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AMC – Analytik & Messtechnik GmbH Chemnitz

Heinrich-Lorenz-Str. 55 Tel.: +49/371/38388-0  
09120 Chemnitz Fax: +49/371/38388-99  
E-Mail: info@amc-systeme.de Web: www.amc-systeme.de

# Industrial Computers and DAQ Solutions

## Total Integrated Solutions for Industrial Automation 2016-2017



ADVANTECH iAutomation  
Premier Partner

- ✓ PICMG Single Board Computers
- ✓ Passive Backplanes
- ✓ ATX Motherboards
- ✓ Server-grade IPCs
- ✓ Industrial Computer Chassis
- ✓ Data Acquisition & Communication



### ADVANTECH

Enabling an Intelligent Planet



IoT Solutions Alliance Premier



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# Full Range of Industrial Computers and Integration Services for Automation Applications

## Overview

Advantech delivers a full range of industrial computers for versatile applications in the automation field. Offering sophisticated system integration services, from customization, integration, validation, and certification, we provide a one-stop solution for rugged systems to customers who require a trusted partner to maximize their solutions.

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## Start your Business with an IPC Expert



Tool-less with thumb screws



Lockable door, flexible with-or-without key



Easily replaced fan module



Front I/O design to facilitate ATE applications



Plug ring-lock securely fastens the power cord



## Automated Optical Inspection (AOI)

Automated optical inspection provides high speed production and helps manufacturers improve efficiency. Advantech AIIS series with compatible Basler and Pointgrey cameras, multiple PoE, USB3, and rich I/O Interface ensures product quality and safety.



## Factory Automation

Factory automation counts on immediate information monitoring to achieve just-in-time manufacture. Advantech WebAccess, a 100% web-based SCADA software with excellent networking capabilities, provides powerful remote monitoring and control functions. Through WebAccess web structure, users can develop a central database from project node to SCADA node via Internet or Intranet.



## PICMG Single Board Computers

Advantech's slot CPU cards deliver a variety of solutions for industrial and embedded applications. Offering a complete selection of standard PICMG 1.0/1.3 full-size as well as half-size SBCs, scalable product lines have flexible I/O capabilities and great expandability, from ISA to PCI and PCI Express. Industrial, slot-hungry demands can be easily accommodated with Advantech full-range backplanes, chassis and peripheral support.



## Passive Backplanes

A wide range of Advantech backplanes are available for PICMG 1.0/1.3 SBCs. They range from two to twenty slots and allow optimal system configurations with flexible combinations of ISA, 32-bit / 64-bit PCI and PCIe slots. Our strict design policy makes it easy for customers to create solutions that ensure system compatibility. Advantech also provides a low-cost, yet professional design service that tailors backplanes to meet expansion requirements within a short time frame.



## Industrial Motherboards

Advantech provides a complete range of industrial motherboards in various form factors, from performance-rich ATX to best price/performance MicroATX and ultra compact highly integrated Mini-ITX. These motherboards are highly integrated and deliver advanced features like multi-core processing and PCI Express technology. They are suited for demanding industrial applications that require seamless upgrades, long term support, proven reliability and strict revision control.



## Server-grade IPCs

Advantech server-grade IPCs provide customers with complete solutions and value-added services rather than just a standard server product. Designed to deliver system integrator solutions for high-end applications, Advantech servers feature multi-processor computing power, hot swap, redundancy, and rich storage capacity.



## Industrial Computer Chassis

Advantech offers a complete selection of industrial computer chassis from 1U to 7U rackmount, to wall-mountable solutions, designed to support a variety of industrial-grade motherboard/single board computer (SBC) form factors, such as ATX, MicroATX, Mini-ITX, PICMG 1.0/1.3 full-size/half-size SBC, 3.5"/5.25" biscuit SBC, etc. Chassis include a range of features such as redundant power supply, hot-swappable accessories, storage and cooling options, and system fault detection mechanisms.



## Data Acquisition (DAQ) & Communication

Advantech provides plug-in IO cards, a full range of industrial data acquisition (DAQ) and control products that are widely used in industrial and laboratory applications such as: data acquisition, monitoring, automation, testing and measurement. With multiple wiring terminals and extensive software support, Advantech provides reliable, efficient, and cost-saving industrial solutions. Moreover, Advantech's DAQ I/O products can simply be bundled with versatile industrial PC chassis, backplanes, CPU modules, flat panel monitors and embedded automation computers.



## Machine Diagnostic

The graphical control interface makes it easy to monitor machine status in real time, and develop an effective, dynamic, preventive maintenance solution that ensures increases equipment reliability and stable overall functioning.



## Automatic Test Equipment & Data Acquisition (DAQ)

Quality control systems have become very expensive in recent years, creating a demand for more cost-effective alternatives. Along with automatic testing and inspection systems, Advantech's products help reduce human error and accelerate time to market.

# DAQNavi Greatly Reduces Costs and Improves Performance



## Features



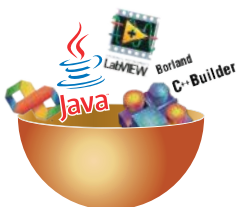
### Guaranteed Reliable Execution for Multi-Thread Programming

Multi-thread programming is now widely-used in DAQ applications. But without careful handling, it can cause unexpected problems like system crashes or data errors. Thread-safe programming technology prevents such problems. DAQNavi has thread-safe mechanisms built into its design, relieving programmers from multi-thread programming problems.



### Latest Operating System Support

DAQNavi adheres to the latest Windows (32-bit and 64-bit) and Linux operating system requirements. In addition, DAQNavi software design helps programmers easily migrate their DAQ applications between OS's, without spending lots of time solving OS-compatibility issues.



### Supports Multiple Programming Languages

For DAQ application development, DAQNavi supports 10 popular programming languages, including C/C++, Visual Basic, C#, VB.NET, Delphi, Qt, Borland C++ Builder (BCB), Java, MATLAB and LabVIEW. DAQNavi saves programmer development time when it is necessary to change programming languages.

## What is DAQNav?

DAQNav, Advantech's next-generation driver package, delivers higher performance, compatibility, and reliability through a brand new driver and SDK; programmers benefit from many new user-friendly templates and shortened development times.

## DAQNav Software Architecture

Apps	Native Code				Managed Code	
	Examples	Examples	Examples	Examples	Examples	Tools
	Java UI	C++Console MFC Qt/BCB	LabVIEW	ANSI C	C#Console C# VB.NET MATLAB Delphi	Navigator Plug-in DataLogger Multi-meter
Interpreter	Java Class Library	C++ class library	LabVIEW VIs	ANSI C API	.NET component	
Core	integrated DLL (BioDAQ.DLL for Windows 10, Windows 8, Windows 7, QNX, Linux)					
	DAQ Device Driver (Windows 10, Windows 8, Windows 7, QNX, Linux)					



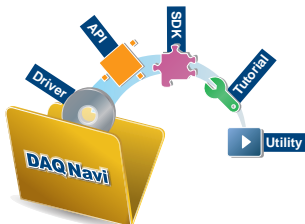
### LabVIEW Programming Support

LabVIEW programmers can easily build DAQ applications with DAQNav Assistant and Polymorphic VI. DAQNav Assistant, based on LabVIEW Express VI technology, provides an intuitive wizard window that helps complete configuration programming quickly. DAQNav Polymorphic VI delivers more programming flexibility to experienced LabVIEW programmers.



### Component-based Programming

Rapidly changing application requirements challenge DAQ developers, who are pressed to shorten development times. DAQNav delivers reusable, component-based libraries, which can save up to 70% on programming code. Programmers can ignore many detailed low-level hardware settings, and concentrate on major parameter configurations. For Visual Studio, BCB and Delphi users, DAQNav offers step-by-step wizards that complete configurations without coding.



### Easy-to-Use Utility

DAQNav provides an integrated utility, Advantech Navigator, where programmers can perform hardware configurations and functionality testing without programming. Hardware manual, software library documentation, and sample source codes are also provided. Everything necessary for DAQ programming is provided in this utility.

# Easy-to-Use Advantech Navigator Utility



## SDKs

### Software Development Manual

DAQNavi offers detailed documents that explain methods, properties, and events for each of the libraries, as well as programming flows and examples.



## Video Tutorial

For each programming language, a dedicated tutorial video is provided that shows how to create a DAQ project.



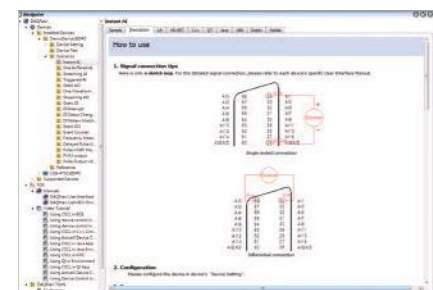
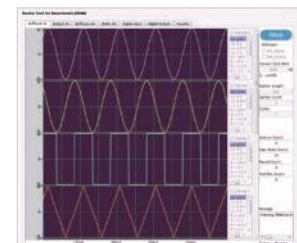
## Devices

All installed Advantech DAQ devices are displayed here, including simulated "DemoDevices". So even if there is no DAQ hardware connected to the computer, relative operations can still be performed. For each device, there are four selectable items:

1. **Device Setting:** Hardware parameter configurations
2. **Device Test:** DAQ function test without any coding
3. **Scenario**

To help programmers get started quickly with DAQNavi component-based libraries, Advantech has designed many DAQ application references, called Scenarios. For different programming languages, examples with source codes are provided. More than 300 examples dramatically reduce programming effort.

