Compact PAC

2

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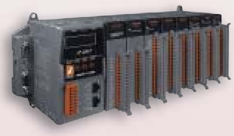

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2.1. XP-8000-Atom Series

• 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 LX 800), it not only improves the CPU performance (5~6 times faster than AMD LX 800), 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

There are two types of I/O modules, Parallel and Serial. The Parallel I/O modules (I-8K high profile series) are high-speed modules and have to be installed in slots of the XP-8000-Atom. The Serial I/O modules (I-87K high profi les series) can be installed in slots or Expansion Units (RU-87Pn).

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.

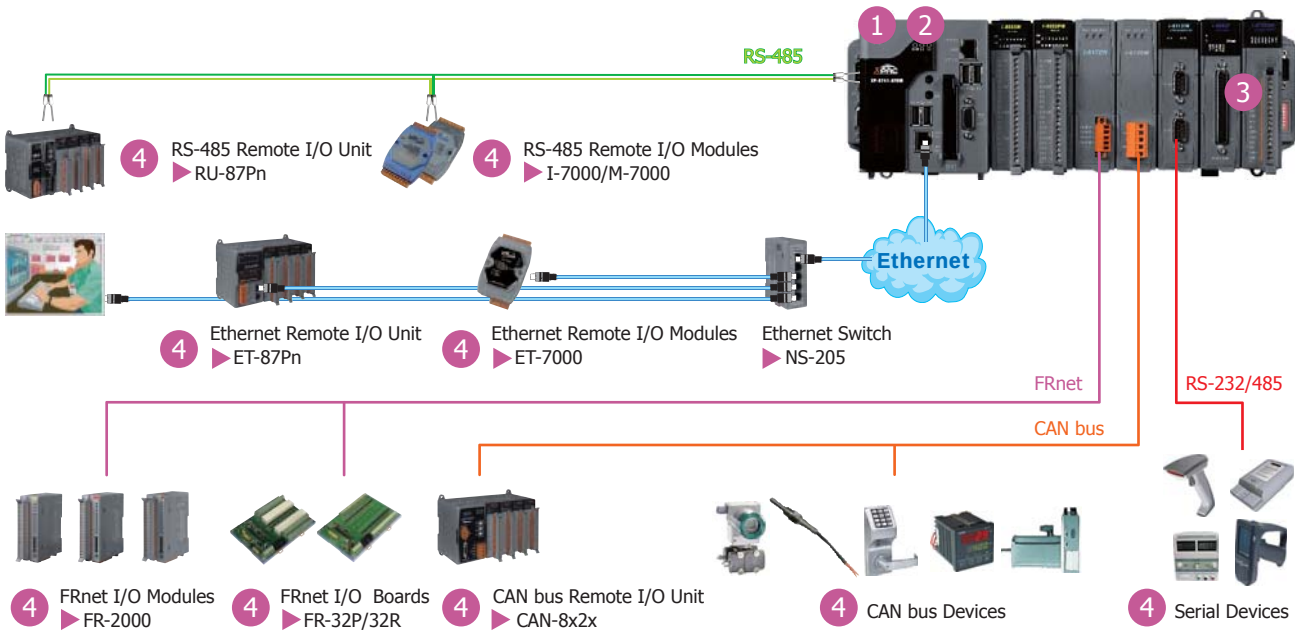
2 Embedded OS

• **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, the next generation of real-time OS used to quickly create Application that support a range of requirements. With Windows CE 6, users can use familiar tools and innovative technologies to develop software for applications. By the high performance and highly reliable Windows CE, users can push XP-8000-Atom to market quickly and efficiently. Windows CE6 operating system 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 XP-8000-Atom.



