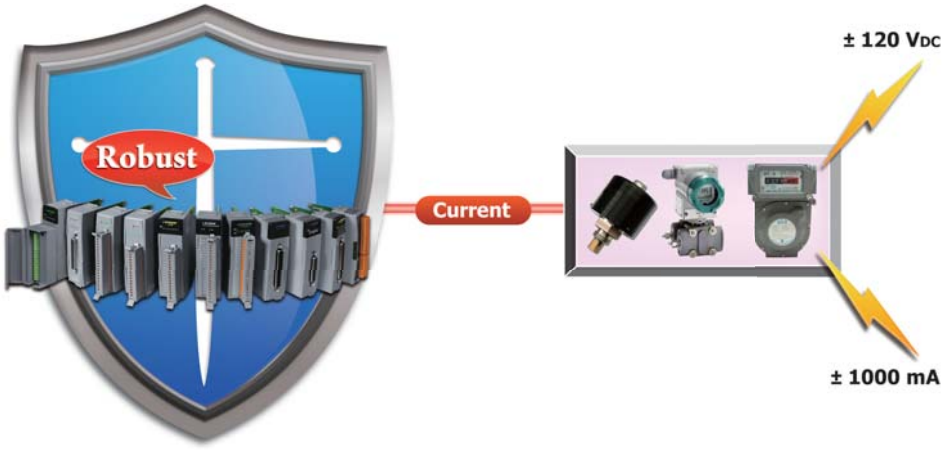
Open Wire Detection

The thermocouple, RTD and thermistor sensors are widely used in temperature control applications. If the system can not monitor the open wire status of the sensors, it may be very dangerous and cause large damage to life and property. When the wire of sensor is broken and the controller does not know the open wire status, the system may heat the boiler continuously and result in fire or explosion. Our thermocouple, RTD, thermistor modules provide open wire detection and make the system safer.



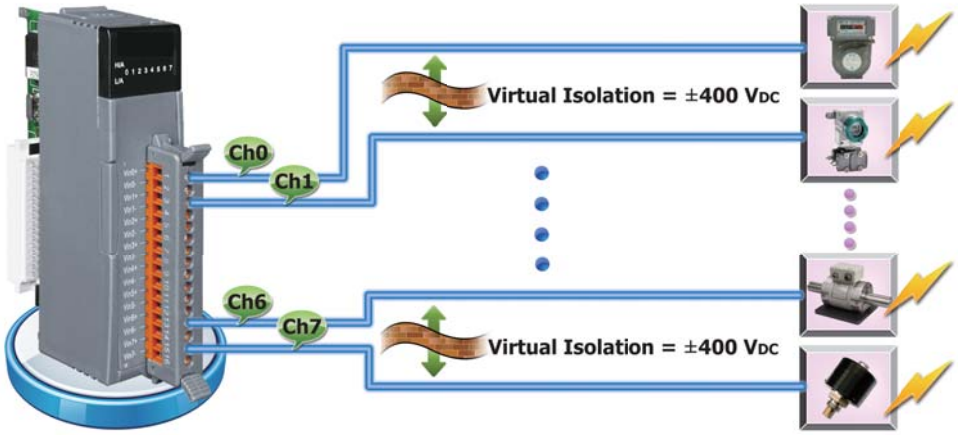
Over-current Protection

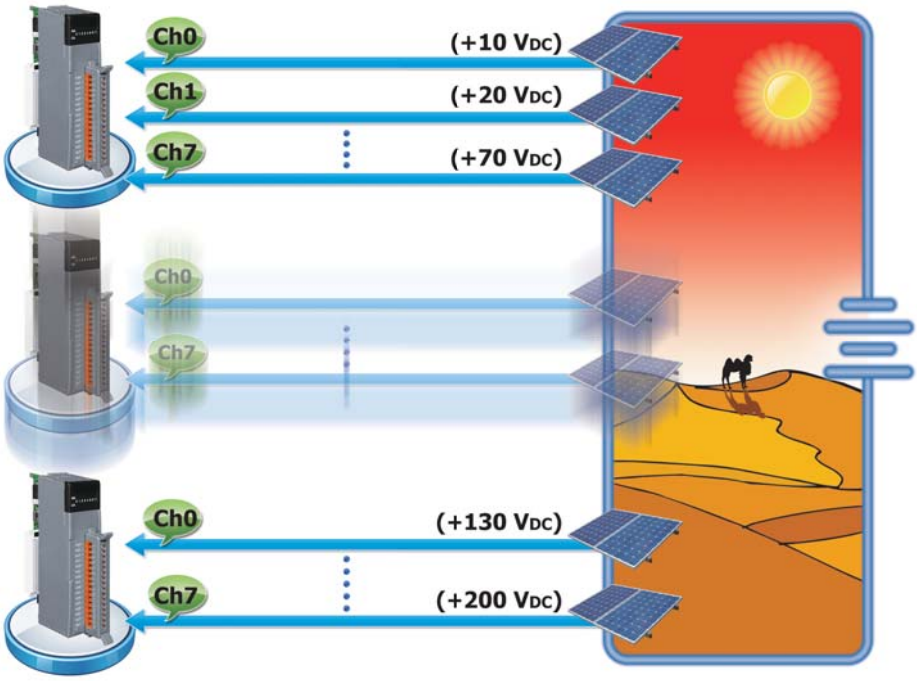
For the current measurement module, it may be damaged when there is high current or voltage introduced into the current loop. The protection for current measurement is improved to +/-120 VDC and +/-1000 mA.. A high current or voltage in the current loop will not damage the current measurement, so the whole system can work normally.



Virtual Channel to Channel Isolation

The "R" and "Z" version of analog input modules provide +/-400 VDC virtual channel to channel isolation to avoid the noise interference from adjacent channel in the industrial environment. To name a few of the modules, they are I-87017RW, I-87017ZW, I-87018RW, I-87018ZW, I-87019RW, and I-87019ZW. Though it is not real channel to channel isolation, there is only 1uA leakage current between two adjacent channels and the interference is very small and can be negligible.



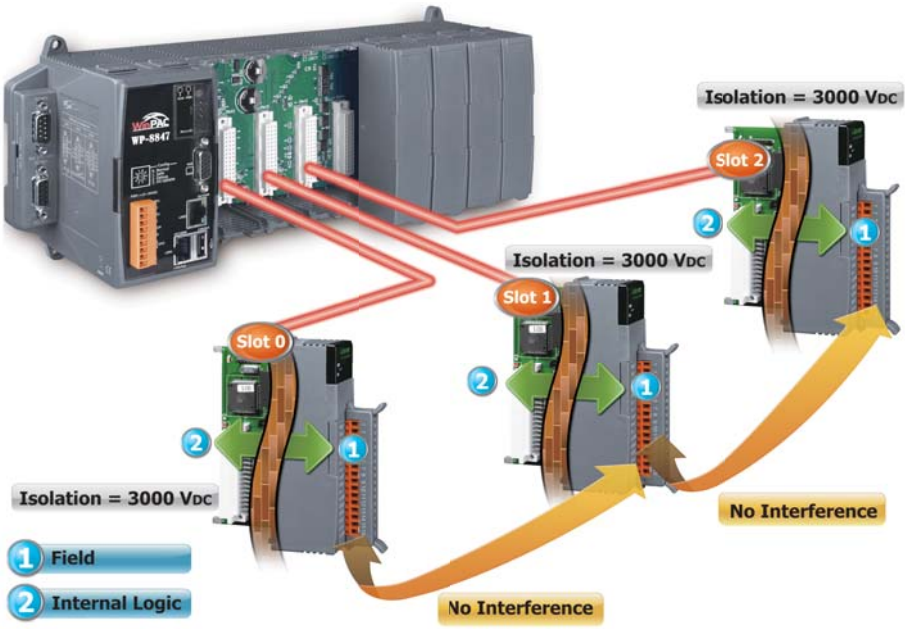


Common Voltage Protection

The typical application is to monitor the charging status of the batteries in series. The voltage of each battery is +10 VDC so the first battery is +10 VDC, the second battery is +20 VDC etc. The differential voltage of the 20th battery is only +10 VDC between vin+ and vin- terminal, while the common voltage is up to 200 VDC. If the common voltage of the analog input module is not large enough, then it can not measure the correct voltage of the battery in charging. ICP DAS analog input modules provide +/-200 VDC high common voltage for industrial applications.

ESD Protection

In the industrial environment there are many noise, spike, electrostatic etc.. If the module is not strong enough, it is very easy to be damaged. The I-8KW and I-87KW modules all pass +/-4 KV ESD contact and +/- 8 KV ESD air tests by static electricity gun in our laboratory. The test procedures follow the IEC 61000-4-2 standard. Our modules are immunity to the electrostatic discharges by using components that can clamp and resist to the high voltages defined by IEC 61000-4-2 standard.



3000 VDC Isolation

The I-8K and I-87K series have 3000 VDC isolation between the field and the internal logic. This isolation prevents the noise from the field to the internal logic that can damage the module. It is recommended to choose isolated modules that will be plugged into controller. There will be no interference from the adjacent slot because the noise from the adjacent slot is isolated.

5.2. Analog Modules

• Selection Guide

Thermistor Introduction

A thermistor is a type of resistor whose resistance varies significantly with temperature, more so than in standard resistors. The word is a portmanteau of *thermal* and *resistor.* Thermistors are widely used as inrush current limiters, temperature sensors, self-resetting overcurrent protectors, and self-regulating heating elements.

Thermistors differ from resistance temperature detectors (RTD) in that the material used in a thermistor is generally a ceramic or polymer, while RTDs use pure metals. The temperature response is also different; RTDs are useful over larger temperature ranges, while thermistors typically achieve a higher precision within a limited temperature range (usually -90 ~ 130°C).

Applications

Thermister Input Module (Serial Bus) — Table 5-2-1

Models	I-87005W
Pictures	
Analog Input	
Sensor Type	Precon ST-A3, Fenwell U, YSI L100, YSI L300, YSI L1000, YSI B2252, YSI B3000, YSI B5000, YSI B6000, YSI B10000, YSI H10000, YSI H30000, User-defined
Channels	8
Wiring	2 Wires
Resolution	16-bit
Accuracy	±0.1% of FSR
Sampling Rate	8 Hz (Total)
Individual Channel Configurable	Yes
3-wire RTD lead resistance elimination	-
Resistance Measurement	200 kΩ
Open Wire Detection	Yes
Overvoltage Protection	±120 V_{DC} /110 V_{AC}
4 KV ESD Protection	Yes
Digital Output	
Channels	8
Type	Open Collector
Sink /Source (NPN /PNP)	Sink
Load Voltage	5 ~ 50 V_{DC}
Over Load Protection	Yes
Short Circuit Protection	Yes
System	
Dual Watchdog	Yes
Isolation	3000 V_{DC}
Power Consumption	1 W
Connector	Terminal Block
Optional Accessories	-

• Selection Guide

RTD Introduction

Resistance Temperature Detectors (RTD), as the name implies, are sensors used to measure temperature by correlating the resistance of the RTD element with temperature. Most RTD elements consist of a length of fine coiled wire wrapped around a ceramic or glass core. The element is usually quite fragile, so it is often placed inside a sheathed probe to protect it. The RTD element is made from a pure material whose resistance at various temperatures has been documented. RTDs are also relatively immune to electrical noise and therefore well suited for temperature measurement in industrial environments, especially around motors, generators and other high voltage equipment.

Applications

RTD Input Module (Serial Bus) Table 5-2-2

Models	I-87013W	I-87015W	I-87015PW
Pictures			
Analog Input			
Sensor Type	Pt100, Pt1000, Cu50, Ni120	Pt100, Pt1000, Ni120, Cu50, Cu100, Cu1000	
Channels	4	7	
Wiring	2/3/4 Wires	2/3 Wire	
Resolution	16-bit	16-bit	
Accuracy	±0.1% of FSR	±0.05% of FSR	
Sampling Rate	10 Hz (Total)	12 Hz (Total)	
Individual Channel Configurable	Yes	Yes	
3-wire RTD lead resistance elimination	Yes	-	Yes
Resistance Measurement	3.2 kΩ	3.2 kΩ	
Open Wire Detection	Yes	Yes	
Overvoltage Protection	±20 V_{DC}	±20 V_{DC}	±120 V_{DC}
4 KV ESD Protection	Yes	Yes	
System			
Dual Watchdog	Yes	Yes	
Isolation	3000 V_{DC}	3000 V_{DC}	
Power Consumption	0.8 W	1 W	
Connector	Terminal Block	Terminal Block	
Optional Accessories	-	-	

■ **3-wire RTD lead resistance elimination**
With the feature, the line resistance of the RTD cable is eliminated regardless the length of the RTD cable for 3-wire RTD measurement.

• Selection Guide

Analog I/O Modules (Parallel Bus) Table 5-2-3

Models	I-8014W	I-8017HW	I-8017DW	I-8017HCW	I-8024W	I-8024DW
Pictures	NEW 		NEW 	NEW 		Available soon 
Analog Input						
Channels	8/16	8/16			-	
Wiring	Differential/ Single-ended	Differential/ Single-ended				
Range	±10 VDC, ±5 VDC, ±2.5 VDC, ±1.25 VDC -20 ~ +20 mA (Requires Optional External 125 Ω Resistor)	±10 VDC, ±5 VDC, ±2.5 VDC, ±-1.25 VDC ±20 mA (Requires Optional External 125 Ω Resistor)	±10 VDC, ±5 VDC, ±2.5 VDC, ±-1.25 VDC ±20 mA (Jumper Select)			
Resolution	16-bit	14-bit				
Accuracy	0.05% of FSR	±0.1% of FSR				
Sampling Rate	Single Channel Polling Mode: 250 k S/s	Single Channel Polling Mode: 100 k S/s Single Channel Interrupt Mode: 50 k S/s 8 channel Scan Mode : 16 k S/s				
Input Impedance	20 k, 200 k, 20 M (Jumper Select)	20 k, 200 k, 20 M (Jumper Select)				
Overvoltage Protection	-45 ~ +60 VDC	±35 VDC				
Analog Output						
Channels	-	-			4	
Range					±10 VDC, 0 ~ +20 mA	
Resolution					14-bit	
Accuracy					±0.1% of FSR for voltage output ; ±0.2% of FSR for current output	
Throughput					External +24 VDC @ 1050 Ω	
Output Capacity					20 mA @ 10 VDC	
Power on Value					-	
Safe Value					-	
System						
Watchdog	-	-			-	
Isolation	2500 Vrms	2500 Vrms			3000 VDC	
Power Consumption	2.5 W	2 W			2 W	
Connector	Terminal Block	Terminal Block	D-Sub 37	Terminal Block	Terminal Block	D-Sub 37
Optional Accessories	-	-	DN-37-381-A	-	-	DN-37-381-A

I/O module with DN-37-381-A

• Selection Guide

Analog Input Modules (Serial Bus) Table 5-2-4

Models	I-87017W	I-87017DW	I-87017RW	I-87017ZW	I-87017W-A5	I-87017RCW	I-87017RCDW	I-87017RCDW-AI
Pictures		NEW 		NEW 			Available soon 	Available soon 
Analog Input								
Channels	8	8/16	8	10/20	8	8	16	16
Wiring	Differential	Differential/ Single-ended	Differential	Differential/ Single-ended	Differential	Differential	Differential	Differential
Range	±150 mV, ±500 mV, ±1 VDC, ±5 VDC, ±10 VDC ±20 mA ,0 ~ +20 mA, +4 ~ +20 mA (Requires Optional External 125 Ω Resistor)			±150 mV, ±500 mV, ±1 VDC, ±5 VDC, ±10 VDC, ±20 mA, 0 ~ +20 mA, +4 ~ +20 mA (Jumper Selectable)	±50 VDC, ±150 VDC	0 ~ +20 mA, +4 ~ +20 mA, ±20 mA (No External Resistor Required)	0 ~ +20 mA, +4 ~ +20 mA, ±20 mA (No External Resistor Required)	0 ~ +100 mA
Resolution	Normal Mode: 16-bit Fast Mode: 12-bit				Normal Mode: 16-bit Fast Mode: 12-bit	Normal Mode: 16-bit Fast Mode: 12-bit		
Accuracy	Normal Mode :±0.1% of FSR Fast Mode :±0.5% of FSR				Normal Mode: ±0.1% of FSR Fast Mode: ±0.25% of FSR	Normal Mode: ±.1% of FSR Fast Mode: ±0.5% of FSR		
Sampling Rate	Normal Mode: 10 Hz (Total) Fast Mode: 60 Hz (Total)			Normal Mode: 10 Hz (Total) Fast Mode: 50 Hz (Total)	Normal Mode: 10 Hz (Total) Fast Mode: 50 Hz (Total)	Normal Mode: 10 Hz (Total) Fast Mode: 60 Hz (Total)		
Input Impedance	20 MΩ	DF: 2 MΩ SE: 1 MΩ	> 2 MΩ	DF: 2 MΩ SE: 1 MΩ	290 KΩ	125 Ω		
Common Voltage Protection	±15 VDC	±200 VDC			±200 VDC	±200 VDC		
Individual Channel Configurable	-	Yes	-	Yes	-		Yes	
Open Daughter Board Detection	-	Yes	-	-	-		Yes	
Overvoltage Protection	±35 VDC	DF: 240 Vrms SE: 120 Vrms	240 Vrms	DF: 240 Vrms SE: 150 Vrms	±200 VDC	±120 VDC	-	
Overcurrent Protection	-			Yes	-	Yes	-	
4 KV ESD Protection	Yes				Yes			
Virtual Channel to Channel Isolation	±30 VDC	±400 VDC			±400 VDC	±150 VDC		
System								
Dual Watchdog	Yes							
Isolation	3000 VDC							
Power Consumption	1.3 W			2.0 W	1.3 W			
Connector	Terminal Block	D-Sub 37	Terminal Block		Terminal Block		D-Sub 37	
Optional Accessories	-	DN-37-381-A	-		-		DN-37-381-A	

I/O module with DN-37-381-A

Introduction

A thermocouple is a temperature sensor which consists of two wires of different conductors.

Based on the Seebeck effect in thermoelectricity, the temperature difference results voltage difference on the two wires.

Thermocouples are widely used in scientific and industrial applications because they're generally accurate and can operate over wide range of temperature.

Thermocouple Type

Type	Range (°C)
J	-210 ~ +760
K	-270 ~ +1372
T	-270 ~ +400
E	-270 ~ +1000
R	0 ~ +1768
S	0 ~ +1768

Type	Range (°C)
B	0 ~ +1820
N	-270 ~ 1300
C	0 ~ 2320
L	-200 ~ +800
M	-200 ~ +100
$L_{DIN43710}$	-200 ~ +900

Thermocouple input module (Serial Bus) — Table 5-2-5

Models	I-87018W	I-87018PW	I-87018RW	I-87018ZW
Pictures		NEW 		
Analog Input				
Sensor Type	±15 mV, ±50 mV, ±100 mV ±500 mV, ±1 V_{DC}, ±2.5 V_{DC}			±15 mV, ±50 mV, ±100 mV, ±500 mV, ±1 V_{DC}, ±2.5 V_{DC}
	±20 mA (Requires Optional External 125 Ω Resistor)	0 ~ +20 mA, + 4 ~ +20 mA, ±20 mA (Requires Optional External 125 Ω Resistor)	±20 mA (Requires Optional External 125 Ω Resistor)	±0 mA, 0 ~ +20 mA, +4 ~ +20 mA (Requires Optional External 125 Ω Resistor)
	Thermocouple (J, K, T, E. R. S, B, N, C, L, M, $L_{DIN43710}$)			Thermocouple (J, K, T, E, R, S, B, N, C, L, M, $L_{DIN43710}$)
Channels	8			10
Wiring	Differential			Differential
Resolution	16-bit			16-bit
Accuracy	±0.1% of FSR			±0.1% of FSR
Temperature outputs consistency	-	Yes	-	Yes
Stable temperature output in the field	-	Yes	-	Yes
Sampling Rate	10 Hz (Total)			10 Hz (Total)
Input Impedance	>400 kΩ			>400 kΩ
Individual Channel Configurable	-	Yes	-	Yes
Open Wire Detection	-	Yes	Yes	Yes
Overvoltage Protection	±35 V_{DC}	240 V_{rms}	240 V_{rms}	240 V_{rms}
4 KV ESD Protection	Yes	Yes	Yes	Yes
Virtual Channel to Channel Isolation	±30 V_{DC}	±400 V_{DC}	±400 V_{DC}	±400 V_{DC}
System				
Dual Watchdog	Yes			Yes
Isolation	3000 V_{DC}			3000 V_{DC}
Power Consumption	0.8 W	0.7 W	0.6 W	1.3 W
Connector	Terminal Block			DB25
Optional Accessories	-	CN-1824	-	DB-1820/DN-1822

- We suggest to choose I-87018PW anbd I-87018ZW for accurate thermocouple measurement
- Special daughter board for thermocouple inputs features two benefits
  - Temperature outputs consistency
  - Stable temperature output in the field

I-87018PW-G/S CR=
I-87018PW connects CN-1824 directly

I-87018ZW-G/S CR=
I-87018ZW connects DB-1820 directly

I-87018ZW-G/S2 CR=
I-87018ZW connects DN-1822 with CD-2518D kit

• Selection Guide

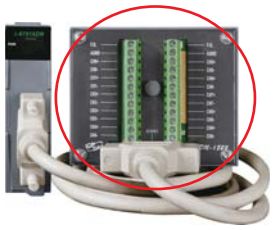
Analog Input Modules (Serial Bus) Table 5-2-6

Models	I-87019PW	I-87019RW	I-87019ZW
Pictures	NEW 		NEW 
Analog Input			
Sensor Type	±15 mV, ±50 mV, ±100 mV, ±150 mV, ±500 mV, ±1 V_{DC} , ±2.5 V_{DC} , ±5 V_{DC} ,±10 V_{DC}		
	±20 mA, 0 ~ +20 mA, +4 ~ +20 mA (Jumper Selectable)		
	Thermocouple Type: (J, K, T, E. R. S, B, N, C, L, M, and $L_{DIN43710}$)		
Channels	8	8	10
Wiring	Differential		
Resolution	16-bit		
Accuracy	±0.1% of FSR		
Temperature outputs consistency	Yes	-	Yes
Stable temperature output in the field	Yes	-	Yes
Sampling Rate	10 Hz (Total)	8 Hz (Total)	10 Hz (Total)
Input Impedance	Voltage Input: >400 kΩ Current Input: 125 Ω		
Individual Channel Configurable	Yes		
Open Wire Detection	Yes, (Software Selectable)	Yes	Yes, (Software Selectable)
Overvoltage Protection	240 V_{rms}		
4 KV ESD Protection	Yes		
Virtual Channel to Channel Isolation	±400 V_{DC}		
System			
Dual Watchdog	Yes		
Isolation	3000 V_{DC}		
Power Consumption	1.3 W	1.1 W	1.4 W
Connector	Terminal Block		DB25
Optional Accessories	CN-1824	-	DB-1820/DN-1822

- We suggest to choose I-87019PW anbd I-87019ZW for accurate thermocouple measurement
- Special daughter board for thermocouple inputs features two benefits
  - Temperature outputs consistency
  - Stable temperature output in the field

I-87019PW-G/S CR=
I-87019PW connects CN-1824 directly

I-87019ZW-G/S CR=
I-87019ZW connects DB-1820 directly



I-87019ZW-G/S2 CR=
I-87019ZW connects DN-1822 with CD-2518D kit

• Selection Guide

Analog Output Modules (Serial Bus) — Table 5-2-7

Models	I-87024W	I-87024RW	I-87024DW	I-87024CW	I-87028CW	I-87028UW
Pictures		NEW 	NEW 	Available soon 		Available soon 
Analog Output						
Channels	4			4	8	
Wiring of Current Output	Sink			Sink		Source
Range	0 ~ +5 VDC, ±5 VDC, 0 ~ +10 VDC, ±10 VDC, 0 ~ +20 mA, +4 ~ +20 mA			0 ~ +20 mA, +4 ~ +20 mA		0 ~ +5 VDC, ±5 VDC, 0 ~ +10 VDC, ±10 VDC, 0 ~ +20 mA, +4 ~ +20 mA
Resolution	14-bit			12-bit		16-bit
Accuracy	±0.1% of FSR			±0.1% of FSR		±0.02% of FSR
DA Output Response Time	10 ms per channel			10 ms per channel		10 ms per channel
Output Capacity	Voltage: 10 VDC @ 5 mA Current: External + 24 VDC @ 1050 Ω	Voltage: 10 VDC @ 20 mA Current: External +24 VDC @ 1050 Ω		External +24 VDC @ 1050 Ω		Voltage: 10 VDC @ 20 mA Current: External +24 VDC @ 1050 Ω
Channel to channel isolation	-			Yes, 1 kV		-
Open Current Detection	-		Yes	Yes		
Short Circuit Protection	Yes			Yes		
4 KV ESD Protection	Yes			Yes		
RS Immunity (IEC 61000-4-2)	-	5 V/m, 80 MHz ~ 1 GHz		-		5 V/m, 80 MHz ~ 1 GHz
Power on Value	Yes			Yes		
Safe Value	Yes			Yes		
System						
Dual Watchdog	Yes			Yes		
Isolation	3000 VDC			1000 VDC		2500 VDC
Power Consumption	2.8 W	3.2 W	3.1 W	0.9 W	1.4 W	0.9 W
Connector	Terminal Block		D-Sub 37	Terminal Block		
Optional Accessories	-		DN-37-381-A	-		

I/O module with DN-37-381-A

5.3. Digital Modules

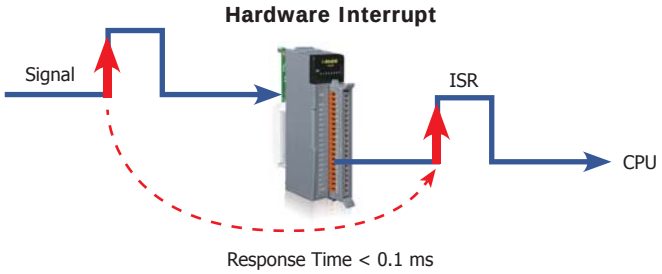
• Selection Guide

Digital Input Modules (Parallel Bus) Table 5-3-1

Models	I-8040W	I-8040PW	I-8046W	I-8048W	I-8051W	I-8052W	I-8053W	I-8053PW	I-8058W
Pictures				Note1 					
Digital Input									
Channels	32		16	8	16	8	16		8
Contact	Wet		Dry	Dry + Wet	Dry	Wet	Wet		Wet
Sink /Source (NPN /PNP)	Sink, Source		Source	Sink, Source	Source	Sink, Source	Sink, Source		Sink, Source
on Voltage Level	10 ~ 30 V_{DC}	19 ~ 30 V_{DC}	Close to GND.	Isolated: 4 ~ 30 V Non-Isolated TTL: 0.8 V Max.	Close to GND.	10 ~ 30 V_{DC}	10 ~ 30 V_{DC}	19 ~ 30 V_{DC}	80 ~ 250 V_{AC}
off Voltage Level	4 V_{DC} Max.	11 V_{DC} Max.	Open	Isolated: 1 V_{DC} Max. Non-Isolated TTL: 2 ~ 5 V_{DC}	Open	4 V_{DC} Max.	4 V_{DC} Max.	11 V_{DC} Max.	30 V_{AC} Max.
Low Pass Filter	-	Yes	-	-	-	-	-	Yes	-
Effective Distance for Dry Contact	-		500 m	100 m	100 m	-			
System									
Watchdog	-		-						
Isolation	3750 V_{rms}		3750 V_{rms}	1500 V_{rms}	-	5000 V_{rms}	3750 V_{rms}		5000 V_{rms}
Power Consumption	0.65 W	1 W	1.3 W	1.75 W	1.1 W	0.3 W	0.4 W	0.45 W	0.6 W
Connector	D-Sub 37		Terminal Block						
Optional Accessories	DN-37-381-A		-						

I/O module with DN-37-381-A

Note1. I-8048W supports hardware interrupt capturing. Each channel can be configured to capture either of rising edge or falling edge signal.

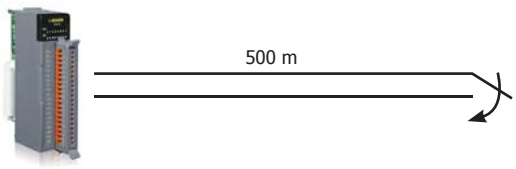


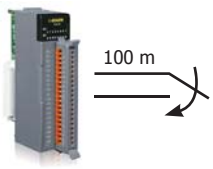
Response Time < 0.1 ms

■ **We suggest to choose "P" version of digital input module for industrial use, example : I-8040PW, I-8053PW ... etc.**

■ **Effective distance for dry contact of DI/DIO module**

In general, the effective distance for dry contact of DI module is 100 m. With the enhanced circuit design, the distance can be extended up to 500 m.





• Selection Guide

Digital Input Modules (Serial Bus) Table 5-3-2

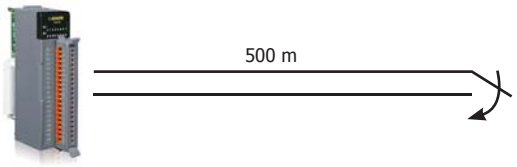
Models		I-87040W	I-87040PW	I-87046W	I-87051W	I-87052W	I-87058W	I-87059W
Pictures								
Digital Input								
Channels		32		16	16	8	8	8
Type		Wet		Dry	Dry	Wet	Differential	Differential
Sink /Source (NPN /PNP)		Sink, Source		Source	Source	Sink, Source	-	-
on	Voltage Level	3.5 ~ 30 V_{DC}	19 ~ 30 V_{DC}	Close to GND.	Close to GND.	3.5 ~ 30 V_{DC}	80 ~ 250 V_{AC}	10 ~ 80 V_{AC}
off	Voltage Level	1 V_{DC} Max.	11 V_{DC} Max.	Open	Open	1 V_{DC} Max.	30 V_{AC} Max.	3 V_{AC} Max.
Counter (100 Hz, 16-bit)		Yes		Yes				
Effective Distance for Dry Contact		-		500 m	100 m	-		
4 KV ESD Protection		Yes		Yes				
Low Pass Filter		Yes		Yes				
System								
Dual Watchdog		Yes		Yes				
Isolation		3750 V_{rms}		-	-	5000 V_{rms}	5000 V_{rms}	3750 V_{rms}
Power Consumption		1.6 W		1 W	0.5 W	0.3 W	0.3 W	0.3 W
Connector		D-Sub 37		Terminal Block				
Optional Accessories		DN-37-381-A		-				

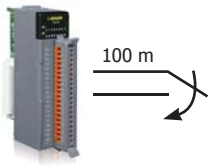
I/O module with DN-37-381-A

■ **We suggest to choose "P" version of digital input module for industrial use, example : I-87040PW ... etc.**

■ **Effective distance for dry contact of DI/DIO module**

In general, the effective distance for dry contact of DI module is 100 m. With the enhanced circuit design, the distance can be extended up to 500 m.





• Selection Guide

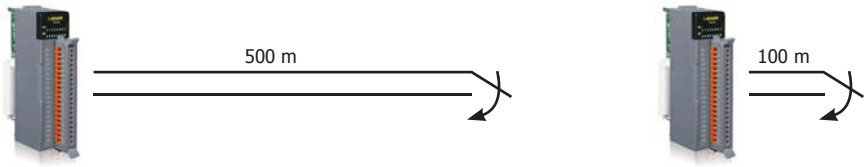
Digital Input Modules (Serial Bus) Table 5-3-3

Models		I-87053W	I-87053PW	I-87053W-A5	I-87053W-AC1	I-87053W-E5
Pictures						
Digital Input						
Channels		16				
Type		Dry+Wet			Wet	Wet
Sink /Source (NPN /PNP)		Sink, Source			AC Voltage	Sink
on	Voltage Level	Dry Contact: Close to GND.	Dry Contact: Close to GND.	Dry Contact: Close to GND.	-	-
		Wet contact: 3.5 ~ 30 V_{DC}	Wet contact: 19 ~ 30 V_{DC}	Wet contact: 68 ~ 150 V_{DC}	Wet contact: 10 ~ 80 V_{AC}	Wet contact: 68 ~ 150 V_{DC}
off	Voltage Level	Dry Contact: Open	Dry Contact: Open	Dry Contact: Open	-	-
		Wet contact: 1 V_{DC} Max.	Wet contact: 11 V_{DC} Max.	Wet contact: 48 V_{DC} Max.	Wet contact: 3 V_{AC} Max.	Wet contact: 48 V_{DC} Max.
Counter (100 Hz, 16-bit)		Yes				
Effective Distance for Dry Contact		500 m			-	500 m
4 KV ESD Protection		Yes				
Low Pass Filter		Yes				
Fuse Protection		-				Yes
System						
Dual Watchdog		Yes				
Isolation		3750 V_{rms}				
Power Consumption		0.8 W	0.8 W	0.9 W	1.5 W	0.8 W
Connector		Terminal Block				
Optional Accessories		-	-	-	-	-

■ **We suggest to choose "P" version of digital input module for industrial use, example : I-8053PW, I-87053PW ... etc.**

■ **Effective distance for dry contact of DI/DIO module**

In general, the effective distance for dry contact of DI module is 100 m. With the enhanced circuit design, the distance can be extended up to 500 m.



• Selection Guide

Digital Output Modules (Parallel Bus) Table 5-3-4

Models	I-8037W	I-8041W	I-8041RW	I-8041AW	I-8056W	I-8057W	I-8057RW	I-8057PW	I-8060W	I-8064W	I-8068W	I-8069W	I-8069RW
Pictures			Available soon 				Available soon 	Available soon 					Available soon 
Digital Output													
Channels	16	32			16				6	8	8	8	
Type	Open Collector	Open Collector			Open Collector				Power Relay			PhotoMOS Relay	
Sink /Source (NPN /PNP)	Source	Sink	Sink	Source	Sink				Form C	Form A	Form A x 4 Form C x 4	Form A	
Load Voltage	5~30 V_{DC}	5~30 V_{DC}			5~30 V_{DC}		5~50 V_{DC}						
Max. Load Current	100 mA/ channel	100 mA/channel			100 mA/channel		700 mA/channel		0.5 A @125 V_{AC} 0.25 A @250 V_{AC} 2A @30 V_{DC}	5 A @250 V_{AC} 5 A @30 V_{DC}	Form A : 5 A @250 V_{AC} 5 A @28 V_{DC} Form C : 5 A (NO) /3A (NC) @30 V_{DC} 5 A (NO) /3A (NC) @ 277 V_{AC}	60 V_{DC} /1.0 A	
Electrical Endurance	-								5 × 10^5 ops.			No arcing, no bounce and no switching	
Power on Value	-	-	Yes	-	-		Yes	-	-	-	-	-	Yes
Safe Value	-	-	Yes	-	-		Yes	-	-	-	-	-	Yes
System													
Watchdog	-	-	Yes	-	-								
Isolation	3750 V_{rms}	3750 V_{rms}			-	3750 V_{rms}	3750 V_{rms}		1500 V_{rms}	2000 V_{rms}	1500 V_{rms}	1500 V_{rms}	
Power Consumption	0.9 W	1.5 W			0.9 W	0.9 W	1.5 W		1 W	1.1 W	2.5 W	0.6 W	
Connector	Terminal Block	D-Sub 37			Terminal Block								
Optional Accessories	-	DN-8K32R, DN-37-381-A		DN-37-381-A	-								

I/O module with DN-8K32R

I/O module with DN-37-381-A

• Selection Guide

Digital Output Modules (Serial Bus) Table 5-3-5

Models	I-87037W	I-87041W	I-87057W	I-87057PW	I-87061W	I-87064W	I-87065W	I-87066W	I-87068W	I-87069W	I-87069PW
Pictures	NEW 			NEW 							NEW 
Digital Output											
Channels	16	32	16		16	8	8	8	8	8	8
Type	Open Emitter	Open Collector			Power Relay		AC SSR	DC SSR	Power Relays	PhotoMOS Relay	
Sink /Source (NPN /PNP)	Source	Sink	Sink		Form A				Form A × 4 Form C × 4	Form A	
Load Voltage	10 ~ 40 V_{DC}	5 ~ 30 V_{DC}	5 ~ 30 V_{DC}	5 ~ 50 V_{DC}	Relay Contact: 0 ~ 250 V_{AC} 0 ~ 30 V_{DC}		24 ~ 265 V_{rms}	3 ~ 30 V_{DC}	Form A: 0 ~ 250 V_{AC} 0 ~ 28 V_{DC} Form C: 0 ~ 277 V_{AC} 0 ~ 30 V_{DC}	350 V Max. at DC/AC	80 V Max. at DC/AC
Max. Load Current	700 mA/ channel	100 mA/ channel	100 mA/ channel	700 mA/ channel	5.0 A_{rms}		1.0 A_{rms}	1.0 A_{rms}	Form A: 8 A Form C: 3 A (NC) 5 A (NO)	0.13 A_{rms}	1.0 A_{rms}
Over Load Protection	Yes	-	-	Yes	-		-	-	-	-	-
Short Circuit Protection	Yes	-	-	Yes	-		-	-	-	-	-
4 KV ESD Protection	Yes	Yes	Yes		Yes		Yes	Yes	Yes	Yes	Yes
Electrical Endurance	-				5×10^5 ops		No arcing, no bounce and no switching		10^5 ops	No arcing, no bounce and no switching	
Power on Value	Yes	Yes	Yes		Yes		Yes	Yes	Yes	Yes	Yes
Safe Value	Yes	Yes	Yes		Yes		Yes	Yes	Yes	Yes	Yes
System											
Dual Watchdog	Yes	Yes	Yes		Yes		Yes	Yes	Yes	Yes	Yes
Isolation	3750 V_{DC}	3750 V_{rms}	3750 V_{rms}		3000 V_{rms}	2000 V_{rms}	2500 V_{rms}	2500 V_{rms}	4000 V_{rms}	5000 V_{rms}	1500 V_{rms}
Power Consumption	0.41 W	0.7 W	1 W		1.8 W	1.5 W	0.6 W	0.6 W	2.5 W	0.5 W	0.5 W
Connector	Terminal Block	D-Sub 37	Terminal Block		Terminal Block		Terminal Block	Terminal Block	Terminal Block	Terminal Block	Terminal Block
Optional Accessories	-	DN-8K32R, DN-37-381-A	-								

I/O module with DN-8K32R

I/O module with DN-37-381-A

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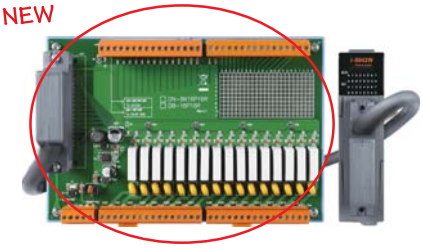
Digital Input & Output Modules (Parallel Bus) Table 5-3-6

Models	I-8042W	I-8050W	I-8054W	I-8054RW	I-8055W	I-8063W
Pictures		Note1 		Available soon 		
Digital Input						
Channels	16	16	8		8	4
Type	Wet	Wet	Wet		Dry	Wet
Sink /Source (NPN /PNP)	Sink, Source	Sink	Sink, Source		Source	Sink, Source
on Voltage Level	10 ~ 30 V_{DC}	10 ~ 30 V_{DC}	10 ~ 50 V_{DC}		Close to GND.	10 ~ 30 V_{DC}
off Voltage Level	4 V_{DC} Max.	4 V_{DC} Max.	4 V_{DC} Max.		Open	4 V_{DC} Max.
Low Pass Filter	-	-	-	Yes	-	-
Effective Distance for Dry Contact	-	-	-	-	100 m	-
Digital Output						
Channels	16	16	8		8	4
Type	Open Collector	Open Collector	Open Collector		Open Collector	Power Relay
Sink /Source (NPN /PNP)	Sink	Sink	Sink		Sink	Form C
Load Voltage	5 ~ 30 V_{DC}	5 ~ 30 V_{DC}	5 ~ 50 V_{DC}		5 ~ 30 V_{DC}	5 A (NO)/3 A (NC) @ 30 V_{DC} 5 A (NO)/3 A (NC) @ 277 V_{AC} 5 A (NO)/3 A (NC) at 65°C
Max. Load Current	100 mA/channel	100 mA/channel	700 mA/channel		100 mA/channel	
Power on Value	-	-	-	Yes	-	-
Safe Value	-	-	-	Yes	-	-
System						
Watchdog	-	-	-		-	-
Isolation	3750 V_{rms}	3750 V_{rms}	3750 V_{rms}		-	3750 V_{rms}
Power Consumption	1.5 W	1 W	0.55 W		1 W	2 W
Connector	D-Sub 37	Terminal Block	Terminal Block		Terminal Block	Terminal Block
Optional Accessories	DN-37-381-A, DN-8K16P16R	-	-		-	-

I/O module with DN-37-381-A

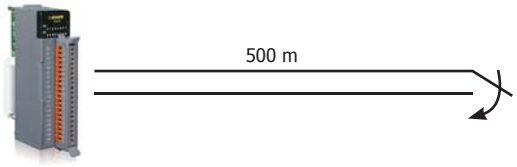
NEW

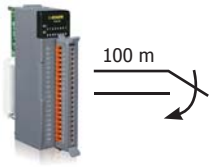


I/O module with DN-8K16P16R

■ **Effective distance for dry contact of DI/DIO module**

In general, the effective distance for dry contact of DI module is 100 m. With the enhanced circuit design, the distance can be extended up to 500 m.





Note1. I-8050W is 16-ch universal digital I/O module. Each channel can be independently configured to be an input or an output channel by software setting.

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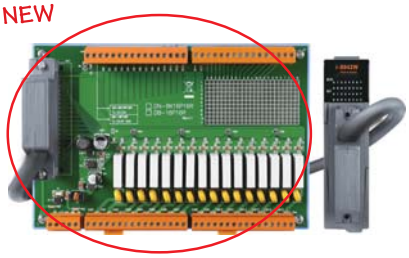
Digital Input & Output Modules (Serial Bus) Table 5-3-7

Models	I-87042W	I-87054W	I-87055W	I-87063W
Pictures	NEW 			
Digital Input				
Channels	16	8	8	4
Contact	Wet	Wet	Dry	Wet
Sink /Source (NPN /PNP)	Sink, Source	Sink, Source	Sink	Sink, Source
on Voltage Level	+3.5 ~ +30 VDC	+3.5 ~ +50 VDC	Close to GND.	+3.5 ~ +30 VDC
off Voltage Level	1 VDC Max.	1 VDC Max.	Open	1 VDC Max.
Counter (100 Hz, 16-bit)	Yes	Yes	Yes	Yes
Low Pass Filter	Yes	Yes	Yes	Yes
Effective Distance for Dry Contact	-	-	100 m	-
Digital Output				
Channels	16	8	8	4
Type	Open Collector	Open Collector	Open Collector	Power Relay
Sink /Source (NPN /PNP)	Sink	Sink	Sink	Form C
Load Voltage	+5 ~ +30 VDC	+5 ~ +50 VDC	+5 ~ +30 VDC	+5 ~ +24 VDC 0 ~ +250 VAC
Max. Load Current	100 mA/channel	700 mA/channel	100 mA/channel	5 A (NO)/3 A (NC) @ 30 VDC 5 A (NO)/3 A (NC) @ 277 VAC
Short Circuit Protection	-	Yes	-	-
4 KV ESD Protection	Yes	Yes	Yes	Yes
Power on Value	Yes	Yes	Yes	Yes
Safe Value	Yes	Yes	Yes	Yes
System				
Dual Watchdog	Yes	Yes	Yes	Yes
Isolation	3750 Vrms	3750 Vrms	-	4000 Vrms
Power Consumption	1.5 W	0.7 W	0.6 W	1.5 W
Connector	D-Sub 37	Terminal Block	Terminal Block	Terminal Block
Optional Accessories	DN-37-381-A, DN-8K16P16R	-	-	-

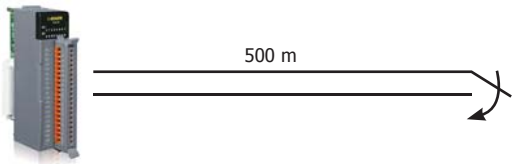
I/O module with DN-37-381-A

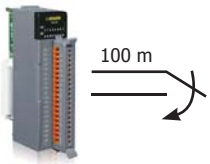
NEW 

I/O module with DN-8K16P16R

■ **Effective distance for dry contact of DI/DIO module**

In general, the effective distance for dry contact of DI module is 100 m. With the enhanced circuit design, the distance can be extended up to 500 m.





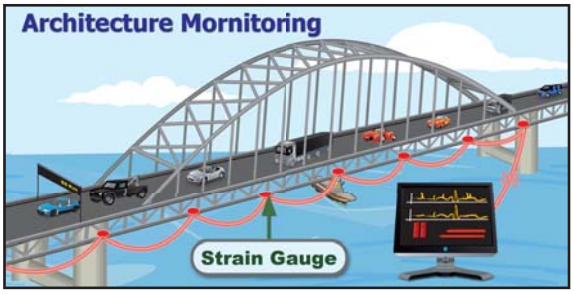
5.4. Multi-Function/Strain Gauge Modules

• Selection Guide

Strain Gauge Introduction

A strain gauge is a resistive sensor. The measurement of strain is usually made using a Wheatstone bridge circuit with excitation voltage. The variation in strain can be calculated based on the measured voltage. The resistance of the gauge varies when the gauge is compressed or stretched. With the characteristic, it can be applied to measure stress or the growth of the crack or movement in buildings, foundations, and other structures to ensure the safety.

Applications

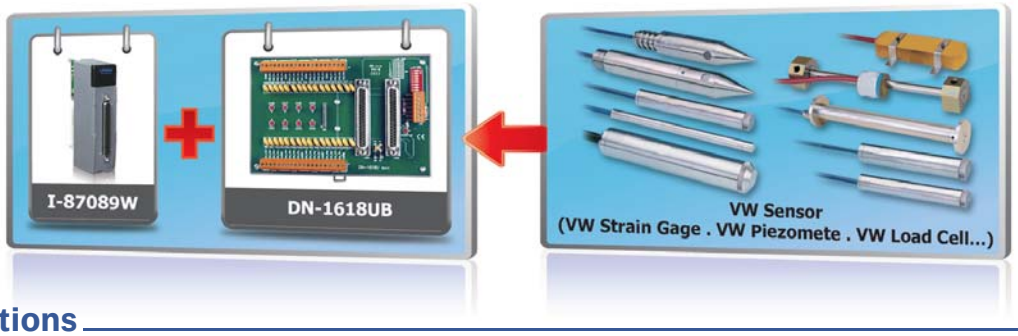


Multi-function Module (Parallel/Serial Bus)				
Models		**I-87016W**	**I-87026PW**	**I-8026PW**
Pictures		NEW 	NEW 	Available soon 
Analog Input				
Channels		2	6	
Range		±15 mV, ±50 mV, ±100 mV, ±500 mV, ±1 V_{DC}, ±2.5 V_{DC}, ±20 mA	±150 mV, ±500 mV, ±1 V, ±5 V, ±10 V, ±20 mA	±10 V_{DC}, ±5 V_{DC}, ±20 mA (Jumper Select)
Strain Gauge Type		Full-Bridge, Half-Bridge, Quarter-Bridge	-	
Resolution		16-bit	16-bit	12-bit
Accuracy		±0.05% of FSR (Voltage), ±0.1% of FSR (Current)	±0.1% of FSR	±0.2% of FSR
Sampling Rate		2 Hz (Total) or 10 Hz (Total)	10 Hz (Total)	35 kHz
Input Impedance		> 400 kΩ (Voltage), 125 Ω (Current)	2 MΩ (Voltage), 125 Ω (Current)	2M Ω
Overvoltage Protection		30 V_{DC}	240 V_{rms}	
Long Distance Strain Gauge Measurement		Yes	-	-
Individual Channel Configurable		Yes	Yes	
Analog Output				
Channels		1	2	
Range		0 ~ +10 V_{DC}	±10 V, ±5 V, 0 ~ 10 V, 0 ~ 5 V, 0 ~ 20 mA, 4 ~ 20 mA	±10 V, ±5 V, 0 ~ 10 V, 0 ~ 5 V, 0 ~ 20 mA
Resolution		16-bit	12-bit	
Accuracy		±0.05% of FSR	±0.1% of FSR	±0.2% of FSR
Output Capacity		10 V @ 80 mA	10 V @ 20 mA	
Digital Input				
Channels		2	2	
Contact		Wet	Wet	
Sink /Source (NPN /PNP)		Sink	Sink	
on	Voltage Level	3.5 ~ 50 V_{DC}	3.5 ~ 50 V_{DC}	
off	Voltage Level	1 V_{DC} Max.	1 V_{DC} Max.	
Low Pass Filter		Yes	Yes	-
Digital Output				
Channels		2	2	
Type		Open Collector	Open Collector	
Sink /Source (NPN /PNP)		Sink	Sink	
Load Voltage		3.5 ~ 50 V_{DC}	3.5 ~ 50 V_{DC}	
Max. Load Current		700 mA/channel	700 mA/channel	
System				
Dual Watchdog		Yes	Yes	-
Data Bus		Serial	Serial	Parallel
Isolation		3000 V_{DC}	2500 V_{DC}	
Power Consumption		2.5 W	1.8 W	3 W
Connector		Terminal Block	Terminal Block	Terminal Block
Optional Accessories		-	-	-

5.5. Vibrating Wire Input Modules

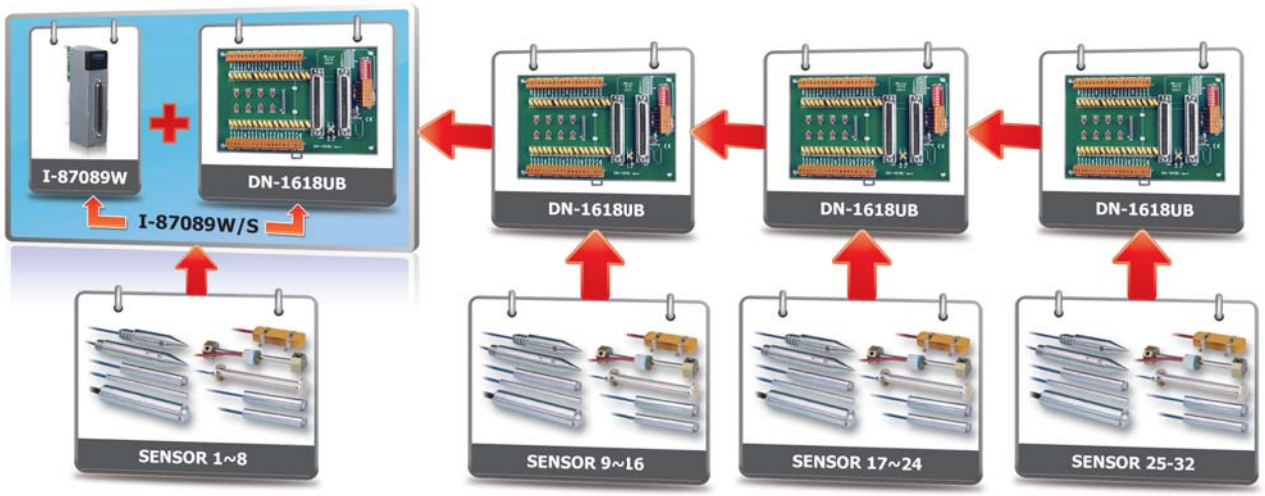
Introduction

The vibrating wire sensor has a wire which is initially plucked by a series of electrical magnetic forces from a coil. The conductive wire after plucking is vibrating in a magnetic field. The wire will disturb the field, and then the coil can pick up the induced voltage change. The signal is amplified and detected by a VW readout device, or called VW reader. After plucking, there is no other force acting on this wire. When the transient response dies out, the reader can read a stable resonant frequency. The resonant frequency is function of the tension of this wire.