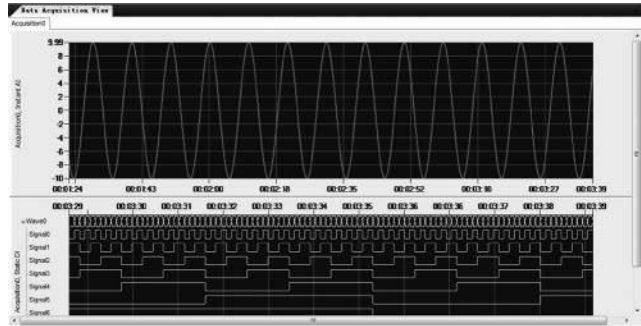
4. **Reference:** Selected-device hardware manual



# DAQNavi DataLogger

## Features

- Data logging, display and recording without programming
- Instant AI, buffered AI and static DI data logging
- Hardware channel parameter configuration wizard
- Supports simulated device operation
- Save configurations into a project file for future use
- Real-time display with zoom and pan
- Supports data recording, store file to disk
- View historical data via recorded data playback
- Supports both analog and digital graph display



## Introduction

Advantech DAQNavi DataLogger is ready-to-use application software that engineers can leverage to perform data logging, recording, and display. Without spending time programming, engineers benefit from the flexibility of acquiring and storing data from various Advantech data acquisition devices.

# DAQNavi SignalMeter

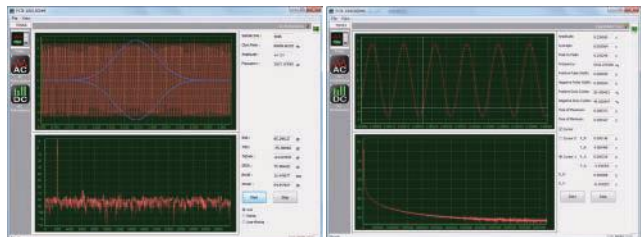
## Features

**Real-time display frequency domain based on zoom and pan operation in time domain.**

- Auto measurement for amplitude, average, peak to peak, and frequency.
- Cursor measurement for signal analysis.
- Provides Window function for AC signal.

**Provides DC and AC performance measurement.**

**Easy to use without programming.**



## Introduction

SignalMeter is a software utility that provides three functions for Advantech DAQ devices. It includes Scope, AC Performance, and DC Performance functions for different angles on data acquisition.

### Scope provides simple oscilloscope features:

- Amplitude: Returns the difference between the High and Low of the signal.
- Average: This is the mean vertical level of the entire captured waveform.
- Peak to Peak: Returns the difference between the extreme Maximum and Minimum values.
- Frequency: The period is the average time for a cycle to complete using the entire waveform in the capture window, so frequency is the inverse of the period.

The Scope function not only shows time-domain and frequency-domain at the same time but also provides synchronous zoom on time-domain and frequency-domain.

AC Performance can automatically calculate SNR, THD, SIMAD—important information for user data acquisition. For a DC signal, DC Performance will display RMS noise and chart a histogram graph. The interface is simple and easy to operate.

# Star Product Highlights

## Industrial Rackmount Enclosures



**ACP-4340**

4U Rackmount Chassis for Full-size SHB/SBC or ATX/MicroATX Motherboard with 4 Hot Swap Drive Trays



**ACP-4D00**

Dual-Node 350mm Depth 4U Chassis for Half-Sized Slot SBC



**ACP-2320**

2U Rackmount Chassis for ATX/MicroATX Motherboard with Low-Profile Rear Bracket Option

## Industrial Wallmount Enclosures



**IPC-3026**

Quiet Compact Chassis for Half Size SHB/SBC



**IPC-6025**

5-Slot Desktop/Wallmount Chassis with Scalability as 5U Quad-System Solution



**IPC-7130**

Desktop/Wallmount Chassis for ATX/MicroATX Motherboard

## Server-grade Rackmount Enclosures



**HPC-7242**

2U Rackmount Chassis for ATX Motherboard with 4 Hot-Swap SAS/SATA HDD Trays and RPS



**HPC-7320**

3U Short-depth Rackmount/Tower Chassis for EATX/ATX



**HPC-7442**

4U Rackmount Chassis for Full-size SHB/SBC or EATX/ATX Motherboard with 4 Hot Swap Drive Trays

## Slot Single Board Computers



**PCE-3029**

LGA 1151 6th Gen Intel® Core™ i7/i5/i3 Half-size SHB with PCIe 3.0/Dual independent display/ Dual GbE LAN/SATA III/m-SATA/ USB 3.0



**PCE-5129**

Intel® LGA1151 processor PICMG1.3 SHB supports 2 DDR4 RDIMM, Triple display, M.2, AMT



**PCE-9228**

Dual LGA 2011-R3 Intel® Xeon® E5-2600v3 PICMG1.3 Server grade SHB supports 8 DDR4 RDIMM, IPMI support

## Industrial Motherboards



### AIMB-785

LGA1151 6th Generation Intel® Core™ i7/i5/i3/ Celeron/Pentium ATX with Triple Display, DDR4, SATA III



### ASMB-585

LGA 1151 Intel® Xeon® E3 v5/ 6th Generation Core™ Micro ATX Server Board with 4 DDR4, 1 PCIe x16, 3 PCIe x4, Quad LANs, USB 3.0



### ASMB-785

LGA 1151 Intel® Xeon® E3 v5/ 6th Generation Core™ ATX Server Board with DDR4, 4 PCIe, 3 PCI, 6 USB 3.0, 6 COM, 6 SATA3, Quad/Dual LANs

## Server-grade Motherboards



### ASMB-913

Dual LGA 2011-R3 Intel® Xeon® E5-2600 v3 EATX Server Board with 16 x DDR4 DIMM, 3 PCIe x16, 6 USB 3.0, PME support



### ASMB-823

Dual LGA 2011-R3 Intel® Xeon® E5-2600 v3 ATX Server Board with DDR4, 4 PCIe x16, 6 USB 3.0, SATA3, Dual LAN, IPMI 2.0



### ASMB-923

Dual LGA 2011-R3 Intel® Xeon® E5-2600v3 EATX Server Board with DDR4, 4 PCIe x16+ 2 PCIe x8(Gen 3.0), 4 USB 3.0

## Serial Communication Cards



### PCI-E-1622C

8-port RS-232/422/485 PCI Express Communication Card



### PCI-E-1680

2-Port CAN-Bus PCIE card with Isolation Protection



### PCE-USB4

4-Port USB 3.0 PCI Express Expansion Card

## Data Acquisition Cards



### PCI-E-1810

800 kS/s, 12-bit, 16-ch PCI Express Multifunction DAQ Card



### PCI-E-1802

8-ch, 24-Bit, 216 kS/s Dynamic Signal Acquisition PCI Express Card



### PCI-E-1840

4-ch 16-Bit 125 MS/s High-Speed PCI Express Digitizer

# Automatic Wafer/LED Defect Inspection Improves Efficiency

## Project

For high-tech productions like semiconductor fabrication plants, which often deal with tiny components, human visual and manual operations often fail to meet the high standards for speed and precision. For example, there may be over a hundred grain-sized dies on a post-sawing LED wafer. Human inspection is time-consuming and cannot avoid mistakes due to fatigue, and the removal of defective LED dies with tweezers runs the risk of mishaps due to shaky human hands. Therefore, automatic optical inspection (AOI) systems accompanied by robotic applications are now used by hi-tech manufacturers for wafer defect inspection. They are able to conduct more reliable operations, reduce personnel costs, improve quality and enhance competitiveness. Advantech IPC-3026 compact system is designed to address the needs for automated visual and motion controls. Featuring a powerful computing core and rich I/O, yet with a small form factor, the IPC-3026 compact system is robust and able to deliver great space and cost efficiencies.

## Requirements

- 4 expansion slots in addition to motion, I/O, vision and field bus cards
- Compact size for convenient system integration
- Highly vibration resistant
- Operation temperature up to 40 °C
- Quad-core Core™ i7 computing power with 16GB memory for image analysis



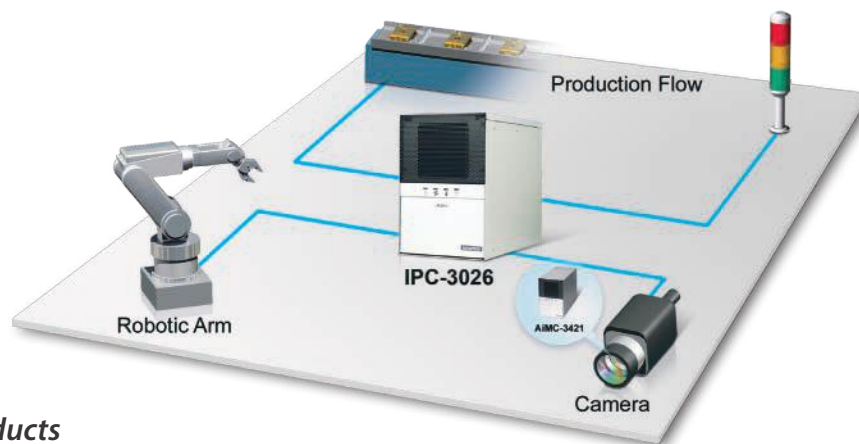
## System

An automatic system combining vision and motion controls usually requires a robust computing core and more than two expansion slots—for motion, I/O, vision and field bus cards, and for connecting with robot, camera, and other devices, and communicating with the SCADA server. These requirements usually mean a larger system size, but Advantech, the world's biggest industrial computer supplier with decades of accumulated expertise, employs outstanding thermal designs and fulfills the aforementioned functionalities with a system as small as a set-top box. The IPC-3026 compact system is a combination of IPC-3026 ultra compact chassis, PCE-4129 CPU card, which supports the latest Intel® 6th gen. Core™ i and 32GB DDR4 memory and PCE-3B06-00A1E backplane, which offers 1 PCIe x16 and 3 PCIe x1 slots. Compatible CPUs run at speeds ranging from 2.3 ~ 3.4GHz (Intel's quad-core Core™ i7 3.4GHz). The PCIe x16 is a broad-bandwidth interface for connecting with a frame grabber (graphics card) that can link to 2-4 digital cameras. The motion control card for enabling robotic applications takes a PCIe x1 slot, and the remaining two slots go to I/O and field bus cards to link with other devices and a SCADA server in the control room. In addition to thermal and I/O considerations, special design emphasis was put on workplace safety, including ergonomics that facilitate easy and safe maintenance such as rounded edges to protect worker's hands, and an easy-maintenance fan and HDD carrier. IPC-3026 compact system has CE/FCC and UL/CB certifications.