Selection Guide

XP-8 X X X -Atom

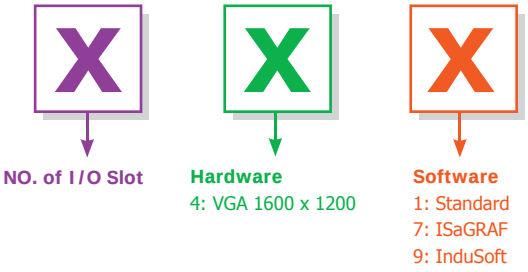
- **NO. of I/O Slot**
- **Hardware**
  4: VGA 1600 x 1200
- **Software**
  1: Standard

Standard XP-8000-Atom (Windows Embedded Standard 2009)

Model Name	OS	Pre-installed Software	CPU	Flash	DDR2 SDRAM	VGA Resolution	Ethernet Port	RS-232/ RS-485	I/O Slot	Page
XP-8041-Atom	XPE2009	None	Atom Z520 (1.33 GHz)	8 GB	1 GB	1600 x 1200	2	5	0	2-1-5
XP-8141-Atom								4	1	
XP-8341-Atom									3	
XP-8741-Atom									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

XP-8 X X X -Atom-CE6



Standard XP-8000-Atom-CE6 (Windows CE .NET 6.0 Inside)

Model Name	OS	Pre-installed Software	CPU	Flash	DDR2 SDRAM	VGA Resolution	Ethernet Port	RS-232/ RS-485	I/O Slot	Page
XP-8041-Atom-CE6	CE 6.0	None	Atom Z510 (1.10 GHz)	1 GB	512 MB	1024 x 768	2	5	0	2-1-9
XP-8141-Atom-CE6								4	1	
XP-8341-Atom-CE6									3	
XP-8741-Atom-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 XP-8000-Atom-CE6 (Windows CE .NET 6.0 Inside)

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

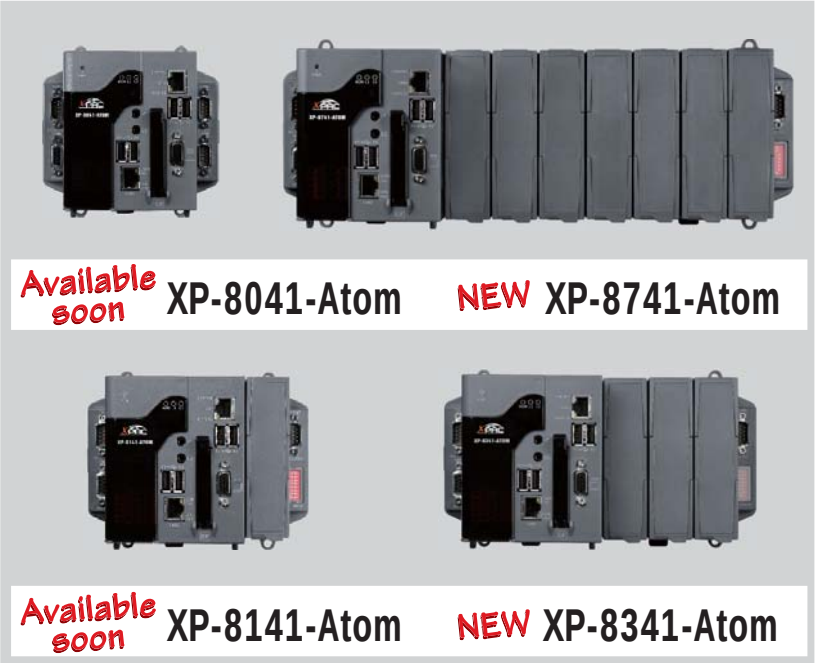
The controller fully supports all five of the IEC61131-3 standard PLC languages:
1. Ladder diagram,
2. Function block diagram,
3. Sequential function chart,
4. Structured text,
5. Instruction List plus flow chart.

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 XP-8000-Atom-CE6 (Windows CE .NET 6.0 Inside)

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



Highlight Information

- Windows Embedded Standard 2009
- SQL Server 2005 Express Edition
- Intel Atom Z520 CPU (1.33 GHz)
- Audio with Microphone-In and Earphone-Out
- VGA Port Output
- Support eLogger HMI
- High Performance PC Power, Open System
- Redundant Power Input
- Operating Temperature: -25 ~ +75 °C

Introduction

XP-8x41-Atom Series is the new generation Windows Embedded Standard 2009 based PACs of ICP DAS. It is equipped with an Intel Atom Z500 Series CPU, 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