Applications

The I-87089W/S can be extended to 32 channels by connecting 3 extra DN-1618UB.



VW Input Module	
Models	**I-87089W/S**
Pictures	Available soon 
Vibrating Wire Input	
Channels	8
Input Type	Vibrating Wire Sensor (2 VW wire + 2 Temperature wire +1 shield wire)
Measurement Range	Wire: 450 ~ 6000 Hz
Excitation mode	Enhanced square wave
Resolution	Wire: 0.01Hz / Temperature: 0.01°C
Accuracy	Wire: ±0.01% of FSR / Temperature: ±0.1% of FSR
Channel to channel isolation	Yes, 1 kV
System	
Dual Watchdog	Yes
Isolation	3000 V_{DC}
Power Consumption	3.6 W
Connector	D-Sub 37
Optional Accessories	DN-1618UB

5.6. Counter/Frequency/PWM Modules

• Selection Guide

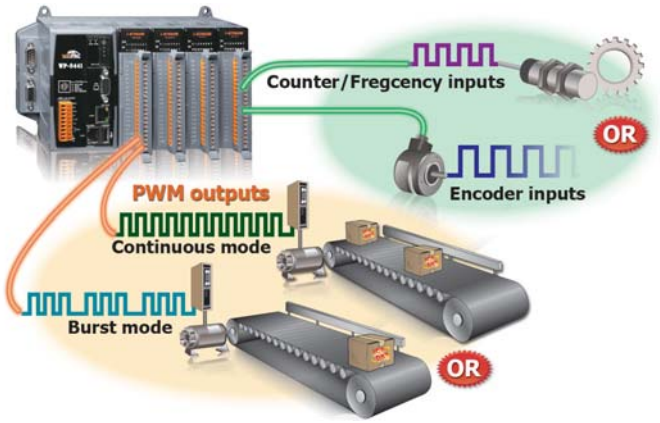
PWM Introduction

PWM (Pulse width modulation) is a powerful technique for controlling analog circuits. It uses digital outputs to generate a waveform with variant duty cycle and frequency to control analog circuits. I-8088W and I-87088W have 8 PWM output channels and 8 digital inputs. It can be used to develop powerful and cost effective analog control system.

PWM Features

- Automatic generation of PWM outputs by hardware, without software intervention.
- Software and hardware trigger mode for PWM output
- Individual and synchronous PWM output
- Burst mode PWM operation for standby
- DI channel can be configured as simple digital input channel or hardware trigger source of the PWM output.

Applications



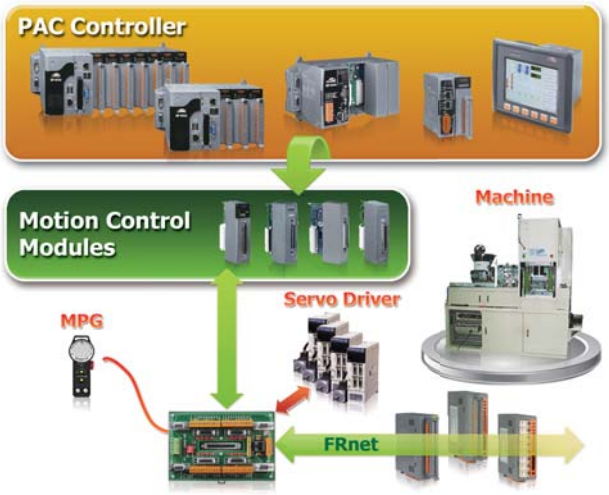
Counter/Frequency/PWM Module (Parallel/Serial Bus)						
Models		**I-87082W**	**I-8084W**	**I-87084W**	**I-8088W**	**I-87088W**
Pictures				NEW 		Available soon 
Digital Input						
Channels		2	8		8	8
Type		Isolated or Non-isolated	Isolated or Non-isolated (Jumper Selectable)		Isolated	Isolated
on	Voltage Level	3.5 ~ 30 VDC (isolated) 2.4 ~ 5 VDC (Non-isolated)	3.5 ~ 30 VDC (isolated) 2.4 ~ 5 VDC (Non-isolated)		5 ~ 30 VDC	2.4 ~ 5 VDC
off	Voltage Level	1 VDC Max. (isolated) 0~ 0.8 VDC (Non-isolated)	1 VDC Max. (isolated) 0 ~ 0.8 VDC (Non-isolated)		0.8 VDC Max.	0.8 VDC Max.
Threshold Voltage		Programmable	Fixed		Fixed	Fixed
Counter		Up	Up/Down		-	Up
Max.Counts		32-bits (4,294,967,295)	32-bits (4,294,967,295)		-	32-bits (4,294,967,295)
Max. Counter Speed		100 kHz	250 kHz (isolated) 1 MHz (Non-isolated)		-	1 MHz
Digital Filter		2 ~ 65000 µs	1 ~ 32767 µs		-	-
Virtual Battery Backup for Counter Value		-	-	Yes	-	Yes
Max. Frequency		100 kHz	250 kHz		-	-
Frequency Accuracy		1Hz or 10Hz	±0.4% of Input Frequency		-	
Encoder		-	CW/CCW, Dir/Pulse, AB Phase		-	-
Digital Output						
Channels		2	-		8	
Type		Sink, Open Collector	-		Source, PWM	
Output Voltage		5 ~ 30 VDC	-		5 VDC	
Output Current		30 mA	-		1 mA	
Alarm Output		Yes	-		-	
PWM Frequency		-	-		1 ~ 500 kHz	
PWM Duty Cycle		-	-		0.1 ~ 99.9%	
PWM Mode		-	-		Burst, Continuous	
Burst Count		-	-		1 ~ 65535	
Trigger Start		-	-		Hardware, Software	
System						
Dual Watchdog		Yes	-	Yes	-	Yes
Data Bus		Serial	Parallel	Serial	Parallel	Serial
Isolation		3750 Vrms	1000 Vrms	2000 VDC	3000 VDC	2500 Vrms
Power Consumption		0.5 W	0.6 W	0.6 W	1.8 W	1.8 W
Connector		Terminal Block			Terminal Block	
Optional Accessories		-			-	

5.7. Motion Control Modules

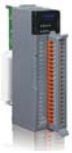
Introduction

The i-8092/4/F/A/H is a 2/4-axis stepping/pulse-type servo motor control module. This module contains a high-performance motion ASIC. Apart from a wide speed range, this intelligent motion controller also has a variety of motion control functions built in, such as 2/3 (4 axis only) - axis linear interpolation, 2-axis circular interpolation, T/S-curve acceleration/deceleration, various synchronous actions (4 axis only), automatic homing(4 axis only), and others. In addition, most of the motion control functions are performed with light load on the processor. While driving the motors, the motion status, and the other I/O status on the PAC modules, can still be monitored. As a result of the low CPU loading requirements, one or more motion modules may be used on a single PAC controller.

The i8092F/4F/4H modules have one port of FRnet. The FRnet port allows this module to expand its fast remote I/O easily. This two-wired FRnet can automatically scan its 128 DI and 128 DO with a period of 2.88 ms.



Selection Guide

Motion Control Modules (Parallel Bus)						
Model Name	**I-8092F**	**I-8093W**	**I-8094**	**I-8094F**	**I-8094A**	**I-8094H**
Pictures						
Encoder Input						
Axis	2	3	4			
Counter	32-bit	32-bit	32-bit			
Speed (pps)	1 M	1 M	1 M			
Signal	CW/CCW, A/B	CW/CCW, A/B, Pulse/Dir	CW/CCW, A/B			
Command Pulse Output						
Axis	2	-	4			
Counter	32-bit	-	32-bit			
Speed (pps)	4 M	-	4 M			
Signal	CW/CCW, Pulse/Dir	-	CW/CCW, Pulse/Dir			
System						
Programmable CPU (MiniOS7 inside)	-		-	-	Yes	Yes
FRnet	Yes	-	-	Yes	-	Yes
Isolation			2500 V_{rms}			
Power Consumption	1.9 W	2 W	2 W	2.5 W	3 W	3.5 W
Optional Accessories	DN-8237	-	DN-8468	DN-8468	DN-8468	DN-8468

Daughter-Board for two-axis motion controller	
DN-8237 Series	**DN-8237GB**: for general purpose usage
	**DN-8237MB**: for Mitsubishi servo J2 Amplifier
	DN-8237PB: for Panasonic servo minas A Amplifier
	DN-8237YB: for Yaskawa servo Amplifier
Dimensions: 110 mm X 107 mm	**DN-8237DB**: for Delta ASDA A servo Amplifier

Daughter-Board for four-axis motion controller	
DN-8468 Series	**DN-8468GB**: for general purpose usage
	**DN-8468MB**: for Mitsubishi servo J2 Amplifier
	DN-8468PB: for Panasonic servo minas A Amplifier
	DN-8468YB: for Yaskawa servo Amplifier
	DN-8468DB: for Delta ASDA A servo Amplifier
Dimensions: 162 mm X 107 mm	**DN-8468FB**: for FUJI FALDIC-W servo Amplifier

5.8. Serial Communication Modules (Parallel Bus)

• Selection Guide

RS-232/422/485 Communication Module (Parallel Bus)					
Model Name	**I-8112iW**	**I-8114W**	**I-8114iW**	**I-8142iW**	**I-8144iW**
Pictures					
Communication					
Interface	RS-232	RS-232	RS-232	RS-422/485	RS-422/485
Port	2	4	4	2	4
Max. Speed (K bps)	115.2				
Controller Chip	16C950				
System					
Hot Swap	-	-		-	
Isolation	2500 V_{rms}	-	2500 V_{rms}	2500 V_{rms}	
Power Consumption	1.5 W	1.25 W	1.75 W	1.5 W	1.75 W
Connector	D-Sub 9 x 2	D-Sub 37		Terminal Block	
Optional Accessories	CA-0915	CA-9-3705	CA-9-3705	-	-

CA-0915

CA-9-3705

Optional RS-232/422/485 Converter/Repeater

Model Name	tM-7520U	I-7520	I-7520R	I-7520A	I-7520AR	I-7551	tM-7510U	I-7510	I-7510A	I-7510AR
Pictures	NEW 						NEW 			
Function	Converter						Repeater			
Interface	RS-232 to RS-485			RS-232 to RS-422/485		RS-232 to RS-232	RS-485	RS-485	RS-422/485	
Isolation	2500 V_{DC} RS-232 side	3000 V_{DC} RS-232 side	3000 V_{DC} RS-485 side	3000 V_{DC} RS-232 side	3000 V_{DC} RS-422/485 side	3000 V_{DC} 3 ways	2500 V_{DC}	3000 V_{DC}		3000 V_{DC} 3 ways
Operating Temperature	-25 ~ +75°C									

Optional RS-232/485 to RS-485 Hub

Model Name	I-7513	I-7520U4	I-7514U
Pictures		NEW 	NEW 
Function	3-CH Hub/Splitter/Repeater	4-CH Hub/Splitter	4-CH Hub/Splitter/Repeater
Interface	RS-485 to 3-CH RS-485	RS-232 to 4-CH RS-485	RS-485 to 4-CH RS-485
Isolation	3000 V_{DC} 3 ways	2500 V_{DC} RS-232 side	2500 V_{DC} CH1-CH4 side
Operating Temperature	-25 ~ +75°C		

5.9. CAN/CANopen/DeviceNet Master Modules (Parallel/Serial Bus)

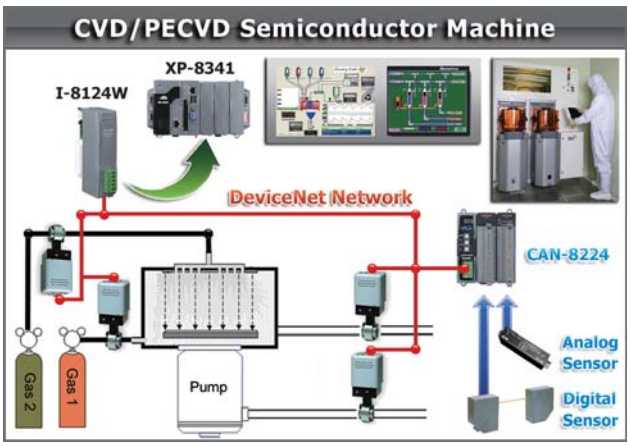
Introduction

These CAN bus communication modules are the solutions to the various CAN application requirements in PAC family with rich CAN bus protocols. The I-8123W, I-87123W, I-8124W, and I-87124W separately support CANopen and DeviceNet master protocols. Users can apply them in PAC to connect to CANopen and DeviceNet devices to reach various CANopen and DeviceNet systems easily.
For the especial CAN bus applications, the I-8120W and I-87120 are designed for users to apply in PAC series. The default firmware of I-8120W and I-87120 provides the transmission and reception of CAN bus messages in PAC. In addition, users can design the specific firmware in these modules to reduce the loading of the PAC in C language.

CAN Bus Applications

• CANopen/DeviceNet Application Stories

When the quality of motors is required to upgrade gradually, the precise and the fast motor equipment is more and more important. The high speed motor winding machine uses the I-8123W to monitor and control the distributed I/O data through the CANopen network. When the I-8123W gets these input data from tension sensors, pressure sensors, and so on, the WinPAC will trigger the CANopen DO modules and the motors to control relay, switch, pneumatic valve, and robot to do the winding. As the CANopen features, fast and safe, it can really improve the speed and quality.



This system utilizes XP-8341 and I-8124W as the controlling center of the remote I/O devices. I-8124W provides DeviceNet master engine to collect the remote I/O data, including pneumatic valve "MKS 683" and Beckhoff DeviceNet I/O. XP-8341 exists an operating program to control the situation in the chamber. It is important to control the reacting time of the wafer in the chamber which have some kind of gas inside. After tuning timing and pressure parameter, this series equipment has been developed successfully and works in some semiconductor factories.

• Selection Guide

CAN/CANopen/DeviceNet Master Module (Parallel/Serial Bus)					
Model Name	**I-8120W**	**I-8123W**	**I-87123**	**I-8124W**	**I-87124**
Pictures					
Communication					
Interface	ISO 11898-2 CAN				
Port	1				
Terminator	120 Ω Selected By Jumper				
Max. Speed (K bps)	1000	1000		500	
Controller Chip	SJA1000T				
Transceiver Chip	82C250				
Protocol	CAN 2.0 A/2.0 B	CANopen DS-301 ver 4.02, DS-401 ver 2.1		DeviceNet Volume I ver 2.0, Volumn II ver 2.0	
System					
Hot Swap	-	-	Yes	-	Yes
Data Communication	Parallel Interface	Parallel Interface	Serial Interface	Parallel Interface	Serial Interface
User-defined Firmware	Yes	-		-	
Isolation	2500 V_{rms}				
Power Consumption	2 W				
Connector	5-pin Terminal Block				
PAC Driver Support					
I-8000, iP-8000	-	-	BC, TC	-	BC, TC
VP-2111					
WP-8000	eVC++ 4.0, VB.Net 2005, C#.Net 2005				
VP-2000					
XP-8000-CE6, XP-8000-Atom-CE6	VB.Net 2005, C#.Net 2005, VC 2005				
XP-8000, XP-8000-Atom	VB.Net 2005, C#.Net 2005, VC 6				
LP-8000	-	-	GCC	-	GCC

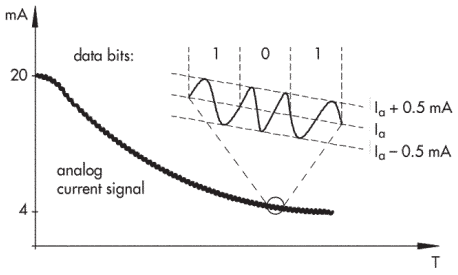
Model Name	I-2532	I-2533	I-7531	I-7532
Pictures				
Function	Converter	Bridge	Repeater	Bridge
Interface	CAN to Fiber Optics		2-port CAN	2-port CAN
Note.	ST type Fiber Optics Connector and Multi-mode		3000 V_{DC} Isolated on 3 Ways	
Operating Temperature	-25 ~ +75°C			

Model Name	I-7530	I-7530-FT	I-7530A	I-7530A-MR	I-7540D	I-7540D-MTCP	I-7540D-WF	I-7565	I-7565-H1	I-7565-H2
Pictures										
CPU	8-bit, 20 MHz		8-bit, 20 MHz	32-bit, 96 MHz	80186, 80 MHz		32-bit, 96 MHz	8-bit, 20 MHz	32-bit 72 MHz	
Interface	CAN ↔ RS-232		CAN ↔ RS-232/RS-422/ RS-485		CAN ↔ Ethernet		CAN ↔ Wi-Fi	CAN ↔ USB	CAN x 1 ↔ USB	CAN x 2 ↔ USB
Tools	VC6, VB6, VS.Net				VC6, VB6, VS.Net			VC6, VB6, VS.Net		
Description	CAN to RS-232 converter	Low-Speed/ Fault-Tolerance CAN to RS-232 converter	CAN to RS-232/ RS-422/ RS-485 converter	CAN to Modbus RTU slave converter	CAN to Ethernet converter	CAN to Modbus TCP server converter	CAN to Wi-Fi converter	USB to CAN converter	High performance 1-port USB to CAN converter	High performance 2-port USB to CAN converter

5.10. HART Communication Modules

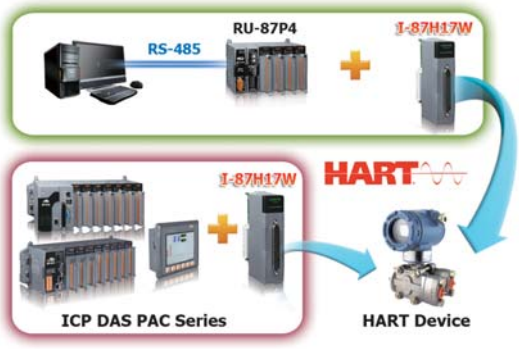
Introduction

The HART (Highway Addressable Remote Transducer) protocol uses the Bell 202 Frequency Shift Keying (FSK) standard to superimpose digital communication signals on the 4-20 mA loop current shown as below figure. HART communicates at 1200 bps without interrupting and interference with the 4-20mA signal and allows a host application (master) to send/receive digital information from a smart field device. The 4-20mA signal communicates the primary measured value - the fastest and most reliable industry standard. The digital signal can be used for additional device information including device status, diagnostics, additional measured or calculated values, etc. Therefore, the HART communication including analog and digital information provides a low-cost and very robust complete field communication solution that is easy to use and configure.



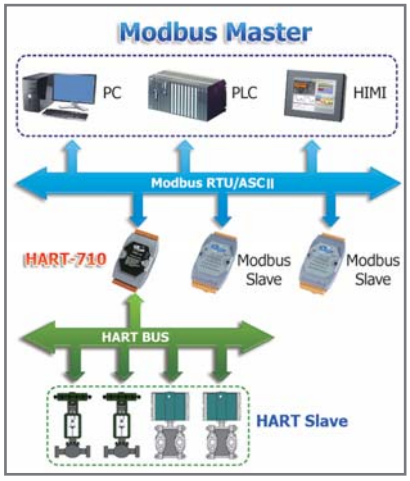
Communication Module for PAC

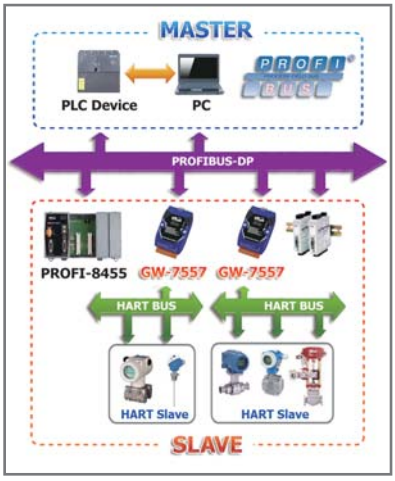
The HART communication is used in PAC to send/receive HART commands.		
Pictures	**Model**	**Description**
NEW 	**I-87H17W**	HART Module with 8-ch analog inputs for PAC
Available soon 	**I-87H24W**	HART Module with 4-ch analog outputs for PAC



Converter		
Pictures	**Model**	**Description**
Available soon 	**I-7547**	Ethernet to HART converter
NEW 	**I-7567**	USB to HART converter
NEW 	**I-7570**	RS-232/422/485 to HART converter

Gateway		
Pictures	**Model**	**Description**
	**HART-710**	Modbus RTU/ASCII to HART gateway
Available soon 	**GW-7437**	Modbus TCP to HART gateway
	**GW-7557**	PROFIBUS to HART gateway





5.11. FRnet Communication Modules (Parallel Bus)

Introduction

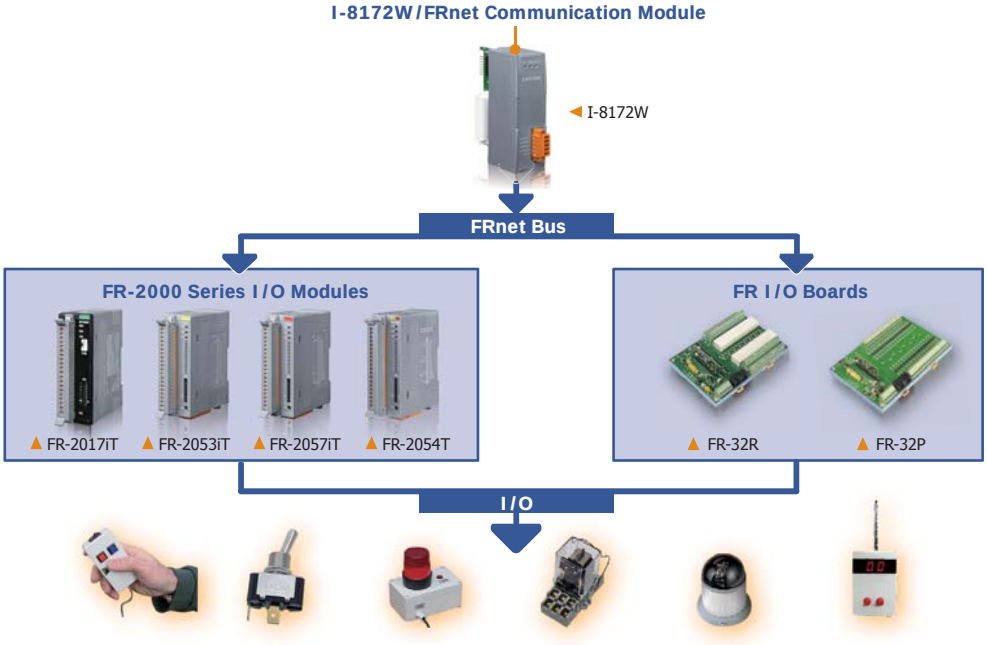
FRnet is an innovative industrial field bus. It uses twisted pair cable to be the transmission medium. Each FRnet port can link up to 128 DI and 128 DO channels. The whole I/O statuses are updated at a fixed cycle time (0.72 ms or 2.88 ms) no matter how many FRnet I/O modules are connected to the FRnet network. Further more, the update is done by hardware, there is no communication protocol is needed. Using FRnet, the user can easily and quickly implement high-speed distributed I/O control systems. Its key features are:

Features

- Easy connection: multi-drop networking with twisted pair cable
- Easy programming: memory mapping (no communication protocol needed)
- I/O expansion ability for each port: 8 SA nodes (for DI) and 8 RA nodes (for DO), each node addresses to 16 DI or DO channels
- Normally FRnet module provides two communication speeds. OEM customer can call manufacturer to design special FRnet module for long distance communication.

Speed	Baudrate	Max. Distance	Fixed Cycle Time
High Speed	1 Mbps	100 m	0.72 ms
Low Speed (Default)	250 kbps	400 m	2.88 ms

Applications



2-PORT FRnet module (Parallel Bus)	
Model Name	**I-8172W**
Pictures	
Communication	
Interface	FRnet
Port	2
Transfer distance	Max. 400 m for speed 250Kbps (Default); Max. 100 m for speed 1 Mbps
Transfer speed	2.88 ms for speed 250Kbps (Default) / 0.72 ms for speed 1 Mbps
Protocol	None (memory mapping)
I/O Expansion for Each Port	8 SA nodes (for DI) and 8 RA nodes (for DO); each node for DI or DO channels
networking	multi-drop networking with twisted pair cable
System	
Hot Swap	-
Intra-module Isolation, Field to Logic	3000 V_{DC}
Power Consumption	6 W
Optional Accessories	-

5.12. 2G/3G/GPS Modules

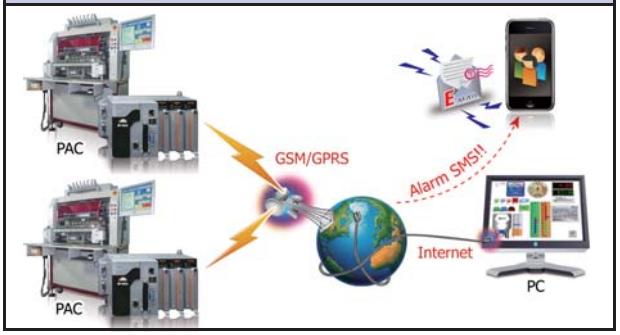
• Selection Guide

Introduction

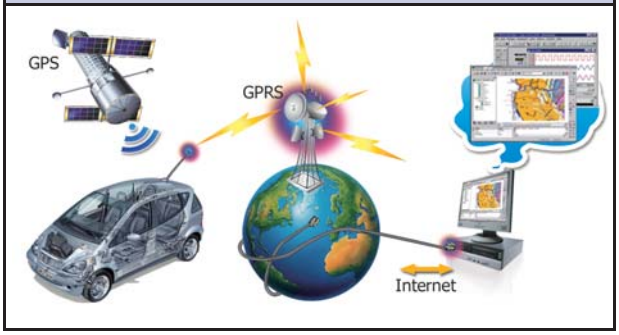
The I-87211W/I-8212W/I-8213W modules are specially designed for GPS, GSM and GPRS applications in PAC series. They expand the capability of PAC series into Machine to Machine, Mobile, Man communication applications. Also, there are rich demos including IsaGraf, InduSoft and C language for users to integrate these modules into M2M applications. By applying these modules in PAC series, the remote control or monitoring can be implemented easily from any location.

Applications

Remote Machine Management



GPS Vehicle Tracking



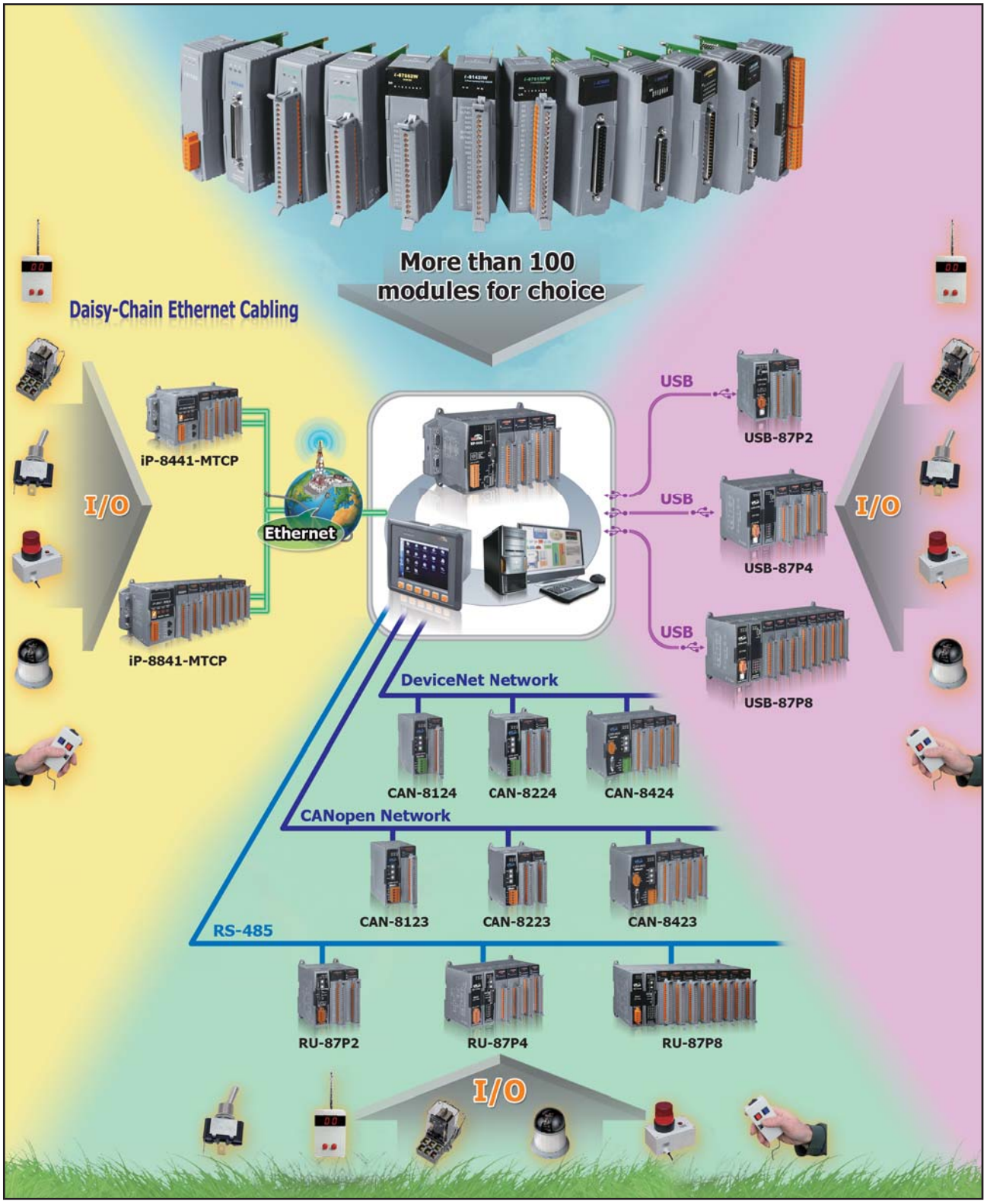
Model Name		I-87211W	I-8212W	I-8212W-3GWA	I-8213W	I-8213W-3GWA
Pictures						
Specifications						
3G	Band	-	-	WCDMA: 2100/1900/850 MHz	-	WCDMA: 2100/1900/850 MHz
	Data Transfer	-	-	WCDMA / HSDPA / HSUPA Upload: Max. 5.76 Mbps; Download: Max. 7.2 Mbps	-	WCDMA / HSDPA / HSUPA Upload: Max. 5.76 Mbps; Download: Max. 7.2 Mbps
2G	Band	-	850/900/1800/1900 MHz			
	GPRS Multi-slot	-	Class 10/8			
	GPRS Mobile Station	-	Class B			
	GPRS Class 10	-	Max. 85.6 kbps			
	CSD	-	Up to 14.4 kbps			
	Compliant to GSM phase 2/2+	-	Class 4 (2 W @ 850/900 MHz); Class 1(1 W @ 1800/1900 MHz)			
	Coding Schemes	-	CS 1, CS 2, CS 3, CS 4			
SMS	Mode	-	Text and PDU			
GPS Output	1 PPS	Pulse per second output (Default 100 ms pulse/sec)	-		-	
	RS-232 Interface	GPS information output	-		-	
GPS Receiver	Frequency	L1 1575.42 MHz, C/A code	-		L1 1575.42 MHz, C/A code	
	Support Channel	32	-		32	
	Position Accuracy	Capable of SBAS (WAAS, EGNOS, MSAS)	-		Capable of SBAS (WAAS, EGNOS, MSAS)	
	Max. Altitude	<18,000 m	-		<18,000 m	
	Max. Velocity	<515 m/s	-		<515 m/s	
	Acquisition Time	Cold Start (Open Sky)=36 s (typical)	-		Cold Start (Open Sky)=36 s (typical)	
	Sensitivity	Tracking=Up to -159 dBm	-		Tracking=Up to -159 dBm	
		Cold start=Up to -146 dBm	-		Cold start=Up to -146 dBm	
	Protocol Support	NMEA 0183 version 3.01	-		NMEA 0183 version 3.01	
Digital Output	Output Channels	2 (Sink)	-		-	
	Output Type	Non-isolated Open Collector	-		-	
	Output Current	100 mA/Channel	-		-	
	Load Voltage	Max. 30 V_{DC}	-		-	

I/O Expansion Units

6.1. I/O Expansion Units Overview

• Overview

ICP DAS lunches a series of remote I/O unit for industrial monitoring and controlling applications. With the auto configuration and hot swap features, the unit can eliminate your nightmare of extensive labor on the set-up and maintenance of the automation system. The available I/O modules are also highly flexible and compatible for every kind of application to reduce your inventory of different types of I/O modules. Furthermore, there are various communication interface and protocols for choice in various remote I/O applications.



6.2. RS-485 I/O Expansion Unit

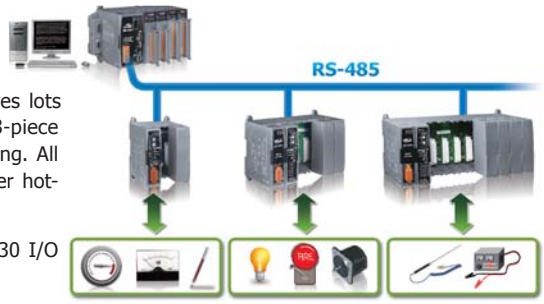
Patent

Taiwan	096134568
China	200710181138.6
USA	11/979,474
Germany	102007053078.3 pending

• Introduction

The RU-87Pn series, RS-485 remote I/O expansion unit, is designed to acquire and control remote I/O through RS-485 connections. It comprises

- A CPU module with none-volatile memory to backup/restore I/O module configurations; LED indicators to diagnose the I/O module; and a RS-485 port for 1.2 Km long distance communication.
- A power module
- A backplane with a number of I/O slots for flexible I/O configuration.



With its patented technologies, namely auto configuration and hot swap, it saves lots of labor on the set up and maintenance of the automation systems. Reliable 3-piece construction enables users to hot swap modules during operation, without rewiring. All I/O module data are backed up in the non-volatile memory of the RU-87Pn. After hot-swapping a module, all settings are automatically loaded to recover.

Furthermore, with the RS-485 network communication interface and more than 30 I/O modules for choice, users can apply the unit to nearly any automation system.

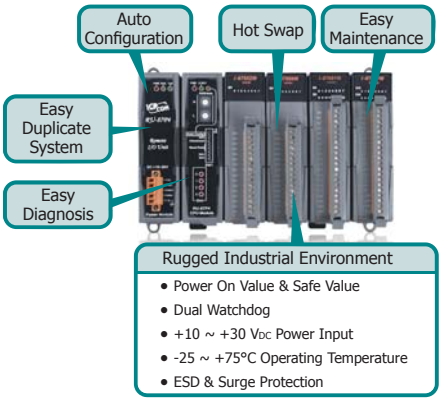
• Features

1. Hot Swap

Reliable 3-piece construction enables users to hot swap modules during operation, without rewiring. All I/O module data are backed up in the non-volatile memory of the RU-87Pn. After hot-swapping a module, all settings are automatically loaded to recover.

2. Auto Configuration

The I-87K I/O modules can be pre-configured and backed up in the non-volatile memory of the RU-87Pn. When the RU-87Pn is power on or plugged in, the RU-87Pn will automatically checks and restores these configurations to each I-87K I/O modules on it.



3. Easy Duplicate System

Using the DCON Utility, you can easily make a backup of the I-87K module configurations and write to another RU-87Pn. This design can easily and quickly duplicate many RU-87Pn.

4. Easy Maintenance and Diagnosis

The basic configurations (includes station number, baudrate) are set by the rotary and DIP switches. The operator can use only one screwdriver to set the RU-87Pn. And there are several LED status indicators to show whether I-87K modules are configured and work properly.

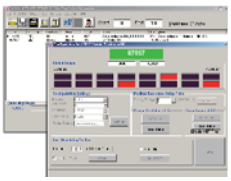
If one I-87K module fails, the operator just needs to replace it with one good I-87K module with the same item number. And then checks the LED indicators to know whether the replacement is performed correctly. The switch and LED design makes it easy for maintenance. There is no PC and Notebook needed.

5. Communication

- RS-485 industrial multi-drop network
  The RU-87Pn uses the industrial EIA RS-485 communication to transmit and receive data over long distance (1.2 Km).

- **DCON protocol**
  I-87K series I/O modules plugged in a RU-87Pn provides a simple command/response protocol (named DCON protocol) for communication. All command/response are in easy use ASCII format.

6. Fully Software Support



The free charge software utility and development kits include

A: DCON Utility: for configuration
B: OPC Servers:
OPC is an industrial standard interface based on OLE technology. With the OPC server, I/O modules can be easily integrated to any software that has OPC client capability.
C. EZ Data Logger
EZ Data Logger is a small data logger software. It can be applied to small remote I/O system.
With its user-friendly interface, users can quickly and easily build a data logger software without any programming skill.
D. Various Software Develop Toolkits
DLL, ActiveX, Labview driver, Indusoft driver, DasyLab driver, Linux driver

Features

- One RS-485 Port for Multi-Drop Topology
- Hot Swap Allowed
- Auto Configuration
- LED Indicators for Fault Detection
- Switches to Configure Communication
- DCON Protocol
- 1/2/4/8 I/O Slots for I-87K Modules
- Operating Temperature: -25 ~ +75°C

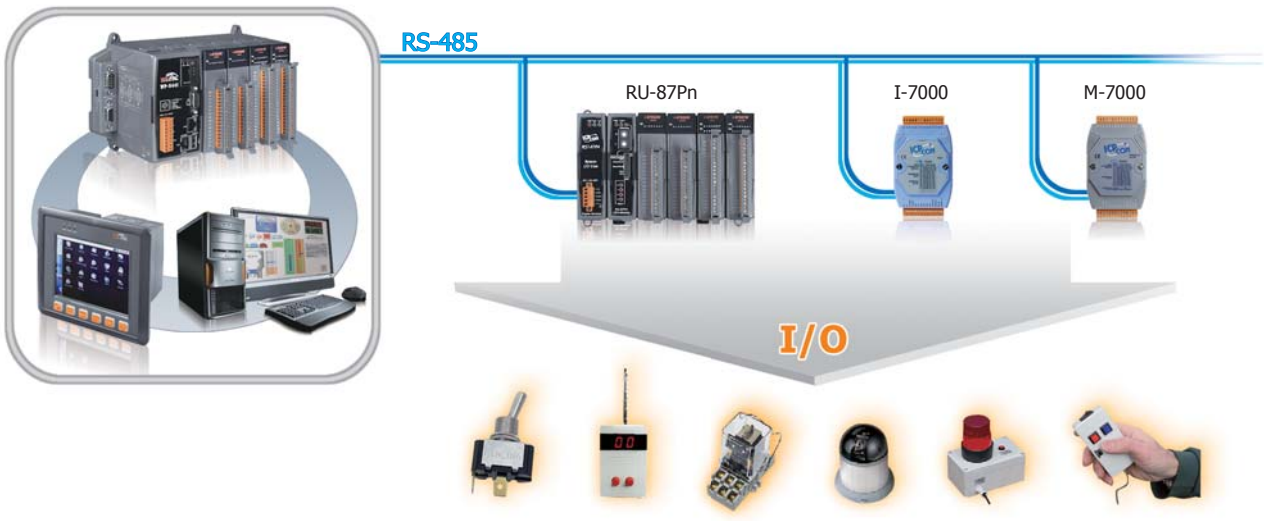
Introduction

RU-87Pn is an unit to expand I/O via the RS-485. It is designed to be used in harsh and noisy environment, so the hardware is manufactured with wide power input range (10 ~ 30 VDC), isolated power input and can operate under wide temperature (-25 ~ +75°C). To simplify installation and maintenance of I/O modules, it provides many useful features, such as: hot swap allowed, auto configuration, LED indicators for fault detection, dual watchdog to keep alive, programmable power on and safe values for safety.

There are more than 30 I/O modules supported with the unit, including analog input/output, digital input/output, counter, frequency I/O modules. We provide various software development kits (SDK) and demos, such as DLL, ActiveX, Labview driver, InduSoft driver, Linux driver, OPC server, etc. The I-87K series I/O modules plugged in the RU-87Pn can be easily integrated into variant software system.

Applications

Rich I/O Expansion Ability

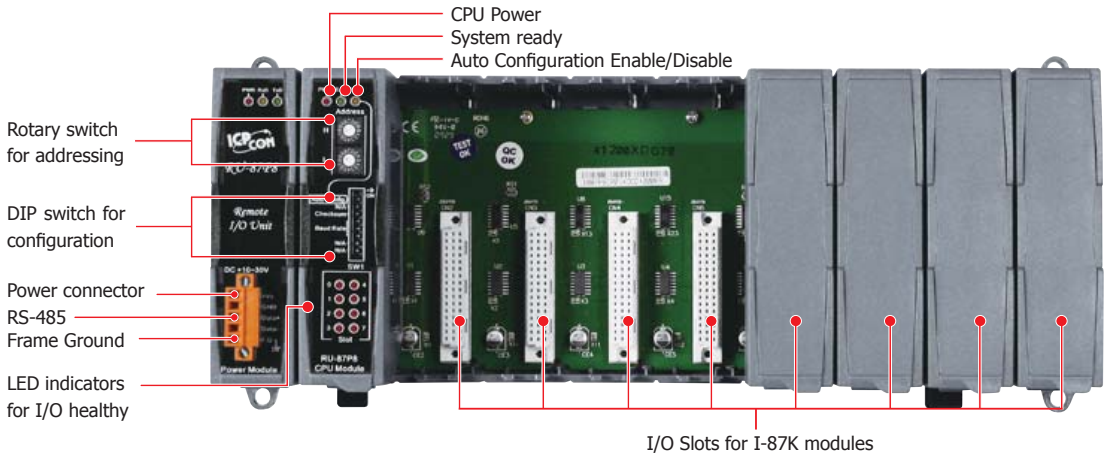


Specifications

Models	RU-87P1	RU-87P2	RU-87P4	RU-87P8
Interface Type (RS-485)				
Baud Rate	115200 bps maximum			
Distance	1.2 km (4000 ft) maximum			
Isolation	3000 VDC			
ESD Protection	+/-4 K Contact Discharge and +/-8 K Air Discharge			
Communication Protocol	DCON Protocol (ASCII Format)			
Switch				
Rotary Switch	x2, For RS-485 address			
DIP Switch	8-bit × 1, For auto configuration, check sum and baud rate			
LED Indicators				
Power	Yes			
System Ready	Yes			
Auto Configuration	Yes			
Slot Status	Yes			
I/O Expansion Slots				
Hot Swap	Yes			
Auto Configuration	Yes			
Support Module Type	High profile I-87K module only			
Slots Numbers	1	2	4	8
Mechanical				
Dimensions (W x L x H)	64 mm x 120 mm x 110 mm	95 mm x 132 mm x 111 mm	188 mm x 132 mm x 111 mm	312 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			
Reverse Polarity Protection	Yes			
Isolation	1000 VDC			
Frame Ground	Yes			
Consumption	1 W	1 W	2 W	2.4 W
Power Board Driving	5 W	8 W	30 W	30 W

Appearance

RU-87P8



Ordering Information

RU-87P1 CR	1 slot I/O Expansion Unit (RoHS)
RU-87P2 CR	2 slots I/O Expansion Unit (RoHS)
RU-87P4 CR	4 slots I/O Expansion Unit (RoHS)
RU-87P8 CR	8 slots I/O Expansion Unit (RoHS)

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-665	24 VDC/2.7 A, 65 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-20-24 CR	24 VDC/1.0 A, 24 W Power Supply with DIN-Rail Mounting (RoHS)
I-7560 CR	USB to RS-232 Converter (RoHS)

6.3. Modbus TCP I/O Expansion Unit

• Introduction

Modbus is a communication protocol developed by Modicon in 1979 for linking devices with Modicon PLCs using a master/slave relationship. Different versions of Modbus today include Modbus RTU, Modbus ASCII and Modbus TCP. Where Modbus RTU and ASCII are based on serial communication like RS-232 and RS-485, and Modbus TCP is based on Ethernet communication. It's a standard, truly open and widely used in industrial automation field.

The iP-8000-MTCP series is an I/O unit with Modbus protocol. It supports most of high profile I-8K and I-87K series I/O modules. SCADA and HMI software can easily access variant I/O signals via the iP-8000-MTCP.

• Features

- **Modbus TCP on two independent LAN ports**
- **Modbus RTU/ASCII on COM ports**

- **I/O Slots for high profile I-8K and I-87K series I/O modules**
- **Auto Configuration**

The configurations of I/O modules are backed up in the EEPROM of the iP-8000-MTCP. The iP-8000-MTCP automatically checks and restores the configurations to each I/O modules during booting procedure. If one I/O module fails, the operator just needs to replace it with another one. And then check the LED indicators to know whether the auto configuration is performed correctly.

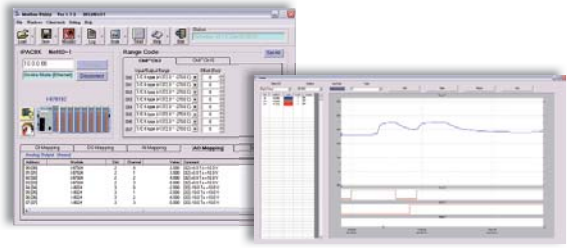
- **Firmware Programmable**

The iP-8000-MTCP is not just an I/O unit but also a programmable controller. Programmers can use the Modbus SDK to customize the firmware in C language.

• Modbus Utility

The Modbus Utility package is for Windows 98/2K/XP/7. It includes

- **Modbus Utility**
  1. Configure I/O Modules and COM ports
  2. Generate Modbus register mapping table of I/O modules
  3. Online monitor
     - Control/Monitor I/O module
     - With trend line and table viewing
     - Automatically log I/O value to a .txt file

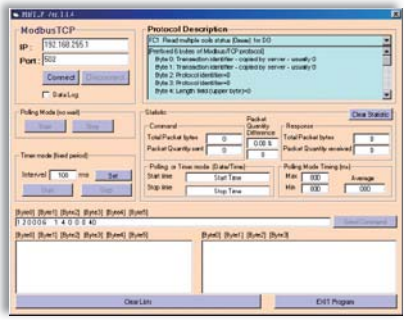


MBRTU

- Modbus RTU client (with source code in VB6) to diagnostic Modbus RTU slave devices.

MBTCP

- Modbus TCP client (with source code in VB6) to diagnostic Modbus TCP slave devices.



• Modbus SDK

We provide Modbus SDK to users. You can use it to integrate several serial devices.

	Modbus lib	nModbus dll	
Platform	MiniOS7	Windows 2k/XP/7	WinCE 5.0/6.0
Development Language	Borland C, Turbo C	C# .NET 2005/2008 VB .NET 2005/2008	
Purpose	To customize the firmware of iP-8000-MTCP	To develop a program on PC based controllers to access the iP-8000-MTCP	
Feature	Modbus RTU/ASCII: Master/Slave Modbus TCP/UDP: Master/Slave		

NEW **iP-8441-MTCP**

NEW **iP-8841-MTCP**

Features

- 80186, 80 MHz CPU
- 2 independent Ethernet ports
- Supports Modbus TCP
- Supports Modbus RTU/ASCII
- Supports Modbus TCP to RTU Gateway
- Auto Configuration
- 4/8 I/O Slots for I-8K and I-87K Series Modules
- Operating Temperature: -25 ~ +75°C

Introduction

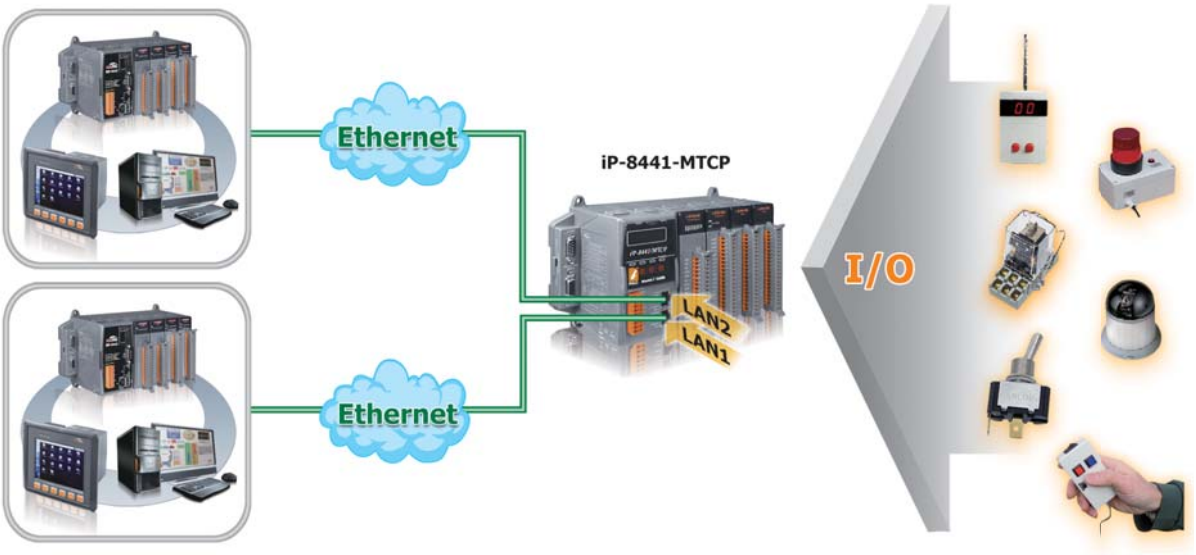
iP-8000-MTCP is an unit to expand I/O via the Ethernet. There are more than 50 I/O modules supported with the unit, including analog input/output, digital input/output, counter, frequency I/O modules.