## Conclusion

In the world of hi-tech manufacturing, speed and precision decide competitiveness. As human eyes and hands often fall short in implementing the precise operations based on quantifiable repeatability, machine vision and motion systems are musts for achieving consistent quality and fast operations. The IPC-3026 compact system addresses production efficiency for quality-minded manufacturers.

IPC-3026 compact system provides great flexibility and rich options for integrators to develop their applications. Product designs are meant to maximize our customers' convenience and safety as well as their competitiveness and serviceability in marketplace.



## Implemented Products

<p><b>IPC-3026BP-15ZE</b></p>	<ul style="list-style-type: none"> <li>• Supports 6-slot PICMG 1.3/1.0 backplane</li> <li>• Shockproof, easy-maintenance drive bay for one 3.5" HDD</li> <li>• Supports two 2.5" HDDs by hot-swap tray</li> <li>• LED indicators for system fault detection</li> <li>• Lockable front door prevents unauthorized access</li> <li>• Built-in Intelligent System Module enables whole system fan control and remote manageability</li> </ul>
<p><b>PCE-3029G2-00A1E</b></p>	<ul style="list-style-type: none"> <li>• Complies with PICMG 1.3</li> <li>• Supports Intel® 6th Gen. Core™ i processor with H110 chipset</li> <li>• Dual Channel (Non-ECC) DDR4 1866/2133 up to 32 GB</li> <li>• Supports USB 3.0, SATA III, PCIe 3.0</li> <li>• Supports dual displays (CRT, DVI-D/DP)</li> </ul>
<p><b>PCE-3B06-00A1E</b></p>	<ul style="list-style-type: none"> <li>• 6 slot backplane for 6-slot chassis</li> <li>• One CPU card slot, one PCIe x16, four PCIe x1 expansion slots (one PCIe x1 can not be used due to CPU cooler mechanical interference)</li> </ul>

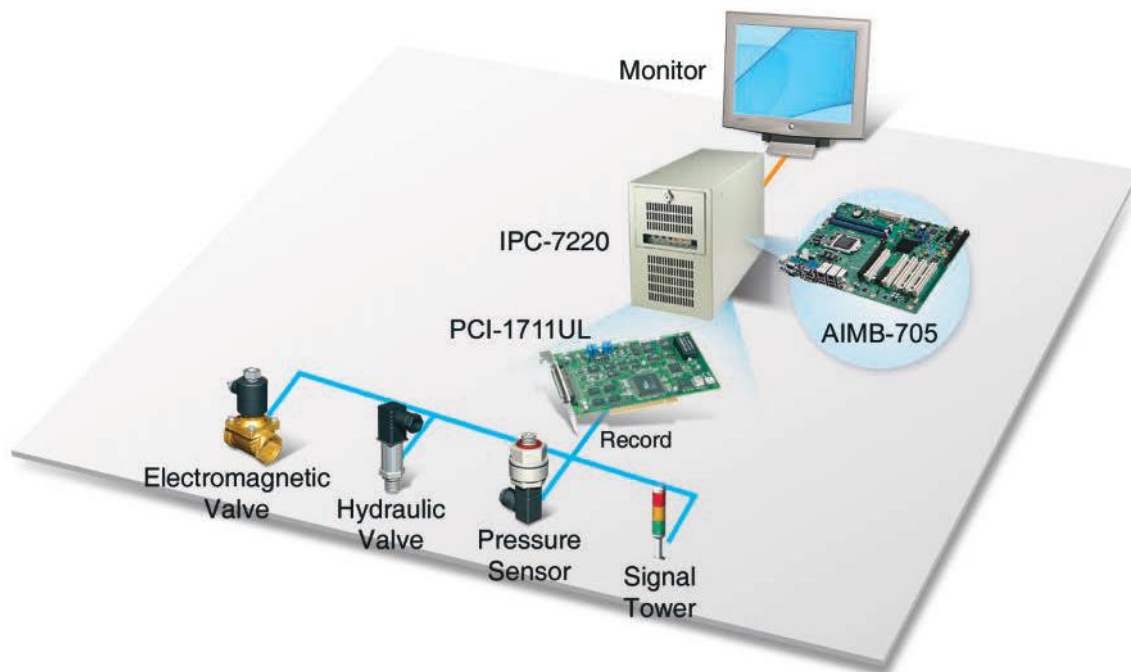
# Auto Safety Airbag High-Pressure Tank Testing Machine

## Project

When an airbag-equipped vehicle is involved in a collision, a storage tank of compressed gas and/or propellant causes airbags in the steering wheel and on the sides of the instrument panel to inflate in around 0.04 seconds, preventing people in the vehicle from suffering injury. Of course these high-pressure tanks must have guaranteed quality and safety. If a tank were to rupture, it could cause great injury to nearby objects and persons. So manufacturing, quality, and inspection guidelines are in place for these high-pressure steel tanks. In addition, specialized, air-container-failure-limitation-test machines that test the tanks are used to ensure product quality, and safety during the manufacturing process.

## Requirements

Various types of steel tanks require container verification testing during the manufacturing process. The high-pressure tanks used for auto airbags are only the size of two fingers. The main test items for these tanks are fatigue and rupture testing. First, a test machine's fatigue testing system must automatically pressurize containers to the specified test pressure, then release, for a preset number of cycles. In addition, the rupture testing system must monitor tanks subjected to high pressures in order to find out at what pressures they do fail. Afterwards, the system records the test process and calculates pressure-time curves, which allow for product analysis and revision. In the past, this kind of test equipment employed a PC and programmable logic controller (PLC) to perform processing of test data. However, because PLCs have insufficient analog signal sampling speed, data distortion could occur. As a result, when accurate data could not be obtained, tank tolerances could not be accurately calculated. Furthermore, Taiwan currently does not produce this type of standard test machine, and our customers must therefore develop and assemble their own air container failure limitation test machines. These customers required immediate local support in order to resolve technical issues quickly. Customers also felt concerns about whether they could purchase all parts and components from one source, and whether products from different suppliers might have compatibility problems.



## System

Advantech provides IPC-7220, AIMB-705, and PCI-1711L I/O cards for fast data acquisition. The AIMB-705 is Advantech's basic industrial motherboard, and it can support an Intel® 6th Gen. Core™ i processor, DDR4 memory, 5 PCI slots, and 2 PCIe slots. It also allows customers to install various types of I/O and interface cards. In addition to greatly increasing the sampling rate, the system offers a speed roughly ten times faster than that of PLC products. As for the customer's need to obtain accurate pressure data, the PCI-1711L performs rapid data acquisition 100 times faster than a PLC. This resolved the data distortion problem encountered by customers using PCs in conjunction with PLCs.

## Conclusion

Advantech's wide range of products satisfies most customer hardware and software needs. From the most basic embedded industrial computers to all types of I/O modules and software, customers no longer have to settle for cobbled solutions involving different configurations of individual products. Our worldwide network of professional technicians can provide real-time assistance throughout customers' R&D and assembly processes, assisting with the resolution of problems and bottlenecks, and shortening test machine completion time.



## Implemented Products

IPC-7220	<ul style="list-style-type: none"> <li>• Desktop chassis, supports standard ATX motherboard, with anti-vibration optical drive bracket</li> <li>• Supports two 5.25" and two 3.5" HDDs, smart system LED lights; monitor temperature, voltage, fan, and hard drives for abnormalities</li> <li>• An audio alarm module beeps to provide early warning of problems affecting system operating status</li> <li>• Fan and filters are easy to replace, reducing system down-time due to maintenance</li> <li>• The power module design facilitates easy operation and assembly</li> </ul>
AIMB-705	<ul style="list-style-type: none"> <li>• ATX industrial motherboard supports Intel® 6th generation Core™ i7/i5/i3/Pentium® processor with H110 chipset</li> <li>• Dual channel (Non-ECC) DDR4 1866/2133 up to 32GB</li> <li>• Supports VGA and DVI display</li> <li>• Supports SATA3.0, USB3.0, dual GbEs</li> <li>• Supports 5 RS-232 and 1 RS-232/422/485 serial ports</li> <li>• 1 PCIe x16 (Gen3) and 1 PCIe x4 (Gen3), and 5 PCI expansion slots</li> </ul>
PCI-1711L	<ul style="list-style-type: none"> <li>• PCI multifunction card</li> </ul>