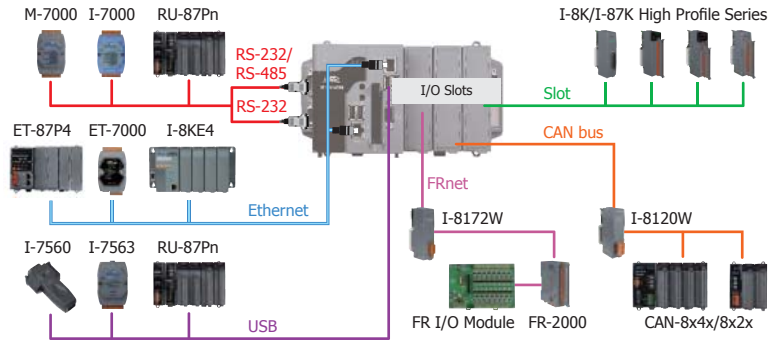
- Enhanced Write Filter (EWF): Protects disk against improper disk write operations.
- Same Win32 API: Makes developing applications just like Windows XP Professional developers do.

This makes almost every PC-based program can be easily ported to XPAC-Atom and effectively reduces the efforts of developing 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.

Applications

Rich I/O Expansion Ability



Features

Software

- Windows Embedded Standard 2009
- Internet Information Services
  - FTP server and web server
- ASP.NET
- SQL Server 2005 Express Edition
- .NET Framework 3.5
- Remote Desktop Connection
- Built-in OPC Server
- Rich Software Solutions
  - SDK for Microsoft Visual Studio.NET 2005/2008 and Visual Studio 6.0 Borland C++ Builder and Delphi

Hardware

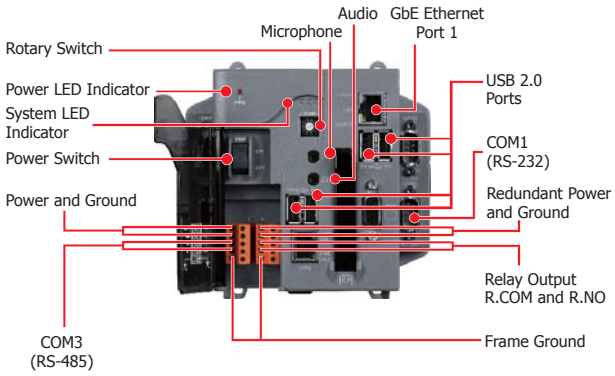
- Powerful CPU Module
  - Intel Atom Z520 CPU (1.33 GHz)
- Memory size:
  - DDR2 SDRAM (1 GB), Built-in Flash Disk (8 GB)
  - EEPROM (16 KB), CF Card (8 GB)
  - Dual Battery Backup SRAM (512 KB)
- VGA Port x 1, USB 2.0 Ports x 4
- Programmable LED indicator x 2
- Audio with Microphone-In and Earphone-Out
- 64-bit Hardware Serial Number
- Dual Watchdog Timers
- 4/5 Serial Ports (RS-232/RS-485)
- Dual Giga bit Ethernet Ports (10/100/1000M)
- Redundant Power Input
- DIN-Rail or Wall Mounting
- Operating Temperature: -25 ~ +75 °C