It is designed to be used in harsh and noisy environment, so the hardware is manufactured with wide power input range (10 ~ 30 V_{DC}), isolated power input and can operate under wide temperature (-25 ~ +75°C). To simplify installation and maintenance of I/O modules, it provides many useful features, such as: auto configuration, LED indicators for fault detection, dual watchdog to keep alive, programmable power on and safe values for safety.

Modbus is a very wide known protocol in the industrial manufacturing and environment monitoring fields. Many SCADA software, HMI and PLC has built-in driver to support Modbus devices. Besides, we also provide SDK on different platforms, such as Windows XP, Window CE 5.0/6.0, Linux, MiniOS7. Therefore, it is very easy to integrate remote I/O to customer's applications.

Further more, the iP-8000-MTCP is also a c language based programmable controller that equipped a DOS-like OS (MiniOS7). Programmers can use C compilers that can create 16 bit executable file (*.exe) to customize the Modbus firmware which preinstalled in the iP-8000-MTCP. The SDK provides rich functions for Modbus communication, such as Modbus TCP master/slave, Modbus RTU master/salve, Modbus ASCII master/slave, etc.

Applications



Specifications

Models	iP-8441-MTCP	iP-8841-MTCP
System Software		
OS	MiniOS7 (DOS-like embedded operating system)	
Program Download Interface	RS-232 (COM1) or Ethernet	
Programming Language	C language	
Compilers to create.exe Files	TC++ 1.01 TC 2.01 BC++3.1 ~ 5.2x MSC 6.0 MSVC++ (before version 1.5.2)	
CPU Module		
CPU	80186, 80 MHz	
SRAM	768 KB	
Flash	512 KB (100,000 erase/write cycles) with Flash protection switch	
Expansion Flash Memory	microSD socket (can support 1/2 GB microSD)	
Dual Battery Backup SRAM	512 KB; data valid up to 5 years	
EEPROM	16 KB	
NVRAM	31 bytes (battery backup, data valid up to 5 years)	
RTC (Real Time Clock)	Provide second, minute, hour, date, day of week, month, year	
64-bit Hardware Serial Number	Yes, for Software Copy Protection	
Watchdog Timers	Yes (0.8 second)	
NET ID	8-pin DIP switch to assign NET ID as 1 ~ 255	
Communication Ports		
Protocol	Modbus TCP Slave	
	Modbus RTU/ASCII Slave	
	Modbus TCP to RTU Gateway	
Ethernet	RJ-45 x 2, 10/100 Base-TX (Auto negotiating, Auto MDI/MDI-X, LED indicators)	
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; 3000 V_{DC} isolated	
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	
SMMI		
LED Display	Yes, 5-Digit	
Programmable LED Indicators	3	
Push Buttons	4	
Buzzer	Yes	
I/O Expansion Slots		
Slot Number	4	8
	Note: For High Profile I-8K and I-87K Modules Only	
Data Bus	8/16 bits	
Address Bus Range	2 K for each slot	
Mechanical		
Dimensions (W x L x H)	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 V_{DC}	
Isolation	1 kV	
Redundant Power Inputs	Yes, with one power relay (1 A @ 24 V_{DC}) for alarm	
Capacity	30 W	30 W
Consumption	6.7 W	7.2 W

Ordering Information

iP-8411-MTCP	4 slots I/O Expansion Unit with Modbus TCP protocol
iP-8841-MTCP	8 slots I/O Expansion Unit with Modbus TCP protocol

Accessories

DP-660	24 V_{DC}/2.5 A, 60 W and 5 V_{DC}/0.5 A, 2.5 W Power Supply with DIN-Rail Mounting
DP-665	24 V_{DC}/2.7 A, 65 W Power Supply with DIN-Rail Mounting
I-7560 CR	USB to RS-232 Converter (RoHS)
3LMSD-2000 CR	2 GB microSD card (RoHS)

6.4. USB I/O Expansion Unit

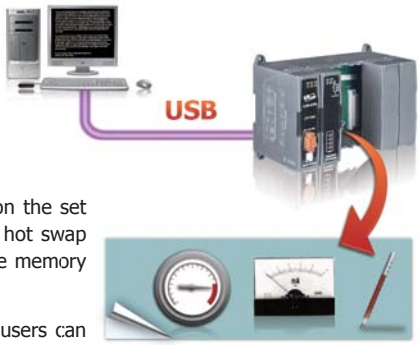
Patent

Taiwan	096134568
China	200710181138.6
USA	11/979,474
Germany	102007053078.3 pending

• Introduction

The USB-87Pn series, USB I/O expansion unit, is designed to acquire and control I/O through USB connections. It comprises

- A CPU module with none-volatile memory to backup/restore I/O module configurations; LED indicators to diagnose the I/O module; and a USB port for communication.
- A power module
- A backplane with a number of I/O slots for flexible I/O configuration.



With its patented technologies, namely auto configuration and hot swap, it saves lots of labor on the set up and maintenance of the automation systems. Reliable 3-piece construction enables users to hot swap modules during operation, without rewiring. All I/O module data are backed up in the non-volatile memory of the USB-87Pn. After hot-swapping a module, all settings are automatically loaded to recover.

Furthermore, with the USB communication interface and more than 30 I/O modules for choice, users can apply the unit to nearly any automation system.

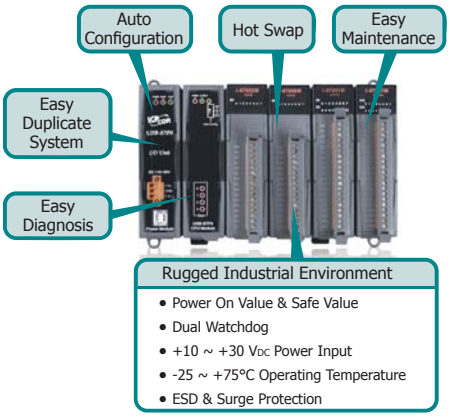
• Features

1. Hot Swap

Reliable 3-piece construction enables users to hot swap modules during operation, without rewiring. All I/O module data are backed up in the non-volatile memory of the USB-87Pn. After hot-swapping a module, all settings are automatically loaded to recover.

2. Auto Configuration

The I-87K I/O modules can be pre-configured and backed up in the non-volatile memory of the USB-87Pn. When the USB-87Pn is power on or plugged in, the USB-87Pn will automatically checks and restores these configurations to each I-87K I/O modules on it.



3. Easy Diagnosis System

Using the DCON Utility, you can easily make a backup of the I-87K module configurations and write to another USB-87Pn. This design can easily and quickly duplicate many USB-87Pn.

4. Easy Maintenance and Diagnosis

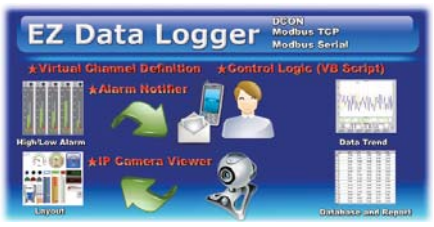
There are several LED status indicators to show whether I-87K modules are configured and work properly. If one I-87K module fails, the operator just needs to replace it with one good I-87K module with the same item number. And then checks the LED indicators to know whether the replacement is performed correctly. The LED indicator design makes it easy for maintenance. There is no PC and Notebook needed.

5. Communication

- USB network
  The USB network connects the USB-87Pn to regular PC and notebook without any other media converter.

- **DCON protocol**
  I-87K series I/O modules plugged in a USB-87Pn provides a simple command/response protocol (named DCON protocol) for communication. All command/response are in easy use ASCII format.

6. Fully Software Support



The free charge software utility and development kits include

A: DCON Utility: for configuration

B: OPC Servers:
OPC is an industrial standard interface based on OLE technology. With the OPC server, I/O modules can be easily integrated to any software that has OPC client capability.

C. EZ Data Logger
EZ Data Logger is a small data logger software. It can be applied to small remote I/O system. With its user-friendly interface, users can quickly and easily build a data logger software without any programming skill.

D. Various Software Develop Toolkits
DLL, ActiveX, Labview driver, Indusoft driver, DasyLab driver, Linux driver

Features

- One USB Port
- Hot Swap Allowed
- Auto Configuration
- LED Indicators for Fault Detection
- DCON Protocol
- 1/2/4/8 I/O Slots for I-87K Modules
- Operating Temperature: -25 ~ +75°C

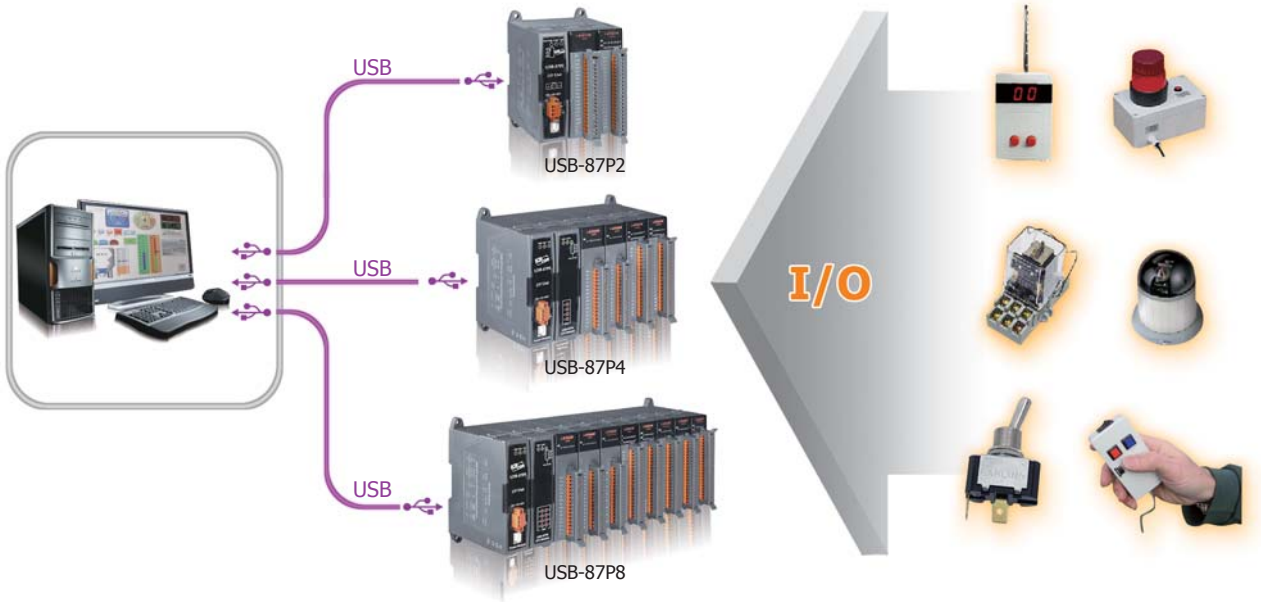
Introduction

USB-87Pn is an unit to expand I/O via the USB. It is designed to be used in harsh and noisy environment, so the hardware is manufactured with wide power input range (10 ~ 30 VDC), isolated power input and can operate under wide temperature (-25 ~ +75°C). To simplify installation and maintenance of I/O modules, it provides many useful features, such as: hot swap allowed, auto configuration, LED indicators for fault detection, dual watchdog to keep alive, programmable power on and safe values for safety.

There are more than 30 I/O modules supported with the unit, including analog input/output, digital input/output, counter, frequency I/O modules. We provide various software development kits (SDK) and demos, such as DLL, ActiveX, Labview driver, InduSoft driver, Linux driver, OPC server, etc. The I-87K series I/O modules plugged in the USB-87Pn can be easily integrated into variant software system.

Applications

Rich I/O Expansion Ability

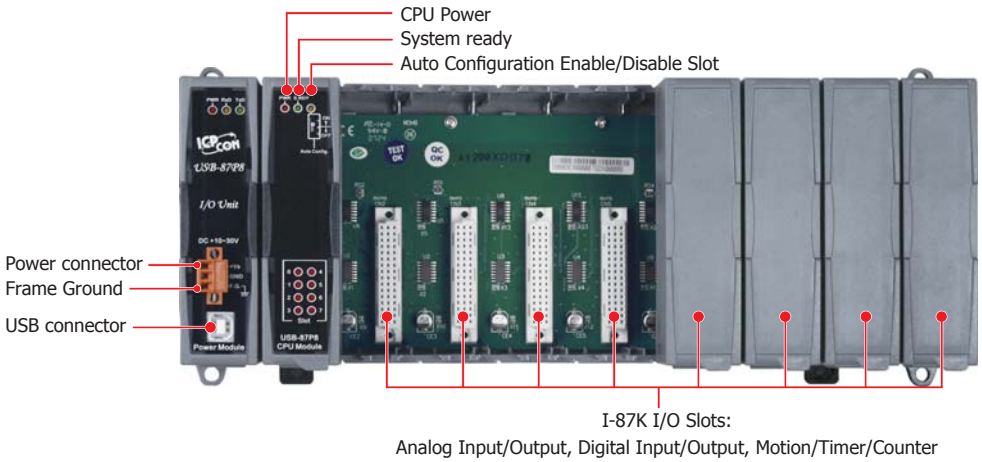


Specifications

Models	USB-87P1	USB-87P2	USB-87P4	USB-87P8
Interface Type (Full speed with USB 1.1 specifications)				
Cable	USB type A connector			
Baud Rate	115200 bps Default			
Isolation	3000 VDC			
ESD Protection	+/-4 K Contact Discharge and +/-8 K Air Discharge			
Communication Protocol	DCON Protocol (ASCII Format)			
Switch				
DIP Switch	1-bit × 1, For auto configuration			
LED Indicators				
Power	Yes			
System Ready	Yes			
Auto Configuration	Yes			
Slot Status	Yes			
I/O Expansion Slots				
Hot Swap	Yes			
Auto Configuration	Yes			
Support Module Type	High profile I-87K module only			
Slots Numbers	1	2	4	8
Mechanical				
Dimensions (W x L x H)	64 mm x 120 mm x 110 mm	95 mm x 132 mm x 111 mm	188 mm x 132 mm x 111 mm	312 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			
Reverse Polarity Protection	Yes			
Isolation	1000 VDC			
Frame Ground	Yes			
Consumption	1 W	1 W	2 W	2.4 W
Power Board Driving	5 W	8 W	30 W	

Appearance

USB-87P8



Ordering Information

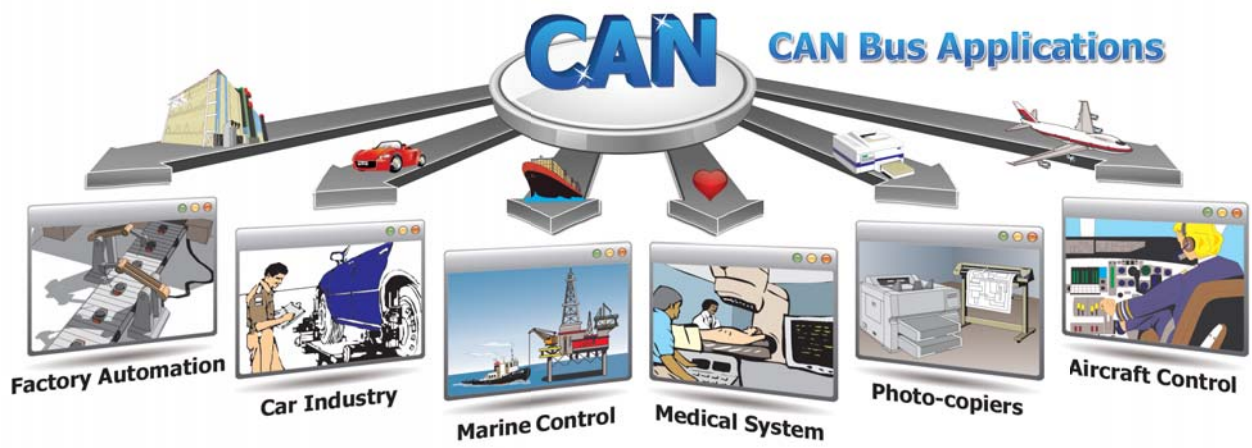
USB-87P1 CR	1 slot I/O Expansion Unit (RoHS)
USB-87P2 CR	2 slots I/O Expansion Unit (RoHS)
USB-87P4 CR	4 slots I/O Expansion Unit (RoHS)
USB-87P8 CR	8 slots I/O Expansion Unit (RoHS)

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-665	24 VDC/2.7 A, 65 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-20-24 CR	24 VDC/1.0 A, 24 W Power Supply with DIN-Rail Mounting (RoHS)

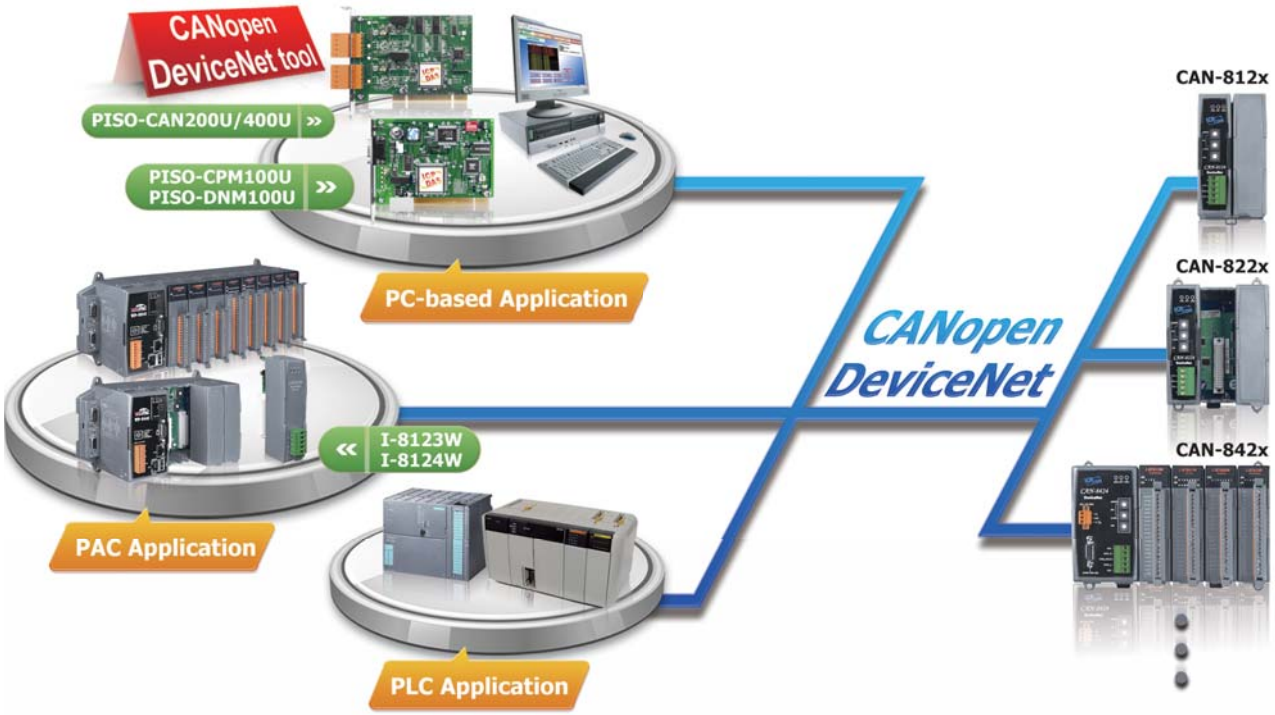
6.5. CAN Bus I/O Expansion Unit

• Introduction



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 process mechanisms and message priority concepts. These features can improve the network reliability and transmission efficiency. Furthermore, CAN supplies the multi-master capabilities, and is especially suited for networking "intelligent" devices as well as sensors and actuators within a system or sub-system.

ICP DAS has been developing CAN-based/CANopen/DeviceNet/J1939 protocol products for several years. The CAN-8000 series provide the CANopen and DeviceNet remote I/O solutions. CAN-8000 series can be chosen with 1,2 or 4 I/O slots. With the various I-8K or I-87K I/O modules in ICP DAS, they can be applied in PC-based, PAC-based or PLC-based CANopen or DeviceNet applications flexibly.

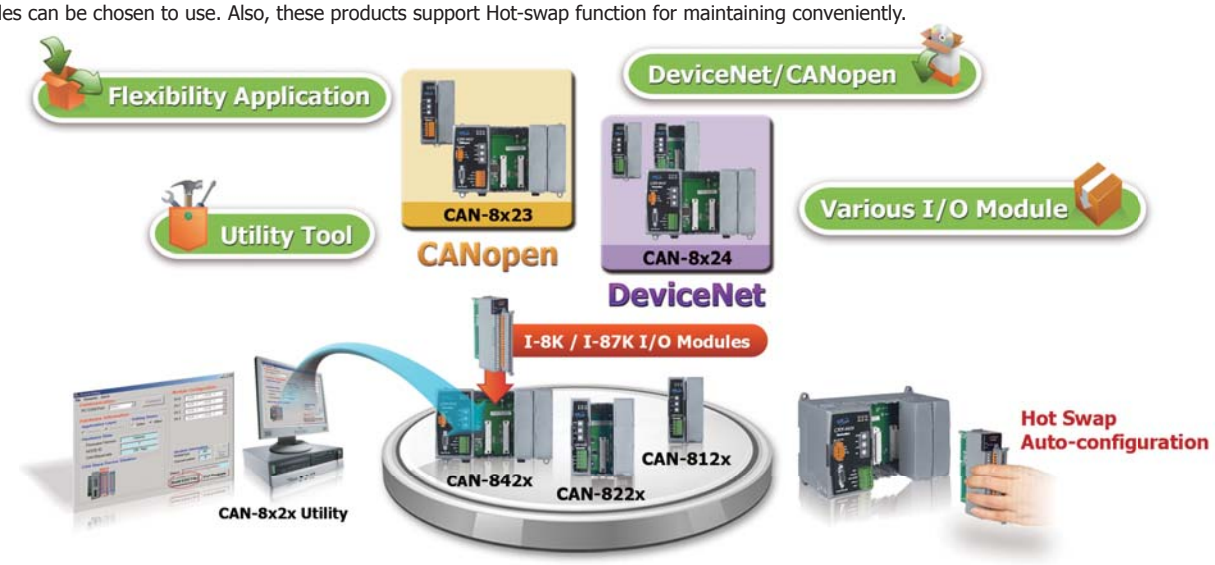


CANopen-CANopen is a CAN-based application layer protocol. It was developed as a standardized embedded network with highly flexible configuration capabilities. CANopen was designed for motion-oriented machine control networks, such as handling systems. By now it is used in many various fields, such as medical equipment, off-road vehicles, maritime electronics, public transportation, building automation, etc.

DeviceNet-DeviceNet based on the CAN bus is one of the world's leading device-level networks for industrial automation. The DeviceNet network is a flexible open and low-cost option which you can use to connect industrial devices to a network and to eliminate costly and time-consuming hardwiring. Direct connectivity improves communication and provides device-level diagnostics or easily accessible through hardwired I/O interfaces.

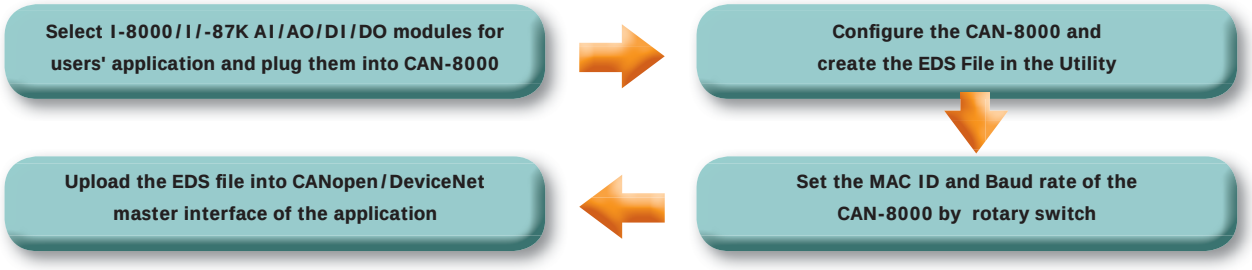
• Main features

CAN-8000 series are specially designed for the slave device of CANopen/DeviceNet protocol with 1/2/4 I/O expansion slots. There are various modules can be chosen to use. Also, these products support Hot-swap function for maintaining conveniently.



• Application Flowchart

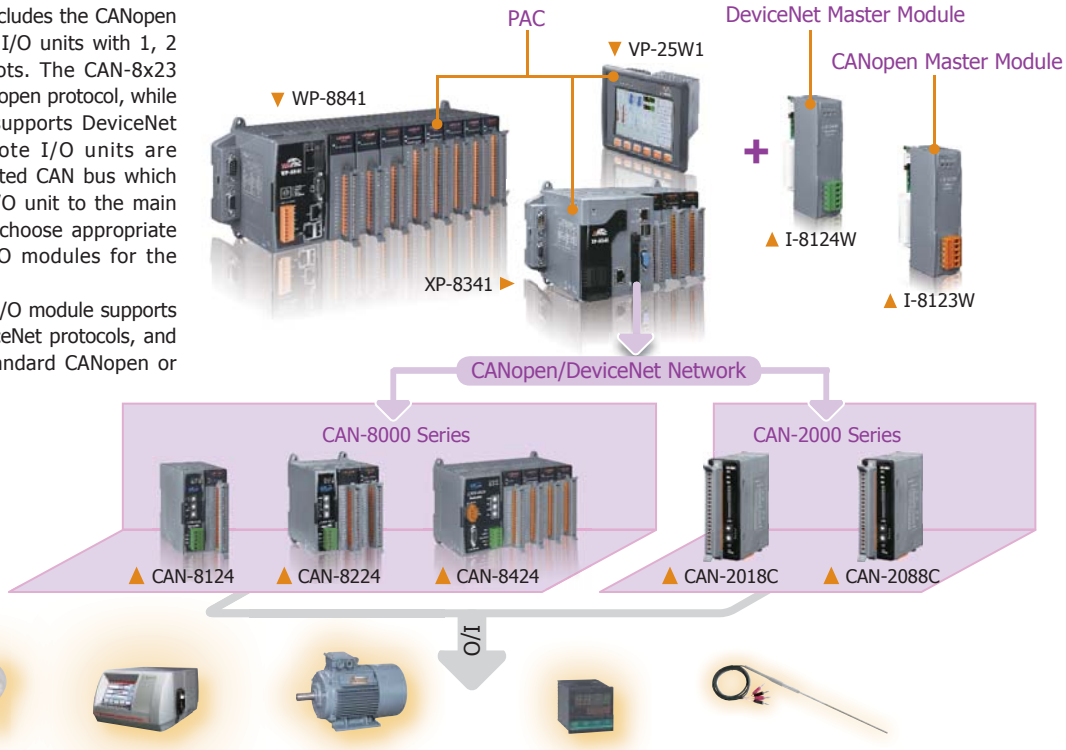
The following simple steps show how to use CAN-8000 in CANopen/DeviceNet systems



CAN Bus Remote I/O Unit

The CAN-8000 series includes the CANopen and DeviceNet remote I/O units with 1, 2 or 4 I/O expansion slots. The CAN-8x23 series supports the CANopen protocol, while the CAN-8x24 series supports DeviceNet protocol. Those remote I/O units are equipped with an isolated CAN bus which connects the remote I/O unit to the main control unit. User can choose appropriate I-8KW and I-87KW I/O modules for the CAN-8000 series.

The CAN-2000 remote I/O module supports the CANopen and DeviceNet protocols, and can be used in the standard CANopen or DeviceNet network.



Features

- 80186, 80 MHz CPU
- One ISO-11898-2 High Speed CAN Port
- Hot Swap Allowed
- Auto Configuration
- Standard CANopen LED Indicator
- Rotary Switch For Baudrate and Node ID
- CANopen DS 301 Ver 4.02 Specification
- CANopen DS 401 Ver 2.1 Specification
- 1/2/4/8 I/O Slots for I-87K and I-8K Series Modules
- Operating Temperature: -25 ~ +75°C

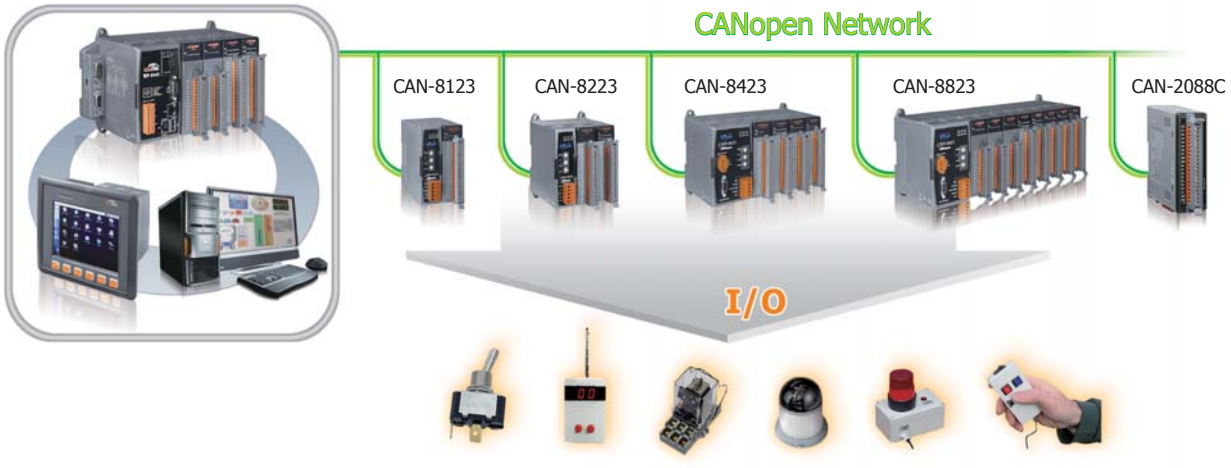
Introduction

CAN-8x23 is an unit to expand I/O via the CAN bus. Through the I-87K and I-8K I/O modules, controller can make it acquire the data of the various sensors and actuators, such as thermocouple, RTD, strain gauge, relay, heater, PWM driver … and so forth. It features hot swap, auto configuration, CANopen standard LED indicators, programmable output power-on value and output safe value when host controller or communication fails. The CAN interface of CAN-8x23 follows CANopen DS 301 version 4.02 and DS 401 version 2.1. In order to deal with other CANopen master software, CAN-8x23 provides the required EDS file, depending on plug-in I-87K or I-8K modules.

CANopen Features	
NMT	Slave
Error Control	Heart beat to Node Guarding selectable
No. of PDOs	16Rx, 16Tx
PDO Modes	Event Triggered, Remotely requested, Cyclic and acyclic SYNC
PDO Mapping	Variable
No. of SDOs	1 server, 0 client
Emergency Message	Yes
CANopen Version	DS-301 v4.02
Device Profile	DSP-401 v2.0
Baud Rate Setting by Rotary Switch	10K, 20K, 50K, 125K, 250K, 500K, 800K, and 1Mbps
Produce EDS file Dynamically	Yes
CAN, ERR, and Tx/Rx LED	Yes

Applications

Rich I/O Expansion Ability

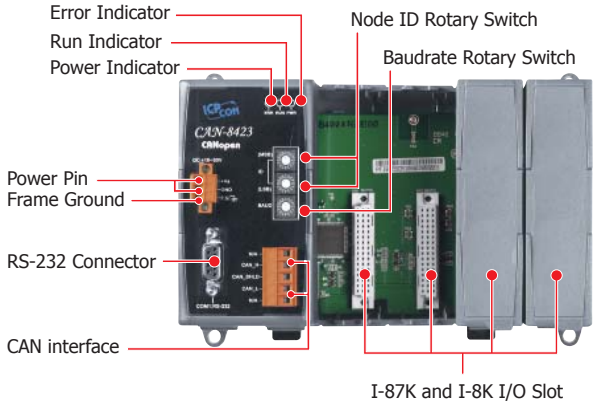


Specifications

Models	CAN-8123	CAN-8223	CAN-8423	CAN-8823
UART Interface				
COM 1	No		RS-232 (For configuration)	
CAN Interface				
Controller	NXP SJA1000T with 16 MHz clock			
Transceiver	NXP 82C250			
Connector	5-pin screwed terminal block (GND, CAN_L, CAN_SHLD, CAN_H, V+)		5-pin screwed terminal block (N/A, CAN_L, CAN_SHLD, CAN_H, N/A)	9-pin screwed terminal block (N/A, CAN_L, CAN_SHLD, CAN_H, N/A)
Node ID	1~127 (By rotary switch)			
Baud Rate (bps)	10 k, 20 k, 50 k, 125 k, 250 k, 500 k, 800 k, 1 M (By rotary switch)			
Transmission Distance (m)	Depend on baud rate (for example, max. 1000 m at 50 kbps)			
Isolation	1000 V_{DC} for DC-to-DC, 2500 V_{rms} for photo-couple			
Terminator Resistor	Jumper for 120 Ω terminator resistor			
Specification	ISO-11898-2, CAN 2.0A and CAN 2.0B			
Protocol	CANopen DS 301 ver4.02, DS 401 ver2.1			
Hardware				
CPU	80186, 80 MHz			
SRAM/Flash/EEPROM	512 KB / 512 KB / 2 KB			
NVRAM	31 bytes (battery backup, data valid up to 10 years)			
RTC (Real Time Clock)	Provide second, minute, hour, date, day of week, month, year			
Watchdog	CPU built-in			
I/O Expansion Slot				
Hot Swap	Yes			
Auto Configuration	Yes			
Support Module Type	High profile I-87K module, low profile I-87K module and I-8K module			
Slots Numbers	1	2	4	8
LED				
Round LED	PWR LED, RUN LED, ERR LED			
Mechanism				
Dimensions (W x L x H)	64 mm x 119 mm x 91 mm	95 mm x 132 mm x 91 mm	188 mm x 132 mm x 91 mm	312 mm x 132 mm x 91 mm
Installation	DIN-Rail Mounting	DIN-Rail or Wall Mounting		
Environmental				
Operating Temperature	-25 ~ +75°C			
Storage Temperature	-30 ~ +80°C			
Humidity	10 ~ 90% RH (non-condensing)			
Power				
Input Range	20 W unregulated +10 ~ +30 V_{DC}			
Reverse Polarity Protection	Yes			
Frame Ground	No		Yes	
Consumption	1 W	2 W	2.5 W	3 W
Power Board Driving	20 W			

Appearance

CAN-8423



Ordering Information

CAN-8123-G	CANopen Embedded Device with 1 I/O Expansion Slot
CAN-8223-G	CANopen Embedded Device with 2 I/O Expansion Slots
CAN-8423-G	CANopen Embedded Device with 4 I/O Expansion Slots
CAN-8823-G	CANopen Embedded Device with 8 I/O Expansion Slots

Accessories

DP-660	24 V_{DC}/2.5 A, 60 W and 5 V_{DC}/0.5 A, 2.5 W Power Supply with DIN-Rail Mounting
DP-665	24 V_{DC}/2.7 A, 65 W Power Supply with DIN-Rail Mounting
DP-1200 CR	24 V_{DC}/5.0 A, 120 W Power Supply with DIN-Rail Mounting (RoHS)
MDR-20-24 CR	24 V_{DC}/1.0 A, 24 W Power Supply with DIN-Rail Mounting (RoHS)
I-7560 CR	USB to RS-232 Converter (RoHS)

Features

- 80186, 80 MHz CPU
- One ISO-11898-2 High Speed CAN Port
- Hot Swap Allowed
- Auto Configuration
- Standard DeviceNet LED Indicator
- Rotary Switch For Baudrate and Node ID
- DeviceNet Volume I Ver 2.0, Volumn II Ver 2.0
- Predefined Master/Slave Connection Set
- 1/2/4/8 I/O Slots for I-87K and I-8K Series Modules
- Operating Temperature: -25 ~ +75°C

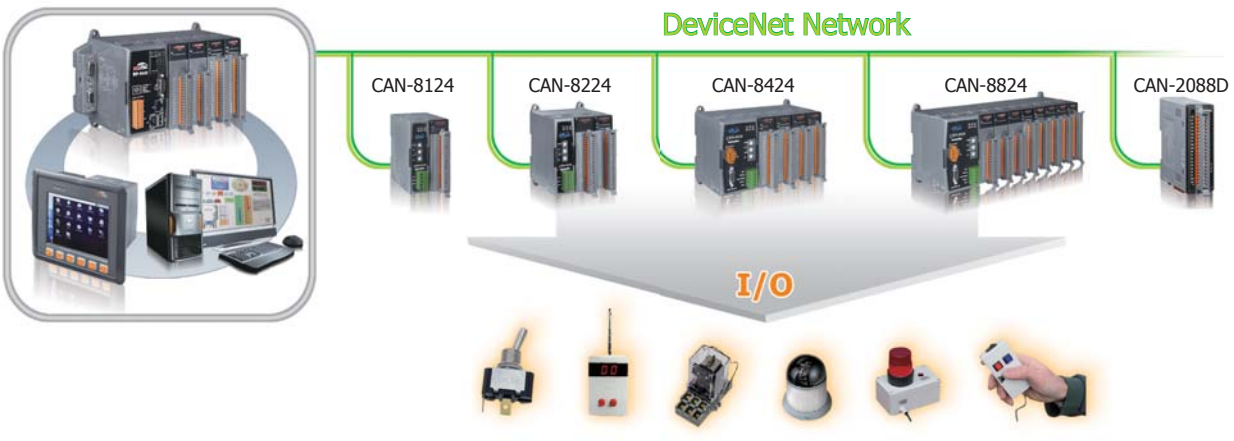
Introduction

CAN-8x24 is an unit to expand I/O via the CAN bus. Through the I-87K and I-8K I/O modules, controller can make it acquire the data of the various sensors and actuators, such as thermocouple, RTD, strain gauge, relay, heater, PWM driver … and so forth. It features hot swap, auto configuration, DeviceNet standard LED indicators, programmable output power-on value and output safe value when host controller or communication fails. The CAN interface of CAN-8x24 follows DeviceNet Specification Volume I & II, Release 2.0 version. In order to deal with other DeviceNet master software, CAN-8x24 provides the required EDS file, depending on plug-in I-87K or I-8K modules.

DeviceNet features	
DeviceNet Version	DeviceNet Specification Volume I & II, Release 2.0
Number of Nodes	64(Max)
Baud Rate	125K, 250K, 500K
Support Message Groups	Group 2 only Server
UCMM	Not Support
I/O Operating Modes	Poll, Bit-Strobe, Change of State/ Cyclic
Device Heartbeat Message	Yes
Device Shutdown Message	Yes
Produce EDS file Dynamically	Yes
No. of Fragment I/O	128 Bytes (Max) (Input/ Output)
MAC ID Setting	Rotary Switch
Baud Rate Setting	Rotary Switch
DeviceNet Status LED	NET, MOD, PWR

Applications

Rich I/O Expansion Ability

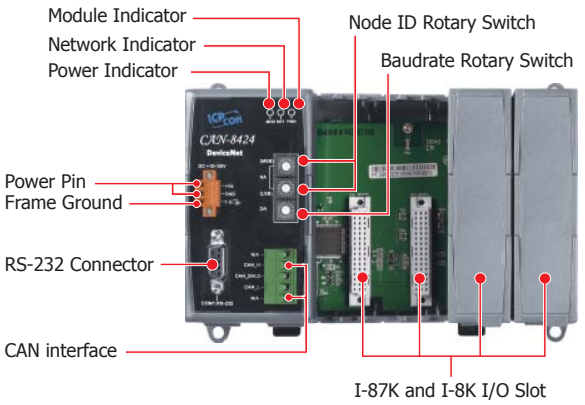


Specifications

Models	CAN-8124	CAN-8224	CAN-8424	CAN-8824
UART Interface				
COM 1	No		RS-232 (For configuration)	
CAN Interface				
Controller	NXP SJA1000T with 16 MHz clock			
Transceiver	NXP 82C250			
Connector	5-pin screwed terminal block (GND, CAN_L, CAN_SHLD, CAN_H, V+)		5-pin screwed terminal block (N/A, CAN_L, CAN_SHLD, CAN_H, N/A)	9-pin screwed terminal block (N/A, CAN_L, CAN_SHLD, CAN_H, N/A)
Node ID	1~63 (By rotary switch)			
Baud Rate (bps)	125 k, 250 k, 500 k (By rotary switch)			
Transmission Distance (m)	Depend on baud rate (for example, max. 500 m at 125 kbps)			
Isolation	1000 V_{DC} for DC-to-DC, 2500 V_{rms} for photo-couple			
Terminator Resistor	Jumper for 120 Ω terminator resistor			
Specification	ISO-11898-2, CAN 2.0A and CAN 2.0B			
Protocol	DeviceNet Volume I ver2.0, Volumn II ver2.0 Predefined Master/Slave Connection set			
Hardware				
CPU	80186, 80 MHz			
SRAM/Flash/EEPROM	512 KB / 512 KB / 2 KB			
NVRAM	31 bytes (battery backup, data valid up to 10 years)			
RTC (Real Time Clock)	Provide second, minute, hour, date, day of week, month, year			
Watchdog	CPU built-in			
I/O Expansion Slot				
Hot Swap	Yes			
Auto Configuration	Yes			
Support Module Type	High profile I-87K module, low profile I-87K module and I-8K module			
Slots Numbers	1	2	4	8
LED				
Round LED	PWR LED, NET LED, MOD LED			
Mechanism				
Dimensions (W x L x H)	64 mm x 119 mm x 91 mm	95 mm x 132 mm x 91 mm	188 mm x 132 mm x 91 mm	312 mm x 132 mm x 91 mm
Installation	DIN-Rail Mounting	DIN-Rail or Wall Mounting		
Environmental				
Operating Temperature	-25 ~ +75°C			
Storage Temperature	-30 ~ +80°C			
Humidity	10 ~ 90% RH (non-condensing)			
Power				
Input Range	Unregulated +10 ~ +30 V_{DC}			
Reverse Polarity Protection	Yes			
Frame Ground	No		Yes	
Consumption	1.7 W	2 W	2.5 W	3 W
Power Board Driving	20 W			

Appearance

CAN-8424



Ordering Information

CAN-8124-G	DeviceNet Embedded Device with 1 I/O Expansion Slot
CAN-8224-G	DeviceNet Embedded Device with 2 I/O Expansion Slots
CAN-8424-G	DeviceNet Embedded Device with 4 I/O Expansion Slots
CAN-8824-G	DeviceNet Embedded Device with 8 I/O Expansion Slots

Accessories

DP-660	24 V_{DC}/2.5 A, 60 W and 5 V_{DC}/0.5 A, 2.5 W Power Supply with DIN-Rail Mounting
DP-665	24 V_{DC}/2.7 A, 65 W Power Supply with DIN-Rail Mounting
DP-1200 CR	24 V_{DC}/5.0 A, 120 W Power Supply with DIN-Rail Mounting (RoHS)
MDR-20-24 CR	24 V_{DC}/1.0 A, 24 W Power Supply with DIN-Rail Mounting (RoHS)
I-7560 CR	USB to RS-232 Converter (RoHS)

6.6 . PROFIBUS I/O Expansion Unit

• Introduction

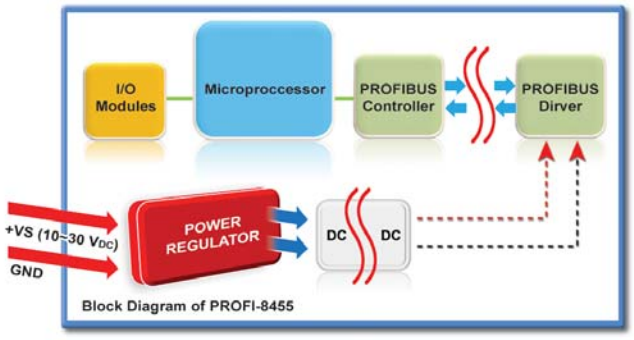
PROFIBUS (PROCESS FIELD BUS) which is anchored in the international standards IEC 61158 and IEC 61784 is an open, digital communication system with a wide range of applications, particularly in the fields of factory and process automation. It is suitable for both fast, time-critical applications and complex communication tasks.

• Features

- Baudrate up to 12 Mbit/s.
- Maximum 244 bytes input and 244 bytes output per slave.
- Slave configuration and parameters are set from the master side by GSD file.
- Allow Multi-master system.
- Fast Cyclic data communication between master and slave.
- 124 slaves can be put in Data Exchange.
- 32 stations on one segment.

High protection hardware design

To apply these PROFIBUS I/O expansion units in various industrial environments , we design the isolation in power-in and communication sides to prevent the external noise disturbance. That can make PROFI-8x55 series robust and stably in the harsh applications.

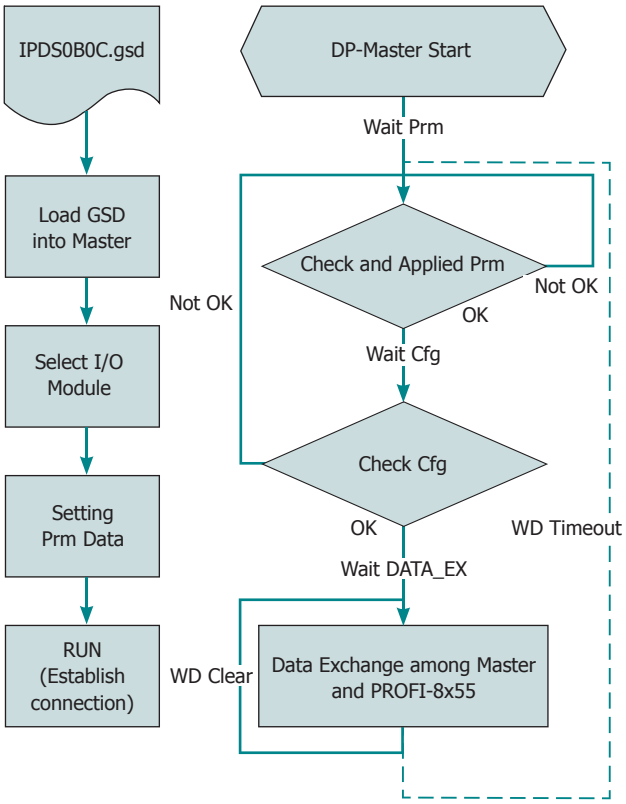


Hot-Swap in PROFIBUS remote I/O units (PROFI-8x55)

The Hot-Swap function of PROFI-8x55 is provided to maintain the system easily. Therefore, users can on-line diagnose the damaged I/O module and change the module.

Hot Swap, Auto Configuration
(I-87K high profile modules)

• Flow chart



Features

- Protocol & hierarchy: DP-V0 & DP-V1 Slave
- Detect transmission Rate Automatically (Max.12 Mbps)
- Support Device-Related & Channel-Related Diagnosis
- Address 0 ~ 126 Set by Rotary Switches or SSA-Telegram
- Support Hot-Swap for I-87K High-Profile I/O Modules
- 3000 VDC Isolation Protection on PROFIBUS side
- 1/2/4/8 I/O Slots for I-87K and I-8K Series I/O Modules
- 4 KV ESD Protection (contacting for any terminal)
- Operating Temperature: -25 ~ +75°C

Introduction

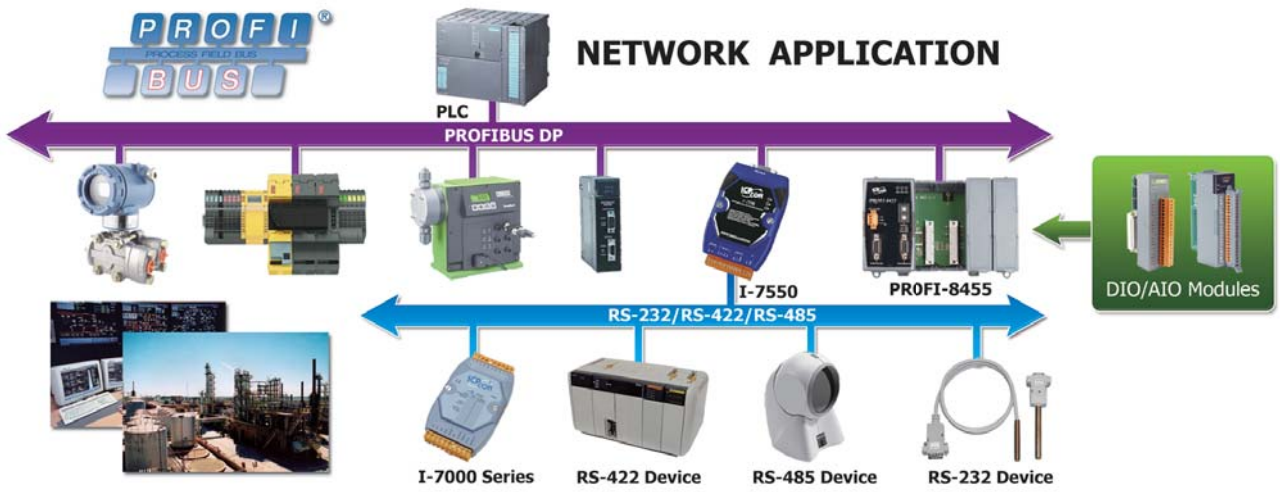
PROFIBUS (PROCESS FIELD BUS) which is anchored in the international standards IEC 61158 and IEC 61784 is an open, digital communication system with a wide range of applications, particularly in the fields of factory and process automation. It is suitable for both fast, time-critical applications and complex communication tasks.