# Integrated IC Packaging Machine Solution

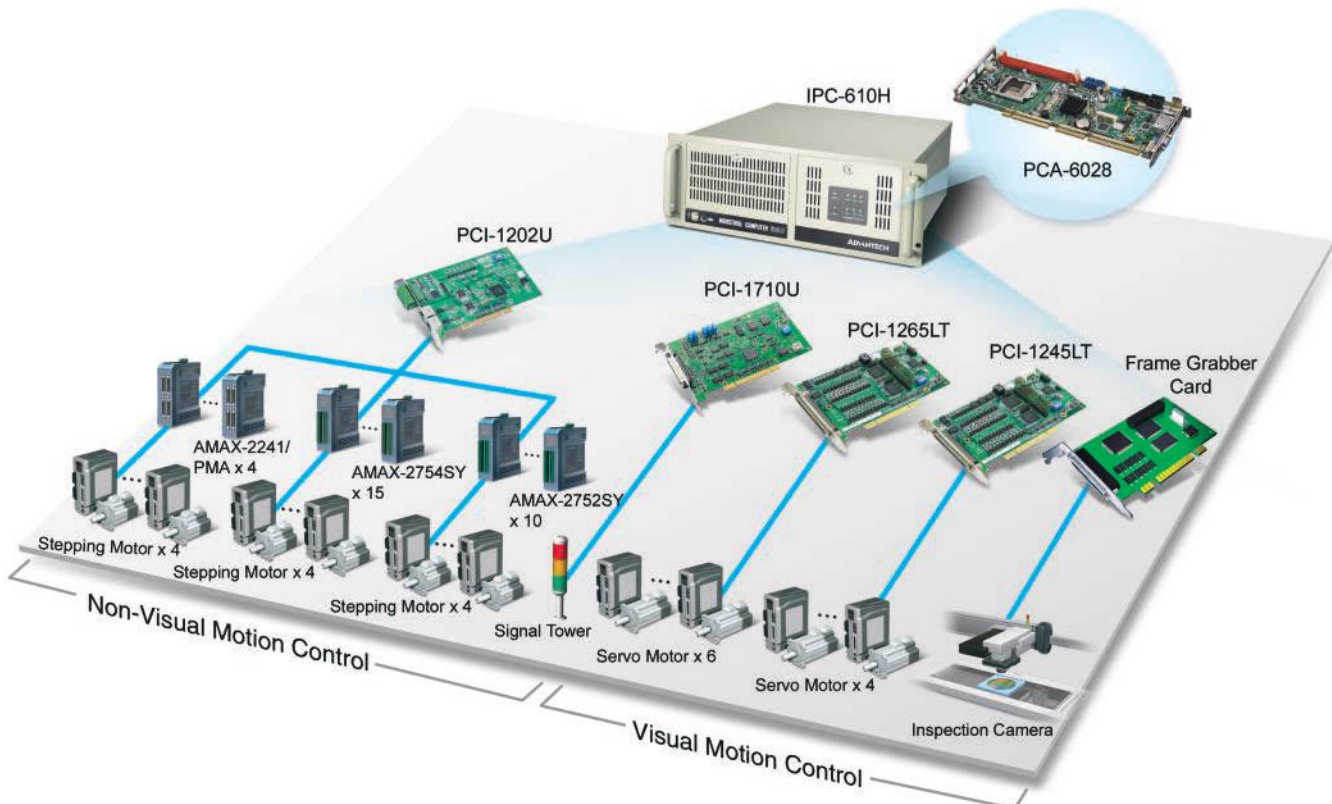
## Project

As semiconductor firms race to introduce ever faster and better-performing chips, wafer thickness has been shrinking steadily and is now at the nanometer level. In addition, in view of the great diversity of semiconductor products, which include flash memory, logic chips, analog chips, etc., semiconductor manufacturers are requiring an increasing output rate per unit time and shorter production cycles. Responding to technological and market trends, the integration of multiple processes in individual machines during back-end semiconductor processes is employed as a strategy for simplifying production line equipment, while also greatly shortening process cycles. Integrated production machines must therefore accommodate ever more control cards, motion cards, and image acquisition cards in order to achieve high-speed image pickup and testing actions, and reduce the error rate, as well as the cost of manual inspection.

## Requirements

While in the past machines were usually designed to perform individual specific functions, the need to achieve integration and accommodate high-speed production has led to the incorporation of multiple functions in single machines. This trend toward integrated machines has increased structural complexity, and caused the number of control axes in a machine to increase dramatically. Accordingly, this solution responded to the following customer needs:

- Must employ at least a dual-core industrial computer in order to achieve high processing speeds and shorten control cycle time.
- Because several processes are integrated within a single piece of equipment, there may be as many as 30 control axes, and there must be support for numerous external card slots.
- Must have a high level of expandability and support a PCI interface backplane.
- Since space was limited, machine volume was restricted.



## System

In view of the fact that customers may need to integrate several work stations in a single machine, Advantech provides integrated systems consisting of highly expandable single board computer and backplane combinations equipped with control axis cards, high-speed motion pick-up cards, and image acquisition cards. An Intel® LGA1150 PCA-6028 single-board computer met the customers' high-speed processing needs, and a PCA-6114P12 backplane was integrated with an Advantech control card and motion card. The use of Advantech industrial control cards avoids the possible incompatibilities that may occur when using products from different companies. The use of a backplane solution enabled better use of space than ordinary commercial motherboard systems, and also provided customers with the expandability needed to accommodate more external cards, ensuring an effective structure and optimal control performance. In addition, the IPC-610H panel and warning functions could accurately pinpoint system problems, greatly shortening system troubleshooting time.

## Conclusion

Advantech provides all-round solutions that allow customers to select product configurations that meeting their own particular needs, and strike an optimal balance between cost and performance. Apart from providing secure, reliable platforms, Advantech's sturdy industrial computer systems also offer the newest multi-core technology, and can process and analyze data and images from multiple work points. The system backplane ensures accurate processing and a high degree of expandability, while offering diverse transmission interface options, and maintaining compatibility with various control cards, data acquisition cards, and image cards.



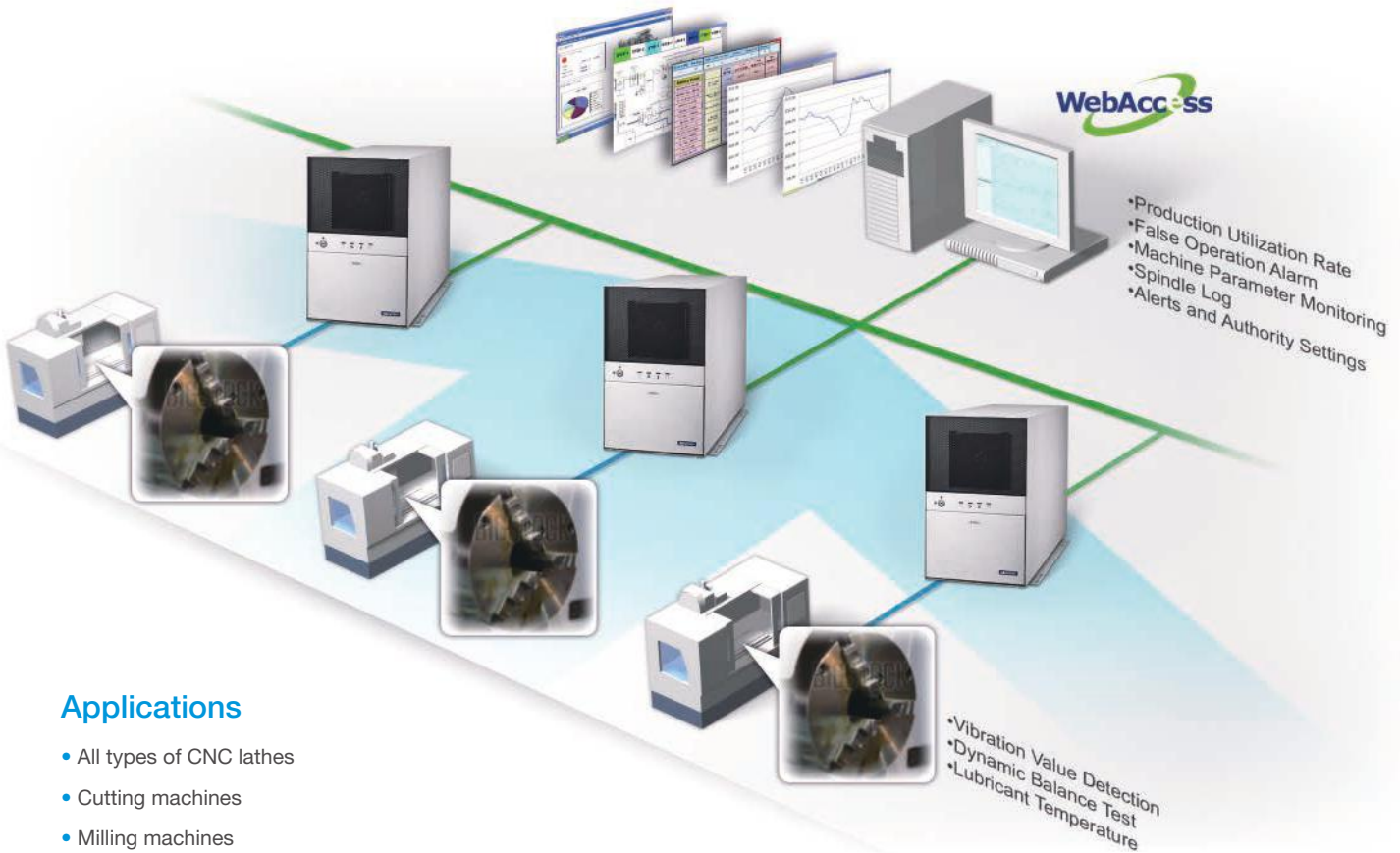
## Implemented Products

<b>IPC-610</b>	<ul style="list-style-type: none"> <li>• 4U frame-type industrial chassis, supports standard PICMG 1.0 slot SBCs</li> <li>• Equipped with 12 expansion slots and anti-vibration optical drive bracket</li> <li>• Supports two 5.25" and one 3.5" HDDs</li> <li>• Dual fan module not only optimizes system cooling, but also facilitates maintenance and reduces system stoppage</li> <li>• Front panel has a lockable hatch boosting system security</li> </ul>
<b>PCA-6028</b>	<ul style="list-style-type: none"> <li>• PICMG 1.0 full-size card, supports Intel® Core™ i7/i5/i3 LGA1150 processors with H81</li> <li>• Supports USB 3.0, SATA 3.0</li> <li>• Dual network interfaces</li> <li>• Equipped with PCI backplane</li> <li>• Provides an optimal, all-in-one platform.</li> </ul>
<b>PCA-6114P12</b>	<ul style="list-style-type: none"> <li>• 14-slot backplane, 12 PCI slots</li> </ul>
<b>PCI-1202U</b>	<ul style="list-style-type: none"> <li>• AMONet motion communication card</li> </ul>
<b>AMAX-2241/PMA</b>	<ul style="list-style-type: none"> <li>• AMONet can support a Panasonic Minas A3/A4 distributed motion module</li> </ul>
<b>AMAX-275xSY Series</b>	<ul style="list-style-type: none"> <li>• AMONet digital I/O module</li> </ul>
<b>PCI-1265LT</b>	<ul style="list-style-type: none"> <li>• SoftMotion 6-axis motion control card</li> </ul>