Specifications

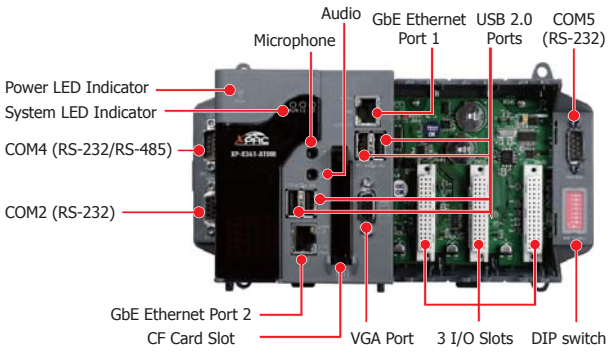
Models		XP-8041-Atom	XP-8141-Atom	XP-8341-Atom	XP-8741-Atom
System Software					
OS		Microsoft Windows Embedded Standard 2009			
.Net Compact Framework		3.5			
Embedded Service		FTP Server, Internet Information Service 5.1, ASP (Java Script, VB Script), SQL Server 2005 Express			
SDK Provided		Dll for VC, VB, Delphi, BCB, Visual Studio .NET 2005/2008			
Multilanguage Support		English, German, French, Spanish, Russian, Italian, Czech, Japanese, Simplified Chinese, Traditional Chinese			
CPU Module					
CPU		Intel Atom Z520 CPU (1.33 GHz)			
System Memory		1 GB DDR2 SDRAM			
Dual Battery Backup SRAM		512 KB (for 5 years data retain while power off)			
Flash		8 GB as IDE Master			
EEPROM		16 KB			
		Data Retention: 40 years; 1,000,000 erase/write cycles			
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			
Yes, for Software Copy Protection		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		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	D2+, D2-; self-tuner ASIC inside			
	Isolation	3000 V_{DC}			
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	1	3	7
Hot Swap * Will be available		-	For High Profile I-87K Modules Only		
Mechanical					
Dimensions (W x L x H)		137 mm x 132 mm x 125 mm	169 mm x 132 mm x 125 mm	231 mm x 132 mm x 125 mm	355 mm x 132 mm 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		3.6 A, 5 V supply to CPU and backplane, 25 W in total	3.7 A, 5 V supply to CPU and backplane, 1.3 A, 5 V supply to I/O expansion slots, 25 W in total	3.8 A, 5 V supply to CPU and backplane, 3.2 A, 5 V supply to I/O expansion slots, 35 W in total	4.0 A, 5 V supply to CPU and backplane, 3.0 A, 5 V supply to I/O expansion slots, 35 W in total
Consumption		16.3 W (0.68 A @ 24 V_{DC})	16.6 W (0.69 A @ 24 V_{DC})	16.8 W (0.7 A @ 24 V_{DC})	18 W (0.75 A @ 24 V_{DC})