To help user implement this powerful communication system more easily, ICP DAS provides various kinds of PROFIBUS DP products. Based upon many years experience in FROFIBUS DP, ICP DAS secures user's automation system safety and stability as mission

The PROFI-8x55 Remote I/O Unit is designed for the slave device of PROFIBUS DP protocol. It supports up to 1/2/4/8 slots for ICP DAS I-8k, I-87k series I/O modules. In addition, we also provide hot-swap function for I-87k High Profiles series I/O modules. To setup network, users can choose and configure I/O modules by using the GSD file without any other setting tools.

Applications

Solution for Fieldbus Communication



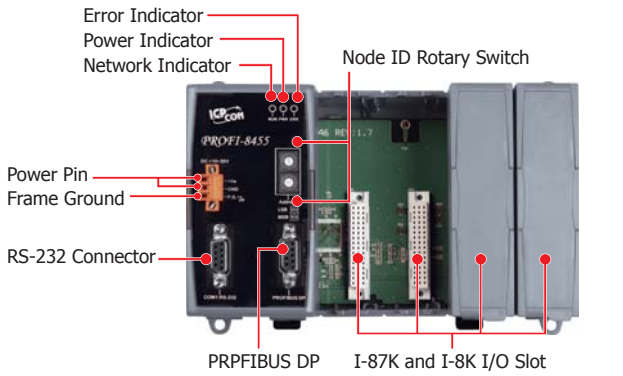
Specifications

Models	PROFI-8155	PROFI-8255	PROFI-8455	PROFI-8855
UART Interface				
COM 1	On-Board at JP1 (RS-232 for Update Firmware purpose).Note 1.		at Front Panel	
I/O Expansion Slot				
Hot Swap	Yes			
Auto Configuration	Yes			
Support Module Type	High/low profile I-8K & I-87K I/O module			High profile I-8K & I-87K I/O module
Slots Numbers	1	2	4	8
LED				
Round LED	PWR LED, RUN LED, ERR LED			
PROFIBUS Features				
Protocol & Hierarchy	DP-V0 & DP-V1 (Read/Write)		DP-V0 Slave	DP-V0 Slave
Address Setting	0~126 set by Rotary Switches or SSA-telegram set by DP-Master (Class 2)		0~126 set by Rotary switches	
Supports Transmission Rate (Kbps)	9.6, 19.2, 45.45, 93.75, 187.5, 500, 1500, 3000, 6000, 12000			
Transmission Rate Setting	detected automatically			
Indicators	PWR, ERR, and RUN LEDs			
I/O modules Configuration	Configured by GSD file			
Network Isolation Protection	High Speed iCoupler			
DC Isolation Protection	3000 VDC on PROFIBUS side			
Max. Input/Output Data Length	128 Bytes			240 Bytes
Number of Channel of Diag.	32		39	
Device-Related Diag. Type	Offline Detection			
Programmable Diag. period	Supported			
Mechanism				
Dimensions (W x L x H)	64 mm x 119 mm x 91 mm	95 mm x 132 mm x 91 mm	188 mm x 132 mm x 91 mm	312 mm x 132 mm x 91 mm
Environmental				
Operating Temperature	-25 ~ +75°C			
Storage Temperature	-30 ~ +80°C			
Humidity	10 ~ 90% RH (non-condensing)			
Power				
Input Range	Unregulated +10 ~ +30 VDC			
Reverse Polarity Protection	YES			
Frame Ground	YES			
Consumption	3 W	3 W	5 W	5.5 W
Power Board Driving	8 W	8 W	25 W	25 W

Note 1: CA-0904 : transform from 4-pin connector to 9-pin Female D-Sub connector.

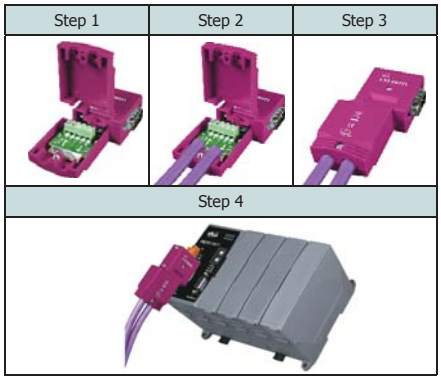
Appearance

PROFI-8455



Accessory

Optional PROFIBUS connector: CNT-PROFI



Installation

Ordering Information

PROFI-8155-G CR	PROFIBUS Remote I/O Unit with 1 Expansion Slot (RoHS)
PROFI-8255-G CR	PROFIBUS Remote I/O Unit with 2 Expansion Slots (RoHS)
PROFI-8455-G CR	PROFIBUS Remote I/O Unit with 4 Expansion Slots (RoHS)
PROFI-8855-G CR	PROFIBUS Remote I/O Unit with 8 Expansion Slots (RoHS)

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-665	24 VDC/2.7 A, 65 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-20-24 CR	24 VDC/1.0 A, 24 W Power Supply with DIN-Rail Mounting (RoHS)

7188/7186 Series µPAC

7.1. 7188/7186 Series µPAC

• Overview

ICP DAS develops a family of palm-size PAC named **µPAC** (micro Programmable Automation Controller). Featuring robust, powerful, space-saving, cost-effective and more, µPAC presents excellent performance in various Industry Automation applications in the challenging environments.

I-7188 — the 1st generation

"I-7188 Series", the first generation of µPAC, has been widely used in various Industry Automation applications. It is characterized by fast-booting operating system MiniOS7, interchangeable X-Board for function expansion, flexible COM port configuration and user-defined I/O pins.

µPAC-7186 — the 2nd generation

"µPAC-7186 Series", debuting in 2008, further improves and upgraded features, such as faster CPU, better 10/100 Base-TX Ethernet port, lower power consumption and diversified Memory combination selections. With better performance, it is suitable for more sophisticated applications: auto-reporting data acquisition, M2M automation system, wire/wireless remote control, data logger application, redundant solution, etc.

Generation	CPU	Ethernet	Memory Expansion	Power consumption
I-7188 Series	40 MHz	10 BaseT	SRAM, Flash	2W
µPAC-7186	80 MHz	10/100 BaseTX	SRAM, Flash	1.5W

• Top 12 reasons to choose µPAC by ICP DAS

1. Powerful Embedded OS — MiniOS7

MiniOS7 is the most stable OS used in the last decade. Up to now, several hundred thousand copies with our PACs have been distributed worldwide.

Features:

- DOS-like embedded OS
- Antivirus ability
- Internet connectivity
- Libraries & demo programs for various peripherals, devices and remote I/O modules
- Short boot time period (<1 Second)
- Less memory resource required
- Faster watchdog response time

2. Free IDE Software — MiniOS7 Studio Simple Programming for Your Applications!

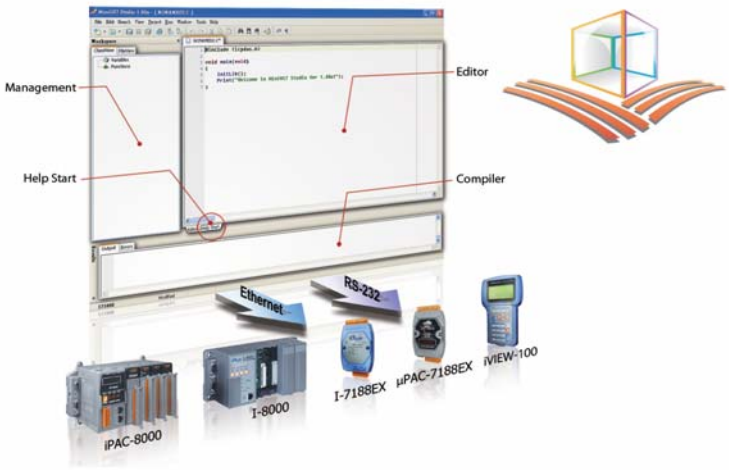
MiniOS7 Studio is a powerful, easy-to-use & free of charge Software Development Toolkit for PACs embedded with MiniOS7.

Including:

Program editor, compiler, debugger, linker, I/O setting, communication configuration, utilities, libraries and networking example code...etc.

Programming support:

• MSC • MSVC • BC++ • TC • TC++



3. Rich Development Support

We provide over 100 Libraries and Demos for users to develop applications easily and quickly to integrate with some popular software, SCADA, protocols or tools.

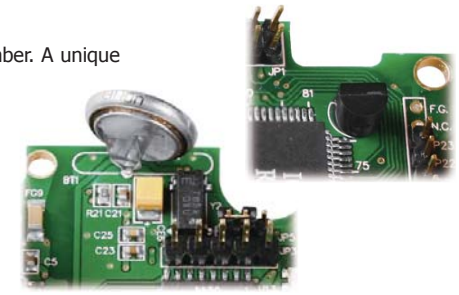
- Provide Libraries: Xserver, Modbus, MiniOS7 Framework
- Support development tool: ISaGRAF, C Language

4. Patented Technology: "Self-Tuner" Chip

Our µPAC contains a patented "Self-tuner" chip which automatically tunes Baud rate and data format in the whole RS-485 network. It also handles the direction of RS-485 communication line.

5. Unique 64-bit Hardware Serial Number Protecting Your Program

All µPAC-7186 series and most I-7188 series come with a 64-bit unique hardware serial number. A unique serial number is assigned to each hardware device to protect your software against piracy.



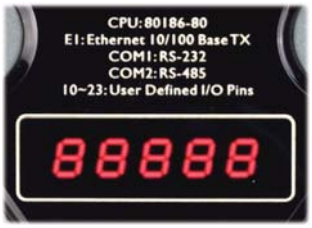
6. Built-in RTC — Real Time Clock

- Provides second, minute, hour, day of week, day of month, month & year (1980 ~ 2079)
- With on-board battery
- Data valid up to 10 years
- Keep accurate time/date while the main power is lost

7. 5-Digit 7-Segment LED Display

Optional 5-digit 7-segment LED display shows information, such as system status, user-defined message...etc.

- Display numbers, letters, symbols, units, etc.



8. Highly Reliable Under Harsh Environment

Our PAC can operate in a wide range of temperature and humidity.

- Operating Temperature: -25 ~ +75°C
- Storage Temperature: -40 ~ +80°C
- Humidity: 10 ~ 90% RH, non-condensing

9. Built-in WDT — Watchdog Timer

When I-7188 or µPAC-7186 is power-up, the watchdog timer can be enabled. The watchdog timer resets the controller after a short period (about 0.8 seconds) when the running software fails to reset the watchdog.

10. Various Memory Expansion Options

- **Memory Configuration:**

Memory	Size	Description
Flash Disk	64 MB NAND	rugged data storage that resists shock and vibration. MiniOS7 file system and APIs are provided to read/write files.
NVRAM	31 bytes	No writing limitation
EEPROM	2 KB or 16 KB	to store not frequently changed parameters.
Note: Different model has different SRAM size, NVRAM and Flash size. Please refer to the Selection Guide.		

- **Expansion Memory Board (Optional):**

Flash memory Board

Battery-backup RAM Board

- **Expansion Memory Board (Optional):**

The writing protection and limitation of Flash and EEPROM prevent memories from being modified due to noise interference. NVRAM doesn't have writing limitation. It is the best choice for temporary data storage. Furthermore, it is non-volatile, data can be kept even when the power is lost or the system crashes.

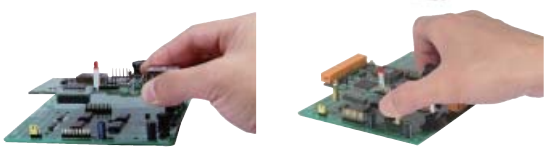
11. Expandable Local I/Os & Hardware Functions

Most µPAC-7186 and I-7188 series have a built-in expansion bus. X-Board can be plugged on the Bus to expand I/O channels, COM Ports, memories or hardware functions (Listed below).

- DI, DO, AI, O, Timer/Counter, Communications, Flash memory, Battery backup SRAM, Motion control , Self-test
  We provide various standard X-Boards, and also ODM service.

The X-Board has two methods to combine with the palm-size PAC. Plug an X-Board into a palm-size PAC or mount a controller on a larger X-Board.

Plug an X-Board into a palm-size PAC



Mount a controller on a larger X-Board

• Selection Guide

I-7188 X X X

Ethernet Port
- : Without I/O Expansion Bus & Ethernet Port
E: With Ethernet Port
X: Without Ethernet Port

Software & Communication Ports
A: C language based (2-DI , 2-DO, RS-232 and RS-485)
B: C language based (1-DI , 1-DO, RS-232 and RS-485)
C: C language based (2-DI , 3-DO, RS-232 and RS-485)
X: C language based (RS-232 and RS-485)
G: ISaGRAF

LED Display
D: With 5-digit 7-segment LED Display

µPAC-7186 E X X - XX

Software
X: C language based
G: ISaGRAF

LED Display
D: With 5-digit 7-segment LED Display

Special Feature
SM: 640 KB SRAM
FD: 64 MB NAND Flash

C Language Based I-7188 and µPAC-7186

Serial Connectivity

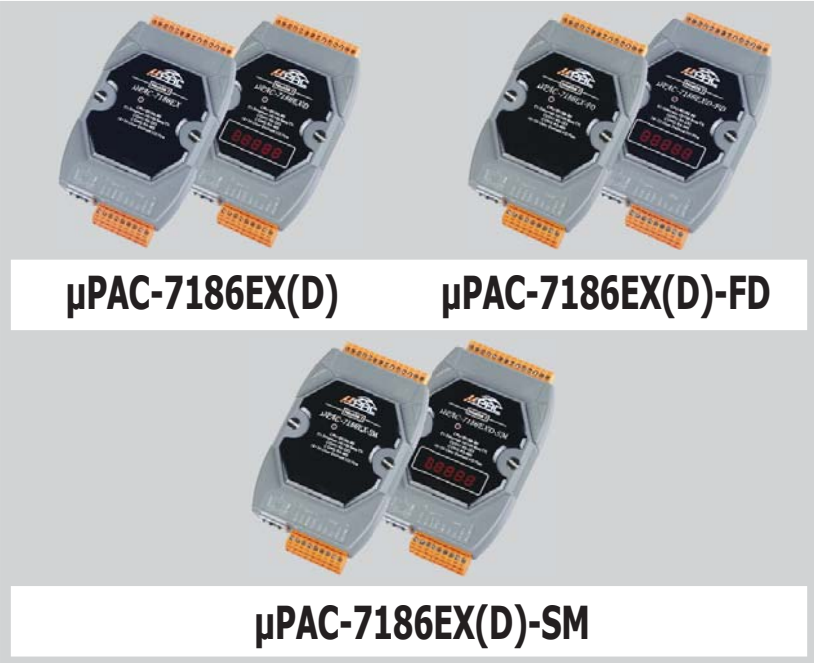
Model Name	CPU	SRAM	Flash	I/O Expansion Bus	64-bit Hardware Serial Number	RTC	DI	DO	RS-232/RS-485
I-7188 I-7188D	40 MHz	256 KB	512 KB	-	-	Yes	-	-	4 (Note)
I-7188XA I-7188XAD		512 KB		For memory board only	Yes		2	2	
I-7188XB I-7188XBD				Yes			1	1	1/1
I-7188XC I-7188XCD	20 MHz	128 KB		Yes	-	-	2	3	

Note: RS-232 × 2, RS-485 × 1, RS-232/485 × 1

Model Name	CPU	SRAM	Flash	NAND Flash	I/O Expansion Bus	RTC	DI	DO	Ethernet	RS-232/RS-485
I-7188EA I-7188EAD	40 MHz	512 KB	512 KB	-	-	Yes	6	7	10 Base-T	1/1
I-7188EX I-7188EXD					Yes		-	-		
µPAC-7186EX µPAC-7186EXD	80 MHz	512 KB	512 KB	-	Yes	Yes			10/100 Base-Tx	1/1
µPAC-7186EX-SM µPAC-7186EXD-SM		640 KB								
µPAC-7186EX-FD µPAC-7186EXD-FD		512 KB		64 MB						

ISaGRAF Based µPAC-7186 & I-7188

Model Name	CPU	SRAM	Flash	I/O Expansion Bus	RTC	DI	DO	Ethernet	RS-232/RS-485
µPAC-7186EG µPAC-7186EGD	80 MHz	768 KB	512 KB	Yes	Yes	-	-	10/100 Base-TX	1/1
I-7188XG I-7188XGD	40 MHz	512 KB				1	1	-	1/1



Features

- 80186, 80 MHz CPU
- MiniOS7 Inside
- C Language Programming
  - TCP/IP Library
  - Modbus Library
  - SNMP Library
- Various Storage Media
  - 512 KB Flash
  - 16 KB EEPROM
  - 64 MB NAND Flash Disk
- Various Communication Interfaces
  - 10/100 Base-TX Ethernet
  - RS-232/485
- 64-bit Hardware Serial Number
- I/O Expansion Bus
- Operating Temperature: -25 ~ +75°C

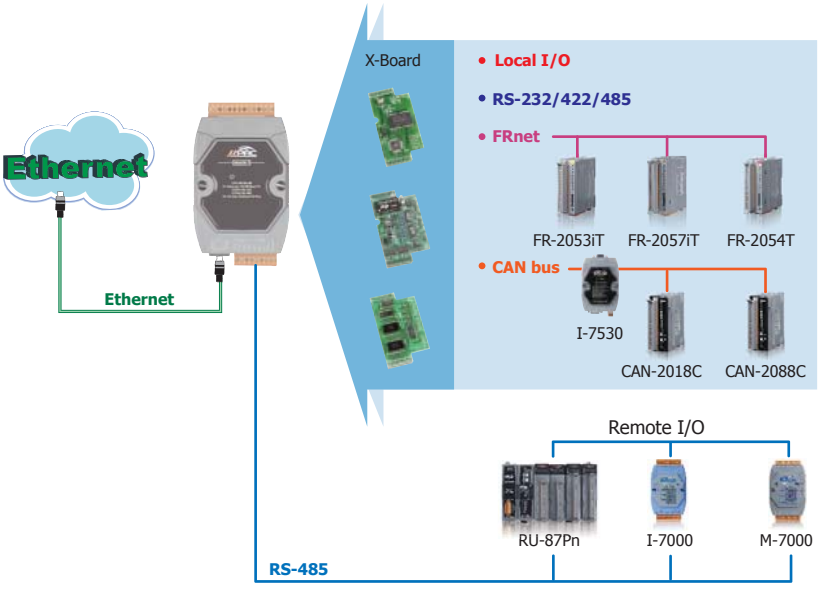
Introduction

The µPAC-7186EX series is a palm-size programmable automation controller that with Ethernet, RS-232, RS-485 communication. ICP DAS provides easy-to-use software development tool kits (Xserver, MiniOS7 framework, VxComm, Modbus libraries). Users can use them to easily integrate serial devices to have Ethernet/Internet communication ability and through the standard Modbus protocol to communicate with SCADA software (Indusoft, ISaGARF, DasyLab, Trace Mode, Citect, iFix, etc.).

For hardware expansion, it also supports an I/O expansion bus. The I/O expansion bus can be used to implement various I/O functions such as D/I, D/O, A/D, D/A, Timer/Counter, UART, flash memory and other I/O functions. Nearly all kinds of I/O functions can be implemented by this bus. But the bus can support only one board. There are more than 50 boards available for µPAC-7186EX, you can choose one of them to expand hardware features.

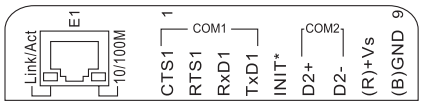
Applications

Rich I/O Expansion Ability

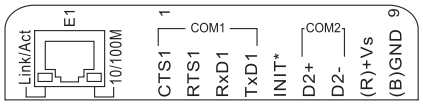


Pin Assignments

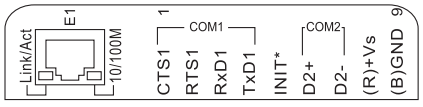
µPAC-7186EX(D)



µPAC-7186EX(D)-FD



µPAC-7186EX(D)-SM



Specifications

Models	µPAC-7186EX(D)	µPAC-7186EX(D)-SM	µPAC-7186EX(D)-FD
System Software			
OS	MiniOS7 (DOS-like embedded operating system)		
Program Download Interface	RS-232 (COM1) or Ethernet		
Programming Language	C language		
Compilers to create.exe Files	TC++ 1.01 TC 2.01 BC++3.1 ~ 5.2x MSC 6.0 MSVC++ (before version 1.5.2)		
CPU Module			
CPU	80186, 80 MHz		
SRAM	512 KB	640 KB	512 KB
Flash	512 KB		
NAND Flash Disk	-		64 MB
EEPROM	16 KB		
NVRAM	31 Bytes (battery backup, data valid up to 10 years)		
RTC (Real Time Clock)	Provides second, minute, hour, date, day of week, month, year		
64-bit Hardware Serial Number	Yes, for Software Copy Protection		
Watchdog Timers	Yes (0.8 second)		
Communication Ports			
Ethernet	RJ-45 x 1, 10/100 Base-TX		
COM 1	RS-232 (TxD, RxD, RTS, CTS, GND), non-isolated, Speed: 115200 bps Max.		
COM 2	RS-485 (Data+, Data-) with internal self-tuner ASIC; non-isolated, Speed: 115200 bps Max.		
CAN Bus	-		
LED Indicator			
System LED	Yes		
LED Display	5-digit 7-segment LED display for D versions		
Special Indicator	-	-	
Hardware Expansion			
I/O Expansion Bus	Yes, 1		
Mechanical			
Dimensions (W x L x H)	72 mm x 123 mm x 35 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 V_{DC}		
Protection	Power reverse polarity protection		
Power Consumption	1.5 W; 2.5 W for (D) version	2 W; 3 W for (D) version	

Ordering Information

µPAC-7186EX CR	µPAC with 10/100M Ethernet (RoHS)
µPAC-7186EXD CR	µPAC-7186EX with display (RoHS)
µPAC-7186EX-SM CR	µPAC with 10/100M Ethernet, 640 KB SRAM (RoHS)
µPAC-7186EXD-SM CR	µPAC-7186EX-SM with display (RoHS)
µPAC-7186EX-FD CR	µPAC with 10/100M Ethernet, 64 MB Flash Disk (RoHS)
µPAC-7186EXD-FD CR	µPAC-7186-FD with display (RoHS)

I-7188XG(D) µPAC-7186EG(D)

Features

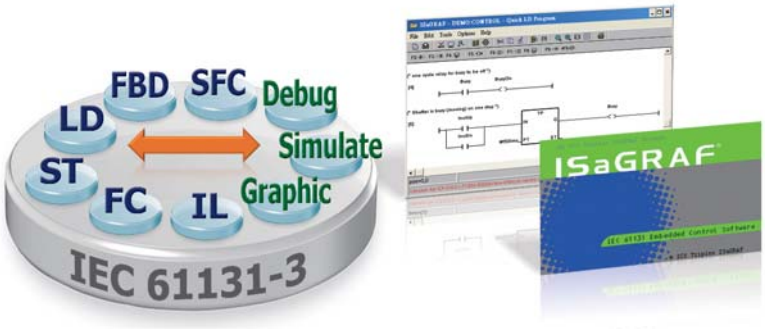
- 80186, 80 MHz CPU or 80188, 40 MHz CPU
- Development Software: ISaGRAF Ver.3
  - Provide 6 PLC Syntaxes (5 IEC 61131-3 Standard)
  - Code Size: Max. 64 KB ISaGRAF Code Size
  - Support Off-line Simulation
  - On-line Debugging, Monitoring and Controlling
  - Easy to integrating with HMI/MMI
- MiniOS7 Inside
- Ethernet
  - 10/100 Base-TX (for µPAC-7186EG)
- Support Modbus Master
  - RTU, ASCII, RS-232/485/422
- Support Modbus RTU/TCP Slave
  - Modbus RTU (RS-232/485/422) Slave
  - Modbus TCP Slave (not for I-7188XG)
- Operating Temperature: -25 ~ +75°C

Introduction

µPAC-7186EG Series is a palm-size PAC and includes ISaGRAF SoftLogic. It has one 10/100 Base-TX Ethernet port, one RS-232 port and one RS-485 port. The user can choose an I/O expansion board, X-Board, to expand the I/Os or memories of µPAC. µPAC-7186EG support Modbus Serial protocol, Modbus TCP/IP protocol, Modbus Master protocol, Remote I/O, Fbus, Ebus, SMS: Short Message Service, modem link, MMICON/LCD, ZigBee wireless communication, GPS application, FRnet, CAN remote I/O connection and user defined protocol.

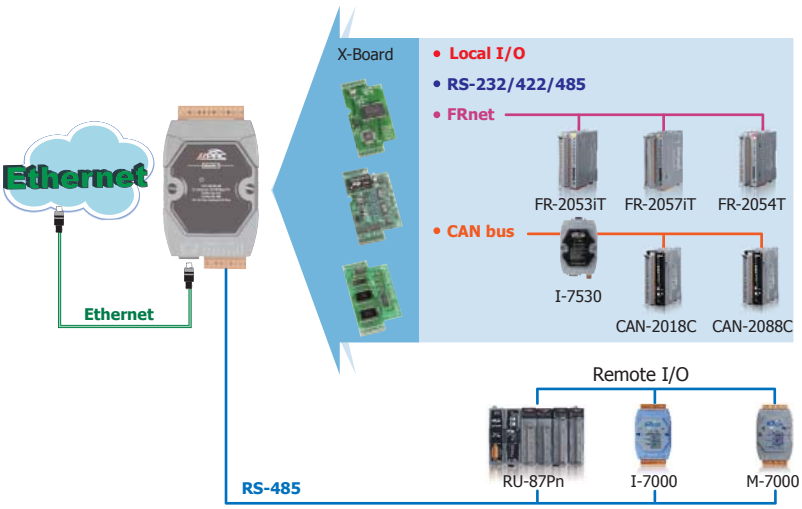
I-7188XG series is a palm-size PAC with ISaGRAF SoftLogic. It has 2 Serial ports (COM1:RS-232/RS-485 & COM2:RS-485).

The user can choose an I/O expansion board, X-Board, to expand COM Ports, I/Os or memories of I-7188XG and µPAC-7186EG.



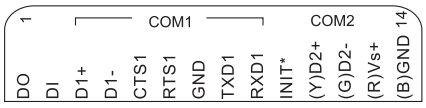
Applications

Rich I/O Expansion Ability

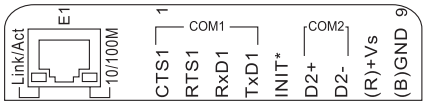


Pin Assignments

I-7188XG(D)



µPAC-7186EG(D)



µPAC Specifications

Models		I-7188XG(D)	µPAC-7186EG (D)
System Software			
OS		MiniOS7 (DOS-like embedded operating system)	
Development Software			
ISaGRAF Software	ISaGRAF Version 3	IEC 61131-3 standard	
	Languages	LD, ST, FBD, SFC, IL & FC	
	Max. Code Size	64 KB	
	Scan Time	5 ~ 100 ms for normal program 25 ~ 500 ms (or more) for complex or large program	2 ~ 5 ms for normal program 10 ~ 125 ms (or more) for complex or large program
CPU Module			
CPU		80188, 40 MHz	80186, 80 MHz
SRAM		512 KB	640 KB
Flash		512 KB	
EEPROM		2 KB	16 KB
NVRAM		31 Bytes (battery backup, data valid up to 10 years)	
RTC (Real Time Clock)		Provides second, minute, hour, date, day of week, month, year	
64-bit Hardware Serial Number		Yes, for Software Copy Protection	
Watchdog Timers		Yes (0.8 second)	
Communication Ports			
Ethernet		-	RJ-45 x 1, 10/100 Base-TX
COM 1		RS-232 or RS-485 with internal self-tuner ASIC; non-isolated	RS-232 (TxD, RxD, RTS, CTS, GND), non-isolated
COM 2		RS-485 with internal self-tuner ASIC; non-isolated	
LED Indicator			
System LED		Yes	
LED Display		5-digit 7-segment LED display for (D) version	
Special Indicator		-	
Digital Input			
Channels		1	-
Contact		Dry	-
On Voltage Level		Connect to GND	-
Off Voltage Level		Open	-
Digital Output			
Channels		1	-
Output Type		Open Collector	-
Load Current		100 mA	-
Load Voltage		30 VDC Max.	-
Hardware Expansion			
I/O Expansion Bus		Yes, 1 (14 Pins)	
Mechanical			
Dimensions (W x L x H)		72 mm x 123 mm x 33 mm	72 mm x 123 mm x 35 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	
Protection		Power reverse polarity protection	
Power Consumption		2 W; 3 W for (D) version	1.5 W; 2.5 W for (D) version

ISaGRAF Specifications

Protocols (some protocols need optional devices)		
NET ID		User-assigned by software, 1 ~ 255
Modbus RTU/ASCII Master Protocol		Up to 2 COM ports: I-7188XG COM 2 ~3, µPAC-7186EG COM 1~3 (*). (To connect to other Modbus Slave I/O devices) Max. Mbus_xxx Function Block amount for 2 ports: µPAC-7186EG: 128; I-7188XG: 64.
Modbus RTU Slave Protocol		Up to 2 COM Ports: COM1, one of COM2 or COM3 (*). (For connecting ISaGRAF, PC/HMI/OPC Server & MMI panels)
Modbus TCP/IP Slave Protocol		Ethernet port supports Modbus TCP/IP Slave protocol for connecting ISaGRAF & PC/HMI. Max. connections: µPAC-7186EG: 6 I-7188XG: 0
User-Defined Protocol		By serial communication function blocks. µPAC-7186EG: COM1 ~ COM8 (*) or I-7188XG: COM2 ~ COM8 (*).
Remote I/O		One of COM2 or COM3:RS-485 (*) supports I-7K, I-87K I/O modules as Remote I/O. I-87K series must plug on RU-87Pn (High profile) or I-87K (Low profile) I/O Unit. Max. 64 I/O modules for one PAC.
Fbus		Built-in COM2 Port to exchange data between ICP DAS's ISaGRAF controllers.
Ebus		To exchange data between ICP DAS's ISaGRAF Ethernet controllers via Ethernet port. (Not for I-7188XG)
Send E-mail		Send email to maximum 10 receivers each time via internet. If applying with an X607/608 X-Board, it could send email with one attached file and the maximum file size is about 488 KB (using X608) or about 112 KB (using X607). (Not for I-7188XG)
SMS: Short Message Service		One COM port (µPAC-7186EG: one of COM1 or COM3 or COM4; I-7188XG: one of COM3 or COM4) (*) can link to a GSM modem to support SMS. User can request data/control the controller by cellular phone. The controller can also send data & alarms to user's cellular phone. Optional GSM modems: GTM-201-RS232 (GSM/GPRS 850/900/1800/1900)
Modem Link		Support PC remotely download & monitor the controller through COM4 of X504.
MMICON/LCD		COM3: RS-232 (*) supports ICP DAS's MMICON. The MMICON is featured with a 240 x 64 dot LCD and a 4 x 4 Keyboard. User can use it to display picture, string, integer, float, and input a character, string, integer and float.
Redundant Solution		One is Master, one is Slave. Master handles all inputs & outputs at run time. If Master is damaged (or Power off), Slave takes the control of Bus7000b. If Master is alive again, it takes the control of Bus7000b again. The change over time is about 5 seconds. Control data is exchanging via Ebus (if using a cross cable, there is no need of any Ethernet switch). All I/O should be RS-485 I/O except the status I/O in the slot 0: X107. (for µPAC-7186EG only)
CAN/CANopen		Use COM1 or COM3 ~ COM8 (*) to connect one I-7530: the RS-232 to CAN converter to support CAN/CANopen devices/sensors. One PAC supports Max. 3 RS-232 ports to connect Max. 3 I-7530 modules. (FAQ-086) (for µPAC-7186EG only)
PWM Output	Pulse Width Modulation Output	All X-Board series DO boards support PWM output. 8 channels Max. for one controller. 500 Hz Max. for Off=1 & On=1 ms, Output square curve: Off: 1 ~ 32767 ms, On: 1 ~ 32767 ms
Counters	Parallel DI Counter	All X-Board series DI boards support DI counter. 8 channels. Max. for one controller. Counter value: 32 bit, 500 Hz Max. Min. ON & OFF width must > 1 ms
	Remote DI Counter	All remote I-7000 & I-87K DI modules support counters. 100 Hz Max. value: 0 ~ 65535 (16-bit)
	Remote High Speed Counter	Optional I-87082: 100 kHz Max., 32-bit
SRAM Expansion	Battery Backup SRAM	With an X607/X608 plug in the only expansion I/O slot. Data can be stored in X607/X608, and then PC can load these data via COM1 or Ethernet. PC can also download pre-defined data to the X607/X608. (for retain variables) Optional: X607: 128 KB, X608: 512 KB

*** Note: COM3 ~ COM8 are resided at the optional X-series board if it is plugged inside the µPAC-7186EG & I-7188XG.**
*** ISaGRAF FAQ: http://www.icpdas.com/faq/isagraf.htm**

Ordering Information

µPAC-7186EG CR	ISaGRAF based µPAC with 10/100M Ethernet (RoHS)
µPAC-7186EGD CR	µPAC-7186EG with display (RoHS)
I-7188XG CR	ISaGRAF based µPAC with 1 DI, 1 DO (RoHS)
I-7188XG CR	I-7188XG with display (RoHS)

Accessories

ISaGRAF Development Software	
ISaGRAF-256-E	ISaGRAF Workbench Software Ver.3 (256 I/O Tags) with One Application Book (English version) and one USB Dongle
ISaGRAF-256-C	ISaGRAF Workbench Software Ver.3 (256 I/O Tags) with One Application Book (Chinese version) and one USB Dongle
ISaGRAF-32-E	ISaGRAF Workbench Software Ver.3 (32 I/O Tags) with One Application Book (English version)
ISaGRAF-32-C	ISaGRAF Workbench Software Ver.3 (32 I/O Tags) with One Application Book (Chinese version)
Note: Do not offer upgrade service from ISaGRAF-32 to ISaGRAF-256	
Others	
MDR-20-24 CR	24 VDC/1.0 A, 24 W Power Supply with DIN-Rail Mounting (RoHS)
GPSU06U-6 CR	24 VDC/0.25 A, 6 W Power Supply (RoHS)
DIN-KA52F CR	24 VDC/1.04 A, 25 W Power Supply with DIN-Rail Mounting (RoHS)
I/O Expansion Boards	Other add-on expansion boards refer to expansion board selection guide
NS-205 CR	Unmanaged 5-port Industrial Ethernet Switch (RoHS)

Features

- 80188, 40 MHz or 20 MHz CPU
- MiniOS7 Inside
- C Language Programming
  - Modbus Library
  - CAN Bus Library
- Various Storage Media
  - 512 KB Flash
  - 2 KB EEPROM
  - 31 Bytes NVRAM
- Various Communication Interfaces
  - RS-232/485
- 64-bit Hardware Serial Number
- I/O Expansion Bus
- Operating Temperature: -25 ~ +75°C

Introduction

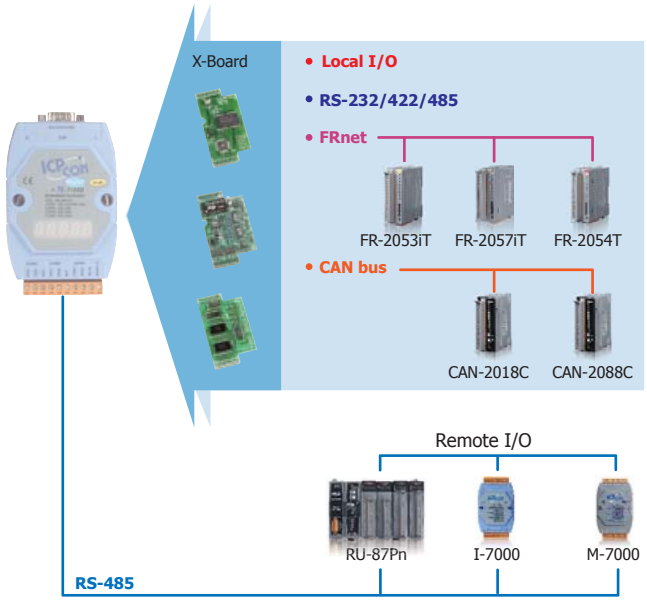
The I-7188 series is a palm-size PAC designed to work in harsh environment. It has a CPU, SRAM, Flash and several RS-232, RS-485 ports. With a DOS-like OS (MiniOS7) and a developed firmware running inside, the I-7188 can act like a small PC.

For the hardware expansion, it supports an I/O expansion bus to implement various I/O functions such as D/I, D/O, A/D, D/A, Timer/Counter, UART, flash memory, etc. Customers can develop their own I/O expansion boards or choose one of 50 available boards that ICP DAS has developed.

For the firmware developing, a 16-bit C compiler for 80188/80186 CPU and C language programming knowledge are needed. To shorten the developing time, there are many demo programs for reference. And for industrial applications, a Modbus library and CAN bus library are provided to ease the developing.

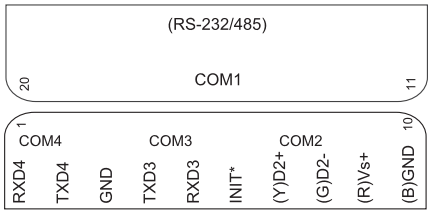
Applications

Rich I/O Expansion Ability

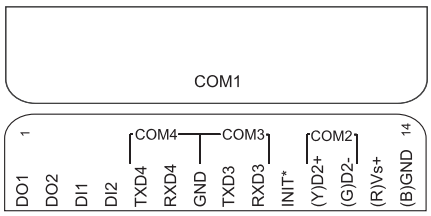


Pin Assignments

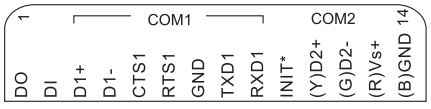
I-7188(D)



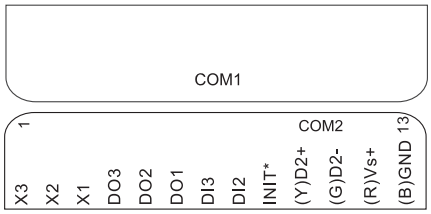
I-7188XA(D)



I-7188XB(D)



I-7188XC(D)



Specifications

Models	I-7188(D)	I-7188XA(D)	I-7188XB(D)	I-7188XC(D)
System Software				
OS	MiniOS7 (DOS-like embedded operating system)			
Program Download Interface	RS-232 (COM4)		RS-232 (COM1)	
Programming Language	C language			
Compilers to create.exe Files	TC++ 1.01; TC 2.01; BC++3.1 ~ 5.2x; MSC 6.0; MSVC++ (before version 1.5.2)			
CPU Module				
CPU	80188, 40 MHz			80188, 20 MHz
SRAM	256 KB	512 KB		128 KB
Flash	512 KB			
EEPROM	2 KB			
NVRAM	31 Bytes (battery backup, data valid up to 10 years)			-
RTC (Real Time Clock)	Provides second, minute, hour, date, day of week, month, year			-
64-bit Hardware Serial Number	-	Yes		-
Watchdog Timers	Yes (0.8 second)			
Communication Ports				
COM 1	RS-232 with modem control or RS-485	RS-232 with modem control or RS-485 with internal self-tuner ASIC; non-isolated	RS-232 or RS-485 with internal self-tuner ASIC; non-isolated	
COM 2	RS-485, non-isolated	RS-485 with internal self-tuner ASIC; 3000 V_{DC} isolated	RS-485 with internal self-tuner ASIC; non-isolated	
COM 3	RS-232 (TxD, RxD, GND)		-	
COM 4	RS-232 (TxD, RxD, GND)		-	
LED Indicator				
System LED	Yes			
LED Display	5-digit 7-segment LED display for (D) versions			
Digital Input				
Channels	-	2	1	2
Contact	-	Dry		
On Voltage Level	-	Connect to GND		
Off Voltage Level	-	Open		
Digital Output				
Channels	-	2	1	3
Type	-	Open Collector		
Load Current	-	100 mA/channel		
Load Voltage	-	+30 V_{DC} Max.		
Hardware Expansion				
I/O Expansion Bus	-	Yes (for memory board only)	Yes	Yes
Mechanical				
Dimensions (W x L x H)	72 mm x 119 mm x 33 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 V_{DC}			
Protection	Power reverse polarity protection			
Power Consumption	2 W; or 3 W for (D) version			

Ordering Information

I-7188/512 CR	µPAC with 4 COM ports (RoHS)
I-7188D/512 CR	I-7188/512 CR with display
I-7188XA CR	µPAC with 4 COM ports and 2 DI, 2 DO (RoHS)
I-7188XAD CR	I-7188XA CR with display
I-7188XB-512 CR	µPAC with 2 COM ports and 1 DI, 1 DO (RoHS)
I-7188XBD-512 CR	I-7188XB-512 CR with display
I-7188XC-512 CR	µPAC with 2 COM ports and 2 DI, 3 DO (RoHS)
I-7188XCD-512 CR	I-7188XC-512 CR with display

Features

- 80188, 40 MHz CPU
- MiniOS7 Inside
- C Language Programming
  - TCP/IP Library
  - Modbus Library
  - SNMP Library
- Various Storage Media
  - 512 KB Flash
  - 2 KB EEPROM
  - 31 Bytes NVRAM
- Various Communication Interfaces
  - 10 Base-T Ethernet
  - RS-232/485
- 64-bit Hardware Serial Number
- I/O Expansion Bus
- Operating Temperature: -25 ~ +75°C

Introduction

The I-7188EX series is a palm-size PAC designed to survive in harsh environment and has ability to connect to the Internet word. It has a CPU, SRAM, Flash, Ethernet port and several RS-232, RS-485 ports. With a DOS-like OS (MiniOS7) and a developed firmware running inside, the I-7188EX series can act like a small PC.

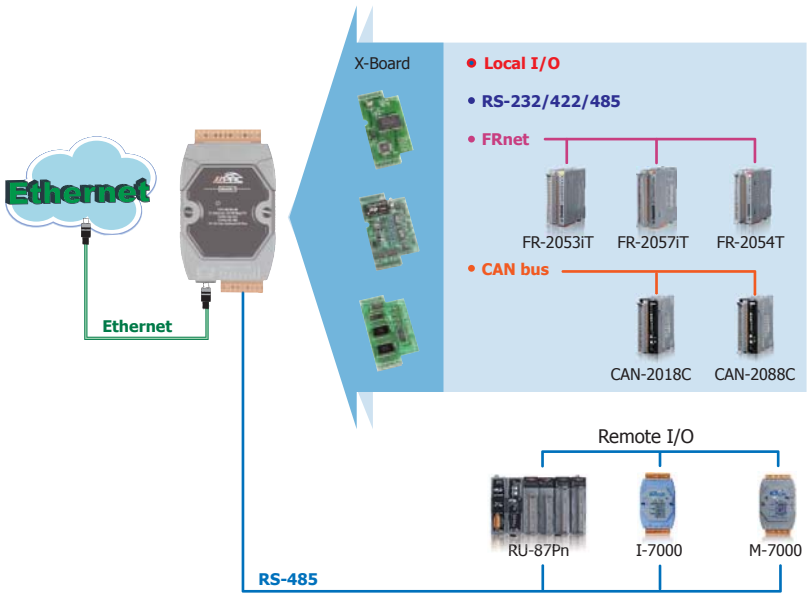
For the hardware expansion, it supports an I/O expansion bus to implement various I/O functions such as D/I, D/O, A/D, D/A, Timer/Counter, UART, flash memory, etc. Customers can develop their own I/O expansion boards or choose one of 50 available boards that ICP DAS has developed.

For the firmware developing, a 16-bit C compiler for 80188/80186 CPU and C language programming knowledge are needed. To shorten the developing time, there are many demo programs for reference. And for industrial applications, a Modbus library is provided to ease the developing.

Depending on the type of embedded firmware that is being developed, and which I/O expansion board, the I-7188EX series can be used as a single versatile controller. The application fields can be factory automation, building automation, machine automation, environment monitoring, etc.

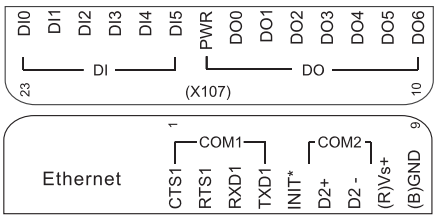
Applications

Rich I/O Expansion Ability

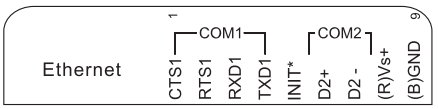


Pin Assignments

I-7188EA(D)



I-7188EX(D)



Specifications

Models	I-7188EA(D)	I-7188EX(D)
System Software		
OS	MiniOS7 (DOS-like embedded operating system)	
Program Download Interface	RS-232 (COM1) or Ethernet	
Programming Language	C language	
Compilers to create.exe Files	TC++ 1.01; TC 2.01; BC++3.1 ~ 5.2x; MSC 6.0; MSVC++ (before version 1.5.2)	
CPU Module		
CPU	80188, 40 MHz	
SRAM	512 KB	
Flash	512 KB	
EEPROM	2 KB	
NVRAM	31 Bytes (battery backup, data valid up to 10 years)	
RTC (Real Time Clock)	Provides second, minute, hour, date, day of week, month, year	
64-bit Hardware Serial Number	Yes, for Software Copy Protection	
Watchdog Timers	Yes (0.8 second)	
Communication Ports		
Ethernet	RJ-45 x 1, 10 Base-T	
COM 1	RS-232 (TxD, RxD, RTS, CTS, GND); non-isolated	
COM 2	RS-485 (Data+, Data-) with internal self-tuner ASIC; non-isolated	
LED Indicator		
System LED	Yes	
LED Display	5-digit 7-segment LED display for (D) versions	
Digital Input		
Channels	6	-
Input Type	Non-isolated	-
On Voltage Level	+3.5 ~+30 V_{DC} Max.	-
Off Voltage Level	1 V_{DC} Max. (Connect to GND)	-
Digital Output		
Channels	7	-
Output Type	Open Collector	-
Load Current	100 mA/channel	-
Load Voltage	+30 V_{DC} Max.	-
Hardware Expansion		
I/O Expansion Bus	-	Yes
Mechanical		
Dimensions (W x L x H)	72 mm x 119 mm x 33 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 V_{DC}	
Protection	Power reverse polarity protection	
Power Consumption	2 W; or 3 W for (D) version	

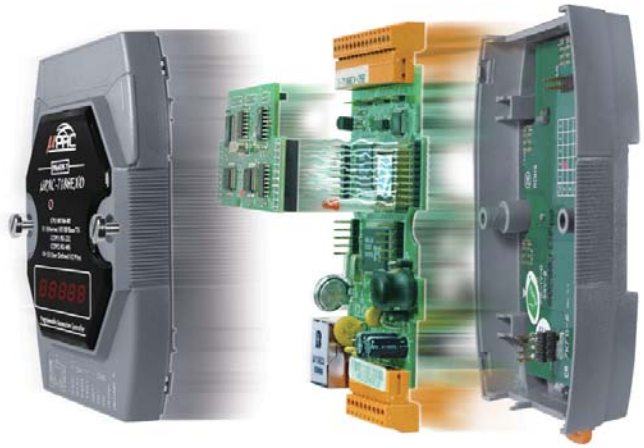
Ordering Information

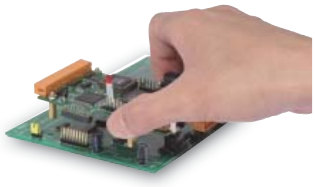
I-7188EA CR	µPAC with 10 M Ethernet and 6 DIs, 7 DOs (RoHS)
I-7188EAD CR	I-7188EA with display (RoHS)
I-7188EX CR	µPAC with 10 M Ethernet (RoHS)
I-7188EXD CR	I-7188EX with display (RoHS)

7.2. I/O Expansion Boards for 7188/7186 Series

• Overview

X-Board is a small I/O expansion board inserted in µPAC (µPAC-7186 Series & I-7188 series) for expanding I/O functions. Most µPACs (except some modules like I-7188 & I-7188D) support one I/O expansion bus. Each bus can be plugged in one X-Board. The X-Board allows users to implement various I/O functions such as DI, DO, A/D, D/A, Timer/Counter, UART, flash memory, battery backup SRAM, AsicKey & other I/O functions.





Users may choose our functioned X-Boards (model number X1xx ~ X7xx) or design their own I/O expansion boards (module number X0xx). We have designed several X-Boards for expanding the µPAC's features. If users choose a small size X-Board, then they can mount this I/O expansion board directly onto the µPAC. Customized I/O Expansion Boards can be ordered through ODM project.