# Process Control and Damage Identification System for Machine Tool Spindle

## Project

Bearings are basic but demanding components that support rotating shafts and other moving parts in various machine tools. Bearings are key components that affect spindle speeds. At high speeds, bearings can be damaged from abnormal lubrication, abnormal preload, or pollution. Through sensor measurement, the system closely monitors the physical status of bearings, including vibration values, dynamic balance, lubricant temperatures, and so on, and transforms this data into signal feedback that when needed automatically stops the machine, or the system can alert the operator to respond appropriately, thus avoiding machine breakdown due to negligence, and increasing the life and safety of bearings and spindles substantially. Meanwhile, the system also monitors data like the utilization rates and spindle logs, providing useful information for manufacturing systems.



## Applications

- All types of CNC lathes
- Cutting machines
- Milling machines

## Requirements

There are very few solutions for monitoring machine health that combine SCADA functions in one compact size computer. This solution, however fulfilled the needs of the application by satisfying the following requirements:

- Must employ at least a Core™ i5 industrial computer in order to achieve rapid data acquisition and processing capability, and serve as a SCADA server
- For upward data communication efficiency, a Gigabit Ethernet port is preferred
- Downward communication with machines is usually achieved via RS-232 or RS-485
- Must have a high level of expandability with at least one PCIe and two PCI slots
- Needs dynamic signal acquisition card to acquire quantified data readings, e.g., vibration, audio noise, and so on
- The environment may be dusty and polluted; a fanless system is strongly recommended

## System

This highly integrated system consists of an IPC-7130 chassis and AIMB-785 motherboard, which supports the latest Intel® 6th-gen Core i™, DDR4 memory, 1 PCIe x16, 3 PCIe x4 and 3 PCI slots, along with high precision dynamic signal acquisition card and RS-232/485 communication card, to fulfill this complex application. All sensors are installed where they can monitor vibration, audio noise, lubricant temperature and electric motor current, and the data are analyzed. Some machines have sensors built in that send data to the system via RS-232/485. If machine health falls below a preset trigger value, the system raises the alarm and shuts down the machine, preventing accidents and saving costs. The WebAccess SCADA software lets the system work as a SCADA server that monitors machine health details.

## Conclusion

Advantech provides a variety of data acquisition and communication cards that are the keys to building up a highly integrated system for machine monitoring. WebAccess enables this system to function as a SCADA server, making it easy to set up cloud-based machine condition monitoring.

The single board computer plus backplane structure enables better use of space than ordinary commercial motherboard systems, and also provides customers with better expandability and easier maintainability.

## Implemented Products

Component	Function	Specifications
<b>Advantech WebAccess</b>	Browser-based HMI/SCADA Software: <ul style="list-style-type: none"> <li>• Networking and remote monitoring capabilities for rapid development of monitoring and diagnostic software</li> <li>• Remote monitoring capability for users to control on-site status through the network, any time, anywhere, and to analyze and make decisions remotely</li> </ul>	According to the needs of different systems, providing different I/O tags. Please refer to system specification
<b>IPC System (IPC-7130 + AIMB-785)</b>	SCADA Server: Built-in WebAccess SCADA software, with real-time data acquisition and powerful computing capability, low power consumption, fanless design. The most durable and reliable data acquisition platform	<ul style="list-style-type: none"> <li>• Intel® 6th-gen Core™ i5 processor</li> <li>• 1 x RS-232/422/485 interface, with automatic data flow control and 5 x RS-232</li> <li>• 2 x 10 on-board Gigabit Ethernet port</li> <li>• Supports triple independent displays VGA x 1, DVI x 2</li> <li>• Audio Mic-in, Line-out</li> <li>• Dual hot-swap 3.5" drive bays</li> </ul>
<b>PCI-E-1802</b>	Dynamic data acquisition module. 8-channel, 24-bit analog acquisition module, with sampling rate up to 216KS/s. It can be directly connected to IEPE sensor to measure vibration, acceleration, microphone signal, and other signals	<ul style="list-style-type: none"> <li>• 8 channel, 24-bit high-resolution analog conversion up to 115dB dynamic range</li> <li>• Sampling rate up to 216KS/s</li> <li>• Choice of AC or DC input coupling</li> <li>• AC coupling frequency lowest to 0.1Hz</li> <li>• 4 or 10 mA IEPE and TEDS, applicable to the microphone and accelerometer through software settings</li> </ul>
<b>PCI-1610B</b>	4-port RS-232PCI communication card, transferring vibration value of machine spindle and bearings, and other information	<ul style="list-style-type: none"> <li>• 1KV surge protection</li> <li>• Communication type: RS-232/422/485</li> <li>• Baud rate: 50 bps ~ 921.6 kbps</li> <li>• Supported operating systems: Windows 7/8/10, and Linux</li> </ul>

# PICMG 1.3 System Host Boards

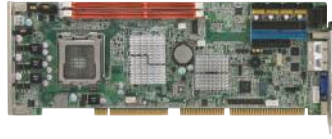


Model Name		LGA1150 PICMG 1.3 SHB	LGA1151 PICMG 1.3 SHB	LGA1151 PICMG 1.3 SHB
		PCE-5128	PCE-5029	PCE-5129
Processor System	CPU	Intel® Core™ i7/Core™ i5/Core™ i3 LGA1150 Processors	Intel® Core™ i7/Core™ i5/ Core™ i3 LGA1151 Processors	Intel® Core™ i7/Core™ i5/Core™ i3 LGA1151 Processors
	Max. Speed	3.1/2.9 GHz	3.7 GHz	3.4 GHz
	Chipset	Intel® Q87	Intel® H110	Intel® Q170
Memory	Technology	Dual-channel (Non-ECC) DDR3 1333/1600	Dual-channels (Non-ECC) DDR4 1866/2133	Dual-channels (Non-ECC) DDR4 1600/1866/2133
	Max. Capacity	16 GB	32 GB	32 GB
	Socket	240-pins DIMM x 2	2 x 288-pins DIMM	2 x 288-pins DIMM
Graphics	Controller	Chipset integrated Intel® HD Graphics	Chipset integrated Intel® HD Graphics	Chipset integrated Intel® HD Graphics
	VRAM	Shared system memory is subject to OS	Shared system memory is subject to OS	Shared system memory is subject to OS
	Video Out	VGA/DVI-D/DVI-D (Optional DVI-D cable)	G2: VGA+DP/DVI (Optional DVI-D/DP cable) VG: VGA	VGA+DP/DVI-D+DP/DVI-D
Ethernet	Interface	10/100/1000 Mbps	10/100/1000 Mbps	10/100/1000 Mbps
	LAN1/LAN2 Controller	Intel® I217LM/I211AT	LAN1: I219-V LAN2: I211-AT (G2 only)	Intel® I219LM/I211
	Connector	RJ45 X 2	G2: 2 VG: 1	RJ45 x 2
	Disable in BIOS	Yes	Yes	Yes
SATA	Max. Data Transfer Rate	600 MB/s SATA3.0	600 MB/s SATA3.0	600 MB/s SATA3.0
	Channel	6 x SATA3.0	4 x SATA3.0	5 x SATA3.0
	S/W Raid	0, 1, 5, 10	-	0, 1, 5, 10
Rear I/O	VGA	1	1	1
	Ethernet	2	2	2
	USB2.0	-	-	0
	USB3.0	1	3	1
	PS/2	1	1	1
	Serial	-	G2: - VG: 1	-
Internal I/O	USB 2.0	9 USB 2.0 (Pin-Header x 4 + USB Type A x 1 + 4 on backplane)	7 (Pin-header x 2+USB Type A x 1+ 4 on backplane)	7 USB2.0 (Pin-header x 2+USB Type A x 1+ 4 on backplane)
	USB 3.0	2 USB3.0 (Pin-Header)	2 USB3.0 (Pin header)	4 USB3.0 (Pin header)
	SATA	6	4	5
	M.2 (2280 Type M)	-	-	1 (Shared w/ SATA0 port)
	Serial	2 RS-232(Pin-Header)	G2: 2 VG: 1	2 RS-232(Pin-Header)
	Parallel	1(SPP/EPP/ECP)	1	1
	PS/2	1	1	1