Appearance

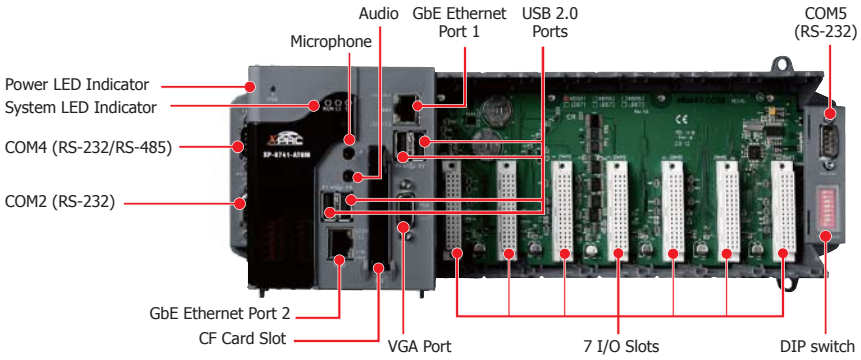
XP-8041-Atom



XP-8341-Atom

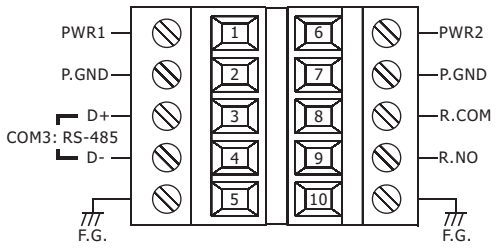


XP-8741-Atom

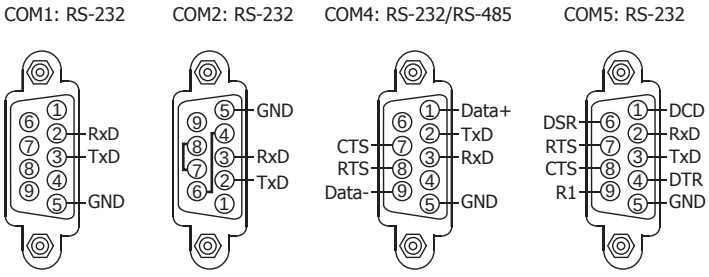


Pin Assignments

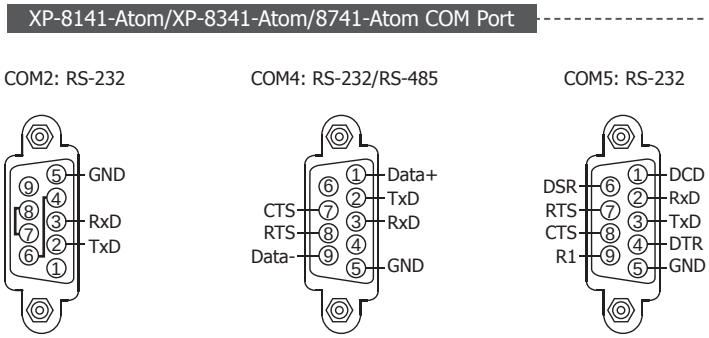
XP-8x41-Atom Terminal Block



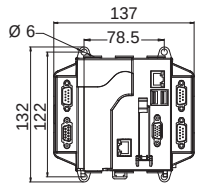
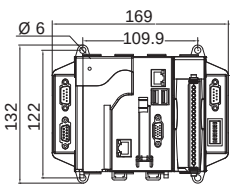
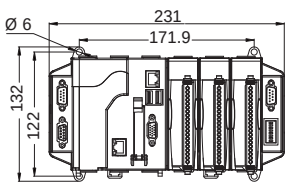
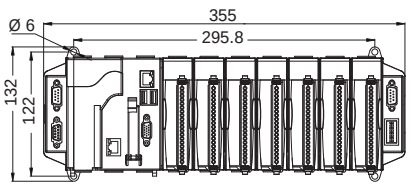
XP-8041-Atom COM Port



XP-8141-Atom/XP-8341-Atom/8741-Atom COM Port



Dimensions (Units: mm)

XP-8041-Atom	XP-8141-Atom	XP-8341-Atom	XP-8741-Atom
			
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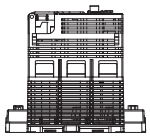	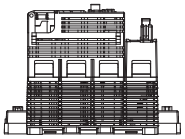		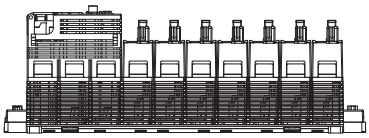
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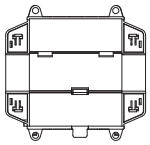
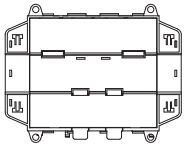
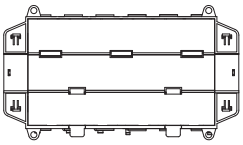
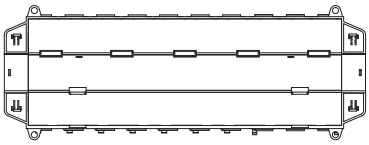
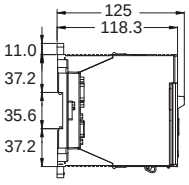
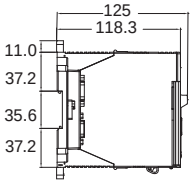
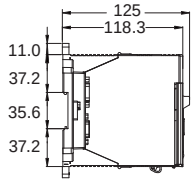
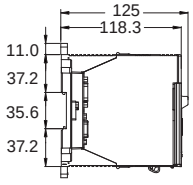
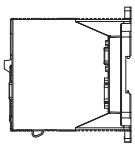
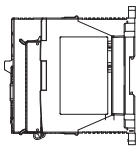
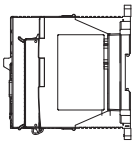
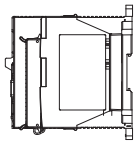
			
Rear View	Rear View	Rear View	Rear View
			
Left Side View	Left Side View	Left Side View	Left Side View
			
Right Side View	Right Side View	Right Side View	Right Side View

Ordering Information

XP-8041-Atom CR	Standard XP-8000-Atom without I/O Slot (Multilingual Version of OS) (RoHS)
XP-8141-Atom CR	Standard XP-8000-Atom with 1 I/O Slots (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)

Highlight Information

- Windows CE 6.0
- Hard Real-Time Capability
- Intel Atom Z510 CPU (1.1 GHz)
- Audio with Microphone-In and Earphone-Out
- VGA Port Output
- Support eLogger HMI
- High Performance PC Power, Open System
- Redundant Power Inputs
- Operating Temperature: -25 ~ +75 °C