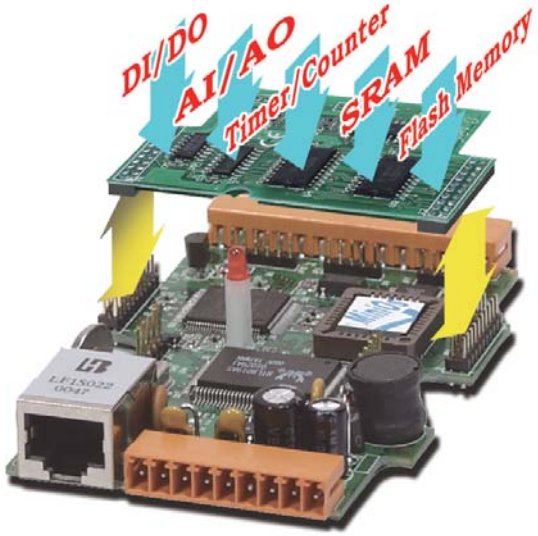
Pin Assignment of I/O Expansion Bus

J1				J2			
GND	01	02	GND	MA0	01	02	AD0
CLKOUTA	03	04	ARDY	MA1	03	04	AD1
INT0	05	06	INT1	MA2	05	06	AD2
VCC	07	08	RESET	MA3	07	08	AD3
GND	09	10	RESET\	MA4	09	10	AD4
TO0	11	12	TO1	MA5	11	12	AD5
TI0	13	14	TI1	MA6	13	14	AD6
SCLK	15	16	DIO9	MA7 (or NC)	15	16	AD7
DIO4	17	18	DIO14	INT4 (or NC)	17	18	WRITE\
VCC	19	20	VCC	CS\	19	20	READ\
CON20A JDIP20P				CON20A JDIP20P			

• Selection Guide

X XXX

1XX: For DI, DO Expansion
2XX: For A/D, D/A, DI, DO Expansion
3XX: For A/D, D/A, DI, DO Expansion
5XX: For RS-232/422/485, DI, DO Expansion
6XX: For Memory Expansion
7XX: For Motion Control Expansion



Following µPAC supports I/O Expansion Bus, can mount one X-Board

- For C language solution: I-7188XB(D), I-7188EX(D), µPAC-7186EX(D), µPAC-7186PEX(D),µPAC-7186EX(D)-FD, µPAC-7186EX(D)-SM
- For ISaGRAF solution: I-7188XG(D), µPAC-7186EG(D)

X-Board is Series has following common specifications

- DI channel: Dry contact, sink type, non-isolated
- DO channel: Open Collector, sink type, 100 mA/channel load current, non-isolated

DI, DO Expansion

Model Name	DI (Dry Contact)	DO (Open Collector)
X107	6	7
X110	14	-
X111	-	13

AI, AO, DI, DO Expansion

Model Name	AI (12-bit)		AO (12-bit)		DI (Dry Contact)	DO (Open Collector)
	Ch	Range	Ch	Range		
X202	7	0 ~ 20 mA	-	-	-	-
X203	2	0 ~ 20 mA	-	-	2	6
X303	1	+/-5 V_{DC}	1	+/-5 V_{DC}	4	6
X304	3	+/-5 V_{DC}	1	+/-5 V_{DC}	4	4
X305	7	+/-5 V_{DC}	1	+/-5 V_{DC}	2	2
X308	4	0 ~ 10 V_{DC}	-	-	-	6
X310	2	0 ~ 20 mA 0 ~ 10 V_{DC}	2	0 ~ 10 V_{DC}	3	3
X324	-	-	4	0 ~ 5 V_{DC}	-	4

RS-232/422/485, DI, DO Expansion

Model Name	Serial Port			DI (Dry Contact)	DO (Open Collector)	EEPROM
	Type	Channel	Wire			
X503	RS-232	1	5-wire	-	-	-
X504	RS-232	2	5-wire and 9-wire			
X505	RS-232	3	5-wire			
X506	RS-232	6	3-wire			
X507	RS-422/485	1	4/2-wire	4	4	
X508	RS-232	1	5-wire	4	4	
X509	RS-232	2	3-wire	4	4	
X510	RS-232	1	3-wire	5	5	256 KB
X510-128	RS-232	1	3-wire	5	5	128 KB
X511	RS-485	3	2-wire	-	-	-
X518	RS-232	1	5-wire	-	8	

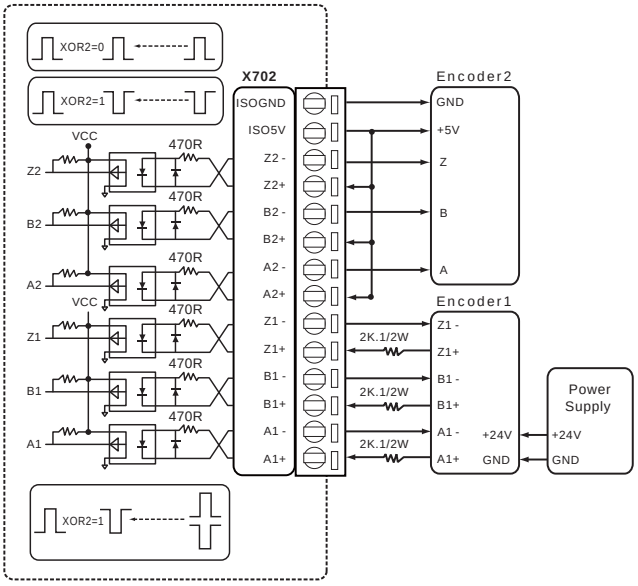
Memory Expansion

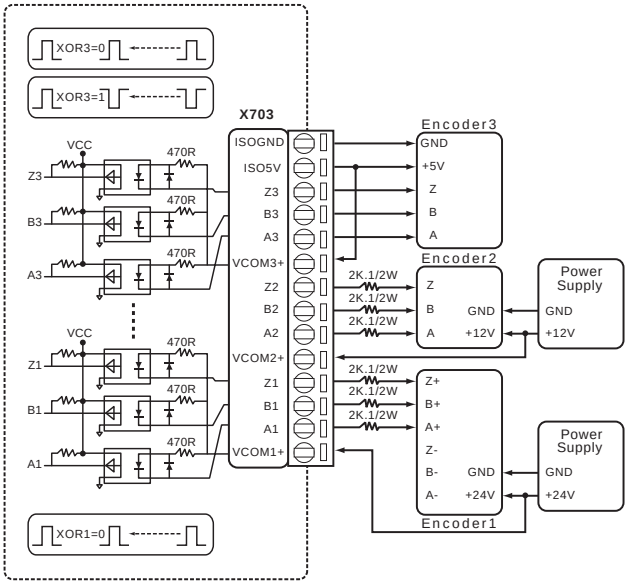
Model Name	Memory Type	Size	Data Retention	Endurance
X603	NAND Flash	256 MB	10 years	100,000 erase cycles
X607	Battery Backup SRAM	128 KB	9 years	No erase cycle limitation
X608		512 KB		

Encoder Expansion

Model Name	Axis	Counter	Mode	Max. Speed	5V Input Level	12V Input Level (with 1 KΩ external resistors)	24V Input Level (with 2 KΩ external resistors)
X702	2	32-bit	Quadrant, CW/CCW, Pulse/Direction	1 MHz	3.5 ~ 5 V 0 ~ 2 V	5 ~ 12 V 0 ~ 2 V	7 ~ 24 V 0 ~ 2 V
X703	3						
Note1: ISaGRAF doesn't support X702 and X703.							

Wiring



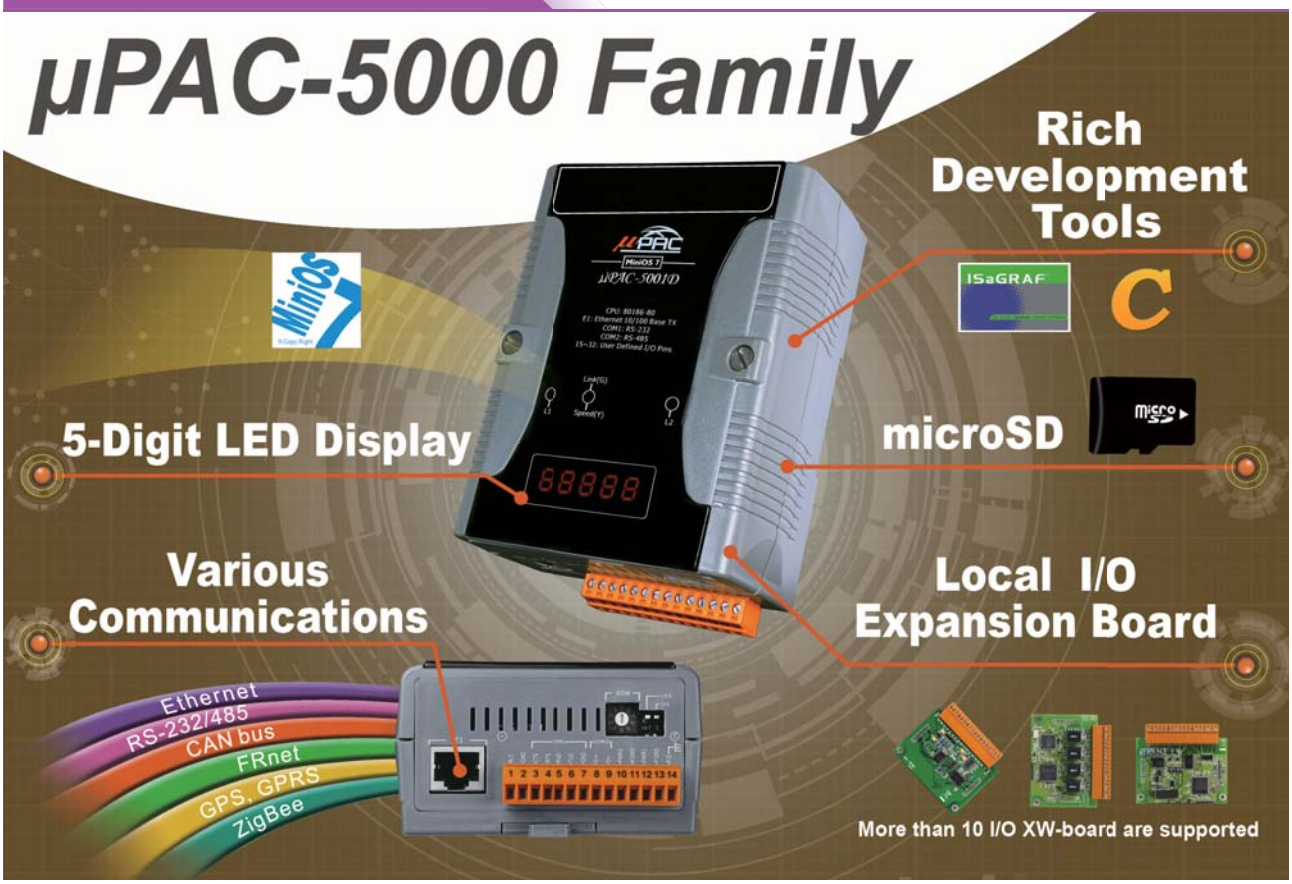


7188XC only						
Model Name	DI (Dry Contact)	DO (Open Collector)	AI (12-bit)		AO (12-bit)	
			Channel	Range	Channel	Range
X101	-	8	-	-	-	-
X106	DI × 3 or DO × 2		-	-	-	-
X200	-	-	1	0 ~ 2.5 VDC	-	-
X302	-	-	1	+/-5 VDC	1	+/-5 VDC

5000 Series PAC

8.1. µPAC-5000 Series

• Overview



The µPAC-5000 Series is equipped a 80186 CPU running a MiniOS7 operating system, various connectivity (Ethernet, RS-232/485) and an I/O expansion bus.

The µPAC-5000 series is an enhanced version of µPAC-7186. Owing to the bigger and special form factor design, the µPAC-5000 can add an internal wireless module, such as 2G, 3G, ZigBee, Wi-Fi, GPS for different wireless application. The optional I/O expansion board, XW-board, is two times larger than the X-board of µPAC-7186 and provides high-protection I/O. With built-in micro SD, the µPAC-5000 can be used as a data logger.

• Common Features

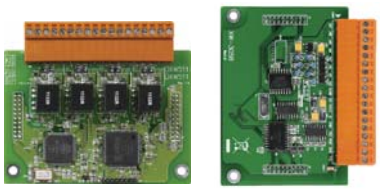
1. MiniOS7 Inside

MiniOS7
80186 CPU
µPAC-5000 Series

- DOS-like real-time OS
- Boot up in 0.4 ~ 0.8 second
- Built-in hardware diagnostic
- Standard version for C language programming
- ISaGRAF version for IEC 61131-3 programming

2. Local I/O and Communication Expansion Board

The µPAC 5000 series equip an I/O expansion bus to support one optional expansion board, called XW-Board. It can be used to implement various I/O functions such as DI, DO, A/D, D/A, Timer/Counter and various communication interface options, such as RS-232/422/485, CAN, FRnet, etc.



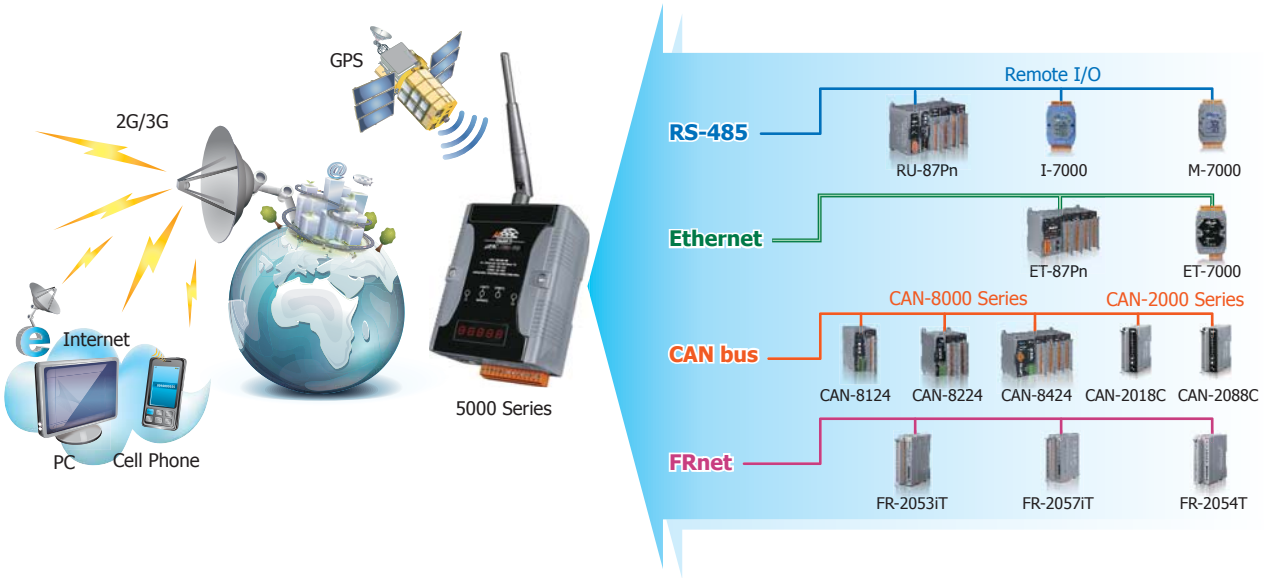
3. Remote I/O Module and Expansion Unit

With the built-in RS-485 and Ethernet ports, the 5000 series can connect RS-485/Ethernet remote I/O units (RU-87Pn/ET-87Pn) or modules (I-7000/M-7000/ET-7000). With an XW-Board, the 5000 series can have more communication ports or different interface to connect to other type of devices, for example, CANOpen devices, DeviceNet devices, or FRnet I/O modules.

4. Multiple Communication Interfaces

Several different types of communication interface are avalible that enable I/O modules to be expanded and connected to external devices:

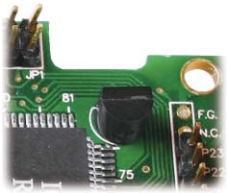
1. Ethernet 2. RS-232/485 3. CAN bus 4. FRnet 5. GPS 6. 2G/3G 7. ZigBee 8. Wi-Fi



5. Various Memory Storage Options

µPAC-5000 provides various memory storage options. Customers can choose the memory based on their characteristics.

- 16 KB EEPROM: to store not frequently changed parameters.
- microSD: to implement portable data logging applications.
- 256 MB NAND Flash Disk: rugged data storage to resist shock and vibration.
- 512 KB battery backup SRAM: to retain data while power lost for 5 years; no write cycle limitation.



6. Unique 64-bit Hardware Serial Number to Protect Your Program

A unique 64-bit serial number is assigned to each hardware device to protect your software against piracy.

Metal Casing

Plastic Casing

7. Plastic and Metal Casing

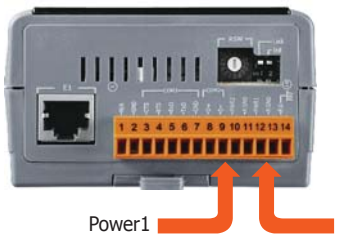
The default case is plastic material. Metal casing is also offered to OEM version.

8. Highly Reliable Under Harsh Environment

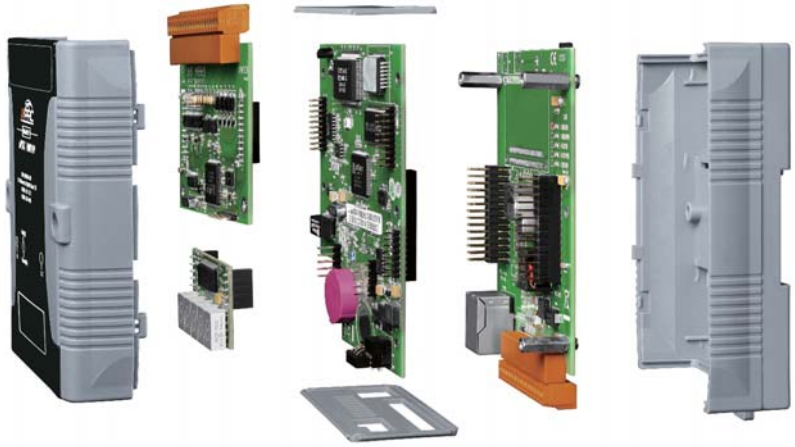
Our µPACs operate in a wide range of temperature and humidity.

- Operating Temperature: -25 ~ +75°C
- Storage Temperature: -30 ~ +80°C
- Humidity 10 ~ 90% RH (non-condensing)

9. Redundant Power Inputs



• µPAC-5000 + XW-Board



• Common Specifications

Models	µPAC-5000 Series		µPAC-5000-FD Series	µPAC-5xx7 Series	
System Software					
OS	MiniOS7 (DOS-like embedded operating system)				
Development Software	**C Language**			**ISaGRAF**	
	Download Interface	RS-232 (COM1) or Ethernet		ISaGRAF Version 3	IEC 61131-3 standard
	Language	C language		Languages	LD, ST, FBD, SFC, IL & FC
	Compilers	TC++ 1.01, TC 2.01, BC++3.1 ~ 5.2x, MSC 6.0, MSVC++ (before version 1.5.2)		Max. Code Size	Accepts max. 64 KB ISaGRAF code size (Appli.x8m must < 64 KB)
				Scan Time	2 ~ 25 ms for normal program; 10 ~ 125 ms (or more) for complex or large program
CPU Module					
CPU	80186, 80 MHz				
SRAM	512 KB			768 KB	
Flash	512 KB				
microSD Expansion	Yes, can support 1 or 2 GB microSD			Yes (but ISaGRAF doesn't support)	
NAND Flash Disk	-		256 MB	-	
Battery Backup SRAM	-			512KB ; data valid up to 5 years (for retain variables)	
EEPROM	16 KB				
NVRAM	31 Bytes (battery backup, data valid up to 10 years)				
RTC (Real Time Clock)	Provide second, minute, hour, date, day of week, month, year				
64-bit Hardware Serial Number	Yes, for Software Copy Protection				
Watchdog Timers	Yes (0.8 second)				
Communication Ports					
Ethernet	RJ-45 x 1, 10/100 Base-TX (Auto-negotiating, Auto MDI/MDI-X, LED indicators)				
COM 1	RS-232 (TxD, RxD, RTS, CTS, GND), non-isolated, Speed: 115200 bps max.				
COM 2	RS-485 (Data+, Data-) with internal self-tuner ASIC; non-isolated, Speed: 115200 bps max.				
LED Indicator					
Programmable LED Indicators	2				
LED Display	5-digit 7-segment LED display for (D) versions				
Hardware Expansion					
I/O Expansion Bus	Yes (for one XW-Board only)				
Mechanical					
Dimensions (W x H x D)	91 mm x 123 mm x 52 mm				
Installation	DIN-Rail Mounting				
Environmental					
Operating Temperature	-25 ~ +75°C				
Storage Temperature	-30 ~ +80°C				
Ambient Relative Humidity	10 ~ 90% RH (non-condensing)				
Power					
Input Range	+12 ~ +48 V_{DC}				
Isolation	-				
Redundant Power Inputs	Yes				
Protection	Power reverse polarity protection				
Frame Ground	Yes (for ESD Protection)				
Power Consumption	2 W; 2.5 W for (D) version				

• Selection Guide

µPAC-5 X O X D - F D

Wireless Communication
0: None
1: GPS
2: 2G (GPRS)
3: 3G (WCDMA)
5: Wi-Fi
8: ZigBee (Host, Coordinator)
9: ZigBee (Slave, Full Function Device)

Software
1: C language based
7: ISaGRAF

Display or Casing
D: LED Display
M: Metal Casing

Memory
FD: 256 MB Flash

C Language Based µPAC-5000

Model Name	CPU	Flash	SRAM	Memory Expansion	Ethernet	Wireless Communication	RS-232/RS-485
µPAC-5001(D)	80 MHz	512 KB	512 KB	microSD	10/100 BaseTX	-	1/1
µPAC-5001(D)-FD				microSD + 256 MB Flash			

C Language Based µPAC-5000 with GPS

Model Name	CPU	Flash	SRAM	Memory Expansion	Ethernet	Wireless Communication	RS-232/RS-485
µPAC-5101(D)	80 MHz	512 KB	512 KB	microSD	10/100 BaseTX	GPS	1/1

The Global Positioning System (GPS) is a space-based global navigation satellite system (GNSS) that provides reliable location and time information anytime and anywhere on the Earth when and where there is an unobstructed line of sight to four or more GPS satellites. The GPS is widely used for driving navigation, geographic monitoring, fleet management and cargo tracking, etc. We also can use GPS for industrial application according to its longitude and latitude value and UTC time.

GPS Specifications	
Channels	32 channels all-in-view tracking
Sensitivity	-159 dBm
Acquisition Rate	Cold start: 42 seconds; warm start: 35 seconds; reacquisition rate: 0.1 second
Accuracy	Position: 25 m CEP (S/A off); Velocity: 0.1 second (S/A off); Time: ±1 ms
Protocol	NMEA

Standard Antenna for GPS

ANT-115-03	
Connector	SMA Male
Radiation	Directional
Band	1575.42 ±1.023MHz
Gain (dBi)	2 ~ 3
Cable Length	5 m
Installation	Magnetic mount base

C Language Based µPAC-5000 with ZigBee

Model Name	CPU	Flash	SRAM	Memory Expansion	Ethernet	Wireless Communication	RS-232/RS-485
µPAC-5801(D)	80 MHz	512 KB	512 KB	microSD	10/100 BaseTX	ZigBee (Host, Coordinator)	1/1
µPAC-5901(D)						ZigBee (Slave, Full Function Device)	

ZigBee is a specification based on the IEEE 802.15.4 standard for wireless personal area networks (WPANs). ZigBee operates in the ISM radio bands and its focus is to define a general purpose, inexpensive, self-organizing, mesh network that can be used for industrial control, embedded sensing, medical data collection, smoke and intruder warning, building automation, and home automation, etc.

ZigBee Specifications	ZigBee (Host, Coordinator)	ZigBee (Slave, Full Function Device)
RF channels	16	
Receive sensitivity	-102 dBm	
Data encryption	AES-CRT/AES-128	-
Transmit power	9 dBm	
Network topology support	Star, Mesh and Cluster Tree	
Antenna (2.4 GHz)	5 dBi Omni-Directional antenna	
Transmission range (LOS)	?? m	

Standard Antenna for ZigBee and Wi-Fi

ANT-124-05	
Connector	RP SMA Male
Radiation	Omni-Directional
Band	2.4 ~ 2.5 GHz
Gain (dBi)	5
Cable Length	20 cm

C Language Based µPAC-5000 with 2G (GPRS)/3G (WCDMA)

Model Name	CPU	Flash	SRAM	Memory Expansion	Ethernet	Wireless Communication	RS-232/RS-485
µPAC-5201(D)	80 MHz	512 KB	512 KB	microSD	10/100 BaseTX	2G (GPRS)	1/1
µPAC-5301(D)	80 MHz	512 KB	512 KB	microSD	10/100 BaseTX	3G (WCDMA)	1/1

The wireless 2G (GSM, GPRS) and 3G (WCDMA) are the public wireless telephone technologies. The wide range of remote control applications are enabled by 2G/3G services such as audio, SMS, GPRS and WCDMA. Additionally, these applications can manage a small, medium and large number of unmanned remote devices as well as mobile terminals using the 2G/3G telecom network. They are widely applied in various applications like hydrographic monitoring, intelligent power, flow meter report system and GPS car-tracking system anytime anywhere.

2G (GPRS) Specifications	
Band	850/900/1800/1900 MHz
GPRS Multi-slot	Class 10/8
GPRS Mobile Station	Class B
GPRS Class 10	Max. 85.6 kbps
CSD	Up to 14.4 kbps
Compliant to GSM phase 2/2+	Class 4 (2 W @ 850/900 MHz); Class 1 (1W @ 1800/1900 MHz)
Coding Schemes	CS 1, CS 2, CS 3, CS 4
SMS	Text and PDU mode

3G (WCDMA) Specifications	
Band	UMTS : 2100/1900/850 MHz
Data Transfer	UMTS / HSDPA / HSUPA Upload: Max. 5.76 Mbps; Download: Max. 7.2 Mbps

Optional Antenna for 2G and 3G

ANT-421-01	
Connector	SMA Male
Radiation	Omni-Directional
Band	824 ~ 960 MHz 1710 ~ 2170 MHz
Gain (dBi)	1.0 ±0.7 @ 830 MHz 0.5 ±0.7 @ 1730 MHz
Cable Length	3 m
Installation	Magnetic mount base

Standard Antenna for 2G and 3G

ANT-421-02	
Connector	SMA Male
Radiation	Omni-Directional
Band	824 ~ 960 MHz 1710 ~ 2170 MHz
Gain (dBi)	-0.9 ±0.7 @ 890 MHz +1.7 ±0.7 @ 1930 MHz
Cable Length	14 cm

C Language Based µPAC-5000 with Wi-Fi

Model Name	CPU	Flash	SRAM	Memory Expansion	Ethernet	Wireless Communication	RS-232/RS-485
µPAC-5501(D)	80 MHz	512 KB	512 KB	microSD	10/100 BaseTX	Wi-Fi (802.11 b/g)	1/1

Wi-Fi (Wireless Local Area Network) links devices by wireless distribution method (spread-spectrum or OFDM radio), and generally provides a connection through an access point to the Ethernet network. The applications of Wi-Fi are getting more popular by mature technology. These Wi-Fi applications can reduce the troublesomely wiring works and have higher mobility than Ethernet network. Additionally, Wi-Fi technology allows users to move device within a local coverage area, and still be connected to the network. High-bandwidth allocation for wireless will make a relatively.

Wi-Fi Specifications	
Protocol	IEEE 802.11 b/g
Frequency Range	2.412GHz ~ 2.484GHz
Channel	13 channels
Security	WEP-64/ WEP-128/WPA-TKIP/WPA-AES
Receive sensitivity	-87 dBm (IEEE 802.11b) / -72 dBm (IEEE 802.11g)
Transmit Power	12 dBm (IEEE 802.11b) / 14 dBm (IEEE 802.11g)

Standard Antenna for ZigBee and Wi-Fi

ANT-124-05	
Connector	RP SMA Male
Radiation	Omni-Directional
Band	2.4 ~ 2.5 GHz
Gain (dBi)	5
Cable Length	20 cm

ISaGRAF Based µPAC-5000

Model Name	CPU	Flash	SRAM	Memory Expansion	Ethernet	Wireless Communication	RS-232/RS-485
µPAC-5007(D)	80 MHz	512 KB	768 KB	microSD + 512 KB Battery Backup SRAM	10/100 BaseTX	-	1/1
µPAC-5107(D)						GPS	
µPAC-5207(D)						2G (GPRS)	
µPAC-5307(D)						3G (WCDMA)	
µPAC-5507(D)						Wi-Fi (802.11 b/g)	

C Language based µPAC-5000(D) Series

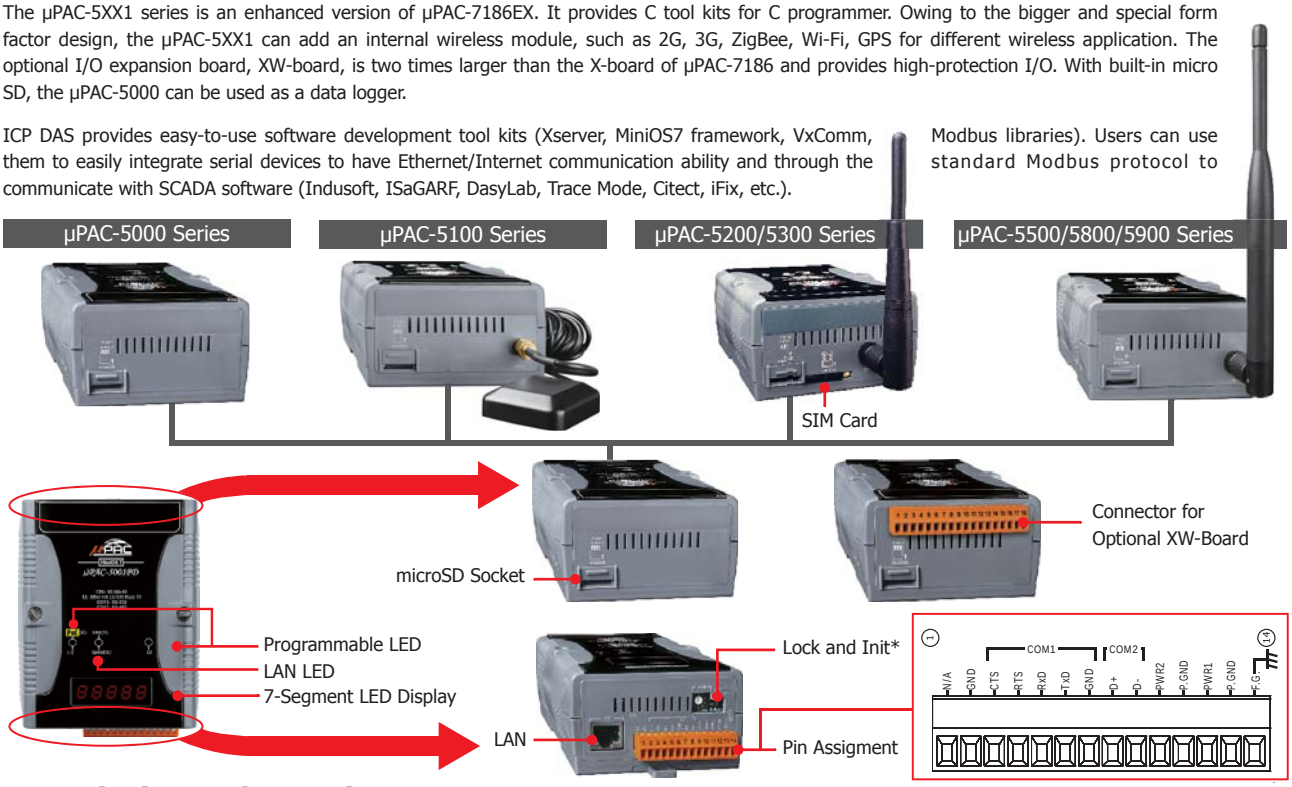
Features

- 80186, 80 MHz CPU
- MiniOS7 Inside
- C Language Programming
  - TCP/IP Library
  - Modbus Library
- Various Storage Media
  - 512 KB Flash
  - 16 KB EEPROM
  - microSD
  - 256 MB NAND Flash Disk
- Various Communication Interfaces
  - 10/100 Base-TX Ethernet
  - RS-232/485
- 64-bit Hardware Serial Number
- I/O Expansion Bus
- Redundant Power Inputs
- Operating Temperature: -25 ~ +75°C

Introduction

The µPAC-5XX1 series is an enhanced version of µPAC-7186EX. It provides C tool kits for C programmer. Owing to the bigger and special form factor design, the µPAC-5XX1 can add an internal wireless module, such as 2G, 3G, ZigBee, Wi-Fi, GPS for different wireless application. The optional I/O expansion board, XW-board, is two times larger than the X-board of µPAC-7186 and provides high-protection I/O. With built-in micro SD, the µPAC-5000 can be used as a data logger.

ICP DAS provides easy-to-use software development tool kits (Xserver, MiniOS7 framework, VxComm, Modbus libraries). Users can use them to easily integrate serial devices to have Ethernet/Internet communication ability and through the standard Modbus protocol to communicate with SCADA software (Indusoft, ISaGARF, DasyLab, Trace Mode, Citect, iFix, etc.).



Ordering Information

Ordering Information	
Models	**Description**
µPAC-5001(D)	µPAC-5000 with LAN
µPAC-5001(D)-FD	µPAC-5000 with LAN and 256 MB flash
µPAC-5101(D)	µPAC-5000 with LAN and GPS
µPAC-5201(D)	µPAC-5000 with LAN and 2G (GPRS)

Ordering Information	
Models	**Description**
µPAC-5301(D)	µPAC-5000 with LAN and 3G (WCDMA)
µPAC-5501(D)	µPAC-5000 with LAN and Wi-Fi (802.11 b/g)
µPAC-5801(D)	µPAC-5000 with LAN and ZigBee (Host, Coordinator)
µPAC-5901(D)	µPAC-5000 with LAN and ZigBee (Slave, Full Function Device)
Note: (D) means with 7-Segment LED Display.	

Option Accessories

NS-205 CR	Unmanaged Industrial 5-Port Ethernet Switch
MDR-20-24	24V/1A, 24 W Power Supply with DIN-Rail Mounting
DIN-KA52F	24V/1.04A, 25 W Power Supply with DIN-Rail Mounting
3LMSD-2000	2 GB microSD card

ISaGRAF based µPAC-5000(D) Series

Features

- 80186, 80 MHz CPU
- MiniOS7 Inside
- ISaGRAF Ver.3 SoftLogic: Five IEC 61131-3 Standard Open PLC Languages + Flow Chart
- Various Storage Media
  - 512 KB Flash
  - 16 KB EEPROM
  - 512 KB Battery Backup SRAM
- Various Communication Interface Options
  - 10/100 Base-TX Ethernet
  - RS-232/485
  - GPS
  - 2G (GPRS) / 3G (WCDMA)
  - Wi-Fi
- 64-bit Hardware Serial Number
- I/O Expansion Bus
- Redundant Power Inputs
- Operating Temperature: -25 ~ +75°C

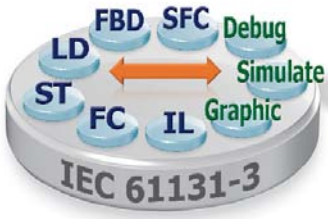
Introduction

The µPAC-5XX7 series is an enhanced version of µPAC-7186EG. It provides ISaGRAF workbench for PLC user. Owing to the bigger and special form factor design, the µPAC-5XX7 can add an internal wireless module, such as 2G, 3G, ZigBee, Wi-Fi, GPS for different wireless application. The optional I/O expansion board, XW-board, is two times larger than the X-board of µPAC-7186 and provides high-protection I/O. With built-in micro SD, the µPAC-5000 can be used as a data logger.

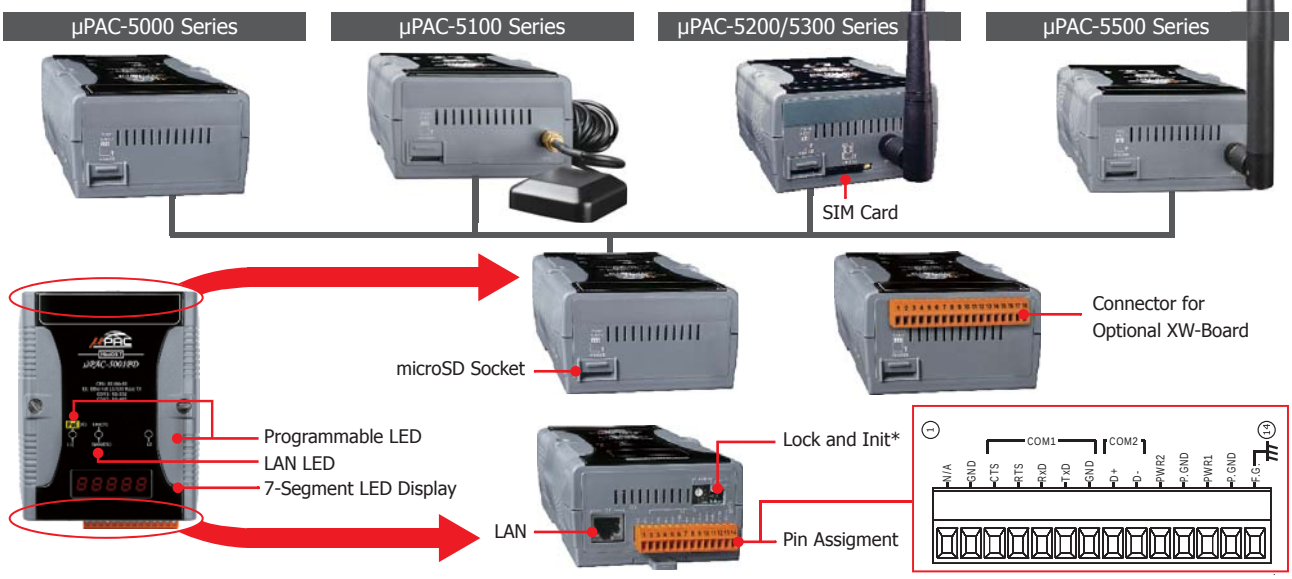
For hardware expansion, it also supports an I/O expansion bus. The I/O expansion bus can be used to implement various I/O functions such as DI, DO, A/D, D/A, Timer/Counter, UART, and other I/O functions. Nearly all kinds of I/O functions can be implemented by this bus. But the bus can support only one board. There are more than 10 boards available for µPAC-5x07 series, you can choose one of them to expand hardware features.

ISaGRAF is the most powerful SoftLogic package on the market. ISaGRAF is a PLC-like software and it supports IEC 61131-3 standard PLC programming languages (LD, FBD, SFC, ST, IL, FC), and can run the application generated by the workbench on any ISaGRAF PACs. The ISaGRAF workbench Ver. 3.x features

- IEC 61131-3 Standard Open PLC Programming Languages (LD, FBD, SFC, ST, IL, FC) + Flow Chart (FC)
- Auto-Scan I/O
- On-Line Debug/Control/Monitor, Off-Line Simulation
- Simple Graphic HMI



Appearance



ISaGRAF Specifications

Protocols (some protocols need optional devices)	
NET ID	User-assigned by software, 1 ~ 255
Modbus RTU/ASCII Master Protocol	Max. 2 COM Ports: COM1, COM2 and COM3 (*). (To connect to other Modbus Slave devices) Max. Modbus_xxx Function Block amount for 2 ports: 128.
Modbus RTU Slave Protocol	Max. 2 COM Ports, COM1 and one of (COM2, COM3) (*). For connecting ISaGRAF, PC/HMI/OPC Server & MMI panels.
Modbus TCP/IP Protocol	Max. 6 connections, Ethernet ports support Modbus TCP/IP Slave Protocol for connecting ISaGRAF & PC/HMI.
User-defined Protocol	COM1, COM2 & COM3 ~ COM8 (*) by serial communication function blocks.
Remote I/O	One of COM2 or COM3 (RS-485) (*) supports I-7000 I/O modules & (I-87Kn or RU-87Pn + I-87K High Profile I/O boards) as Remote I/O. Max. 64 I/O modules for one PAC.
Fbus	Built-in COM2 Port to exchange data between ICP DAS's ISaGRAF PACs.
Ebus	To exchange data between ICP DAS's ISaGRAF Ethernet PACs via Ethernet port.
Send Email	Actively or passively sending E-mail via Ethernet port through internet. Max.10 receivers for each sending and can send E-mail with an attached file. (Max. file size is about 488 KB)
SMS: Short Message Service	One of COM1 or COM3 or COM4 (RS-232) (*) can link to a GSM modem to support SMS. User can request data/control the controller by cellular phone. The controller can also send data & alarms to user's cellular phone. Optional GSM modem: GTM-201-RS232 (GSM/GPRS 850/900/1800/1900) Note: µPAC-5207, 5307 has built-in GPRS, no external GSM/GPRS modem required.
Redundancy Solution	Two PACs plug with XW107 in slot0. One is Master, one is Slave. Master handles all inputs & outputs at run time. If Master is damaged (or power off), Slave will take over the control of Bus7000b. If Master is alive from damaged (or power up again), it takes the control of Bus7000b again. The change over time is about 5 seconds. Control data is exchanging via Ebus (if using a cross cable, no require any Ethernet Switch). All I/O should be RS-485 I/O except the status I/O in the slot 0: XW107.
CAN/CANopen	Use COM1 or COM3 ~ COM8 (*) to connect one I-7530 (RS-232 to CAN converter) to support CAN/CANopen devices and sensors. One PAC supports max. 3 RS-232 ports to connect max. 3 I-7530 modules. (FAQ - 086)
FTP Client	Support FTP client to upload files in the PAC to a remote FTP server on PC. (FAQ-151)
Optional I/O Functions	
PWM Output	
Pulse Width Modulation Output	All XW-Board series support PWM output. Max. 8 channels for one controller. 500 Hz max. for Off = 1 & On = 1 ms Output square wave: Off: 1 ~ 32767 ms, On: 1 ~ 32767 ms
Counters	
Parallel DI Counter	All XW-Board series support DI counter. Max. 8 channels for one controller. Counter value: 32-bit 500 Hz max. Min. ON & OFF width must > 1 ms
Remote DI Counter	All remote I-7000 & I-87K DI modules support counters. 100 Hz max. value: 0 ~ 65535
Remote High Speed Counter	Optional I-87082: 100 kHz max. ,32-bit

*** Note: COM3 ~ COM8 are resided at the optional XW-Board series if it is plugged inside the µPAC-5x07.**
*** ISaGRAF FAQ: http://www.icpdas.com/faq/isagraf.htm**

Ordering Information

Models	Description
µPAC-5007(D)	ISaGRAF based µPAC-5000 with LAN
µPAC-5107(D)	ISaGRAF based µPAC-5000 with LAN and GPS
µPAC-5207(D)	ISaGRAF based µPAC-5000 with LAN and 2G (GPRS)
µPAC-5307(D)	ISaGRAF based µPAC-5000 with LAN and 3G (WCDMA)
µPAC-5507(D)	ISaGRAF based µPAC-5000 with LAN and Wi-Fi (802.11 b/g)
Note: (D) means with 7-Segment LED Display.	

Option Accessories

NS-205 CR	Unmanaged Industrial 5-Port Ethernet Switch
MDR-20-24	24V/1A, 24 W Power Supply with DIN-Rail Mounting
DIN-KA52F	24V/1.04A, 25 W Power Supply with DIN-Rail Mounting

8.2. WinPAC-5000 Series

• Overview

The WP-5000 series is equipped an ARM CPU and running a windows CE.NET 5.0/7.0 operating system. Compared to µPAC-5000, WP-5141 series has a VGA port to support graphic display and no need HMI. WP-5231 series has an optional internal wireless module, such as GPS, 2G/3G, Wi-Fi, ZigBee, etc. Using Windows CE.NET 5.0/7.0, it is capable of running PC-based software, such as Visual Basic.NET, Visual C#, Embedded Visual C++, SCADA software, ISaGRAF,etc.

• Features

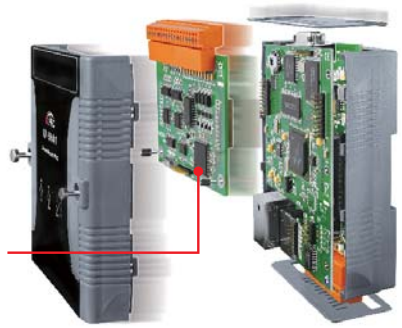
1. Windows CE.net

- Supports PC based software: eVC and VS .NET 2005/2008
- Web server, FTP server, Telnet server
- ISaGRAF version for IEC 61131-3 programming
- InduSoft version for SCADA solution

The WinPAC-5000 series features hard real-time capability, small core size, fast boot speed, interrupt handling at a deeper level, achievable deterministic control and low cost. Using Windows CE.NET 5.0/7.0 gives it the ability to run PC-based control software such as Visual Basic.NET, Visual C#, Embedded Visual C++, SCADA software, SoftPLC …etc.

2. Local I/O and Communication Expansion Board

The optional I/O expansion board, XV-Board and XW-Board, provides high-protection I/O, such as DI, DO, A/D, D/A and various communication ports.



3. Remote I/O Module and Expansion Unit

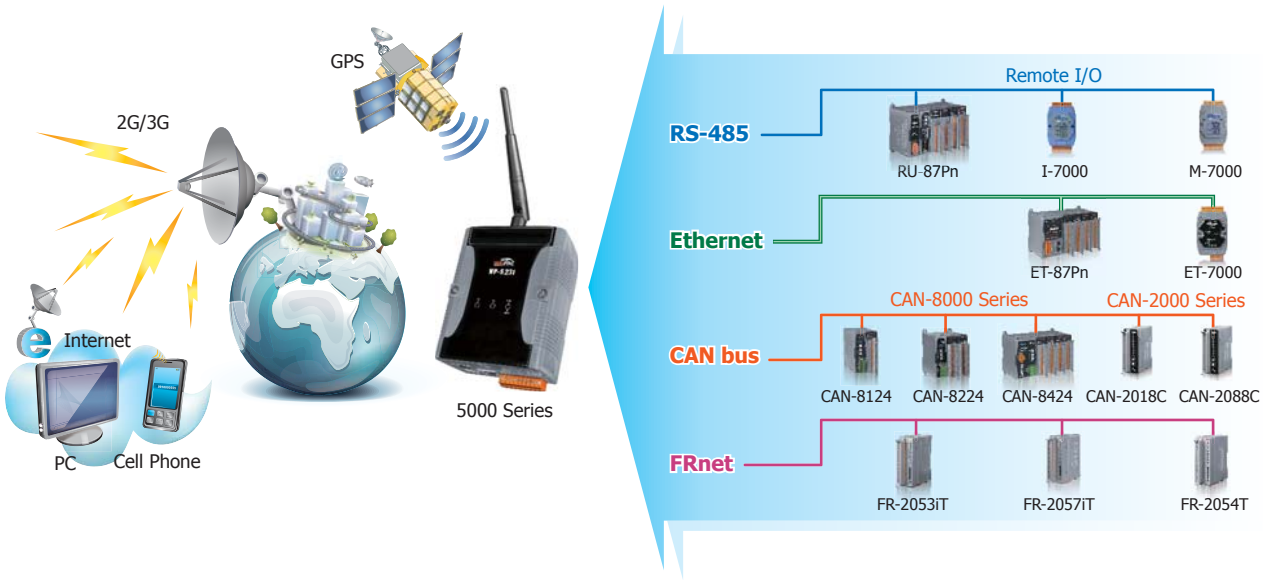
With the built-in RS-485 and Ethernet ports, the 5000 series can connect RS-485/Ethernet remote I/O units (RU-87Pn/ET-87Pn) or modules (I-7000/M-7000/ET-7000). With an XW-Board, the 5000 series can have more communication ports or different interface to connect to other type of devices, for example, CANopen devices, DeviceNet devices, or FRnet I/O modules.

4. Multiple Communication Interfaces

Several different types of communication interface are avalible that enable I/O modules to be expanded and connected to external devices:

1. Ethernet 2. RS-232/485 3. CAN bus 4. FRnet 5. GPS 6. 2G/3G 7. ZigBee 8. Wi-Fi

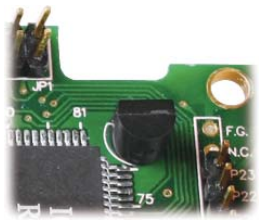
The internal wireless module options are avaliable for WP-5231 series.



5. Various Memory Storage Options

WinPAC-5000 provides various memory storage options, such as EEPROM and microSD.

- 16 KB EEPROM: to store not frequently changed parameters.
- microSD/microSDHC: to save application program, image file, audio file and data.



6. Unique 64-bit Hardware Serial Number to Protect Your Program

A unique 64-bit serial number is assigned to each hardware device to protect your software against piracy.

7. Plastic and Metal Casing

The default case is plastic material. Metal casing is also offered to provide extra security.

Metal Casing

Plastic Casing

8. Highly Reliable Under Harsh Environmen

Our WinPAC operate in a wide range of temperature and humidity.

- Operating Temperature: -25 ~ +75°C
- Storage Temperature: -30 ~ +80°C
- Humidity 10 ~ 90% RH (non-condensing)

Selection Guide

WP-5 X X X - YY - XX

CPU
1: PXA270
2: AM335X

Ethernet
3: Ethernet x 1
4: Ethernet x 2

Software
1: Standard
7: ISaGRAF
9: InduSoft

Options
OD: Audio
GPS: GPS
2G: GPRS
3G: WCDMA
WF: Wi-Fi
ZH: ZigBee Host
ZS: ZigBee Slave

Language
EN: English
TC: Traditional Chinese
SC: Simplified Chinese

Standard WinPAC

Model Name	OS	Pre-installed Software	CPU	Flash	SDRAM	VGA Resolution	Ethernet	RS-232/ RS-485	Wireless Module	I/O Expansion Bus	Audio Port
WP-5141	WinCE 5.0	-	PXA270, 520 MHz	64 MB	128 MB	800 x 600	2	2/1	-	XW-Board	-
WP-5141-OD											Yes
WP-5231	WinCE 7.0	-	AM335X, 720 MHz	256 MB	128 MB	-	1	1/2	Yes	XV-Board	-

ISaGRAF Based WinPAC

Model Name	OS	Pre-installed Software	CPU	Flash	SDRAM	VGA Resolution	Ethernet	RS-232/ RS-485	Wireless Module	I/O Expansion Bus	Audio Port
WP-5147	WinCE 5.0	ISaGRAF	PXA270, 520 MHz	64 MB	128 MB	800 x 600	2	2/1	-	XW-Board	-
WP-5147-OD											Yes

InduSoft Based WinPAC

Model Name	OS	Pre-installed Software	CPU	Flash	SDRAM	VGA Resolution	Ethernet	RS-232/ RS-485	Wireless Module	I/O Expansion Bus	Audio Port
WP-5149	WinCE 5.0	InduSoft	PXA270, 520 MHz	64 MB	128 MB	800 x 600	2	2/1	-	XW-Board	-
WP-5149-OD											Yes

WP-5141 WP-5141-OD

Features

- PXA270, 520 MHz CPU
- Windows CE.NET 5.0 Core
- Hard Real-Time Capability
- 64-bit Hardware Serial Number for Software Protection
- Audio with Microphone-In and Earphone-Out
- I/O Expansion Bus
- VGA Port Output
- Dual 10/100M Ethernet Ports
- 3 Serial Ports (RS-232/485)
- Operating Temperature: -25 ~ +75°C

Introduction

The WP-51xx series is equipped a PXA270 CPU and running a windows CE.NET 5.0 operating system. Compared to µPAC-5000, it has a VGA port to support graphic display and no need HMI. Instead of internal wireless module, the user should use external wireless device through Ethernet or RS-232 for wireless communication. Using Windows CE.NET 5.0, it is capable of running PC-based software, such as Visual Basic.NET, Visual C#, Embedded Visual C++, SCADA software, ISaGRAF …etc.