Model Name		LGA1150 PICMG 1.3 SHB	LGA1151 PICMG 1.3 SHB	LGA2011 PICMG 1.3 SHB
		PCE-7128	PCE-7129	PCE-9228
Processor System	CPU	Intel® Xeon® and Core™ i7/Core™ i5/Core™ i3 LGA1150 Processors	Intel® Xeon® and Core™ i7/Core™ i5/Core™ i3 LGA1151 Processors	Intel® Xeon® E5-2600 v3 series LGA2011 Processors
	Max. Speed	3.5/2.9 GHz	3.6 GHz	2.5 GHz
	Chipset	Intel® C226	Intel® C236	Intel® C612
Memory	Technology	Dual-channel (ECC) DDR3 1333/1600	Dual-channels (ECC) DDR4 1600/1866/2133	Quad-channel ECC-Register DDR4 1600/1866/2133
	Max. Capacity	16 GB	32 GB	256 GB
	Socket	240-pins DIMM x 2	2 x 288-pins DIMM	288-pins DIMM x 8
Graphics	Controller	Chipset integrated Intel® HD Graphics	Chipset integrated Intel® HD Graphics	AST1400/AST2400
	VRAM	Shared system memory is subject to OS	Shared system memory is subject to OS	DDR3 64MB
	Video Out	VGA/DVI-D/DVI-D (Optional DVI-D cable)	VGA+DP/DVI-D+DP/DVI-D	VGA
Ethernet	Interface	10/100/1000 Mbps	10/100/1000 Mbps	10/100/1000 Mbps
	LAN1/LAN2 Controller	Intel® I217LM/I210AT	Intel® I219LM/I210AT	Intel® I210AT/I210AT
	Connector	RJ45 x 2	RJ45 x 2	RJ45 x 2
	Disable in BIOS	Yes	Yes	Lan1: No; Lan2: Yes
SATA	Max. Data Transfer Rate	600 MB/s SATA3.0	600 MB/s SATA3.0	600 MB/s SATA3.0
	Channel	6 x SATA3.0	5 x SATA3.0	8 x SATA3.0
	S/W Raid	0, 1, 5, 10	0, 1, 5, 10	0, 1, 5, 10
Rear I/O	VGA	1	1	1
	Ethernet	2	2	3 (IPMI occupy 1 LAN)
	USB2.0		0	2
	USB3.0	1	1	2
	PS/2	1	1	1
	Serial	-	-	-
Internal I/O	USB 2.0	9 USB 2.0 (Pin-Header x 4 + USB Type A x 1 + 4 on backplane)	7 USB2.0 (Pin-header x 2+USB Type A x 1+ 4 on backplane)	4 USB 2.0 (On backplane)
	USB 3.0	2 USB3.0 (Pin-Header)	4 USB3.0 (Pin header)	2 USB3.0 (Pin-Header)
	SATA	6	5	8
	M.2 (2280 Type M)		1 (Shared w/ SATA0 port)	
	Serial	2 RS-232(Pin-Header)	2 RS-232(Pin-Header)	1 RS-232(Pin-Header)
	Parallel	1(SPP/EPP/ECP)	1	-
	PS/2	1	1	-

# PICMG 1.0 Single Board Computers

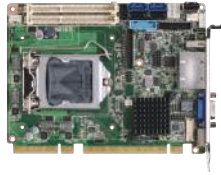


Model Name		Core™ 2 Quad PICMG 1.0 SBC	Atom™ N455/D525 PICMG 1.0 SBC
		PCA-6011	PCA-6012
Processor System	CPU	Intel® Core™ 2 Quad/Core™ 2 Duo/Pentium dual-Core™/ Celeron LGA775 processors	Onboard Intel® Atom™ N455 (VG version only) Onboard Intel® Atom™ D525 (G2 version only)
	Max. Speed	3.0 GHz/3.16 GHz/2.93 GHz/2.2 GHz	1.66 GHz/1.8 GHz
	Max. L2 Cache	12 MB/6 MB/8 MB/512 KB	512 KB/1MB
	Chipset	Intel® G41 + ICH7 (VG version only) Intel® G41 + ICH7R (G2 version only)	Intel® ICH8M
Graphics	Controller	Chipset integrated Intel® Graphics Media Accelerator X4500	Embedded Gen3.5+ GFX Core™ technology, Direct X 9/Pixel Shader 2.0 compliant
	VRAM	Shared with system memory up to 352 MB	Shared with system memory up to 224 MB
	LCD/DVI	DVI (Optional)	LVDS (G2 version only)
Ethernet	Interface	10/100/1000 Mbps	10/100/1000 Mbps
	Controller	LAN1: Intel® 82583V LAN2: Intel® 82583V	LAN1: Intel® 82567V LAN2: Intel® 82583V
	Connector	RJ-45 x 2	RJ-45 x 2
	Disabled in BIOS	Yes	Yes
Memory	Technology	Dual-channel DDR3 1066/800 MHz	Dual-channel DDR3 800 MHz
	Max. Capacity	8 GB	2 GB (VG version only) 4 GB (G2 version only)
	Socket	240-pin DIMM x 2	204-pin SODIMM x 2
SATA	Max. Data Transfer Rate	300 MB/s	300 MB/s
	Channel	4	3
	RAID	0, 1, 5, 10 (G2 version only)	-
EIDE	Mode	ATA 100/66/33	ATA 100/66/33
	Channel	1 (Max. two devices)	1 (Max. two devices)
I/O Interface	USB	8 (USB 2.0, for VG version) 7 (USB 2.0, for G2 version)	8 (USB 2.0, for VG version) 9 (USB 2.0, for G2 version)
	Serial	2 (RS-232)	2 (RS-232)
	Parallel	1 (SPP/EPP/ECP)	1 (EPP/ECP)
	FDD	1	1
	PS/2	1	1
	LAN	1 (for VG version) 2 (for G2 version)	1 (for VG version) 2 (for G2 version)



Model Name		Atom™ N455/D525 PICMG 1.0 SBC	LGA1150 PICMG 1.0 SBC
		PCA-6013	PCA-6028
Processor System	CPU	Onboard Intel® Atom™ N455 (VG version only) Onboard Intel® Atom™ D525 (G2 version only)	Intel® Core™ i7/i5/i3/Pentium LGA 1150 Processors
	Max. Speed	1.66 GHz/1.8 GHz	up to 3.2GHz
	Max. L2 Cache	512 KB/1MB	up to 8MB
	Chipset	Intel® ICH8M	Intel® H81
	BIOS	AMI 16Mb SPI Flash	AMI 128Mbit SPI Flash
	FSB	-	-
Bus	PCI	32-bit/33 MHz PCI	32 bit/33 MHz PCI
	ISA	HISA (ISA High Drive)	HISA (ISA High Driver)
Graphics	Controller	Embedded Gen3.5+ GFX Core™ technology, Direct X 9/Pixel Shader 2.0 compliant	Chipset integrated Intel® HD Graphics
	VRAM	Shared with system memory up to 224 MB	Shared system memory is subject to OS
	LCD/DVI	LVDS (G2 version only)	DVI (G2 version only)
Ethernet	Interface	10/100/1000 Mbps	10/100/1000 Mbps
	Controller	LAN1: Intel® 82567V LAN2: Intel® 82583V	LAN 1: Intel I217V LAN 2: Intel® I211 (Only in G2 Sku)
	Connector	RJ-45 x 2	RJ45 x 1 (VG sku); RJ45 x 2 (G2 sku)
	Disabled in BIOS	Yes	Yes
Memory	Technology	Dual-channel DDR3 800 MHz	Dual channel (Non-ECC) DDR3 1333/1600 MHz
	Max. Capacity	2 GB (VG version only) 3 GB (G2 version only)	16 GB (8 GB per DIMM)
	Socket	1 GB on Board + 204-pin SODIMM x 1	DDR3 240-pin DIMM x 2
SATA	Max. Data Transfer Rate	300 MB/s	600 MB/s
	Channel	3	4 (1x SATA2.0, 2x SATA3.0, 1x mSATA)
	RAID	-	-
EIDE	Mode	ATA 100/66/33	-
	Channel	1 (Max. two devices)	-
I/O Interface	USB	8 (USB 2.0, for VG version) 9 (USB 2.0, for G2 version)	Up to 8 x USB2.0 (6x pin header, 1x type A, 1x rear in G2 sku only) 2x USB3.0 (Pin header)
	Serial	2 (RS-232)	2 RS-232 (Pin-Header)
	Parallel	1 (EPP/ECP)	1
	FDD	1	-
	PS/2	1	1
	LAN	1 (for VG version) 2 (for G2 version)	1 (for VG version) 2 (for G2 version)

# Half-Size Single Board Computers



Specifications		PCIe Half-Size SBC		
		PCE-3028	PCE-3029	PCE-4129
Processor System	CPU	Intel® Core™ i7/i5/i3/Pentium® LGA 1150 Processor	Intel® Core™ i7/i5/i3/Pentium® LGA 1151 Processor	Intel® Xeon® E3-1200v5 series, Core™ i7/i5/i3 LGA1151 processors
	Speed	Up to 3.5 GHz	Up to 3.7 GHz	Up to 3.7 GHz
	L2 Cache	Up to 8MB	Up to 8 MB	Up to 8 MB
	Chipset	Intel® H81	Intel® H110	Intel® C236
Graphics	Controller	Chipset integrated graphics with Intel® HD	Chipset integrated graphics with Intel® HD	Chipset integrated graphics with Intel® HD
	VRAM	Shared with system memory is subject to OS	Shared with system memory is subject to OS	Shared with system memory is subject to OS
	Video output	D-sub VGA port, DVI	VGA, DVI, DP	VGA, DVI, DP
Ethernet	Interface	10/100/1000 Mbps	10/100/1000 Mbps	10/100/1000 Mbps
	Controller	LAN1: Intel® I217V LAN2: Intel® I211AT	LAN1: Intel® I219V LAN2: Intel® I211AT	LAN1: Intel® I219LM LAN2: Intel® I210AT
	Connector	RJ-45 x2	RJ-45 x2	RJ-45 x2
	Disabled in BIOS	Yes	Yes	Yes
Memory	Technology	Dual-channel DDR3 1066/1333/1600 MHz	Dual-channel DDR4 1866/2133 MHz	Dual channel DDR4 ECC 1866/2133 MHz (ECC function enable depends on processor support)
	Max. Capacity	16 GB	32 GB	32GB
	Socket	204-pin SODIMM x2	260-pin SODIMM x2	260-pin SO-DIMM X2
SATA	Max. Data Transfer Rate	600 MB/s, 300 MB/s	600MB/s	600MB/s
	Channel	4	4	4
	RAID	-	-	0,1,5,10
I/O Interface	USB	2 USB 3.0 + 8 USB 2.0	3 USB 3.0 + 7 USB 2.0	3 USB 3.0 + 7 USB 2.0
	Serial	2 x RS-232	2 x RS-232	2 x RS-232
	Parallel	1	1	1
	FDD	-	-	-
	PS/2	1	1	1
	LAN	2	2	2