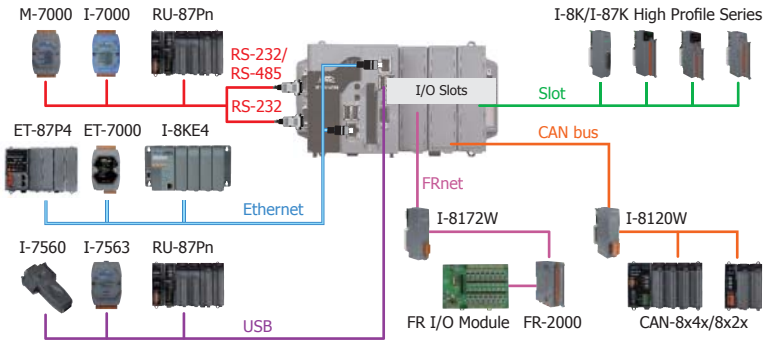
Introduction

XP-8x41-Atom-CE6 Series is the new generation Windows CE 6.0 based PACs of ICP DAS. It is equipped with an Intel Atom Z500 Series CPU, 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.

Applications

Rich I/O Expansion Ability



Features

Software

- Windows Compact Edition 6.0
- System Rescue Mechanism
- ASP
- SQL Compact Edition 3.5
- .NET Compact Framework 3.5
- Remote Display
- Built-In OPC Server (Quicker)
- InduSoft
  - ☐ HMI and SCADA development tool
- Rich Software Solutions
  - ☐ SDK for Microsoft Visual Studio.NET 2005/2008

Hardware

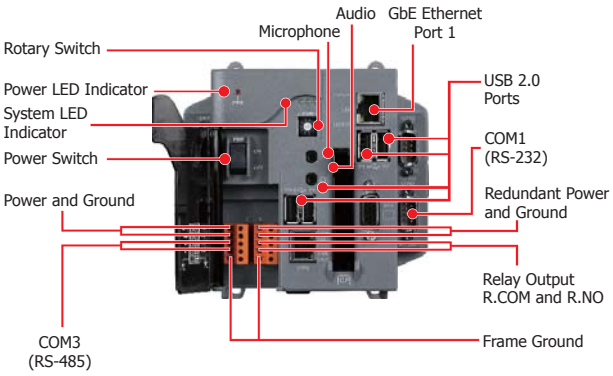
- Powerful CPU Module
  - ☐ Intel Atom Z510 CPU (1.1 GHz)
- Memory size:
  - ☐ DDR2 SDRAM (512 MB), Built-in Flash Disk (1 GB)
  - ☐ EEPROM (16 KB), CF Card (2 GB)
  - ☐ Dual Battery Backup SRAM (512 KB)
- VGA Port x 1, USB 2.0 Ports x 4
- Programmable LED indicator x 2
- Audio with Microphone-In and Earphone-Out
- 64-bit Hardware Serial Number
- Dual Watchdog Timers
- 4/5 Serial Ports (RS-232/RS-485)
- Dual Giga bit Ethernet Ports (10/100/1000M)
- Redundant Power Inputs
- DIN-Rail or Wall Mounting
- Operating Temperature: -25 ~ +75 °C