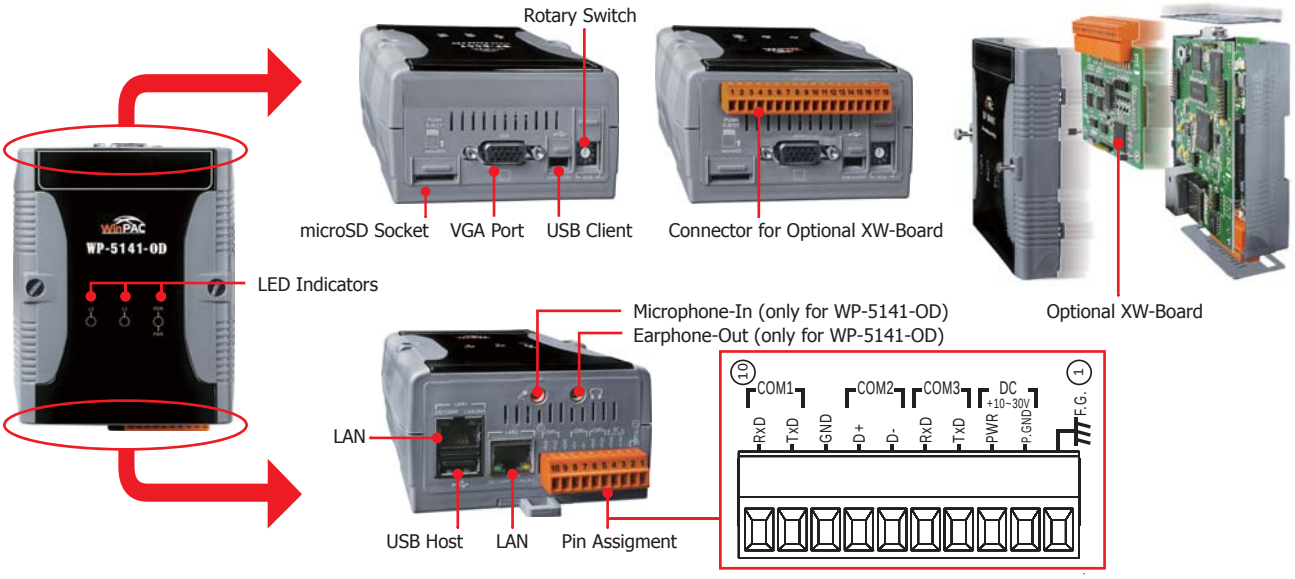
Windows CE5

Microsoft Windows CE.net

Windows CE 5 is a compact and real-time OS used to quickly create time critical and high performance applications. Using Windows CE 5 gives an ability to run PC-based control software such as Visual Basic .NET, Virtual C#, SCADA software, SoftPLC… etc.

★ FTP Server
★ Web Server
★ SQL Compact Edition 3.5
★ .NET Compact Framework 3.5
★ Virtual CE Pro (VCEP)
★ OPC Server (NAPOPC_CE5 DA Server)
★ Soft PLC solution: WP-8xx7, WP-5xx7 and VP-25W7 (ISaGRAF inside)
★ SCADA solution: WP-8xx9, WP-5xx9 and VP-25W9 (InduSoft inside)

Appearance



Specifications

Models	WP-5141	WP-5141-OD
System Software		
OS	Windows CE 5.0 Core	
.Net Compact Framework	3.5	
Embedded Service	FTP server, Web server	
SDK Provided	Dll for eVC, Dll for Visual Studio.Net 2003/2005/2008	
Multilanguage Support	English, German, French, Spanish, Russian, Italian, Korean, Simplified Chinese, Traditional Chinese	
CPU Module		
CPU	PXA270, 520 MHz	
SDRAM	128 MB	
Flash	64 MB	
EEPROM	16 KB	
Expansion Flash Memory	microSD socket with one 2 GB microSD card (support up to 32 GB microSDHC card)	
RTC (Real Time Clock)	Provide second, minute, hour, date, day of week, month, year	
64-bit Hardware Serial Number	Yes, for Software Copy Protection	
Dual Watchdog Timers	Yes	
LED Indicators	1 LED for Power and Running 2 LEDs for user programmable	
Rotary Switch	Yes (0 ~ 9)	
VGA & Communication Ports		
VGA	Yes 640 × 480 / 800 × 600	
Ethernet	RJ-45 x 2, 10/100 Base-TX (Auto-negotiating, Auto MDI/MDI-X, LED indicators)	
USB 1.1 (client)	1	
USB 1.1 (host)	1	
Audio	-	Microphone-In and Earphone-Out
COM 1	RS-232 (RxD, TxD and GND); Non-isolated	
COM 2	RS-485 (Data+, Data-); 2500 V_{DC} isolated	
COM 3	RS-232 (RxD, TxD and GND); Non-isolated	
I/O Expansion		
I/O Expansion Bus	Yes, to mount one optional XW-Board.	
Mechanical		
Dimensions (W x L x H)	91 mm x 132 mm x 52 mm	
Installation	DIN-Rail 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	
Consumption	4.8 W	6 W

Ordering Information

WP-5141-EN CR	Standard WinPAC-5000 (English Version of OS) (RoHS)
WP-5141-OD-EN CR	Standard WinPAC-5000 with Audio (English Version of OS) (RoHS)
WP-5141-TC CR	Standard WinPAC-5000 (Traditional Chinese Version of OS) (RoHS)
WP-5141-OD-TC CR	Standard WinPAC-5000 with Audio (Traditional Chinese Version of OS) (RoHS)
WP-5141-SC CR	Standard WinPAC-5000 (Simplified Chinese Version of OS) (RoHS)
WP-5141-OD-SC CR	Standard WinPAC-5000 with Audio (Simplified Chinese Version of OS) (RoHS)

Option Accessories

DP-660	24 V_{DC}/2.5 A, 60 W and 5 V_{DC}/0.5 A, 2.5 W Power Supply with DIN-Rail Mounting
DP-1200 CR	24 V_{DC}/5.0 A, 120 W Power Supply with DIN-Rail Mounting (RoHS)
MDR-20-24 CR	24 V_{DC}/1.0 A, 24 W Power Supply with DIN-Rail Mounting (RoHS)
MDR-60-24 CR	24 V_{DC}/2.5 A, 60 W Power Supply with DIN-Rail Mounting (RoHS)
XW-Board	Add-on I/O Expansion Board

Available soon **WP-5231 Series**

Features

- AM335X, 720 MHz CPU
- Windows CE.NET 7.0 Core
- Hard Real-Time Capability
- 64-bit Hardware Serial Number for Software Protection
- I/O Expansion Bus
- 10/100M Ethernet Ports
- Wireless Module Options
- 3 Serial Ports (RS-232/485)
- Operating Temperature: -25 ~ +75°C

Introduction

The WP-5231 series is equipped a AM335X CPU (720 MHz) and running a windows CE.NET 7.0 operating system. Instead of external wireless module, the WP-5231 can add an internal wireless module, such as 2G, 3G, ZigBee, Wi-Fi, GPS for different wireless application. The optional I/O expansion board, XV-board, provides high-protection I/O. Using the built-in micro SD, the WP-5231 series can save application program, image file and data.

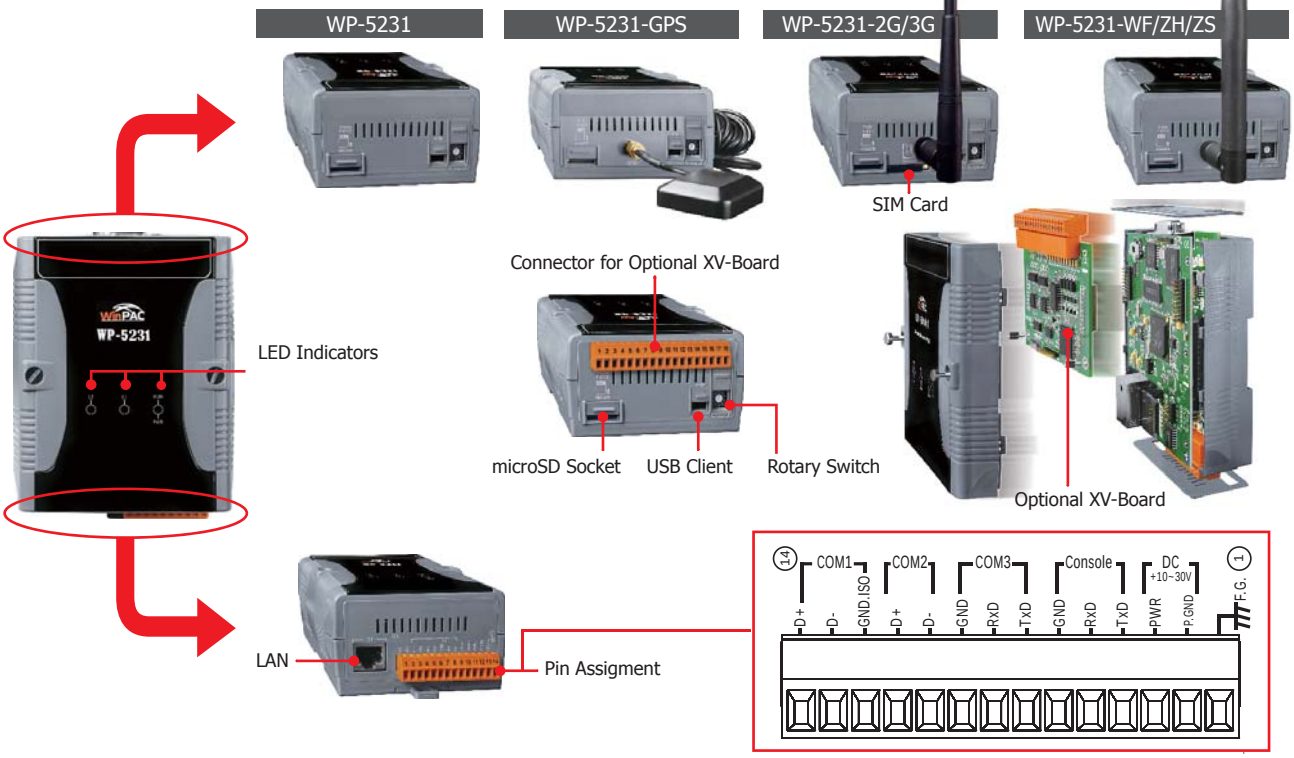
Windows CE7

Microsoft Windows CE.net

Windows CE 7.0 is a compact and real-time OS used to quickly create time critical and high performance applications. Using Windows CE 7.0 gives an ability to run PC-based control software such as Visual Basic .NET, Virtual C#... etc.

- ★ FTP Server
- ★ Web Server
- ★ SQL Compact Edition 3.5
- ★ .NET Compact Framework 3.5
- ★ Virtual CE Pro (VCEP)
- ★ OPC Server (NAPOPC_CE5 DA Server)

Applications



Specifications

Models	WP-5231	WP-5231-GPS	WP-5231-2G	WP-5231-3G	WP-5231-WF	WP-5231-ZH	WP-5231-ZS
System Software							
OS	Windows CE 7.0 Core						
.Net Compact Framework	3.5						
Embedded Service	FTP server, Web server						
SDK Provided	Dll for Visual Studio.Net 2003/2005/2008						
Multilanguage Support	English, German, French, Spanish, Russian, Italian, Korean, Simplified Chinese, Traditional Chinese						
CPU Module							
CPU	AM335X, 720 MHz						
DDR2 SDRAM	128 MB						
Flash	256 MB						
EEPROM	16 KB						
Expansion Flash Memory	microSD socket with one 2 GB microSD card (support up to 32 GB microSDHC card)						
RTC (Real Time Clock)	Provide second, minute, hour, date, day of week, month, year						
64-bit Hardware Serial Number	Yes, for Software Copy Protection						
Dual Watchdog Timers	Yes						
LED Indicators	1 LED for Power and Running; 2 LED for user defined						
Rotary Switch	Yes (0 ~ 9)						
Communication Ports							
Ethernet	RJ-45 x 1, 10/100 Based-TX (Auto-negotiating, Auto MDI/MDI-X, LED indicators)						
USB 2.0 (host)	1						
Console	RS-232 (RxD, TxD and GND); Non-isolated, Reserved for OS						
COM 1	RS-485 (Data+, Data-); 2500 V_{DC} isolated						
COM 2	RS-485 (Data+, Data-); Non-isolated						
COM 3	RS-232 (RxD, TxD and GND); Non-isolated						
Wireless Port	-	GPS	2G (GPRS)	3G (WCDMA)	Wi-Fi	ZigBee (Host, Coordinator)	ZigBee (Slave, Full FunctionDevice)
I/O Expansion							
I/O Expansion Bus	Yes, one optional XV-board						
Mechanical							
Dimensions (W x L x H)	91 mm x 132 mm x 52 mm						
Installation	DIN-Rail 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}						
Consumption	4.8 W						

Ordering Information

WP-5231-EN CR	PAC with WinCE 7.0 and one LAN port (English Version of OS) (RoHS)
WP-5231-GPS-EN CR	PAC with WinCE 7.0 and one LAN port and GPS module (English Version of OS) (RoHS)
WP-5231-2G-EN CR	PAC with WinCE 7.0 and one LAN port and 2G (GPRS) module (English Version of OS) (RoHS)
WP-5231-3G-EN CR	PAC with WinCE 7.0 and one LAN port and 3G (WCDMA) module (English Version of OS) (RoHS)
WP-5231-WF-EN CR	PAC with WinCE 7.0 and one LAN port and Wi-Fi (802.11 b/g) module (English Version of OS) (RoHS)
WP-5231-ZH-EN CR	PAC with WinCE 7.0 and one LAN port and ZigBee (Host, Coordinator) module (English Version of OS) (RoHS)
WP-5231-ZS-EN CR	PAC with WinCE 7.0 and one LAN port and ZigBee (Slave, Full Function Device) module (English Version of OS) (RoHS)

Option Accessories

DP-660	24 V_{DC}/2.5 A, 60 W and 5 V_{DC}/0.5 A, 2.5 W Power Supply with DIN-Rail Mounting
DP-1200 CR	24 V_{DC}/5.0 A, 120 W Power Supply with DIN-Rail Mounting (RoHS)
MDR-20-24 CR	24 V_{DC}/1.0 A, 24 W Power Supply with DIN-Rail Mounting (RoHS)
MDR-60-24 CR	24 V_{DC}/2.5 A, 60 W Power Supply with DIN-Rail Mounting (RoHS)
XV-Board	Add-on I/O Expansion Board

WP-5147 WP-5147-OD

Features

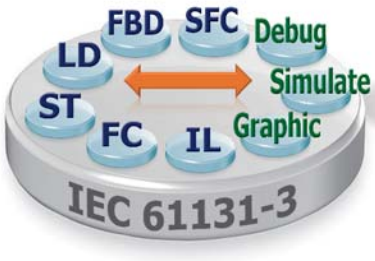
- PXA270, 520 MHz CPU
- Windows CE.NET 5.0 Core
- ISaGRAF Ver.3 SoftLogic Inside (IEC 61131-3)
- Support Soft-GRAF HMI
- Hard Real-Time Capability
- 64-bit Hardware Serial Number for Software Protection
- Audio with Microphone-In and Earphone-Out
- I/O Expansion Bus
- VGA Port Output
- Dual 10/100M Ethernet Ports
- 3 Serial Ports (RS-232/485)
- Operating Temperature: -25 ~ +75°C

Introduction

WP-5147 and WP-5147-OD Series are equipped a PXA270 CPU (520 MHz) running a Windows CE.NET 5.0 operating system, various connectivity (VGA, USB, Ethernet, RS-232/485) and I/O expansion bus for one XW-Board. The benefits of running Windows CE 5.0 on WinPAC features hard real-time capability, small core size, fast boot speed, interrupt handling at a deeper level and achievable deterministic control. WinPAC is also capable of running ISaGRAF and 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.

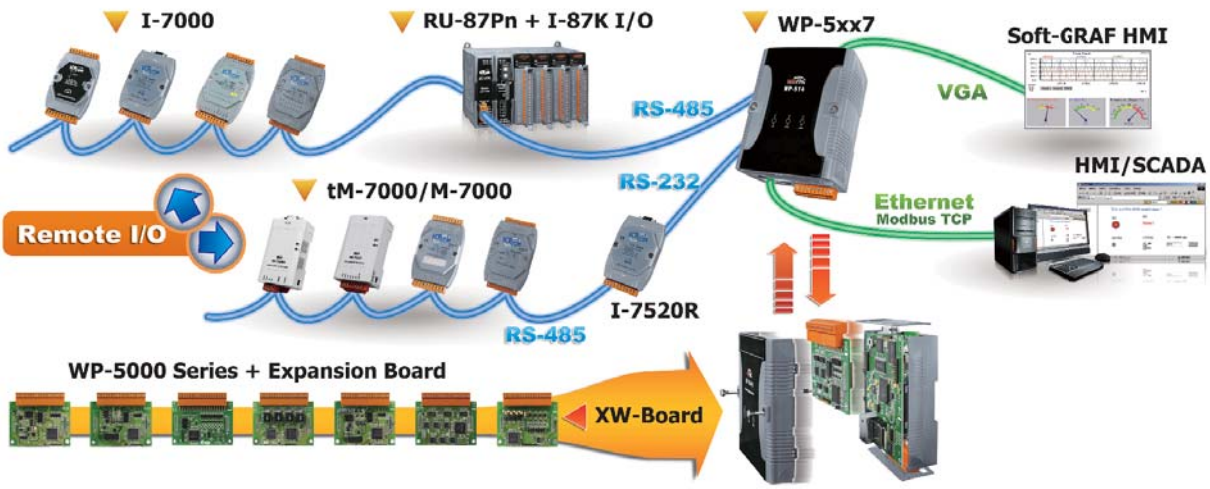
ISaGRAF is the most powerful SoftLogic package on the market. ISaGRAF is a PLC-like software and it supports IEC 61131-3 standard PLC programming languages (LD, FBD, SFC, ST, IL, FC), and can run the application generated by the workbench on any ISaGRAF PACs. The ISaGRAF workbench Ver. 3.x features

- IEC 61131-3 Standard Open PLC Programming Languages (LD, FBD, SFC, ST, IL, FC) + Flow Chart (FC)
- On-Line Debug/Control/Monitor, Off-Line Simulation
- Simple Graphic HMI
- Support Soft-GRAF HMI



Applications

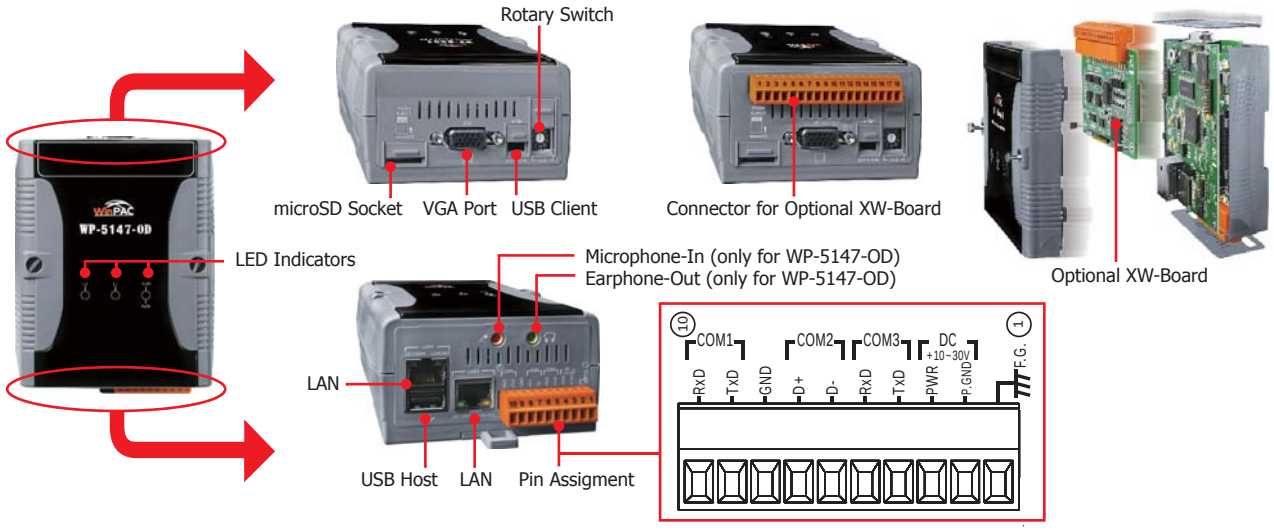
Rich I/O Expansion Ability



Specifications

Models		WP-5147	WP-5147-OD
System Software			
OS		Windows CE 5.0 Core	
.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 Soft-GRAF HMI: XP-8xx7-CE6, WP-8xx7, VP-2xW7 and WP-5xx7 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)	
CPU Module			
CPU		PXA270, 520 MHz	
SDRAM		128 MB	
Flash		64 MB	
EEPROM		16 KB	
Expansion Flash Memory		microSD socket with one 2 GB microSD card (support up to 32 GB microSDHC card)	
Battery Backup SRAM		Require one XW608, 512 KB (for retain variables)	
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	
LED Indicators		1 LED for Power and Running 2 LEDs for user programmable	
Rotary Switch		Yes (0 ~ 9)	
VGA & Communication Ports			
VGA		Yes 640 × 480 / 800 × 600	
Ethernet		RJ-45 x 2, 10/100 Base-TX (Auto-negotiating, Auto MDI/MDI-X, LED indicators)	
USB 1.1 (client)		1	
USB 1.1 (host)		1	
Audio		-	Microphone-In and Earphone-Out
COM 1		RS-232 (RxD, TxD and GND); Non-isolated	
COM 2		RS-485 (Data+, Data-); 2500 V_{DC} isolated	
COM 3		RS-232 (RxD, TxD and GND); Non-isolated	
I/O Expansion			
I/O Expansion Bus		Yes, to mount one optional XW-Board.	
Mechanical			
Dimensions (W x L x H)		91 mm x 132 mm x 52 mm	
Installation		DIN-Rail 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	
Consumption		4.8 W	6 W

Appearance



ISaGRAF Specifications

Protocols (some protocols need optional devices)	
NET ID	1~255, user-assigned by software
Modbus TCP/IP Master	Link to max. 100 devices that support Standard Modbus TCP/IP Slave protocol
Modbus RTU/ASCII Master	Support Multi-port. Max. 10 ports
Modbus RTU Slave	Max. 5 Ports
Modbus TCP/IP Slave	Ethernet LAN1 & LAN2 support total up to 32 connections. When one Ethernet port is broken, the other one can still connect to PC/ HMI.
Web HMI Protocol	Ethernet Ports for connecting PC running Internet Explorer
I-7000 & I-87K RS-485 Remote I/O	COM2 supports I-7000 I/O modules, I-87K base + I-87K Serial I/O boards and RU-87Pn + I-87K High Profile I/O boards as Remote I/O. Max. 255 modules for one controller.
M-7000 Series Modbus I/O	Max. 10 RS-485 ports can support M-7000 I/O. Each port can connect 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 is broken, it will switch to LAN1 automatically to continuously work. (LAN1 & LAN2's IP are requested set in the same IP domain) (FAQ-042)
Send Email	Supports functions to send email with one attached file via Ethernet port.
Ebus	LAN2 to exchange data between ISaGRAF Ethernet PAC via Ethernet port.
UDP Server & UDP Client : Exchange Message & Auto-Report	LAN1 or LAN2 supports UDP Server and UDP Client protocol to send/receive message to/from PC/HMI or other devices.
TCP Client : Exchange Message & Auto-Report	LAN1 or LAN2 supports TCP Client protocol to send/receive message to/from PC/HMI or other devices which support TCP server protocol. Ex: automatically report data to InduSoft's RXTX driver, or to connect a location camera.
Soft-GRAF HMI	Support the Soft-GRAF HMI. User can use the Soft-GRAF Studio on the PC to design the HMI screen and then download it to the PAC to display the HMI on the PAC. (FAQ-146)
SQL Client	Support SQL Client function to write data to (or read data from) Microsoft SQL Server (2000 SP3, 2005, 2008).
User-Defined Protocol	COM1 ~ COM3 and COM5 ~ COM12 (*) by Serial communication function blocks.
CAN/CANopen	COM1, COM3 and COM5 ~ COM12 (*) can connect one I-7530 (converter: RS-232 to CAN) to support CAN/CANopen devices and sensors. One WP-5xx7 supports max.10 RS-232 ports to connect max. 10 I-7530. (FAQ-086)
FTP Client	Support FTP client to upload files in the PAC to a remote FTP server on PC. (FAQ-151)

*** Note: COM5 ~ COM12 are resided at the optional expansion XW-Board series if it is plugged inside the WP-5xx7.**
*** ISaGRAF FAQ: http://www.icpdas.com/faq/isagraf.htm**

Ordering Information

WP-5147-EN CR	ISaGRAF based WinPAC-5000 (English Version of OS) (RoHS)
WP-5147-OD-EN CR	ISaGRAF based WinPAC-5000 with Audio (English Version of OS) (RoHS)
WP-5147-TC CR	ISaGRAF based WinPAC-5000 (Traditional Chinese Version of OS) (RoHS)
WP-5147-OD-TC CR	ISaGRAF based WinPAC-5000 with Audio (Traditional Chinese Version of OS) (RoHS)
WP-5147-SC CR	ISaGRAF based WinPAC-5000 (Simplified Chinese Version of OS) (RoHS)
WP-5147-OD-SC CR	ISaGRAF WinPAC-5000 with Audio (Simplified Chinese Version of OS) (RoHS)

Option 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-20-24 CR	24 VDC/1.0 A, 24 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)
XW-Board	Add-on I/O Expansion Board

WP-5149 **WP-5149-OD**

Features

- PXA270, 520 MHz CPU
- Windows CE.NET 5.0 Core
- InduSoft Web Studio v6.1
- Hard Real-Time Capability
- 64-bit Hardware Serial Number for Software Protection
- Audio with Microphone-In and Earphone-Out
- I/O Expansion Bus
- VGA Port Output
- Dual 10/100M Ethernet Ports
- 3 Serial Ports (RS-232/485)
- Operating Temperature: -25 ~ +75°C

Introduction

WP-5149 and WP-5149-OD Series are equipped a PXA270 CPU (520 MHz) running a Windows CE.NET 5.0 operating system, various connectivity (VGA, USB, Ethernet, RS-232/485) and I/O expansion bus for one XW-Board.

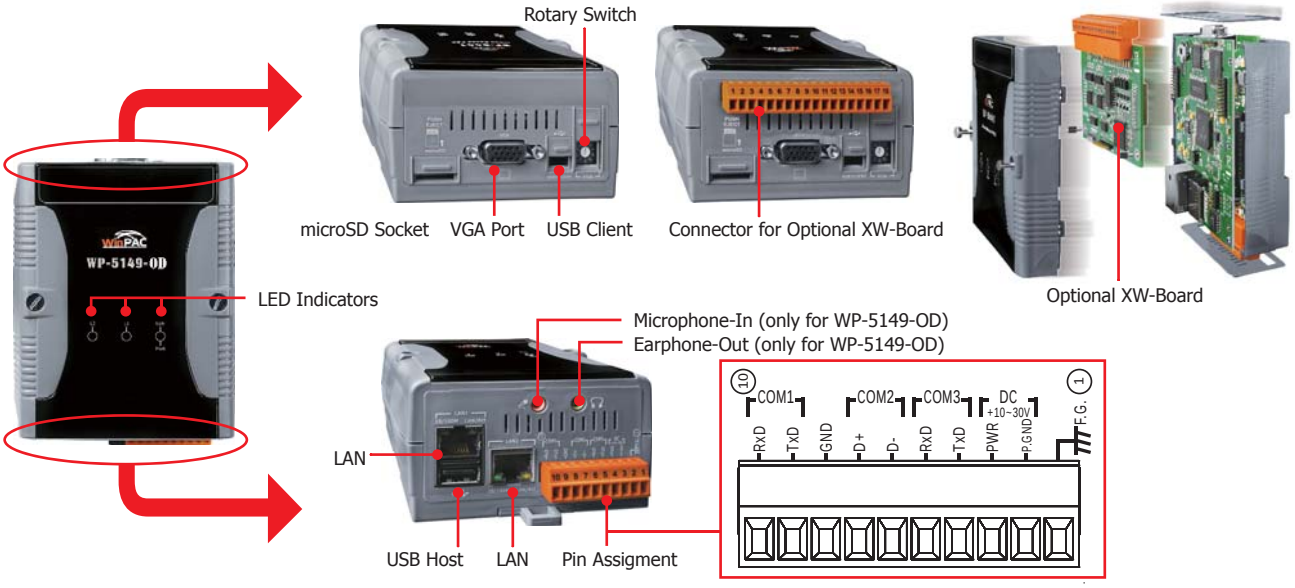
WP-5149 and WP-5149-OD are capable of running Indusoft Web Studio, InduSoft Web Studio is a powerful, integrated collection of automation tools that includes all the building blocks needed to develop modern Human Machine Interfaces (HMI), Supervisory Control and Data Acquisition (SCADA) systems, and ViewPAC applications. InduSoft Web Studio's application runs in native Windows NT, 2000, XP, CE and CE .NET environments and conforms to industry standards such as Microsoft .NET, OPC, DDE, ODBC, XML, and ActiveX.

InduSoft Features

- Elegant Graphics
- Multi-Language
- Database (Access, Excel, SQL, Oracle…)
- Recipes and Reports
- Remote Web Client Control & Security
- System Redundancy
- Online and History Alarm / Event / Trend
- Various Communication Driver (DCON, Modbus, OPC, DDE, TCP/IP…)
- ActiveX (GSM / SHM / COM /WEB provided by ICP DAS)
- Online Configuration and debugging
- Others (VBScript, E-mail, FTP, SNMP...)

InduSoft® Tools for Automation TM

Appearance



Specifications

Models	WP-5149	WP-5149-OD
System Software		
OS	Windows CE 5.0 Core	
.Net Compact Framework	3.5	
Embedded Service	FTP server, Web server	
SDK Provided	Dll for eVC, Dll for Visual Studio.Net 2003/2005/2008	
Multilanguage Support	English, German, French, Spanish, Russian, Italian, Korean, Simplified Chinese, Traditional Chinese	
CPU Module		
CPU	PXA270, 520 MHz	
SDRAM	128 MB	
Flash	64 MB	
EEPROM	16 KB	
Expansion Flash Memory	microSD socket with one 2 GB microSD card (support up to 32 GB microSDHC card)	
RTC (Real Time Clock)	Provide second, minute, hour, date, day of week, month, year	
64-bit Hardware Serial Number	Yes, for Software Copy Protection	
Dual Watchdog Timers	Yes	
LED Indicators	1 LED for Power and Running 2 LEDs for user programmable	
Rotary Switch	Yes (0 ~ 9)	
VGA & Communication Ports		
VGA	Yes 640 × 480 / 800 × 600	
Ethernet	RJ-45 x 2, 10/100 Base-TX (Auto-negotiating, Auto MDI/MDI-X, LED indicators)	
USB 1.1 (client)	1	
USB 1.1 (host)	1	
Audio	-	Microphone-In and Earphone-Out
COM 1	RS-232 (RxD, TxD and GND); Non-isolated	
COM 2	RS-485 (Data+, Data-); 2500 VDC isolated	
COM 3	RS-232 (RxD, TxD and GND); Non-isolated	
I/O Expansion		
I/O Expansion Bus	Yes, to mount one optional XW-Board.	
Mechanical		
Dimensions (W x L x H)	91 mm x 132 mm x 52 mm	
Installation	DIN-Rail 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	
Consumption	4.8 W	6 W

Ordering Information

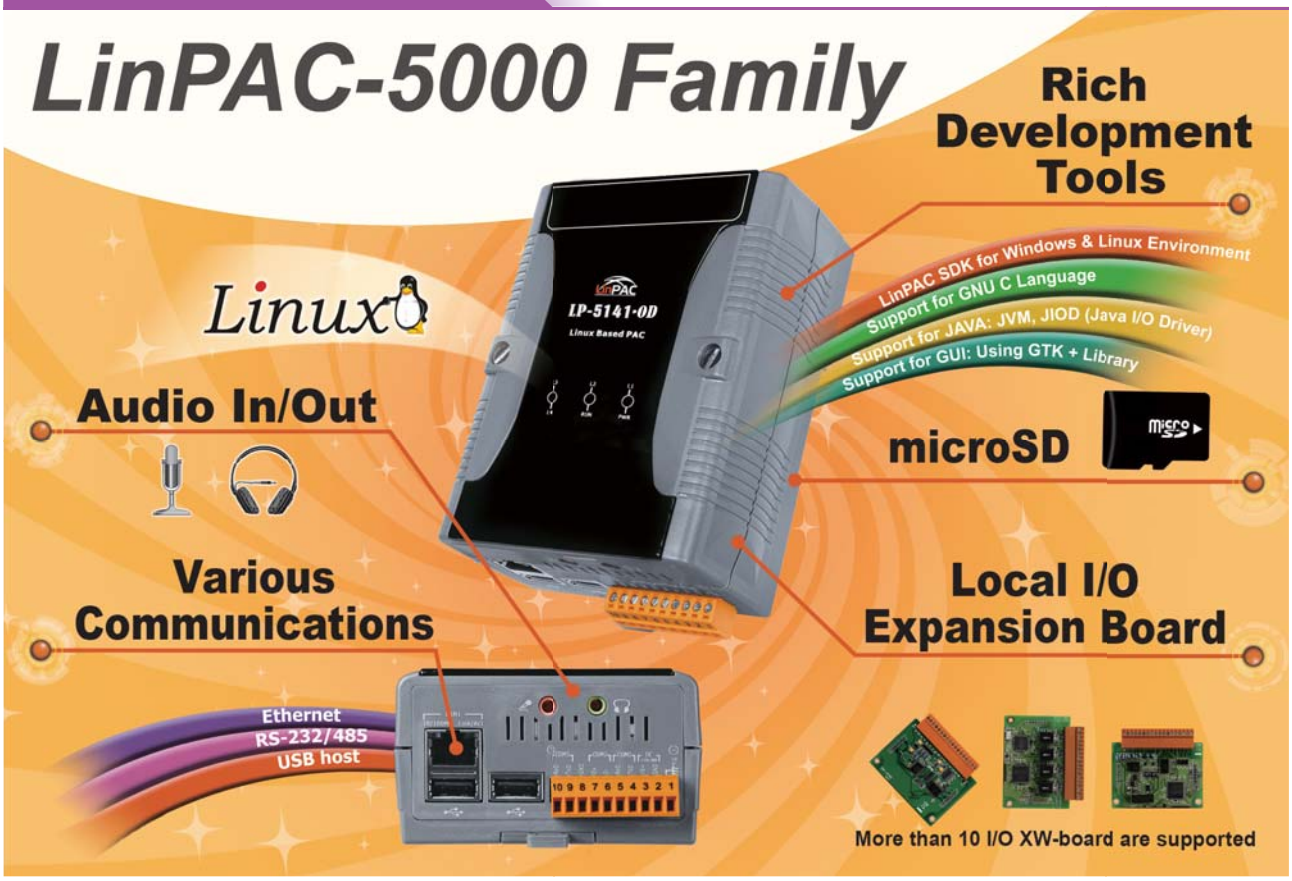
WP-5149-EN CR	InduSoft based WinPAC-5000 (English Version of OS) (RoHS)
WP-5149-OD-EN CR	InduSoft based WinPAC-5000 with Audio (English Version of OS) (RoHS)
WP-5149-TC CR	InduSoft based WinPAC-5000 (Traditional Chinese Version of OS) (RoHS)
WP-5149-OD-TC CR	InduSoft based WinPAC-5000 with Audio (Traditional Chinese Version of OS) (RoHS)
WP-5149-SC CR	InduSoft based WinPAC-5000 (Simplified Chinese Version of OS) (RoHS)
WP-5149-OD-SC CR	InduSoft based WinPAC-5000 with Audio (Simplified Chinese Version of OS) (RoHS)

Option 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-20-24 CR	24 VDC/1.0 A, 24 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)
XW-Board	Add-on I/O Expansion Board

8.3. LinPAC-5000 Series

• Overview



The LinPAC-5000 family is a palm-size PAC and is designed to provide fast, convenient, flexible and simplified solutions for industrial and embedded applications. It is equipped with an ARM CPU running a Linux kernel operating system, multiple communication interfaces (VGA, USB, Ethernet, RS-232/485 and audio ports) and powerful software including development tools.

• Features

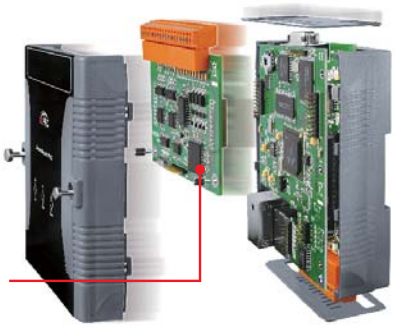
1. Wide range of Development Support Tools

Linux kernel 2.6
ARM CPU
LP-5000 Series

- LinPAC SDK for Windows and Linux
- Support for GNU C Language
- Support for GUI: Using GTK + Library
- Support for DCON, Modbus and SNMP Protocols
- Support for USB to Serial Converter

2. Local I/O and Communication Expansion Board

The LinPAC-5000 series is equipped with an I/O expansion bus to support one optional expansion board, called the XV-Board or XW-Board. It can be used to implement various I/O functions, such as DI, DO, A/D, D/A, Timer/Counter and various communication interfaces, such as RS-232/422/485, etc.



3. Remote I/O Module

With the built-in RS-485 and Ethernet ports, the LinPAC-5000 series can connect to remote RS-485/Ethernet I/O units (RU-87Pn/ET-87Pn) or modules (I-7000/M-7000/ET-7000).

4. Multiple Communication Interfaces

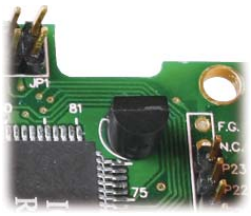
Several different types of communication interface are avalible that enable I/O modules to be expanded and connected to external devices:

1. Ethernet
2. RS-232/485
3. USB host
4. GPS
5. GSM/GPRS

5. Various Memory Storage Options

LinPAC-5000 provides various memory storage options, such as EEPROM, Flash or microSD. Customers can choose the memory based on their characteristics.

- 16 KB EEPROM: to store not frequently changed parameters.
- microSD/microSDHC: to implement portable data logging applications.



6. Unique 64-bit Hardware Serial Number to Protect Your Program

A unique 64-bit serial number is assigned to each hardware device to protect your software against piracy.

7. Plastic and Metal Casing

The default case is plastic material. Metal casing is also offered to provide extra security.

Metal Casing　　Plastic Casing

8. Highly Reliable Under Harsh Environments

The LinPAC-5000 operates in a wide range of temperatures and humidity levels.

- Operating Temperature: -25 ~ +75°C
- Storage Temperature: -30 ~ +80°C
- Humidity 10 ~ 90% RH (non-condensing)

• Selection Guide

LP-5 X X X - YY - XX

CPU
1: PXA270
2: AM335X

Ethernet
3: Ethernet x 1
4: Ethernet x 2

Software
1: Standard

Options
OD: Audio
GPS: GPS
2G: GPRS
3G: WCDMA
WF: Wi-Fi
ZH: ZigBee Host
ZS: ZigBee Slave

Language
EN: English

Standard LinPAC

Model Name	OS	Pre-installed Software	CPU	Flash	SDRAM	VGA Resolution	Ethernet	RS-232/ RS-485	Wireless Module	I/O Expansion	Audio Port
LP-5131	Linux kernel 2.6.19	-	PXA270, 520 MHz	64 MB	128 MB	800 x 600	1	2/1	-	XW-Board	-
LP-5131-OD											Yes
LP-5141							2				-
LP-5141-OD											Yes
LP-5231	Linux kernel 2.6.30		AM335X, 720 MHz	256 MB		-	1	1/2	Yes	XV-Board	-

The controller supports following software development tools:
1. SDK for Linux environment
2. SDK for Windows environment

LP-51xx Series

Features

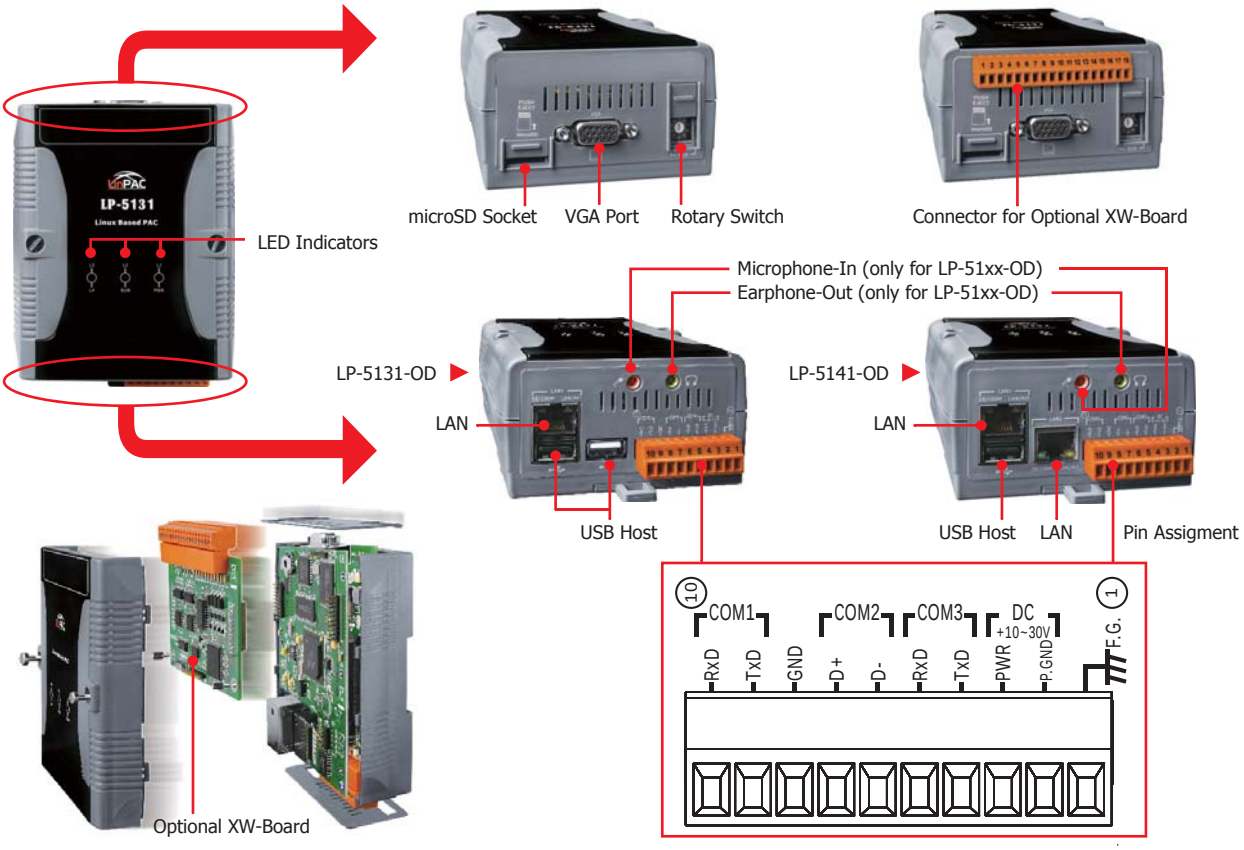
- PXA270, 520 MHz CPU
- Linux kernel 2.6.19 Inside
- Embedded Service: Web Server, FTP Server, Telnet Server, SSH Server
- 64 MB Flash, 128 MB SDRAM
- Built-in Ethernet, USB, RS-232, RS-485 Ports
- Built-in 800 × 600 VGA Port
- Built-in Audio with Microphone-In and Earphone-Out
- I/O Expansion Board Optional
- Operating Temperature: -25 ~ +75°C

Introduction

The LP-51xx series is equipped with a PXA270 CPU (520 MHz) and running a Linux kernel 2.6.19 operating system, multiple communication interfaces, such as VGA, USB, Ethernet, RS-232/485 and audio ports. Further more, it also contains an optional I/O expansion board to implement various I/O functions, such as DI, DO, A/D, D/A, Timer/Counter, UART, fl ash memory, or battery backup SRAM, etc.

Main advantage of the LP-51xx series is its high quality control system, including its stability, small core size, optional I/O expansion board, support for Web services (Web/FTP/Telnet/SSH server), and multiple development environments (LinPAC SDK for Linux and Windows environment using the GNU C language, GUI software), etc., all of which give users the best features of both traditional PLCs and Linux capable PCs, meaning that it is one of the most powerful and flexible embedded control systems available.

Appearance



Specifications

Models	LP-5131	LP-5131-OD	LP-5141	LP-5141-OD
System Software				
OS	Linux kernel 2.6.19			
Embedded Service	Web Server, FTP Server, Telnet Server, SSH Server			
SDK Provided	Standard LinPAC SDK for Windows and Linux by GNU C language			
CPU Module				
CPU	PXA270, 520 MHz			
SDRAM	128 MB			
NVRAM	31 Byte (Battery backup, data valid up to 10 years)			
Flash	64 MB			
EEPROM	16 KB			
Expansion Flash Memory	microSD socket with one 2 GB microSD card (support up to 32 GB microSDHC card)			
RTC (Real Time Clock)	Provide second, minute, hour, date, day of week, month, year			
64-bit Hardware Serial Number	Yes, for Software Copy Protection			
Dual Watchdog Timers	Yes			
LED Indicator	3 Dual-Color LEDs (PWR, RUN, L1 ~ L4; RUN, L1 ~ L4 for user programmable)			
Rotary Switch	Yes (0 ~ 9)			
VGA & Communication Ports				
VGA	Yes 640 × 480 / 800 × 600			
Ethernet	RJ-45 x 1, 10/100 Base-TX (Auto-negotiating, Auto MDI/MDI-X, LED indicators)		RJ-45 x 2, 10/100 Base-TX (Auto-negotiating, Auto MDI/MDI-X, LED indicators)	
USB 1.1 (host)	2		1	
Audio (Microphone-In and Earphone-Out)	-	Yes	-	Yes
COM 1	RS-232 (RxD, TxD and GND); Non-isolated			
COM 2	RS-485 (Data+, Data-); 2500 V_{DC} isolated			
COM 3	RS-232 (RxD, TxD and GND); Non-isolated			
I/O Expansion				
I/O Expansion Bus	I/O expansion board optional			
Mechanical				
Dimensions (W x L x H)	91 mm x 132 mm x 52 mm			
Installation	DIN-Rail			
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			
Consumption	4.8 W	6 W	4.8 W	6 W

Ordering Information

LP-5131-EN CR	PAC with Linux kernel 2.6.19 and one LAN port (English Version of OS) (RoHS)
LP-5131-OD-EN CR	PAC with Linux kernel 2.6.19 and one LAN port and Audio (English Version of OS) (RoHS)
LP-5141-EN CR	PAC with Linux kernel 2.6.19 and two LAN ports (English Version of OS) (RoHS)
LP-5141-OD-EN CR	PAC with Linux kernel 2.6.19 and two LAN ports and Audio (English Version of OS) (RoHS)

Option Accessories

DP-660	24 V_{DC}/2.5 A, 60 W and 5 V_{DC}/0.5 A, 2.5 W Power Supply with DIN-Rail Mounting
DP-1200 CR	24 V_{DC}/5.0 A, 120 W Power Supply with DIN-Rail Mounting (RoHS)
MDR-20-24 CR	24 V_{DC}/1.0 A, 24 W Power Supply with DIN-Rail Mounting (RoHS)
MDR-60-24 CR	24 V_{DC}/2.5 A, 60 W Power Supply with DIN-Rail Mounting (RoHS)
XW-Board	Add-on I/O Expansion Board

Available soon **LP-5231 Series**

Features

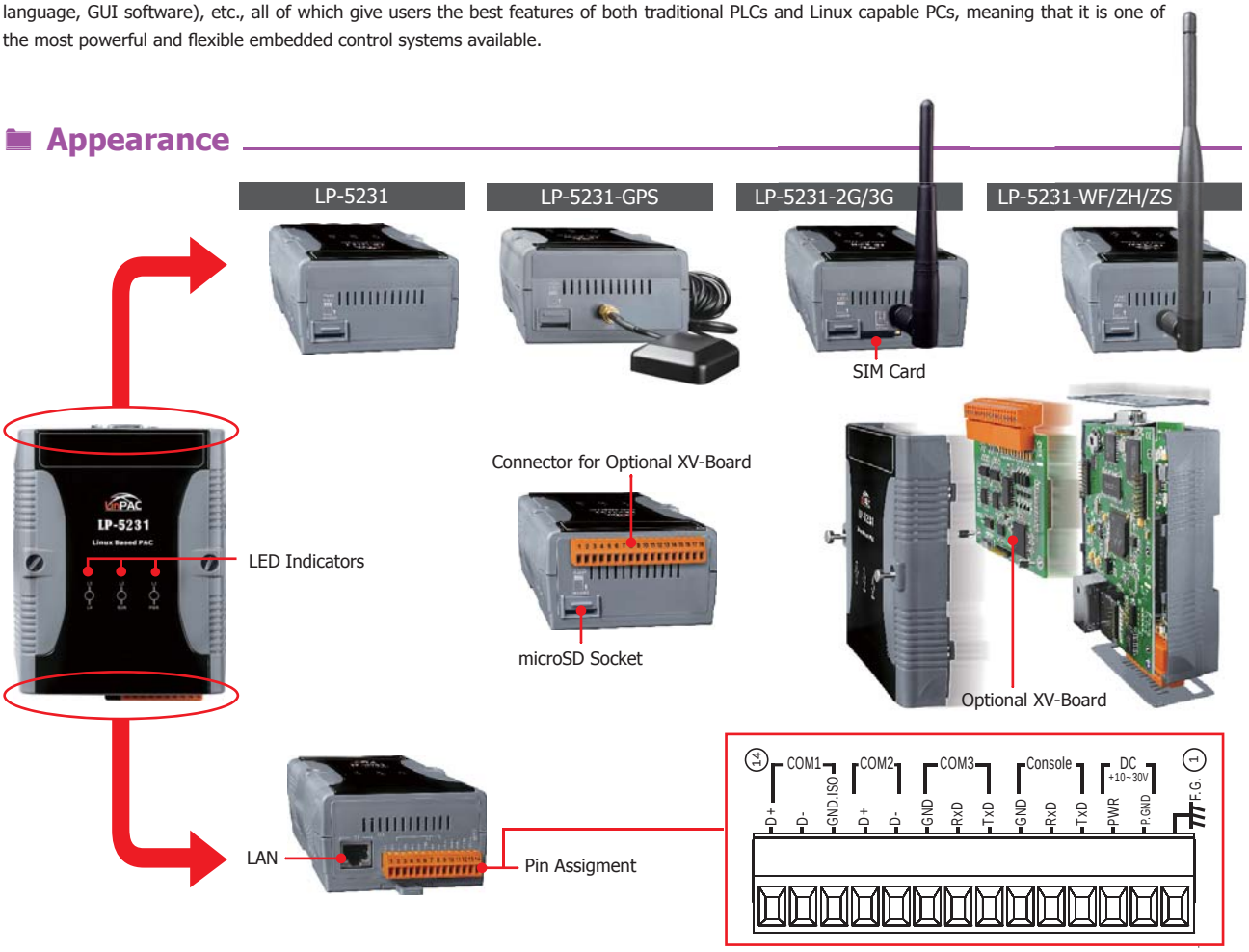
- AM335X, 720 MHz CPU
- Linux kernel 2.6.30 Inside
- Embedded Service: Web Server, FTP Server, Telnet Server, SSH Server
- 256 MB Flash, 128 MB SDRAM
- Built-in Ethernet, USB, RS-232, RS-485 Ports
- 64-bit Hardware Serial Number for Software Protection
- I/O Expansion Board Optional
- Wireless Module Options
- Operating Temperature: -25 ~ +75°C

Introduction

The LP-5231 series is equipped with a AM335X CPU (720 MHz) and running a Linux kernel 2.6.30 operating system, multiple communication interfaces, such as USB, Ethernet, RS-232/485 and optional internal wireless module. The internal wireless module option includes 2G, 3G, ZigBee, Wi-Fi, GPS for different wireless application. Further more, it also contains an optional I/O expansion board to implement various I/O functions, such as DI, DO, A/D, D/A.