Specifications		ISA/PCI Half-Size SBC		
		PCI-7032	PCA-6763	PCA-6743
Processor System	CPU	Intel® Celeron® J1900/N2930	AMD G-Series APU T16R	DM&P Vortex86DX
	Speed	2.00/1.83 GHz	615 MHz	800 MHz
	Chipset	Intel® Celeron® J1900/N2930 SOC	AMD T16R+A55E	DM&P Vortex86DX
Bus	PCI	32-bit/33 MHz PCI	-	-
	ISA	-	16-bit ISA Bus	16-bit ISA Bus
Graphics	Controller	Chipset integrated graphics with Intel® HD	Radeon HD 6250	SMI 712 graphic controller
	VRAM	Shared with system memory is subject to OS	Shared with system memory up to 384MB	4 MB display memory
	Video output	D-sub VGA port, 48-bit LVDS, DVI	D-sub VGA port, LVDS (48-bit for G2 SKU, 18-bit for VG SKU), DVI	D-Sub VGA port, up to 24 bit TTL or 18 bit LVDS (optional)
Ethernet	Interface	10/100/1000 Mbps	10/100/1000 Mbps	10/100 Mbps
	Controller	LAN1: Intel® I211 LAN2: Intel® I211	LAN1: Intel® I211 LAN2: Intel® I211	LAN on Vortex86DX
	Connector	RJ-45 x 2	RJ-45 x 2	RJ-45 x 1
	Disabled in BIOS	Yes	Yes	Yes
Memory	Technology	Dual-Channel DDR3L 1333	Onboard 1GB DDR3 1066 MHz SODIMM DDR3 1066 MHz up to 4GB	Default onboard DDR2 (for VE SKU) Default onboard DDR2 (for F SKU)
	Max. Capacity	8GB (for G2/F SKU) 4GB (for VG SKU)	5GB	256 MB (for VE SKU) 512 MB (for F SKU)
	Socket	204-pin SODIMM x 2 (for G2/F SKU) 204-pin SODIMM x 1 (for VG SKU)	204-pin SODIMM x 1	-
SATA	Max. Data Transfer Rate	300 MB/s	300 MB/s	150 MB/s
	Channel	2 (SATA 2 can change mSATA)	2 (SATA 2 can change mSATA)	1 (for F SKU)
EIDE	Mode	-	-	UDMA 100
	Channel	-	-	1 (Max. 2 devices)
I/O Interface	USB	1 USB 3.0 + 6 USB 2.0 (for G2/F SKU) 1 USB 3.0 + 5 USB 2.0 (for VG SKU)	7 USB 2.0 (for G2 SKU) 6 USB 2.0 (for VG SKU)	4 USB 2.0
	Serial	4 x RS-232/422/485 (for G2/F SKU)	2 x RS-232	F SKU: 2 x RS-232/422/485 & 2 x RS-232
	Parallel	1	1	1
	FDD	-	1	1
	PS/2	1	1	1
	LAN	2	2	1

# PICMG1.3 Full-Size SHB Backplanes

## Server Grade: Compatible with PCE-7000 Series CPU Boards

Category	Model Name	PCIe				PCI-X			PCI
		x16	x8	x4	x1	64/66	64/100	64/133	32/33
2U Butterfly BP	PCE-7B06V-04A1E	-	1	-	-	-	-	-	4
8 slots BP	PCE-7B08-04A1E	-	2	1	-	-	-	-	4
14 slots BP	PCE-7B09R-04A1E	-	1	3	-	-	-	-	4
	PCE-7B10-04A1E	-	-	5	-	-	-	-	4
	PCE-7B13-64C1E	-	2	-	-	4	2	-	4
	PCE-7B13-07A1E	-	2	3	-	-	-	-	7
	PCE-7B13D-04A1E	-	1,2	-	-	-	-	-	4
20 slots BP	PCE-7B17-00A1E	-	5	11	-	-	-	-	-

Category	Model Name	Wallmount/Desktop Chassis			
		IPC-6025	IPC-6606	IPC-6806(W)	IPC-6608
8 slots BP	PCE-7B08-04A1E	-	-	-	V
14 slots BP	PCE-7B09R-04A1E	-	-	-	-
	PCE-7B10-04A1E	-	-	-	-
	PCE-7B13-64C1E	-	-	-	-
	PCE-7B13-07A1E	-	-	-	-
	PCE-7B13D-04A1E	-	-	-	-
20 slots BP	PCE-7B17-00A1E	-	-	-	-

Category	Model Name	Rackmount Chassis															
		ACP-1010	ACP-1320	ACP-2000EBP	IPC-602EBP	IPC-510	IPC-610	IPC-611	ACP-4000	ACP-4010	ACP-4320	ACP-4340	ACP-4360	IPC-623	IPC-622		
		2-slot / 1U			6-slot / 2U			15-slot / 4U								20-slot / 4U	20-slot / 6U
2U Butterfly BP	PCE-7B06V-04A1E	-	-	V	V	-	-	-	-	-	-	-	-	-	-	-	-
8 slots BP	PCE-7B08-04A1E	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
14 slots BP	PCE-7B09R-04A1E	-	-	-	-	V	V	V	V	V	V	V	V	V	-	-	-
	PCE-7B10-04A1E	-	-	-	-	V	V	V	V	V	V	V	V	V	-	-	-
	PCE-7B13-64C1E	-	-	-	-	V	V	V	V	V	V	V	V	V	-	-	-
	PCE-7B13-07A1E	-	-	-	-	V	V	V	V	V	V	V	V	V	-	-	-
	PCE-7B13D-04A1E	-	-	-	-	-	-	-	-	-	V	-	-	-	-	-	-
20 slots BP	PCE-7B17-00A1E	-	-	-	-	-	-	-	-	-	-	-	-	-	V	V	-

## Desktop: Compatible with PCE-5000 Series CPU Boards

Category	Model Name	PCIe				PCI-X			PCI
		x16	x8	x4	x1	64/66	64/100	64/133	32/33
1U Butterfly BP	PCE-5B03V-01A1E	1	-	-	-	-	-	-	1
	PCE-5B03V-00A1E	1	-	1	-	-	-	-	-
2U Butterfly BP	PCE-5B05V-30B1E	1	-	-	-	2	1	-	-
	PCE-5B06V-00A1E	1	-	-	4	-	-	-	-
5 slot BP	PCE-5B06V-04A1E	1	-	-	-	-	-	-	4
	PCE-5B04-20B1E	1	-	-	-	-	2	-	-
	PCE-5B05-02A1E	1	-	1	-	-	-	-	2
	PCE-5B05-03A1E	1	-	-	-	-	-	-	3
	PCE-5B05-04A1E	-	-	-	-	-	-	-	4
6 slot BP	PCE-5B06-00A1E	1	-	-	4	-	-	-	-
	PCE-5B06-03A1E	1	-	1	-	-	-	-	3
	PCE-5B06-04A1E	1	-	-	-	-	-	-	4
8 slot BP	PCE-5B07-04A1E	1	-	1	-	-	-	-	4
	PCE-5B08-02A1E	1	-	-	4	-	-	-	2
10 slot BP	PCE-5B09-04A1E	1	-	3	-	-	-	-	4
	PCE-5B09-06A1E	1	-	1	-	-	-	-	6
14 slot BP	PCE-5B10-04A1E	1	-	-	4	-	-	-	4
	PCE-5B12-07A1E	1	-	3	-	-	-	-	7
	PCE-5B12-64C1E	1	-	-	-	4	2	-	4
	PCE-5B13-08A1E	1	-	-	3	-	-	-	8
	PCE-5B12D-04A1E	1	-	-	-	-	-	-	4
20 slot BP	PCE-5B12-00A1E	10	-	1	-	-	-	-	-
	PCE-5B16Q-02A1E	1	-	-	-	-	-	-	2
	PCE-5B18-88B1E	1	-	-	-	8	-	-	8
	PCE-5B19-00A1E	17	-	1	-	-	-	-	-

Category	Model Name	Wallmount/Desktop Chassis					
		IPC-6025	IPC-6606	IPC-6806	IPC-6806W	IPC-6608	IPC-7132
1U Butterfly BP	PCE-5B03V-01A1E	-	-	-	-	-	-
	PCE-5B03V-00A1E	-	-	-	-	-	-
2U Butterfly BP	PCE-5B05V-30B1E	-	-	-	-	-	-
	PCE-5B06V-00A1E	-	-	-	-	-	-
	PCE-5B06V-04A1E	-	-	-	-	-	-
5 slot BP	PCE-5B04-20B1E	V	-	-	-	-	-
	PCE-5B05-02A1E	V	-	-	-	-	-
	PCE-5B05-03A1E	V	-	-	-	-	-
	PCE-5B05-04A1E	V	-	-	-	-	-
	PCE-5B06-00A1E	-	V	-	V	-	-
6 slot BP	PCE-5B06-03A1E	-	V	-	V	-	-
	PCE-5B06-04A1E	-	V	-	V	-	-
	PCE-5B07-04A1E	-	-	-	-	V	-
8 slot BP	PCE-5B08-02A1E	-	-	-	-	V	-
	PCE-5B09-04A1E	-	-	-	-	-	V
10 slot BP	PCE-5B09-06A1E	-	-	-	-	-	V
	PCE-5B10-04A1E	-	-	-	-	-	-
	PCE-5B12-07A1E	-	-	-	-	-	-
14 slot BP	PCE-5B12-64C1E	-	-	-	-	-	-
	PCE-5B13-08A1E	-	-	-	-	-	-
	PCE-5B12D-04A1E	-	-	-	-	-	-
	PCE-5B12-00A1E	-	-	-	-	-	-
	PCE-5B16Q-02A1E	-	-	-	-	-	-
20 slot BP	PCE-5B18-88B1E	-	-	-	-	-	-
	PCE-5B19-00A1E	-	-	-	-	-	-
	PCE-5B19-00A1E	-	-	-	-	-	-