Specifications

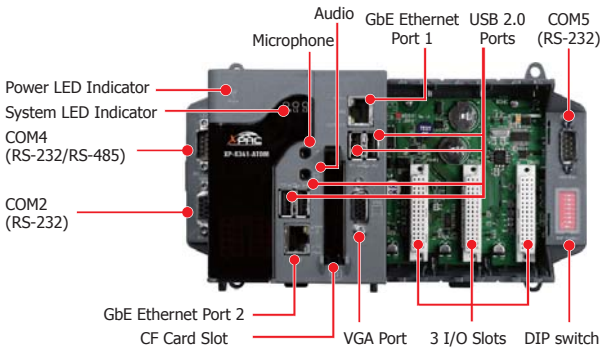
Models	XP-8041-Atom-CE6	XP-8141-Atom-CE6	XP-8341-Atom-CE6	XP-8741-Atom-CE6
System Software				
OS	Windows CE 6.0 core version			
.Net Compact Framework	3.5			
Embedded Service	FTP Server, ASP (Java Script, VB Script), SQL Compact Edition 3.5			
SDK Provided	Dll for Visual Studio .Net 2005/2008			
Multilanguage Support	English, German, French, Spanish, Russian, Italian, Japanese, Simplified Chinese, Traditional Chinese			
CPU Module				
CPU	Intel Atom Z510 CPU (1.1 GHz)			
System Memory	512 MB DDR2 SDRAM			
Dual Battery Backup SRAM	512 KB (for 5 years data retain while power off)			
Flash	1 GB as IDE Master			
EEPROM	16 KB			
	Data Retention: 40 years; 1,000,000 erase/write cycles			
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	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	D2+, D2-; self-tuner ASIC inside			
COM 3 Isolation	3000 V_{DC}			
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	1	3	7
Hot Swap * Will be available	-	For High Profile I-87K Modules Only		
Mechanical				
Dimensions (W x L x H)	137 mm x 132 mm x 125 mm	169 mm x 132 mm x 125 mm	231 mm x 132 mm x 125 mm	355 mm x 132 mm 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	3.6 A, 5 V supply to CPU and backplane, 25 W in total	3.7 A, 5 V supply to CPU and backplane, 1.3 A, 5 V supply to I/O expansion slots, 25 W in total	3.8 A, 5 V supply to CPU and backplane, 3.2 A, 5 V supply to I/O expansion slots, 35 W in total	4.0 A, 5 V supply to CPU and backplane, 3.0 A, 5 V supply to I/O expansion slots, 35 W in total
Consumption	16.3 W (0.68 A @ 24 V_{DC})	16.6 W (0.69 A @ 24 V_{DC})	16.8 W (0.7 A @ 24 V_{DC})	18 W (0.75 A @ 24 V_{DC})