Main advantage of the LP-5231 series is its high quality control system, including its stability, small core size, optional I/O expansion board, support for Web services (Web/FTP/Telnet/SSH server), and multiple development environments (LinPAC SDK for Linux and Windows environment using the GNU C language, GUI software), etc., all of which give users the best features of both traditional PLCs and Linux capable PCs, meaning that it is one of the most powerful and flexible embedded control systems available.

Appearance



Specifications

Models	LP-5231	LP-5231-GPS	LP-5231-2G	LP-5231-3G	LP-5231-WF	LP-5231-ZH	LP-5231-ZS
System Software							
OS	Linux kernel 2.6.30						
Embedded Service	Web Server, FTP Server, Telnet Server, SSH Server						
SDK Provided	Standard LinPAC SDK for Windows and Linux by GNU C language						
CPU Module							
CPU	AM335X, 720 MHz						
DDR2 SDRAM	128 MB						
Flash	256 MB						
EEPROM	16 KB						
Expansion Flash Memory	microSD socket with one 2 GB microSD card (support up to 32 GB microSDHC card)						
RTC (Real Time Clock)	Provide second, minute, hour, date, day of week, month, year						
64-bit Hardware Serial Number	Yes, for Software Copy Protection						
Dual Watchdog Timers	Yes						
LED Indicators	1 LED for Power and Running; 2 LED for user defined						
Communication Ports							
Ethernet	RJ-45 x 1, 10/100 Based-TX (Auto-negotiating, Auto MDI/MDI-X, LED indicators)						
USB 2.0 (host)	1						
Console	RS-232 (RxD, TxD and GND); Non-isolated, Reserved for OS						
COM 1	RS-485 (Data+, Data-); 2500 V_{DC} isolated						
COM 2	RS-485 (Data+, Data-); Non-isolated						
COM 3	RS-232 (RxD, TxD and GND); Non-isolated						
Wireless Port	-	GPS	2G (GPRS)	3G (WCDMA)	Wi-Fi	ZigBee (Host, Coordinator)	ZigBee (Slave, Full FunctionDevice)
I/O Expansion							
I/O Expansion Bus	Yes, one optional XV-board						
Mechanical							
Dimensions (W x L x H)	91 mm x 132 mm x 52 mm						
Installation	DIN-Rail 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}						
Consumption	4.8 W						

Ordering Information

LP-5231-EN CR	PAC with Linux kernel 2.6.30 and one LAN port (English Version of OS) (RoHS)
LP-5231-GPS-EN CR	PAC with Linux kernel 2.6.30 and one LAN port and GPS module (English Version of OS) (RoHS)
LP-5231-2G-EN CR	PAC with Linux kernel 2.6.30 and one LAN port and 2G (GPRS) module (English Version of OS) (RoHS)
LP-5231-3G-EN CR	PAC with Linux kernel 2.6.30 and one LAN port and 3G (WCDMA) module (English Version of OS) (RoHS)
LP-5231-WF-EN CR	PAC with Linux kernel 2.6.30 and one LAN port and Wi-Fi (802.11 b/g) module (English Version of OS) (RoHS)
LP-5231-ZH-EN CR	PAC with Linux kernel 2.6.30 and one LAN port and ZigBee (Host, Coordinator) module (English Version of OS) (RoHS)
LP-5231-ZS-EN CR	PAC with Linux kernel 2.6.300 and one LAN port and ZigBee (Slave, Full Function Device) module (English Version of OS) (RoHS)

Option Accessories

DP-660	24 V_{DC}/2.5 A, 60 W and 5 V_{DC}/0.5 A, 2.5 W Power Supply with DIN-Rail Mounting
DP-1200 CR	24 V_{DC}/5.0 A, 120 W Power Supply with DIN-Rail Mounting (RoHS)
MDR-20-24 CR	24 V_{DC}/1.0 A, 24 W Power Supply with DIN-Rail Mounting (RoHS)
MDR-60-24 CR	24 V_{DC}/2.5 A, 60 W Power Supply with DIN-Rail Mounting (RoHS)
XV-Board	Add-on I/O Expansion Board

8.4. I/O Expansion Boards

• Overview

One PAC can only plug only one XV-Board or XW-Board.

	XV-Board	XW-Board
PAC Supported	WP-50xx, LP-50xx	uPAC-5000, WP-51xx, LP-51xx
Bus Type	Serial	Parallel
Bus Speed	Slow	Fast
DIO Board	Yes	Yes
Multifunction Board (AI+AO+DIO)	Yes	Yes
RS-232/485 Board	-	Yes

Relay output Board		
Models		**XV116**
Pictures		Available soon 
Relay Output		
Channel		6
Type		Form A (SPST N.O.)
Operating Voltage Range		250 V_{AC} or 30 V_{DC}
Max. Load Current		Relay 0 ~ 1: 2 A Relay 2 ~ 5: 4 A
Operating Time		Relay 0 ~ 1: 4 ms Max. Relay 2 ~ 5: 5 ms Max.
Release Time		Relay 0 ~ 1: 6 ms Max. Relay 2 ~ 5: 1 ms Max.
Mechanical Life		Relay 0 ~ 1: 100 x 10^6 cycles Relay 2 ~ 5: 30 x 10^6 cycles
On-Resistance		-
Off-State Leakage Current		-
Intra-module Isolation, Field to Logic		3750 V_{DC}
Digital Input		
Channel		5
Contact		Wet
Sink/Source (NPN/PNP)		Sink/Source
Wet Contact	On Voltage Level	+10 V_{DC} ~ 50 V_{DC}
	Off Voltage Level	+4 V_{DC} Max.
Input Impedance		10 KΩ
Overvoltage Protection		60 V_{DC}
Intra-module Isolation, Field to Logic		3750 V_{DC}
Power Requirements		
Consumption		1W

DIO Board

Models		XV107i	XV107Ai	XV110i	XV111i	XV111Ai
Pictures						
Digital Input						
Channel		8	8	16	-	-
Contact		Wet	Wet	Dry+Wet		
Sink/Source (NPN/PNP)		Source	Sink	Sink/Source		
Wet Contact	On Voltage Level	+10 VDC ~ +50 VDC				
	Off Voltage Level	+4 VDC Max.				
Dry Contact	On Voltage Level	-		Close to GND		
	Off Voltage Level	-		Open		
Counters	Max. Count	65535 (16-bit)				
	Max. Input Frequency	100 Hz				
	Min. Pulse Width	5 ms				
Input Impedance		10 KΩ				
Overvoltage Protection		70 VDC				
Intra-module Isolation, Field to Logic		3750 VDC				
Digital Output						
Channel		8		-	16	
Type		Open Collector	Open Emitter	-	Open Collector	Open Emitter
Sink/Source (NPN/PNP)		Sink	Source	-	Sink	Source
Load Voltage		+3.5 VDC ~ 50 VDC	+10 VDC ~ 40 VDC	-	+3.5 VDC ~ 50 VDC	+10 VDC ~ 40 VDC
Max. Load Current		700 mA/channel		-	600 mA/channel	
Overload Protection		1.4 A		-	1.4 A	
Intra-module Isolation, Field to Logic		3750 VDC		-	3750 VDC	
Power Requirements						
Consumption		0.2 W		0.6 W	0.3 W	

DIO Board

Models		XW107	XW107i	XW110i
Pictures				
Digital Input				
Channel		8	8	16
Contact		Dry	Wet	Dry + Wet
Sink/Source (NPN/PNP)		Source	Sink/Source (Jumper setting)	Sink/Source
Wet Contact	On Voltage Level	-	+10 VDC ~ +50 VDC	+10 VDC ~ +50 VDC
	Off Voltage Level	-	+4 VDC Max.	+4 VDC Max.
Dry Contact	On Voltage Level	Close to GND	-	Close to GND
	Off Voltage Level	Open	-	Open
Input Impedance		-	10 KΩ	10 KΩ
Overvoltage Protection		30 VDC	60 VDC	60 VDC for Wet Contact
Intra-module Isolation, Field to Logic		-	3750 Vrms	3750 Vrms
Digital Output				
Channel		8		-
Type		Open Collector		
Sink/Source (NPN/PNP)		Sink		
Load Voltage		+10 VDC ~ 40 VDC		
Max. Load Current		200 mA/channel		
Overload Protection		1.4 A		
Intra-module Isolation, Field to Logic		-	3750 Vrms	
Power Requirements				
Consumption		0.2 W	0.4 W	0.6 W

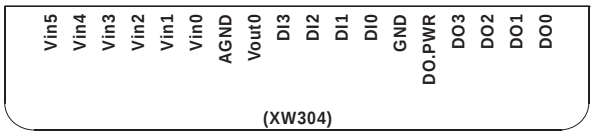
Multifunction Board

Models		XV304i	XV308i	XV310i	XV305i
Pictures					
Analog Input					
Channel		6	8	4	8
Wiring		Single-Ended			Differential
Sensor Type		+/- 1 V, +/- 2.5 V, +/- 5 V, +/- 10 V, 0 ~ 20 mA, 4 ~ 20 mA, +/-20 mA (Jumper selectable)			**Thermistor** Precon ST-A3, Fenwell U, YSI L100, YSI L300, YSI L1000, YSI B2252, YSI B3000, YSI B5000, SI B6000, YSI B10000, YSI H10000, YSI H30000, User-defined
Resolution	Normal Mode	14-bit			16-bit
	Fast Mode	12-bit			
Sampling Rate	Normal Mode	10 Hz			8 Hz
	Fast Mode	200 Hz			
Input Impedance		10 MΩ			-
Overvoltage Protection		120 V_{DC}			
Overcurrent Protection		1000 mA			
Isolation		2500 V_{DC}			
Analog Output					
Channel		1	-	2	-
Range		0 ~ 10 V_{DC}, 0 ~ 20 mA, 4 ~ 20 mA, (Jumper selectable)		0 ~ 10 V_{DC}, 0 ~ 20 mA, 4 ~ 20 mA, (Jumper selectable)	
Resolution		12-bit		12-bit	
Output Capacity		20 mA		10 mA	
Isolation		2500 V_{DC}		2500 V_{DC}	
Digital Input					
Channel		4			-
Contact		Dry			
Sink/Source (NPN/PNP)		Source			
Wet Contact	On Voltage Level	Close to GND			
	Off Voltage Level	Open			
Overload Protection		30 V_{DC}			
Digital Output					
Channel		4	4	4	8
Type		Open Collector			
Sink/Source (NPN/PNP)		Sink			
Load Voltage		+10 V_{DC} ~ +50 V_{DC}			
Max. Load Current		700 mA/Channel			
Overload Protection		1.4 A			
Power Requirements					
Consumption		1 W			

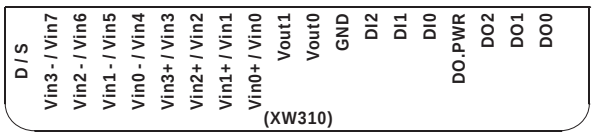
Multifuntion Board				
Models		**XW304**	**XW310**	**XW310C**
Pictures				
Analog Input				
Channel		6	4	4/8
Wiring		Single-Ended	Differential	Differential/Single-Ended
Range		+/- 5 V, 0 ~ +5 V	+/- 10 V	0 ~ 20 mA
Resolution		12-bit		
Sampling Rate		4 KHz		
Input Impedance		1 MΩ		125 Ω
Over voltage Protection		+/- 30 V_{DC}		
Isolation		non-isolated		
Analog Output				
Channel		1	2	2
Range		+/- 5 V	+/- 10 V	0 ~ 20 mA
Resolution		12-bit		
Output Capacity		20 mA	20 mA	20 mA
Isolation		non-isolated		
Digital Input				
Channel		4	3	3
Contact		Dry		
Dry Contact	On Voltage Level	Close to GND		
	Off Voltage Level	Open		
Overvoltage Protection		30 V_{DC}		
Digital Output				
Channel		4	3	3
Type		Open Collector		
Sink/Source (NPN/PNP)		Sink		
Load Voltage		+10 V_{DC} ~ 40 V_{DC}		
Max. Load Current		200 mA/channel at 25°C		
Overload Protection		1.4 A		
Power Requirements				
Consumption		0.3 W	0.9 W	0.4 W

Pin Assignments

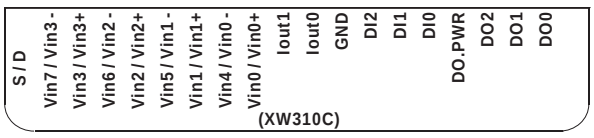
XW304



XW310



XW310C

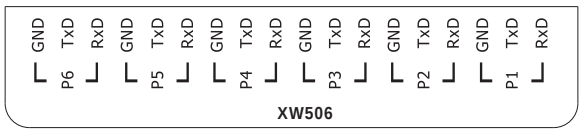


Serial Port Board

Models	XW506	XW509	XW507	XW508	XW511i	XW514
Pictures						
Serial Port						
Type	RS-232	RS-232	RS-422/485	RS-232	RS-485	RS-485
Port	6	2	1	8	4	8
Wire	TxD, RxD, GND	TxD, RxD, GND and TxD, RxD, CTS, RTX, GND	TxD+/D+, TxD-/D-, RxD+, RxD-, GND	TxD, RxD, GND	Data+, Data-	
Controller	16C550 compatible		16C950 compatible			
	Speed: 115200 bps Max.					
	Data bit : 7, 8					
	Stop bit : 1, 1.5, 2					
	Parity : None, Even, Odd, Mark, Space					
	FIFO: Internal 16 bytes for each port		FIFO: Internal 128 bytes for each port			
Intra-module Isolation, Field to Logic	-				2500 V_{rms}	-
Digital Input						
Channel	-	4	5	-		
Contact		Wet				
Sink/Source (NPN/PNP)		Sink/Source				
Wet Contact: On Voltage Level		+10 V_{DC} ~ +50 V_{DC}				
Wet Contact: Off Voltage Level		+4 V_{DC} Max.				
Dry Contact: On Voltage Level		-				
Dry Contact: Off Voltage Level		-				
Input Impedance		10 KΩ				
Overvoltage Protection		60 V_{DC}				
Intra-module Isolation, Field to Logic		3750 V_{rms}				
Digital Output						
Channel	-	4	5	-		
Type		Open Collector				
Sink/Source (NPN/PNP)		Sink				
Load Voltage		+10 V_{DC} ~ +40 V_{DC}				
Max. Load Current		200 mA/channel				
Overload Protection		1.4 A				
Intra-module Isolation, Field to Logic		3750 V_{rms}				
Power Requirements						
Consumption	0.2 W Max.	0.5 W Max.	0.4 W Max.	0.2 W Max.	0.8 W Max.	0.6 W Max.

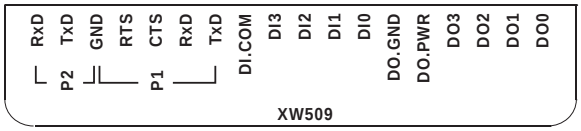
Pin Assignments

XW506

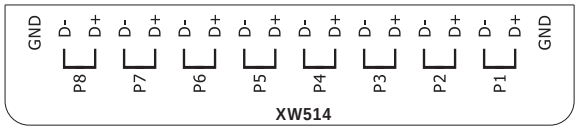


XW507

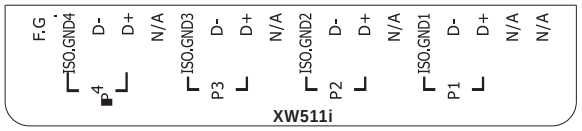
XW509



XW514



XW511i



Redundant System

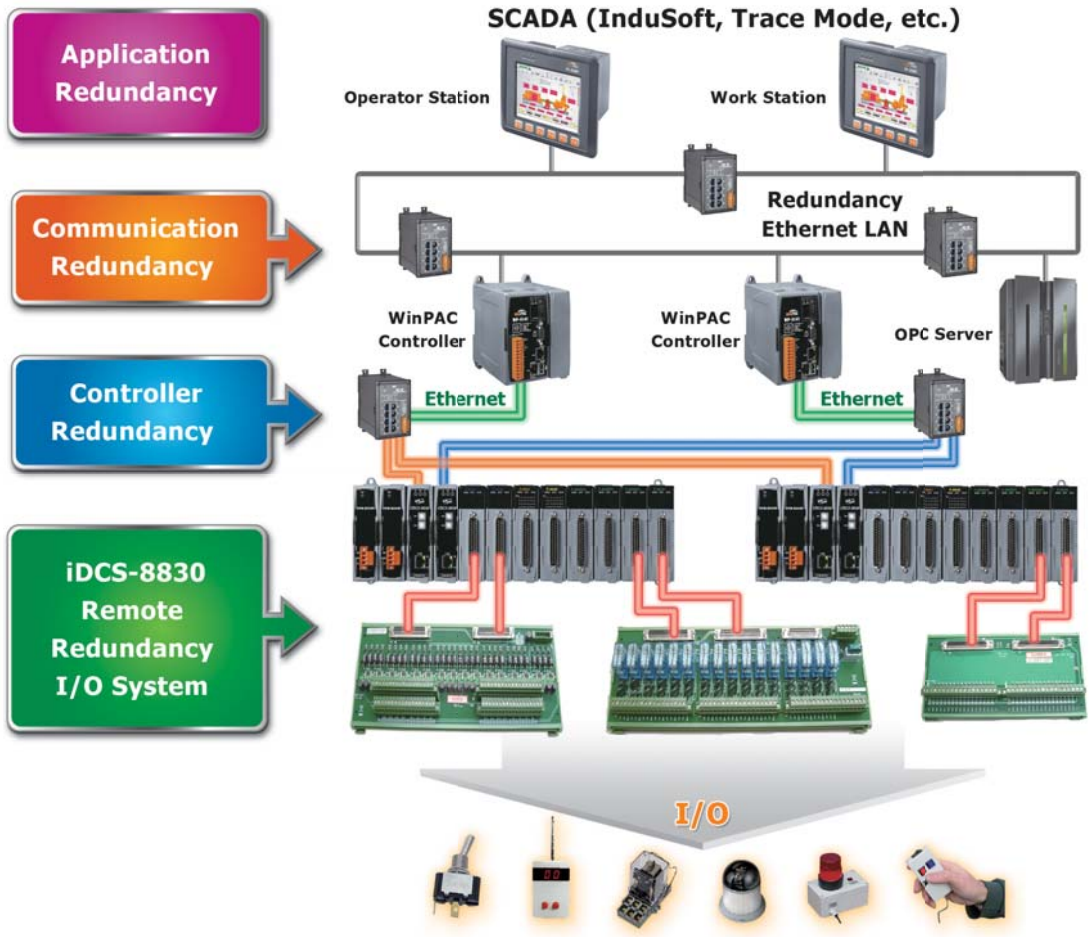
9

9.1.	Redundant System	P9-1-1

9.1. Redundant System

• Overview

Redundancy is a common approach to improve the reliability and availability of a system, with cost increasing and higher complexity of system design. However, if the system is not reliable enough, redundancy may be an attractive option.
For the need of these high reliable systems, ICP DAS provides the SCADA, Communication, Controllers and I/O redundant solutions.



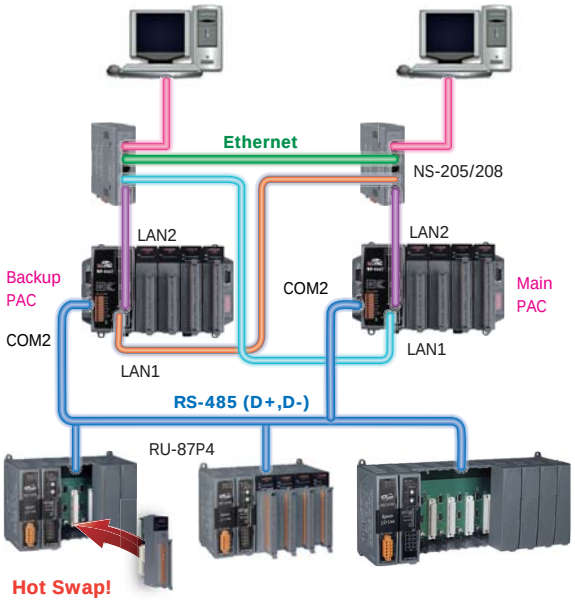
Product with Redundant function

Item	Product	Description
Redundant Application	SCADA (InduSoft, Trace Mode, etc.)	• Deliver the powerful redundant HMI and SCADA software • Support Web-based application • Support for Secondary Database in the modes of "Redundancy" or "Store and Forward" • HMI and SCADA systems
Redundant Communication	RS-405/RSM-405 RS-408/RSM-408 RS-405F/RSM-405F series RSM-405-R	• Support up to 2 fiber and 8 Ethernet • Recover from a copper link failure within approximately 20 ms • 10/100 Mbps speed auto negotiation • Redundant Power Inputs +10 ~ +30 V_{DC} • Power failure alarm by relay output
Redundant Controller	WP-8xx7, XP-8047-CE6	• Support IEC 61131-3 standard • Redundancy switchover time is about 1 sec. • Support Local I/O modules • Redundant Power Inputs
Redundant I/O	iDCS-8000 series	• Dual communication with Modbus TCP protocol • Support redundant I/O modules up to 4 groups • Hot Swap and Auto Configuration I/O modules • Support Local I/O modules

1. Redundant PACs with RS-485 I/O

Features:

- Redundant PACs
- ISaGRAF PAC (WP-8xx7, XP-8047-CE6)
- Modbus TCP protocol for connecting PCs and PACs
- Redundancy switchover time is about 1 sec.
- RS-485 network for connecting PACs and I/O modules
- Hot Swap and Auto Configuration I/O modules

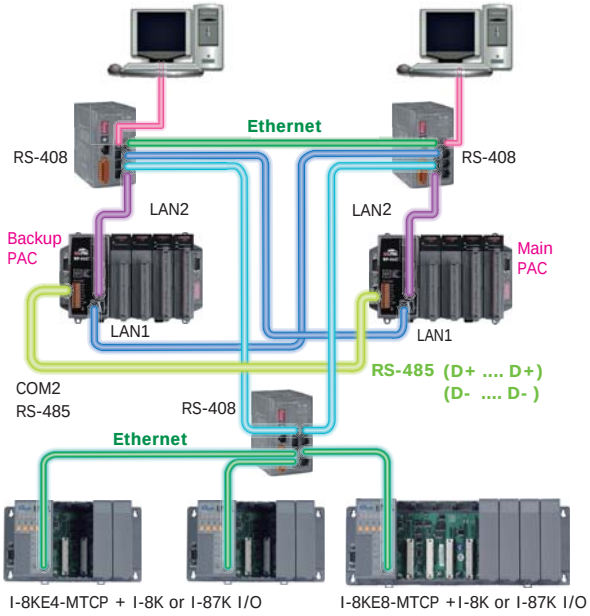


RU-87P4/8 + I-87K I/O (High Profile Modules)

2. Redundant PACs with Ethernet I/O

Features:

- Redundant PACs
- ISaGRAF PAC (WP-8xx7, XP-8047-CE6)
- Modbus TCP protocol for connecting PCs and PACs
- Redundancy switchover time is about 1 sec.
- Ethernet network for connecting PACs and I/O modules
- Hot Swap and Auto Configuration I/O modules



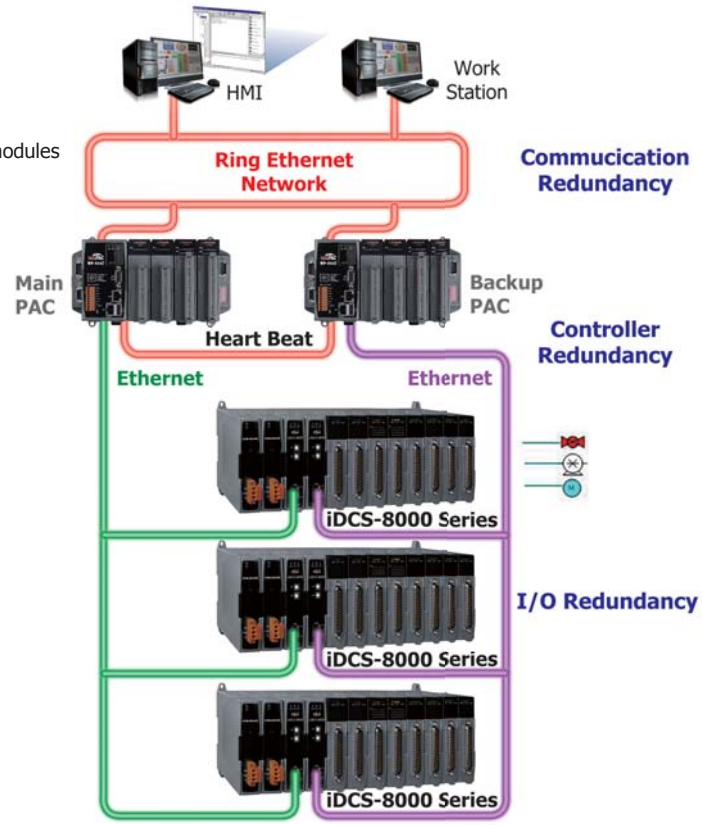
I-8KE4-MTCP + I-8K or I-87K I/O

I-8KE8-MTCP +I-8K or I-87K I/O

3. Redundant PACs with DCS I/O

Features:

- Redundant PACs
- Redundant Ethernet network for connecting PACs and DCS I/O modules
- Redundant power supply for DCS I/O modules
- Redundant DCS I/O modules
- ISaGRAF PAC (XP-8047-CE6)
- Modbus TCP protocol for connecting PCs and PACs
- Redundancy switchover time is about 1 sec.
- Ethernet network for connecting PACs and DCS I/O modules
- Hot Swap and Auto Configuration DCS I/O modules



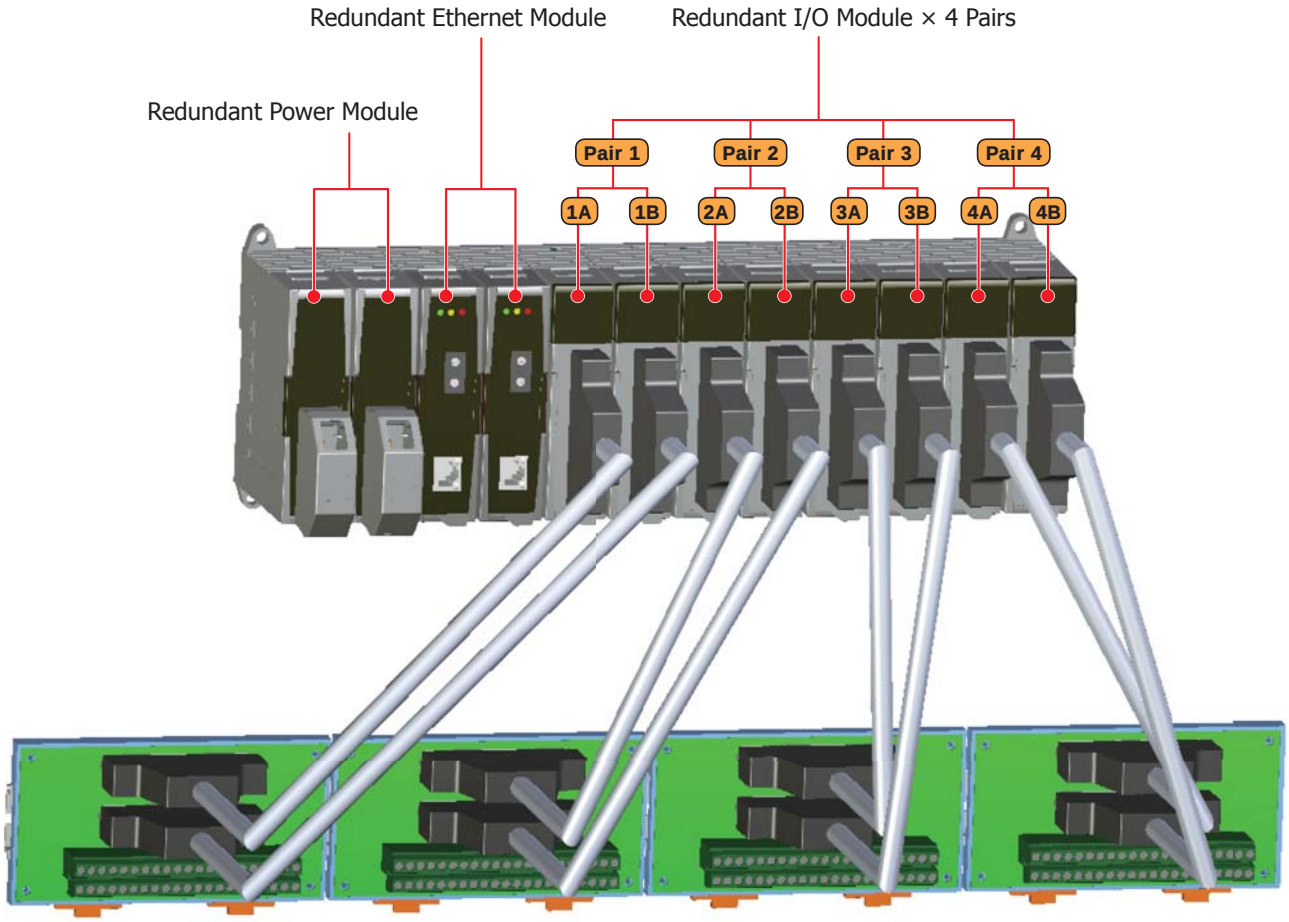
Available soon **iDCS-8830/iDCS-8830R**

Features

- Support Modbus TCP protocol
- Support DI/DO/AI/AO/Counter/Frequency/ HART modules
- Support redundant communication and power modules
- Support redundant I/O modules
- I/O configurable via the Ethernet
- Support Hot-swap and auto configuration
- Support power-on value and safe value for analog/digital output module
- Allows maximum of 4 clients access simultaneously
- Maximum 256 digital I/O in one iDCS-8830
- Maximum 64 analog output in one iDCS-8830
- Maximum 128 analog input in one iDCS-8830

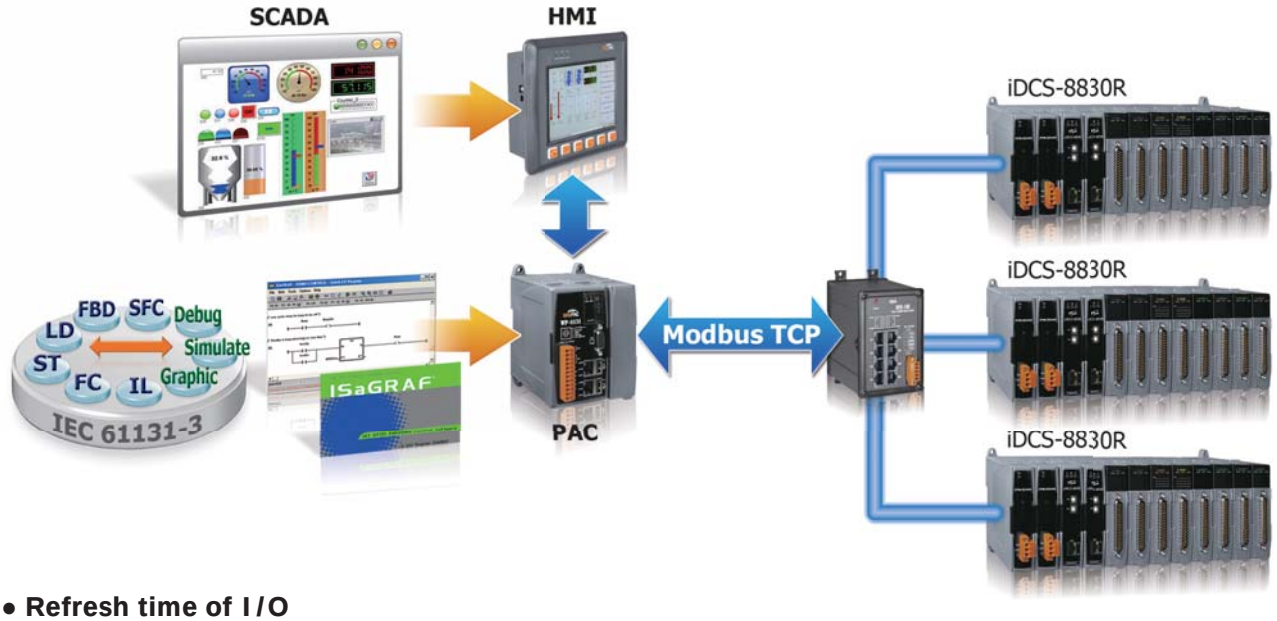
Introduction

The iDCS-8830 is a remote I/O unit in a dual redundant configuration with Modbus TCP protocol. Two communication processors and powers are installed in a backplane, which can install up to 8 I/O modules, such as DI, DO, AI, AO, PI, PO, HART... etc, of iDCS-8830. These I/O modules can be either configured as individual or redundant I/O modules, depending upon the actual requirement. There is up to 4 groups of redundant I/O modules can be used in the iDCS-8000 Series.



• Ethernet based data acquisition I/O unit

The iDCS-8830/iDCS-8830R is a remote Ethernet I/O unit supporting Modbus/TCP protocol. Specifically, the unit is used in industrial environment to control and acquire remote I/O device. As demand, it can be expanded to multiple remote I/O units. Moreover, due to the open Modbus TCP protocol, most SCADA software with built-in Modbus TCP Communication protocol can easily and quickly integrate the iDCS-8830 to the SCADA software as data acquisition and monitor onto the environment.



• Refresh time of I/O

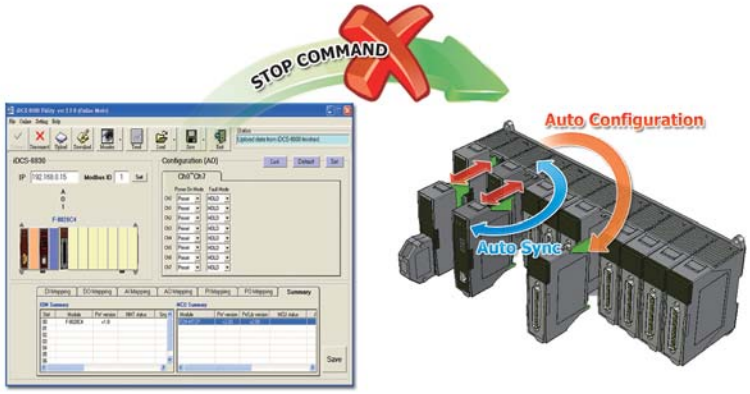
The time of data interchange between the communication module and I/O module depends on the sampling rate of the I/O module.

• Hot-Swap

There is no need to shutdown or stop the system while changing or replacing modules.

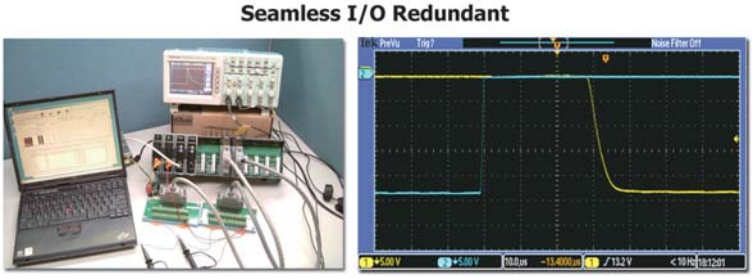
• Auto Configuration

After module replacement, the last settings will be automatically configured.



• High Speed for I/O Switch

When master module is removed from any situation, the slave module would take over the work as soon as possible, and so the sensor or loader would not detect that switching.



• Dedicated Termination Board (Daughter Board)

I/O module has a dedicated external terminal board and the cable which can reduce wiring time, installation effort/costs, and prevent wiring faults.
Every Daughter Board has EMS protection and all terminators are removable.

Utility

- On-line configuration via Ethernet
- Configuration export/import
- Configure I/O modules parameters
- Auto scan/monitor I/O data and status
- Digital/Analog I/O output control
- Power-on value, safe value setting
- Event datalog

Specifications

Models	iDCS-8830	iDCS-8830R
System		
Communication protocol	Modbus TCP Slave	
Watchdog Timers	Yes (0.8 second)	
IP Address	Set by Rotary Switch	
LED Indicators	Yes	
Power-on Value and Safe value	Yes (programmable)	
Communication Ports		
COM 1	RS-232 (to update firmware)	
Ethernet Port	RJ-45 x 2, 10/100 Base-TX (Auto negotiating, Auto MDI/MDI-X, LED indicators	
I/O Expansion Slots		
Slot Number	8	
Hot Swap	Yes	
Auto Configuration	Yes	
I/O redundancy	Max 4 groups I/O Redundancy (programmable)	
Mechanical		
Dimensions (W x L x H)	374 mm x 132 mm x 100 mm	
Installation	DIN-Rail or Wall Mounting	
Environmental		
Operating Temperature	-25 ~ +75°C	
Installation	-30 ~ +80°C	
Ambient Relative Humidity	10 ~ 90% RH (non-condensing)	
Power		
Input Range	+10 ~ +30 V_{DC}	
Isolation	1 kV	
Protection	Power reverse polarity protection	
Short Circuit Protection	Yes	
Capacity	40 W	

Ordering Information

Type	Pictures	Model Name	Description
Single Unit		**iDCS-8830**	1 × Power (FPM-D2440) + 1 × Communication Module(FCM-MTCP) + 1 × 8 I/O slot Backplane
Redundancy Unit		**iDCS-8830R**	2 × Power (FPM-D2440) + 2 × Communication Module(FCM-MTCP) + 1 × 8 I/O slot Backplane

I/O Module Selection Guide

Type		Name	Pictures	Description	Terminal Board
Power Module		**FPM-D2440**		18 ~ 30 VDC Input, 3 5W @ 5 VDC Output and 120W @ 24 VDC Output.	-
Communication Module		**FCM-MTCP**		Support Modbus TCP/IP Protocol and Module Auto-configuration.	-
Digital	DI	**F-8040**		32-channel DI (Sink/Source Type) Module, One Common for 32-channel,LED Display.	DN-DI-32F DN-DI-32W
	DO	**F-8041**		32-channel DO (Sink Type) Module, Open-collector(NPN),LED Display.	DN-DO-16DR-A DN-DO-16DR-B DN-DO-16FRW-A DN-DO-16FRW-B
		F-8041P		16-channel ONESHOT Mode /Continuous Mode, One COM for 32-channel.	
Pulse	PI	**F-8084**		8-channel PI(Source/Sink Type) Module, Maximum input Frequency: Single 500KHz /Duplex 10KHz	DN-PI-08
Analog I/O	AII	**F-8017C1**		8-channel Single-End/Differential Current Input Module, Support 24 VDC Power Output.	DN-AIO-08F
		F-8017C2		16-channel Differential Current Input.	DN-AIO-16F
		F-8017CH		8-channel Single-End/Differential Current Input Module, Support 24 VDC Power Output and HART Protocol.	DN-AIO-08F
	AIV	**F-8017V**		8-channel Differential Voltage Input	DN-AIO-08F
	AO	**F-8028CV**		8-channel Voltage/Current Output Module, One GND for 8 ch.	DN-AIO-16F
		F-8028CH		8-channel Current Output Module, Support 24 VDC Power Output and HART Protocol.	DN-AIO-08F
Temperature	RTD	**F-8015**		8-channel RTD (3-Wire) Module, Support Sensor Type: Pt100, Pt1000, JPt100	DN-RTD-08
	TC	**F-8019**		8-channel Differential Thermocouple (J, K, T, E, R, S, B, N, C) and Voltage Input.	DN-TC-08

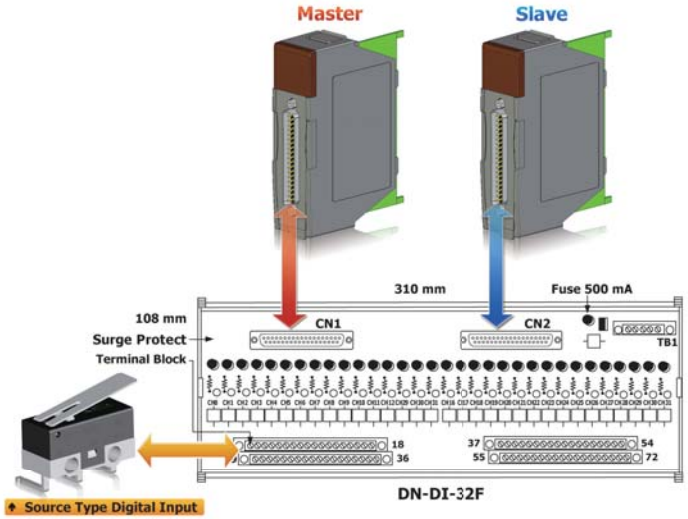
Termination Board

DN - TTT - NN - $X_1X_2X_n$ - 0

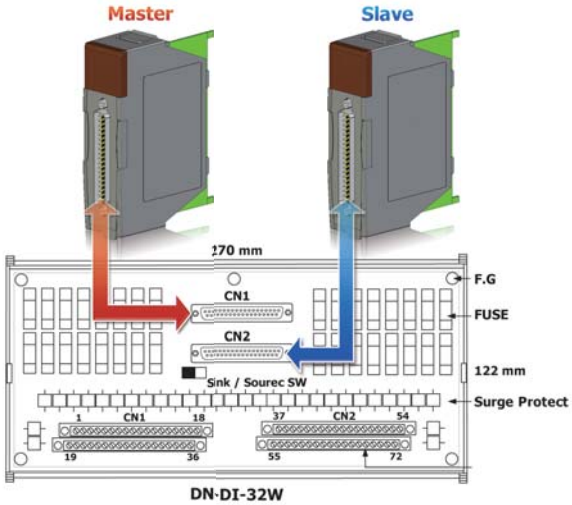
- DN: Daughter Board
- TTT: I/O Type
- NN: Channel numbers
- $X_1X_2X_n$: Function
- 0: Sub Version

I/O Type	DI, DO, AI, AO, AIO, TC, RTD etc...
Function	D: Dry Contact
	W: Wet Contact
	F: EMS Protect
	R: Relay Board

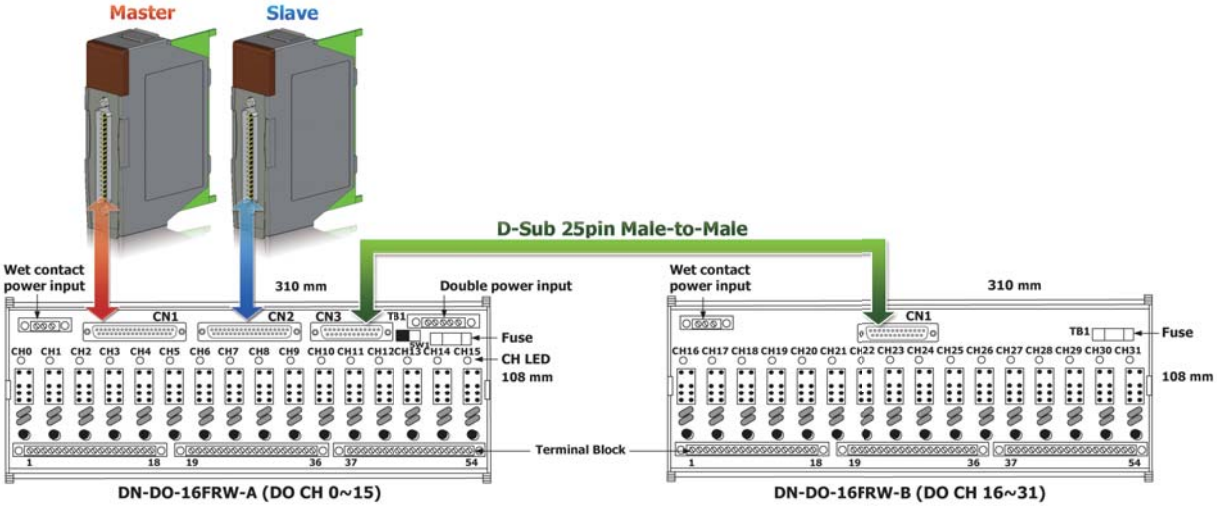
Termination Board for Digital I/O



DN-DI-32F

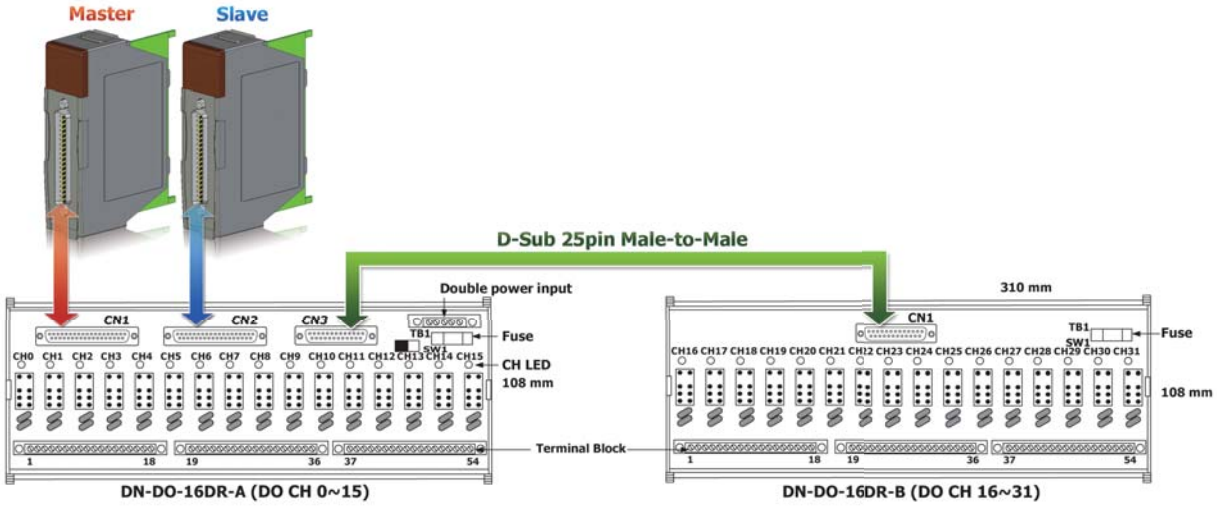


DN-DI-32W



DN-DO-16FRW-A (DO CH 0~15)

DN-DO-16FRW-B (DO CH 16~31)



DN-DO-16DR-A (DO CH 0~15)

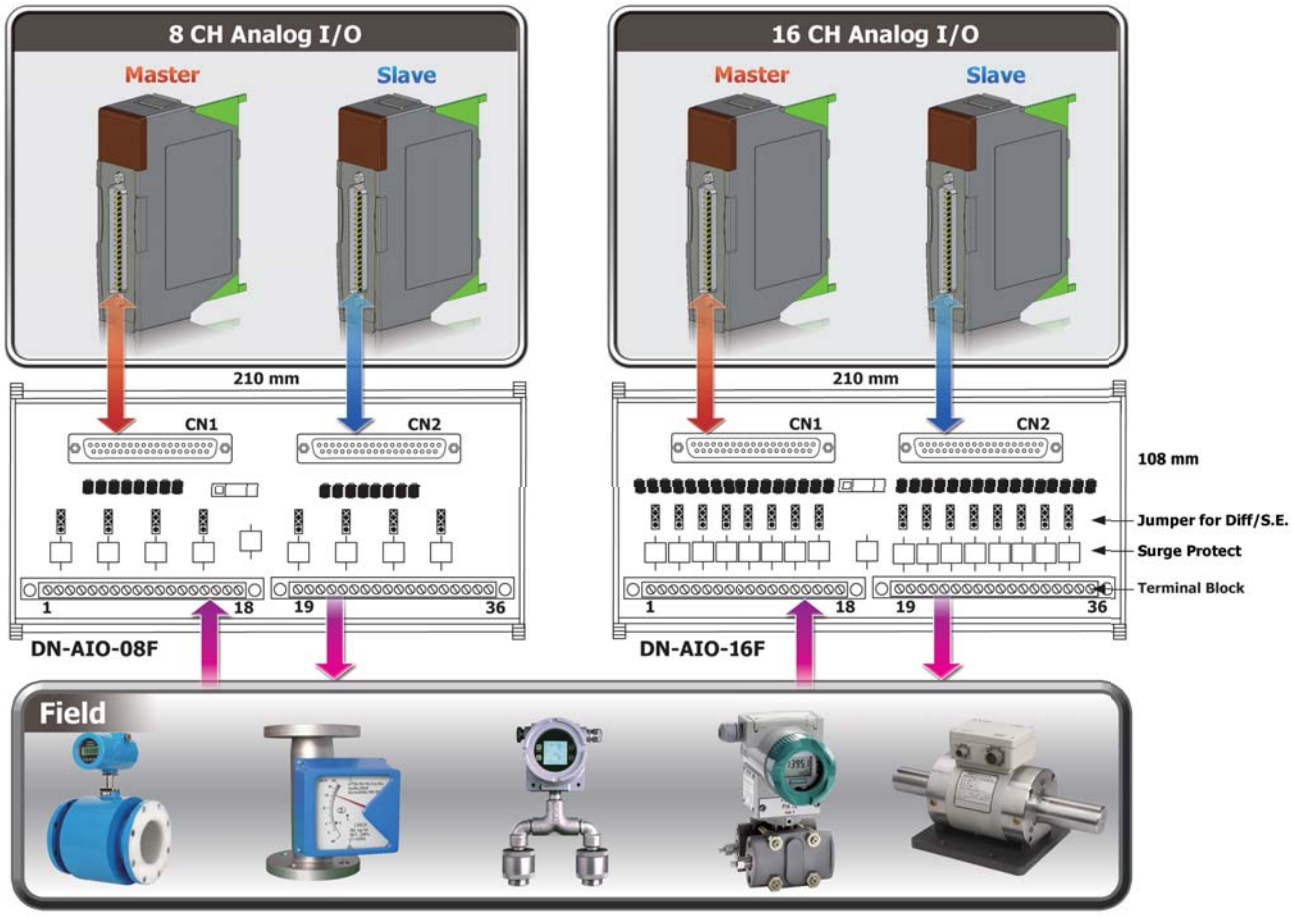
DN-DO-16DR-B (DO CH 16~31)

Model Name	Function Description	Support I/O
DN-DI-32F	• 32-channel Digital Input(Source Type)with LED Display. • EMS Protection • All channels have the 100mA fuse to protect overload, and the fuse is replaceable.	F-8040
DN-DI-32W	• 32-channel Digital Input.(Both of Sink and Source Type) • EMS Protection • All of channels have the 320mA fuse to protect overload • The fuse have the broke alarm and can be replaced.	F-8040
DN-DO-16DR-A DN-DO-16DR-B	• 16-channel Relay Output (Form C, AC/DC , 6A/per channels)(Dry Contact) with LED Display. • EMS Protection • Board A Support F-8041's channel 0 ~ 15. • Board B Support F-8041's channel 16 ~ 31 and must attached to DN-DO-16DR-A or DN-DO-16FRW-A.	F-8041
DN-DO-16FRW-A DN-DO-16FRW-B	• 16-channel Relay Output (Form C, AC/DC, 2A/per channels) (Wet Contact) with LED Display. • All channels have the 2A fuse in the secondary side to protect overload. • The wet power input supports AC or DC. • EMS Protection • A board is controlled by the F-8041's channel 0 ~ 15. • B board is controlled by F-8041's channel 16 ~ 31 and it is must be attached to DN-DO-16DR-A or DN-DO-16FRW-A.	F-8041

Termination Board for Pulse I/O Module

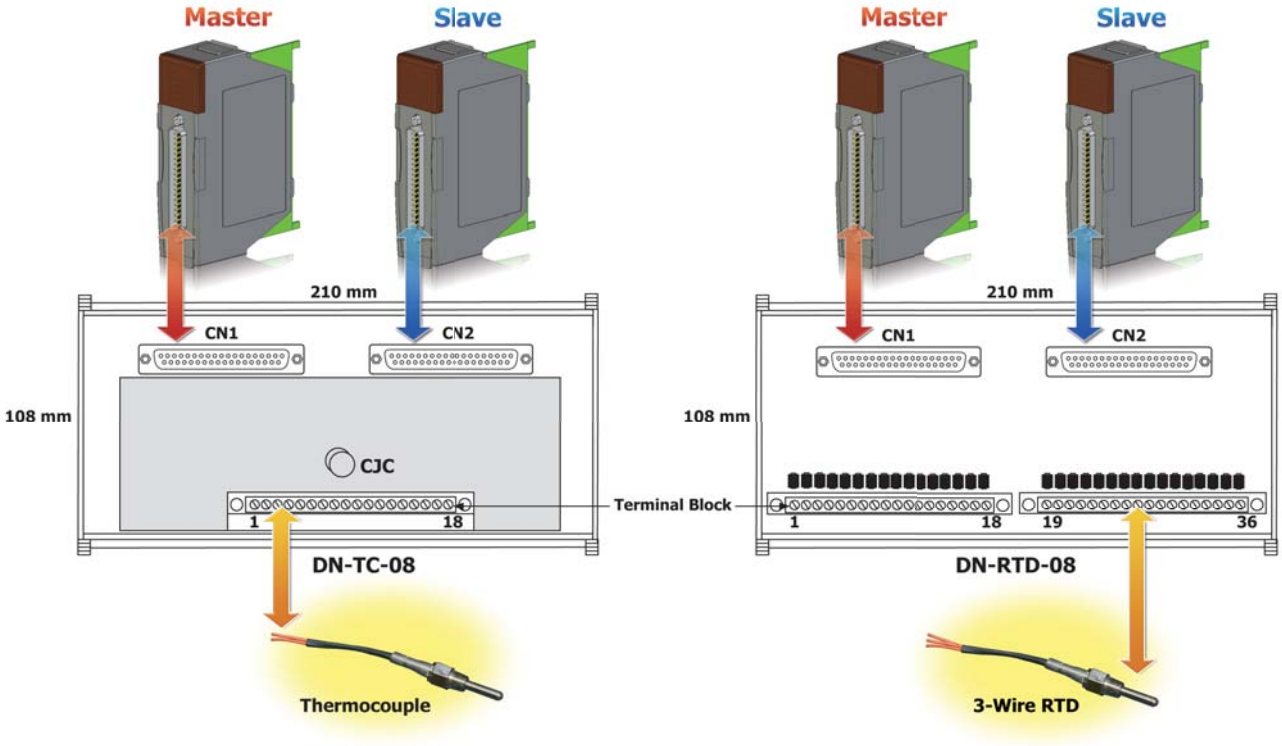
Model Name	Function Description	Support I/O
DN-PI-08	• 8-channel pulse input • Support 2wire, 3wire ,4 wire connection	F-8084

Termination Board for Analog I/O Module



Model Name	Function Description	Support I/O
DN-AIO-08F	• 8-channel Analog Input or Output. • EMS Protection • Jumper select channel Differential or Single-End wiring.	F-8017C1 F-8017H F-8017V F-8028CH
DN-AIO-16F	• 16-channel Analog Input or Output. • EMS Protect (Include >4KV Surge, ESD, etc..) • Jumper select channel Differential or Single-End wiring.	F-8017C2 F-8028CV

Termination Board for Temperature I/O Module



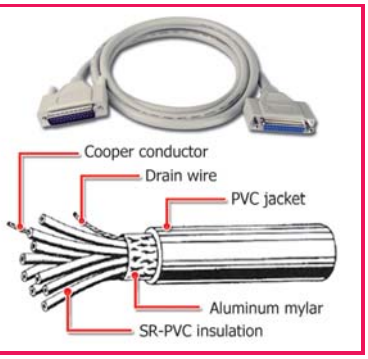
Model Name	Function Description	Support I/O
DN-TC-08	• 8-channel TC. • CJC Compensate.	F-8019
DN-RTD-08	• 8-channel 3wire RTD.	F-8015

General Termination

Model Name	Function Description	Support I/O
DN-37-A	• D-Sub 37pin Connector to I/O Connector Block	ALL

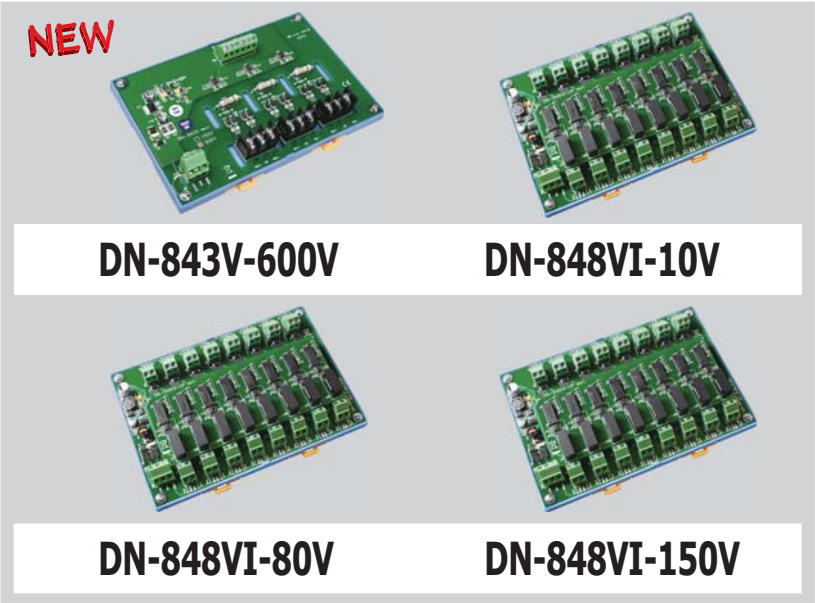
Components

Type Name	Model Name	Description
Blank I/O Module	**4SIPP-801W-CAG**	Blank I/O Module
Rackmount kit	**FRMK**	Install iDCS-8000 series in the 19 inch-rack.
Cable	**CA-01**	D-Sub 37pin Female-Male 1m Cable, 24AWG, 180, UL-2464
	CA-02	D-Sub 37pin Female-Male 2m Cable, 24AWG, 180, UL-2464
	CA-03	D-Sub 37pin Female-Male 3m Cable, 24AWG, 180° UL-2464
	CA-05	D-Sub 37pin Female-Male 5m Cable, 24AWG, 180° UL-2464
	CA-10	D-Sub 37pin Female-Male 10mCable, 24AWG, 180° UL-2464
	CA-2510D	D-Sub 25pin Male-Male 1m Cable, 28AWG, 180, UL-2464
	CA-2520D	D-Sub 25pin Male-Male 1.8m Cable, 28AWG, 180, UL-2464



Accessories

10.1. Voltage Attenuator



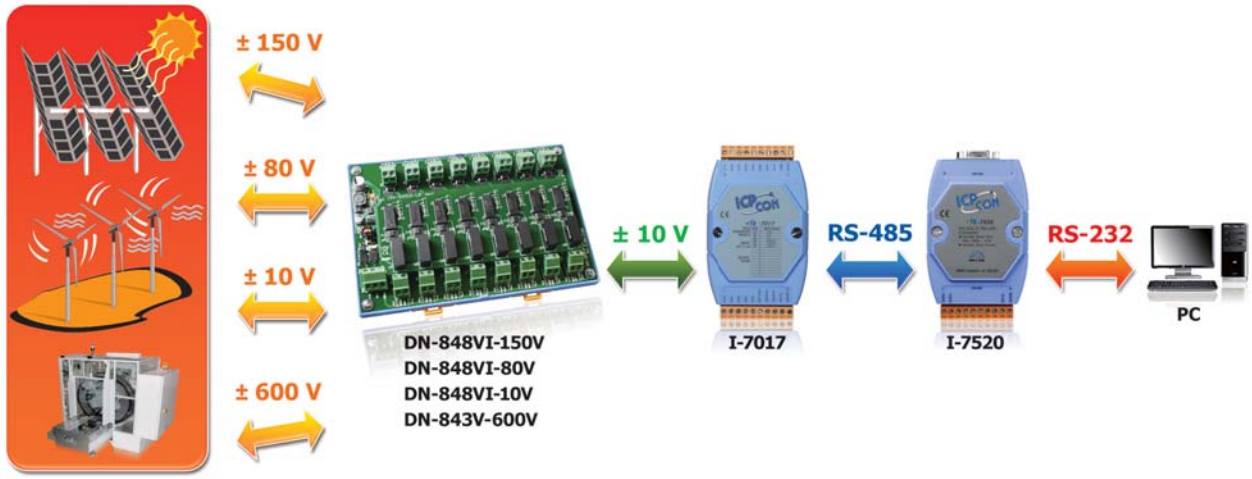
Features

- AC/DC Source Input
- High Voltage Input Measurement
- Linear Attenuation Ratio
- High Input Impedance
- Channel to Channel Isolation for DN-848VI-10V, DN-848VI-80V and DN-848VI-150V
- 4 kV ESD Protection
- 3 kV Surge Protection
- RoHS Compliance
- Operating Temperature: -25 ~ +75°C
- Easily Wire Connection

Introduction

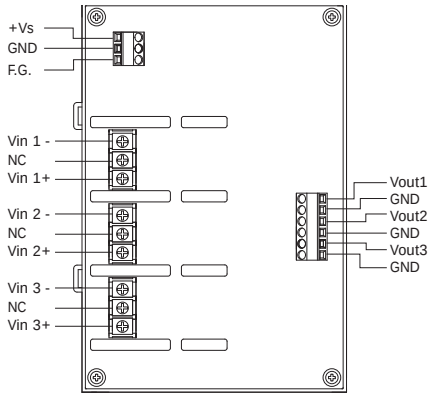
The DN-800V series are voltage input attenuator. The maximum input range is from ±80 V to +/- 600 V and can be attenuated to ±10 V. The "I" version provide 3000 VDC intra-modules isolation and 3000 VDC channel to channel isolation to avoid the noise interference from inputs to outputs or channel to channel. It can be used with the analog input modules such as I-7017 and I-87017 etc. to measure the high voltage.

Applications

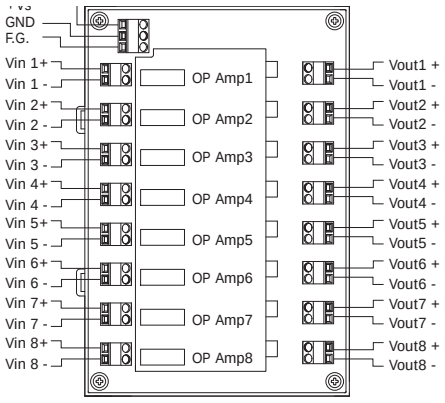


Appearance

DN-843V-600V



DN-848VI-10V/DN-848VI-80V/DN-848VI-150V

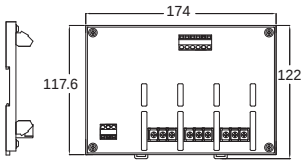


Specifications

Models	DN-848VI-10V	DN-848VI-80V	DN-848VI-150V	DN-843V-600V
General				
Channels	8	8	8	3
Input Type	AC/DC Voltage			
Input Range	+/- 10 V_{pp}	+/- 80 V_{pp}	+/- 150 V_{pp}	+/- 600 V_{pp}
Output Range	+/- 10 V_{pp}			
Accuracy	1% of FSR			
Chanel to Channel Isolation	Yes, 3000 V_{DC}			-
Bandwidth	30 KHz			100 KHz
Input Impedance	> 1 MΩ			
Intra-module Isolation, Input to Output	3000 V_{DC}			-
EMS Protection				
ESD (IEC 61000-4-2)	+/- 4 kV contact for power line, input and output channels , +/- 8 kV air for random point			
Surge (IEC 61000-4-5)	+/- 3 kV for power liner			
Power Input				
Input Range	+10 ~ +30 V_{DC}			
Power Consumption	9.2 W	9.2 W	9.2 W	0.56 W
Mechanical				
Dimensions (W x L x H)	122 mm x 174 mm x 33 mm			122 mm x 174 mm x 24.5 mm
Installation	DIN-Rail Mounting			
Environment				
Operating Temperature	-25 ~ + 75°C			
Storage Temperature	-30 ~ +75°C			
Humidity	10 ~ 90% RH (non-condensing)			

Dimensions (Units: mm)

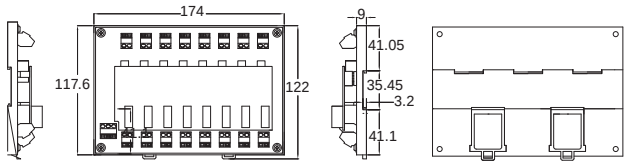
DN-843V-600V



Left View | Front View | Right View | Rear View

Top View | Bottom View

DN-848VI-10V/DN-848VI-80V/DN-848VI-150V



Left View | Front View | Right View | Rear View

Top View | Bottom View

Selection Guide

DN-84 X X X - X X X

- **Number of Channels**
  - 3: 3 channels
  - 8: 8 channels
- **V: Voltage**
- **I: Channel to channel Isolation**
- **Input Voltage Range**

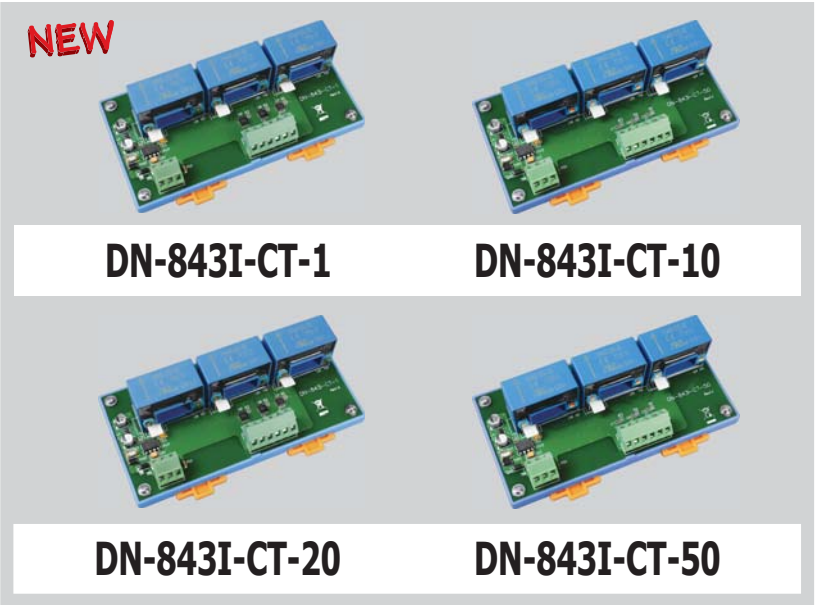
Ordering Information

DN-848VI-10V CR	8-channel 10 V Voltage Attenuator (RoHS)
DN-848VI-80V CR	8-channel 80 V Voltage Attenuator (RoHS)
DN-848VI-150V CR	8-channel 150 V Voltage Attenuator (RoHS)
DN-843V-600V CR	3-channel 600 V Voltage Attenuator (RoHS)

Accessories

	MDR-20-24 CR	24 V/1 A, 24 W Power Supply with DIN-Rail Mounting (RoHS)
	I-7017-G CR	8-channel Analog Input Module (RoHS)
	I-87017-G CR	8-channel Analog Input Module (RoHS)

10.2. Current Transformer



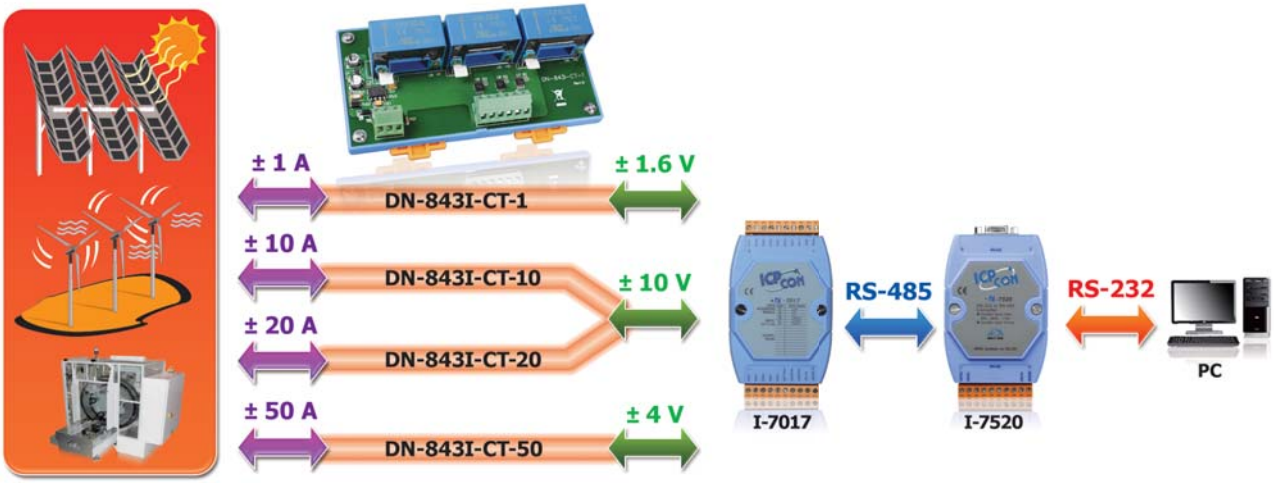
Features

- AC/DC Source Input
- Linear Attenuation Ratio
- High Current Input Measurement
- Isolation Input
- Channel to Channel Isolation
- 4 kV ESD Protection
- RoHS Compliance
- Operating Temperature: -25 ~ +75°C
- Easily Wire Connection

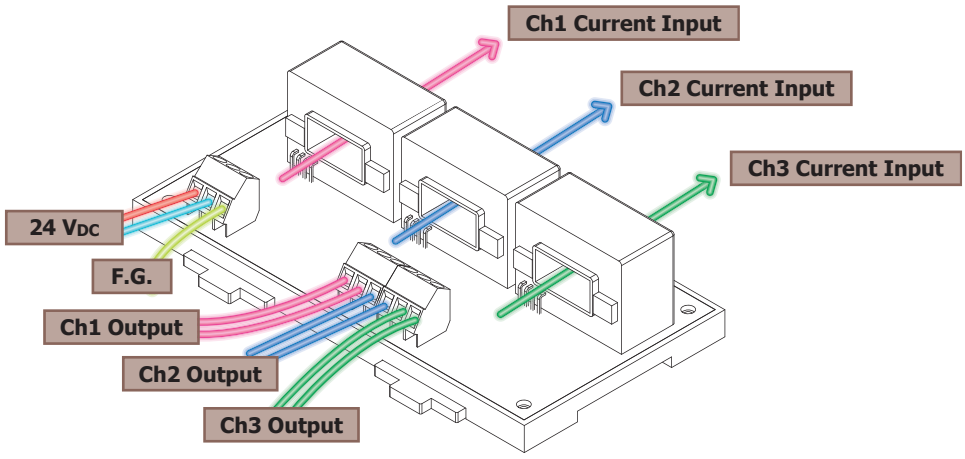
Introduction

The maximum input range is from ±1 A to +/- 50 A and can be attenuated to from ±1.6 V to ±10 V. The "I" version provide 3000 VDC intra-modules isolation and 3000 VDC channel to channel isolation to avoid the noise interference from inputs to outputs or channel to channel. It can be used with the analog input modules such as I-7017 and I-87017 etc. to measure the high current.

Applications



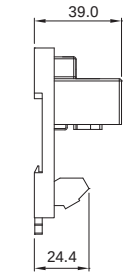
Installation



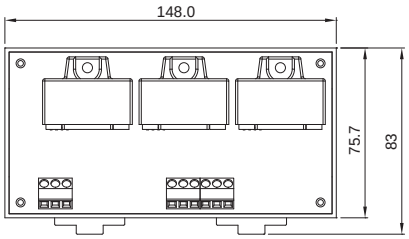
Specifications

Models	DN-843I-CT-1	DN-843I-CT-10	DN-843I-CT-20	DN-843I-CT-50
General				
Channels	3			
Input Type	AC/DC Current			
Input Range	+/- 1 A	+/- 10 A	+/- 20 A	+/- 50 A
Output Type	AC/DC Voltage			
Output Range	+/- 1.6 V_{pp}	+/- 10 V_{pp}	+/- 10 V_{pp}	+/- 4 V_{pp}
CT Type	Solid Core (closed)			
Accuracy	1% of FSR			
Chanel to Channel Isolation	Yes, 3000 V_{rms}			
Intra-module Isolation, Input to Output	3000 V_{DC}			
Bandwidth	50 KHz			
Input Impedance	> 1 MΩ			
EMS Protection				
ESD (IEC 61000-4-2)	+/- 4 kV contact for power line, input and output channels, +/- 8 kV air for random point			
Power Input				
Input Range	+10 ~ +24 V_{DC}			
Power Consumption	1.2 W			
Mechanical				
Dimensions (W x L x H)	148 mm x 83 mm x 39 mm			
Installation	DIN-Rail Mounting			
Environment				
Operating Temperature	-25 ~ + 75°C			
Storage Temperature	-30 ~ +75°C			
Humidity	10 ~ 90% RH (non-condensing)			

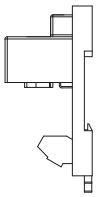
Dimensions (Units: mm)



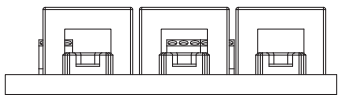
Left View



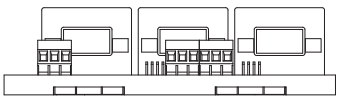
Front View



Right View



Top View



Bottom View

Selection Guide

DN-84 [X] [X] - [X][X] - [X]

- **Number of Channels** (3: 3 channels)
- **C: Current**
- **CT: Current Transformer**
- **Input Current Range**

Ordering Information

DN-843I-CT-1 CR	3-channel 1 A Current Transformer (RoHS)
DN-843I-CT-10 CR	3-channel 10 A Current Transformer (RoHS)
DN-843I-CT-20 CR	3-channel 20 A Current Transformer (RoHS)
DN-843I-CT-50 CR	3-channel 50 A Current Transformer (RoHS)

Accessories

	MDR-20-24 CR	24 V/1 A, 24 W Power Supply with DIN-Rail Mounting (RoHS)
	I-7017-G CR	8-channel Analog Input Module (RoHS)
	I-87017-G CR	8-channel Analog Input Module (RoHS)

10.3. Signal Conditioning Modules (SG-3000 Series)

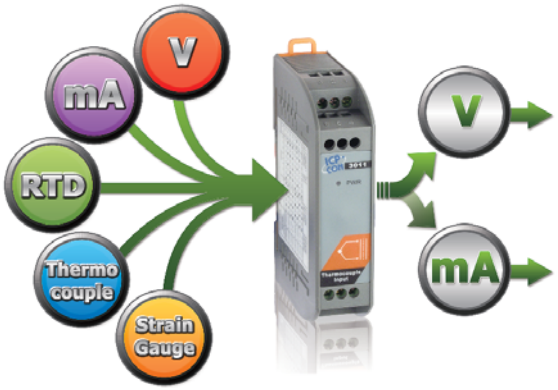
Introduction

SG-3000 series signal conditioning modules are used to accept wide range of input signals, such as voltage, current, temperature (thermocouple and RTD) and provide 0 ~ 10 VDC , 0 ~ 20 mA, 4 ~ 20 mA output signals.

It gives following good features for industrial applications

- 3-way (power/input/output) isolation (1000 VDC)
- Wide operating temperature (-25 ~ +75°C)
- DIN-Rail mounting
- Input and output connectors on the opposite side
- Signal range configureable by swtich

Applications



Description

Analog Conditioning Modules					
Models	**SG-3011**	**SG-3013**	**SG-3016**	**SG-3071**	**SG-3081**
Pictures					
Analog Input					
Channel	1	1	1	1	1
Wiring	Differential	2/3/4 wires	Differential	Differential	Differential
Signal	Thermocouple	RTD	Strain Gauge	Voltage	Current
Type	Type J, K, T, E, R, S, B, N, C, L, M, L2	Pt100 α=0.00385, Pt100 α=0.003916, Ni 120, Pt1000 α=0.00385	±10 mV, ±20 mV, ±30 mV, ±50 mV, ±100 mV	±5 V, ±10 V	0 ~ 20 mA, 4 ~ 20 mA
Resolution	12-bit	12-bit	-	-	-
Accuracy	±0.2% of FSR	±0.1% of FSR	±0.1% of FSR	±0.1% of FSR	±0.1% of FSR
Input Impedance	1.8 MΩ	-	-	1.6 MΩ	250 Ω
Excitation Voltage	-	-	0 ~ 10 V	-	-
Analog Output					
Channel	1	1	1	1	1
Current Output	0 ~ 20 mA	0 ~ 20 mA, 4 ~ 2 0mA	0 ~ 20 mA	0 ~ 20 mA, 4 ~ 20 mA	0 ~ 20 mA, 4 ~ 20 mA
Voltage output	0 ~ 10 V	0 ~ 5 V, 0 ~ 10 V	±5 V, ±10 V, 0 ~ 5 V, 0 ~ 10 V	±5 V, ±10 V	0 ~ 5 V, 0 ~ 10 V
System					
3-way Isolation	1000 VDC				
Power Input	10 ~ 30 VDC				
Power Consumption	1.44 W	1.2 W	1.44 W	1.8 W	1.61 W
Operating Temperature	-25 ~ +75°C				
Dimensions (W x H x D)	25 mm x 114 mm x 71 mm				

Power Conditioning Modules				
Models	**PW-3090-24S**	**PW-3090-12S**	**PW-3090-5S**	**PW-3090-4824S-12**
Pictures				Available soon 
Input	18 ~ 36 V (non-regulated)	18 ~ 36 V (non-regulated)	18 ~ 36 V (non-regulated)	48 V (non-regulated)
Output	24 V @ 0.4 A (Max.)	12 V @ 0.8 A (Max.)	5 V @ 2 A (Max.)	24V @ 0.5 A (Max.)
Isolation	1000 VDC			
Efficiency	83% Typical			
Operating Temperature	-25 ~ +75°C			
Dimensions (W x H x D)	25 mm x 114 mm x 71 mm			

10.4. Relay Modules

Models	DN-PR4	RM-104, RM-108, RM-116	RM-204, RM-208, RM-216
Pictures			
Relay	VE-24H5-K	FINDER - 40.61.7.024.0000	FINDER - 44.52.7.024.0000
Type	Power Relay		
Channel	4	RM-104: 4 channels RM-108: 8 channels RM-116: 16 channels	RM-204: 4 channels RM-208: 8 channels RM-216: 16 channels
Contact	Form C	Form C (SPDT)	Form C (DPDT)
Operating Voltage Range	250 VAC/30 VDC	250 VAC	250 VAC
Max. Load Current	5 A	16 A	6 A
Operate Time	10 ms (Typical)	7 ms (Typical)	8 ms (Typical)
Release Time	5 ms (Typical)	3 ms (Typical)	5 ms (Typical)
LED Indicator	Yes (for Relay status)		
Mechanical			
Dimensions (W x L x D)	96 mm x 103 mm x 34 mm	RM-104: 79 mm x 87 mm x 63 mm RM-108: 135 mm x 87 mm x 63 mm RM-116: 270 mm x 87 mm x 63 mm	RM-204: 90 mm x 87 mm x 63 mm RM-208: 169 mm x 87 mm x 63 mm RM-216: 327 mm x 87 mm x 63 mm
Installation	DIN-Rail Mounting		

Models	DN-SSR4	DN-SSR4DC
Pictures		
Relay	A5P-204U	D3P-054
Type	Solid-State Relay	
Channel	4 channels	
Contact	Form A (SPST)	
Operating Voltage Range	250 VAC/30 VDC	50 VDC
Max. Load Current	4 A	
Operate Time	1/2 Cycle + 1ms and below	0.5 ms and below (Resistance load)
Release Time	1/2 Cycle + 1ms and below	0.5 ms and below (Resistance load)
LED Indicator	Yes (for Relay status)	
Mechanical		
Dimensions (W x L x D)	101 mm x 77 mm x 66 mm	
Installation	DIN-Rail Mounting	

Models	RM-20.22	RM-22.22	RM-38.61	RM-48.61	RM-48.62
Pictures					
Relay	Finder 20.22.9.024.4000	Finder 22.22.9.024.4000	Finder 34.51.7.024.0010	FINDER - 40.61.7.024.0000	FINDER - 44.62.7.024.0000
Type	Step Relay		Power Relay		
Channel	1				
Contact	Form A (DPST)	Form A (DPST)	Form C (SPDT)	Form C (SPDT)	Form C (SPDT)
Operating Voltage Range	230 VAC	230 VAC	250 VAC	250 VAC	250 VAC
Max. Load Current	16 A	20 A	6 A	16 A	10 A
Operate Time	15 ms	15 ms	5 ms	7 ms	7 ms
Release Time	8 ms	8 ms	3 ms	3 ms	3 ms
LED Indicator	-				
Mechanical					
Dimensions (W x L x D)	17.5 mm x 84 mm x 62.7 mm		76.5 mm x 6.5 mm x 89 mm	75 mm x 15.5 mm x 78.5 mm	
Installation	DIN-Rail Mounting				

Note1: **RM-38.61**: 5 pcs in one package
RM-48.61: 4 pcs in one package
RM-48.62: 4 pcs in one package

Note2: **RM-38-093.20** is a 20-way jumper link for RM-38.61

10.5. Power Supplies

NEW

KA-52F
KA-52F-48

DIN-KA52F
DIN-KA52F-48

KA-52F/DIN-KA52F KA52F-48/DIN-KA52F-48

Specifications

Models	KA-52F	DIN-KA52F	KA-52F-48	DIN-KA52F-48
Input				
Range	100 ~ 250 VAC			
Frequency	50 ~ 60 Hz			
Output				
Power	24 VDC/1.04 A Max., 25 W		48 VDC/0.52 A Max., 25 W	
Mechanical				
Dimensions (W x H x D, Units: mm)	54 x 93 x 36	68 x 107 x 50	54 x 93 x 36	68 x 107 x 50
Installation	No-mounting	DIN-Rail Mounting	No-mounting	DIN-Rail Mounting
Environmental				
Operating Temperature	0 ~ +50°C			
Storage Temperature	-20 ~ +85°C			

Ordering Information

KA-52F CR	24 VDC/1.04 A, 25 W Power Supply (RoHS)
DIN-KA52F CR	24 VDC/1.04 A, 25 W Power Supply with DIN-Rail Mounting (RoHS)
KA-52F-48 CR	48 VDC/0.52 A, 25 W Power Supply (RoHS)
DIN-KA52F-48 CR	48 VDC/0.52 A, 25 W Power Supply with DIN-Rail Mounting (RoHS)

NEW

MDR-20-24

MDR-60-24/MDR-60-48

MDR-20-24 MDR-60-24 MDR-60-48

Specifications

Models	MDR-20-24	MDR-60-24	MDR-60-48
Input			
Range	100 ~ 250 VAC		
Frequency	50 ~ 60 Hz		
Output			
Power	24 VDC/1 A Max., 24 W	24 VDC/2.5 A Max., 60 W	48 VDC/1.25 A Max., 60 W
Mechanical			
Dimensions (W x H x D)	22.5 mm x 90 mm x 100 mm	40 mm x 90 mm x 100 mm	40 mm x 90 mm x 100 mm
Installation	DIN-Rail Mounting		
Environmental			
Operating Temperature	-20 ~ +70°C		
Storage Temperature	-20 ~ +85°C		

Ordering Information

MDR-20-24 CR	24 VDC/1 A, 24 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)
MDR-60-48 CR	48 VDC/1.25 A, 60 W Power Supply with DIN-Rail Mounting (RoHS)

DP-660

DP-1200

DP-660 DP-1200

Specifications

Models	DP-660	DP-1200
Input		
Range	100 ~ 250 VAC	
Frequency	50 ~ 60 Hz	
Output		
Power	24 VDC /2.5 A Max., 60 W and 5 VDC /0.5 A Max., 2.5 W	24 VDC /5.0 A Max., 120 W
Mechanical		
Dimensions (W x H x D)	44 mm x 145 mm x 158 mm	65 mm x 111 mm x 125 mm
Installation	DIN-Rail Mounting	
Environmental		
Operating Temperature	0 ~ +50°C	-10 ~ +70°C
Storage Temperature	-20 ~ +85°C	-25 ~ +85°C

Ordering Information

DP-660 CR	24 VDC/2.5 A, 60 W and 5 VDC/0.5 A, 2.5 W Power Supply with DIN-Rail Mounting (RoHS)
DP-1200 CR	24 VDC/5.0 A, 120 W Power Supply with DIN-Rail Mounting (RoHS)

10.6. Touch Panel Monitor

TPM-4100/TP-4100

10.4" Touch Panel Monitor

Features

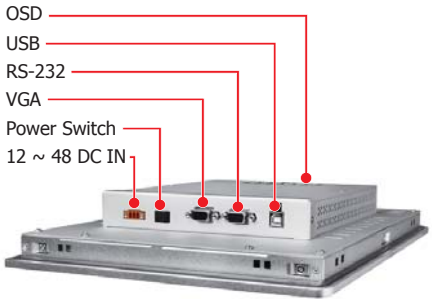
- 10.4" LCD supports 800 x 600 resolution
- Resistive Touch Panel
- Full-function OSD control
- Driver Support: Windows 2k/XP/Vista/7/WES WinCE 5.0/6.0
- LED backlight technology
- Aluminum Casing for TPM-4100
- IP65 Comlipant Front Panel
- Wide operating temperature: -25 ~ +75°C

Specifications

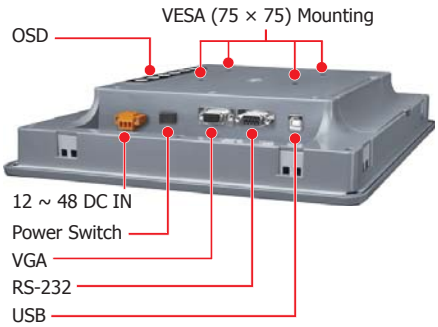
Models	TPM-4100	TP-4100
Display		
Size	10.4"	
Resolution	800 x 600	
Max. Color	16.7 M	
Brightness (cd/m2)	320	
Contrast Ratio	500 : 1	
Viewing Angle (H/V)	140/130	
Backlight Life (hrs)	50,000	
Touch Panel	4-wire	5-wire
	analog resistive, RS-232 or USB1.1 (Type B) interface	
Input Signal	VGA (Analog RGB)	
MMI (Man Machine Interface)		
OSD Control	Functions: Brightness, Contrast, Phase, Horizontal Position, Vertical Position and Sharpness	
Power Switch	Yes	
LED Indicators	Power, Display signal is detected	
Power		
Input Range	+12 ~ 48 V_{DC}	
Power Consumption	8.5 W	
Mechanical		
Material	Aluminum	Plastic
Dimensions (W x L x H)	293 mm x 231 mm x 53 mm	290 mm x 228 mm x 53 mm
Installation	Panel Monuting	Panel Monuting, VESA (75 × 75) Mounting
Ingress Protection	Front panel: IP65	
Environmental		
Operating Temperature	-25 ~ +75°C	
Storage Temperature	-30 ~ +80°C	
Ambient Relative Humidity	10 ~ 90% RH (non-condensing)	

Appearance

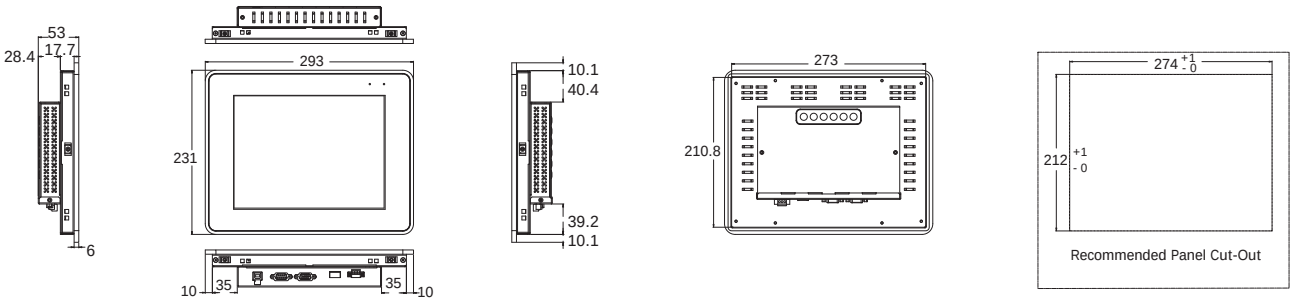
TPM-4100



TP-4100



TPM-4100 Dimensions (Units: mm)



Ordering Information

TP-4100	10.4" (800 x 600) resistive touch panel monitor with RS-232 or USB interface Accessories: Power supply, VGA cable, RS-232 cable, USB cable, Mounting clamps and screws
TPM-4100	TP-4100 with Aluminum Casing

Available soon

TP-3070

7" Touch Panel Monitor

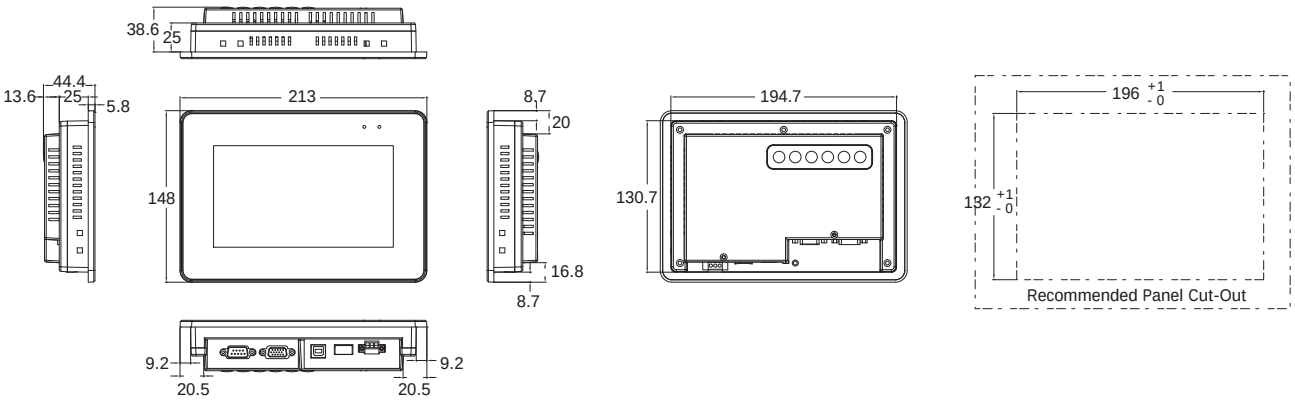
Features

- 7" LCD supports 800 x 480 resolution
- Resistive Touch Panel
- Full-function OSD control
- Driver Support: Windows 2k/XP/Vista/7/WES WinCE 5.0/6/0
- LED backlight technology
- IP65 Comlipant Front Panel
- Wide operating temperature: -20 ~ +70°C

Specifications

Models	TP-3070
Display	
Size	7”
Resolution	800 x 480
Brightness (cd/m2)	320
Contrast Ratio	500 : 1
Viewing Angle (H/V)	140/120
Backlight Life (hrs)	20,000
Touch Panel	4-wire, analog resistive, RS-232 or USB1.1 (TypeB) interface
Input Signal	VGA (Analog RGB)
MMI (Man Machine Interface)	
OSD Control	Functions: Brightness, Contrast, Clock, Phase, Horizontal Position, Vertical Position and Sharpness
Power Switch	Yes
LED Indicators	Power, Display signal is detected
Power	
Input Range	+12 ~ 48 V_{DC}
Power Consumption	5 W
Mechanical	
Dimensions (W x L x H)	213 mm x 148 mm x 44 mm
Casing	Plastic
Ingress Protection	Front panel: IP65
Environmental	
Operating Temperature	-20 ~ +70°C
Storage Temperature	-30 ~ +80°C
Ambient Relative Humidity	10 ~ 90% RH (non-condensing)

Dimensions (Units: mm)



Ordering Information

TP-3070	7" (800 x 480) resistive touch panel monitor with RS-232 or USB interface Accessories: Power supply, VGA cable, RS-232 cable, USB cable, Mounting clamps and screws

10.7. MISC

I-7560

USB to RS-232 Converter

Specifications

Interface	
USB	Compatibility: USB 1.1 and 2.0 standards
RS-232	TxD, RxD, RTS, CTS, DSR, DTR, DCD, RI and GND; non-isolated
Baud Rate	300 ~ 115200 bps
Driver	Windows 98/ME/2000/XP/Vista (32/64-bit)/7 (32/64-bit)/Linux
Mechanical	
Dimensions (W x H x D)	33 mm x 60 mm x 15 mm
Environmental	
Operating Temperature	-25 ~ +75°C
Storage Temperature	-30 ~ +75°C

Ordering Information

I-7560 CR	USB to RS-232 Converter (RoHS)

NEW

USB-2020

USB Audio Device

Specifications

Interface	
Output Channels	Mono, Stereo (L + R)
Input Channels	Mono, Stereo (L + R)
Button	HID volume up, volume down and Mute
Input Voltage Range	+10 ~ +30 VDC
Mechanical	
Dimensions (W x H x D)	33 mm x 107 mm x 78 mm
Installation	DIN-Rail Mounting
Environmental	
Operating Temperature	-25 ~ +75°C
Storage Temperature	-40 ~ +85°C

Ordering Information

USB-2020 CR	USB Audio Device (RoHS)

NEW

USB-2560

4-Port Industrial USB 2.0 Hub

Specifications

Interface	
Ports	Upstream x 1 (Type B); Downstream x 4 (Type A)
Compatibility	Specification Rev. 2.0/1.1/1.0
Transfer Speed	480 Mbit/s-high speed mode
Input Voltage Range	+10 ~ +30 VDC
Mechanical	
Dimensions (W x H x D)	33 mm x 107 mm x 78 mm
Installation	DIN-Rail Mounting
Environmental	
Operating Temperature	-0 ~ +70°C
Storage Temperature	-20 ~ +80°C

Ordering Information

USB-2560 CR	4-port Industrial USB 2.0 Hub (RoHS)
USB-2560/S CR	4-port Industrial USB 2.0 Hub (RoHS) with GPSU06U-6 (Power Supply)

RK-3UD-R

19" Rack Mounting Kit, 3U

Specifications

Mechanical	
Dimensions (W x H x D)	481 mm x 132 mm x 125 mm

Ordering Information

RK-3UD-R	19" Rack Mounting Kit, 3U

Model Index

Model Index

G-4511-2G/G-4511P-2G

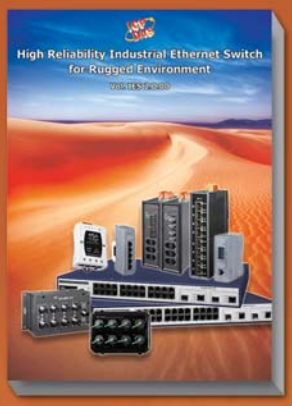
M2M Power Saving Mini-Programmable Automation Controller

FEATURES

- Sleep mode for energy saving and backup battery
- Built-in Solar Panel charging circuit
- Configurable sleep mode for maximum power savings.
- Automatic power supply selection - constant power supply, solar cell, or backup battery
- Integrated GPS/GPRS function in the controller

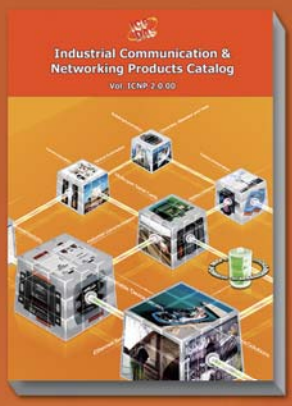
Go Green!

ICP DAS Catalogs & Brochure



High Reliability Industrial Ethernet Switch Catalog

- Managed Ethernet Switches
- Unmanaged Ethernet Switches
  PoE Ethernet Switches
- Media Converters
- Real-time Redundant Ring Ethernet Switches
- IP67 Waterproof Switches
- Cyber-Ring Ethernet Self-healing Technlolgy



Industrial Communication & Networking Products Catalog

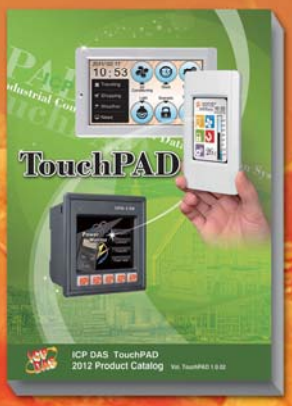
- Multi-port Serial Cards
- Programmable Device Servers (Serial-to-Ethernet)
- Converters, Repeaters and Hubs
- Fieldbus Solutions
- Ethernet Switches

Remote I/O Modules and I/O Expansion Units Products Catalog

- RS-485 Products
- Ethernet Remote I/O Modules
- FRnet I/O Modules
- CAN Bus Products
- PROFIBUS Remote I/O Modules
- HART Products
- Smart Power Meter
- WISE I/O Module

Industrial Fieldbus

- RS-485
- Industrial Ethernet
- Profinet
- CAN bus
- CANopen
- Devicenet
- J1939
- PROFIBUS
- HART
- Ethernet/IP
- BACnet



Touch HMI Devices Brochure

- TPD-430 Series
- TPD-280 Series
- VPD-130 Series

Industrial Wireless Communication Products Catalog

- Industrial Wireless series
- DSSS RF modems
- 2G/3G mini-PAC/Modules/Modems
- ZigBee converters & I/O modules
- GPS solutions

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