Appearance

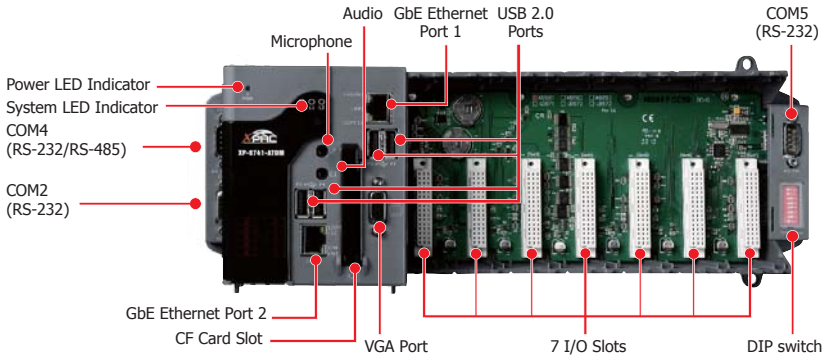
XP-8041-Atom-CE6



XP-8341-Atom-CE6

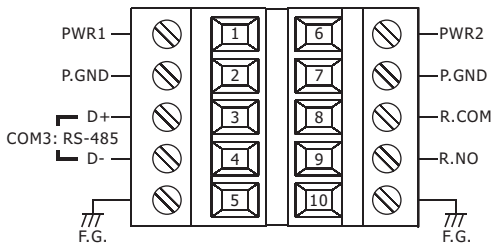


XP-8741-Atom-CE6

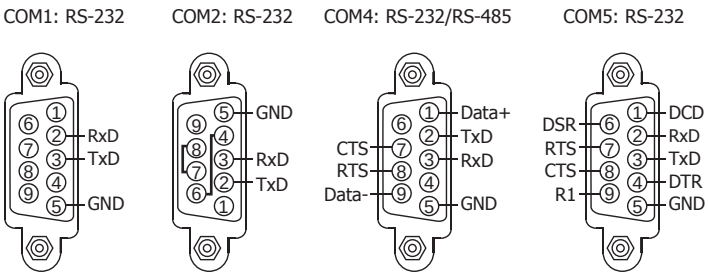


Pin Assignments

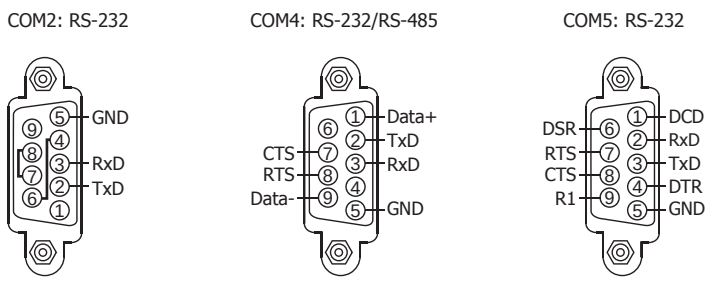
XP-8x41-Atom-CE6 Terminal Block



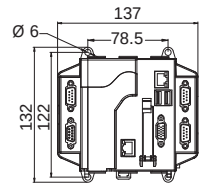
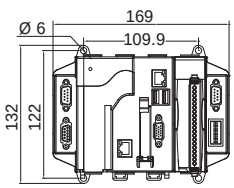
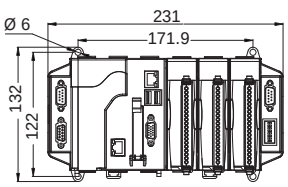
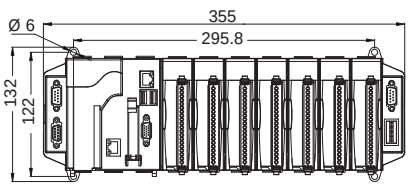
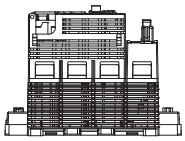
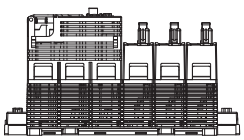
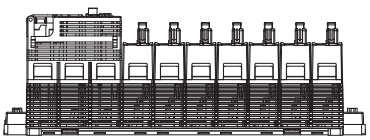
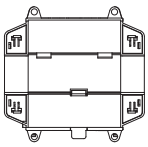
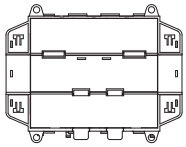
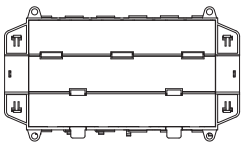
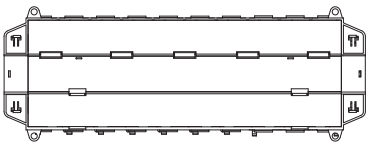
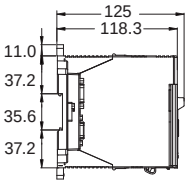
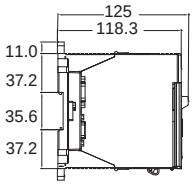
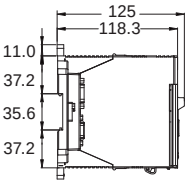
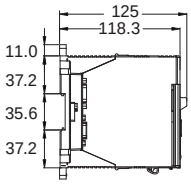
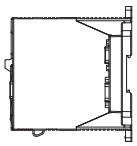
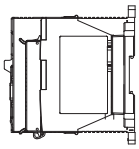
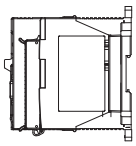
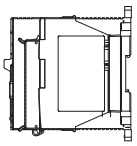
XP-8041-Atom-CE6 COM Port



XP-8141-Atom-CE6/XP-8341-Atom-CE6/8741-Atom-CE6 COM Port



Dimensions (Units: mm)

XP-8041-Atom-CE6	XP-8141-Atom-CE6	XP-8341-Atom-CE6	XP-8741-Atom-CE6
			
Front View	Front View	Front View	Front View
			
Bottom View	Bottom View	Bottom View	Bottom View
			
Rear View	Rear View	Rear View	Rear View
			
Left Side View	Left Side View	Left Side View	Left Side View
			
Right Side View	Right Side View	Right Side View	Right Side View

Ordering Information

XP-8041-Atom-CE6 CR	0 I/O slot 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 slot WinCE 6.0 Based Standard XPAC (OS: Multi-Language version) (RoHS)
XP-8741-Atom-CE6 CR	7 I/O slot WinCE 6.0 Based Standard XPAC (OS: Multi-Language version) (RoHS)
Note: Call for customized XPAC-8000-Atom-CE6	

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)