# PCI/ISA Backplanes

## Selection Guide

Yes: supported/- : not supported/Δ : optional

Category	Model Name	Slot per segment					Segment	AT	ATX	1U Chassis		2U Chassis		4U Chassis		
		ISA	PCI	PICMG	PICMG/ PCI	ISA/ PCI				ACP-1010	ACP-1320	ACP-2000	IPC-602	IPC-510	IPC-610	IPC-611
										2-slot	2-slot	6-slot	6-slot	15-slot	15-slot	15-slot
1U Butterfly BP	PCA-6103P2V-0A2E*	-	2	1	-	-	1	-	Yes	Yes	-	-	-	-	-	
2U Butterfly BP	PCA-6105P4V-0B3E*	-	4	1	-	-	1	-	Yes	-	-	Yes	Yes	-	-	
	PCA-6106P3V-0B2E*	1	3	2	-	-	1	Yes	Yes	-	-	Yes	Yes	-	-	
5 Slot BP	PCA-6105P3-5A1E	1	2	1	-	1	-	Yes	Yes	-	-	-	-	-	-	
6/8 Slot BP	PCA-6106P4-0A2E	-	4	2	-	-	1	Yes	Yes	-	-	-	-	-	-	
	PCA-6106P3-0D2E	2	2	1	1	-	1	Yes	Yes	-	-	-	-	-	-	
	PCA-6108P6-0C1E	1	5	1	1	-	1	Yes	Yes	-	-	-	-	-	-	
	PCA-6108P4-0C2E	3	3	1	1	-	1	Yes	Yes	-	-	-	-	-	-	
	PCA-6108-0B2E	8	-	-	-	-	1	Yes	Yes	-	-	-	-	Yes	Yes	Yes
14/15 Slot BP	PCA-6114P12-0B3E	1	11	1	1	-	1	Yes	Yes	-	-	-	-	Yes	Yes	Yes
	PCA-6114P10-0B2E	2	10	2	-	-	1	Yes	Yes	-	-	-	-	Yes	Yes	Yes
	PCA-6114P7-0E1E	4	6	3	-	1	1	Yes	Yes	-	-	-	-	Yes	Yes	Yes
	PCA-6114P4-0C2E	8	4	2	-	-	1	Yes	Yes	-	-	-	-	Yes	Yes	Yes
	PCA-6113P4R-0C2E	7	4	2	-	-	1	Yes	Yes	-	-	-	-	Yes	Yes	Yes
	PCA-6114-0B2E	14	-	-	-	-	1	Yes	Yes	-	-	-	-	-	-	-
	PCA-6113DP4-0A2E	1	3,4	1,2	1,0	-	2	Yes	Yes	-	-	-	-	-	-	-
20 Slot BP	PCA-6120P18-0A2E	1	17	1	1	-	1	Yes	Δ	-	-	-	-	-	-	-
	PCA-6120P4-0B2E	14	4	2	-	-	1	Yes	Δ	-	-	-	-	-	-	-
	PCA-6120P12-0A2E	7	11	1	1	-	1	Yes	Δ	-	-	-	-	-	-	-
	PCA-6119P7-0C1E	10	7	2	-	-	1	Yes	Δ	-	-	-	-	-	-	-
	PCA-6120Q-0B2E	5	-	-	-	-	4	Yes	Δ	-	-	-	-	-	-	-

Category	Model Name	4U Chassis					6U Chassis		Wallmount/Desktop Chassis				Cage	
		ACP-4000	ACP-4010	ACP-4320	ACP-4340	ACP-4360	IPC-623	IPC-622	IPC-6608	IPC-6606	IPC-6806/ IPC-6806W	IPC-6025	IPC-6006	
		15-slot	15-slot	15-slot	15-slot	15-slot	20-slot	20-slot	8-slot	6-slot	6-slot	5-slot	6-slot	
5 Slot BP	PCA-6105P3-5A1E	-	-	-	-	-	-	-	-	-	-	-	Yes	-
6/8 Slot BP	PCA-6106P4-0A2E	-	-	-	-	-	-	-	-	Yes	Yes	-	Yes	
	PCA-6106P3-0D2E	-	-	-	-	-	-	-	-	Yes	Yes	-	Yes	
	PCA-6108P6-0C1E	-	-	-	-	-	-	-	Yes	-	-	-	-	
	PCA-6108P4-0C2E	-	-	-	-	-	-	-	Yes	-	-	-	-	
14/15 Slot BP	PCA-6114P12-0B3E	Yes	Yes	Yes	Yes	Yes	-	-	-	-	-	-	-	
	PCA-6114P10-0B2E	Yes	Yes	Yes	Yes	Yes	-	-	-	-	-	-	-	
	PCA-6114P7-0E1E	Yes	Yes	Yes	Yes	Yes	-	-	-	-	-	-	-	
	PCA-6114P4-0C2E	Yes	Yes	Yes	Yes	Yes	-	-	-	-	-	-	-	
	PCA-6113P4R-0C2E	Yes	Yes	Yes	Yes	Yes	-	-	-	-	-	-	-	
	PCA-6114-0B2E	Yes	Yes	Yes	Yes	Yes	-	-	-	-	-	-	-	
	PCA-6113DP4-0A2E	-	Yes	-	-	-	-	-	-	-	-	-	-	
20 Slot BP	PCA-6120P18-0A2E	-	-	-	-	-	Yes	Yes	-	-	-	-	-	
	PCA-6120P4-0B2E	-	-	-	-	-	Yes	Yes	-	-	-	-	-	
	PCA-6119P7-0C1E	-	-	-	-	-	Yes	Yes	-	-	-	-	-	
	PCA-6119P7-0B3E	-	-	-	-	-	Yes	Yes	-	-	-	-	-	
	PCA-6120Q-0B2E	-	-	-	-	-	Yes	Yes	-	-	-	-	-	

\*Compatible only with Advantech's 1U/2U chassis

# Backplanes Compatible with Half-Size SBCs

## Selection Guide

Yes : supported/- : not supported

Interface	Category	Model Name	Slots per segment							Segment
			ISA	PCI	PCIe x16	PCIe x 8	PCIe x4	PCIe x1	PICMG	
Pure ISA Backplane	-	PCA-6104-0C2E	3	-	-	-	-	-	1	1
	6-slot	PCA-6106-0B2E	5	-	-	-	-	-	1	1
	-	PCA-6108-0B2E *	7	-	-	-	-	-	1	1
	8-slot	PCA-6108E-0C2E	7	-	-	-	-	-	1	1
Pure PCI Backplane	-	PCA-6104P4-0B2E	-	3	-	-	-	-	1	1
	6-slot	PCA-6105P5-0B2E	-	4	-	-	-	-	1	1
	8-slot	PCA-6108P8-0A2E	-	7	-	-	-	-	1	1
PCI/PCIe Backplane	1U	PCI-7103P1V-01A1E	-	1	-	-	1	-	1	1
PICMG1.3 Half-Size Backplanes	6-slot	PCE-3B03-00A1E	-	-	1	-	1	-	1	1
	6-slot	PCE-3B06-00A1E	-	-	1	-	-	4	1	1
	6-slot	PCE-3B06-03A1E	-	3	1	-	-	1	1	1
	6-slot	PCE-3B06-02A1E	-	2	1	-	-	2	1	1
	3-slot	PCE-3B03A-00A1E	-	-	1	-	1	-	1	1
	3-slot	PCE-3B03-01A1E	-	1	1	-	-	-	1	1
	14-slot	PCE-3B12-08A1E	-	8	1	-	-	2	1	1
	14-slot	PCE-4B13-08A1E	-	8	-	2	-	2	1	1
	14-slot	PCE-4B12-03A1E	-	3	-	1	4	3	1	1
	14-slot	PCE-4B13-00A1E	-	-	-	1	11	-	-	-

Interface	Model Name	AT	ATX	IPC-120	ACP-4020	ACP-4D00	IPC-6806S*	IPC-6006S	IPC-3026	IPC-3012
				Rackmount	Rackmount	Rackmount	Wallmount	Wallmount	Wallmount	Wallmount
				3-slot	14-slot	6-slot	6-slot	6-slot	6-slot	3-slot
Pure ISA Backplane	PCA-6104-0C2E	Yes	Yes	-	-	-	-	-	-	-
	PCA-6106-0B2E	Yes	Yes	-	-	-	Yes	Yes	Yes	-
	PCA-6108-0B2E	Yes	Yes	-	-	-	-	-	-	-
	PCA-6108E-0C2E	Yes	Yes	-	-	-	-	-	-	-
Pure PCI Backplane	PCA-6104P4-0B2E	Yes	Yes	-	-	-	-	-	-	-
	PCA-6105P5-0B2E	Yes	Yes	-	-	Yes	Yes	Yes	Yes	-
	PCA-6108P8-0A2E	Yes	Yes	-	-	-	-	-	-	-
PCI/PCIe Backplane	PCI-7103P1V-01A1E	-	Yes	Yes	-	-	-	-	-	
Half-Size Backplanes	PCE-3B03-00A1E	-	Yes	-	-	Yes	Yes	-	Yes	-
	PCE-3B06-00A1E	-	Yes	-	-	Yes	Yes	-	Yes	-
	PCE-3B06-03A1E	-	Yes	-	-	Yes	Yes	-	Yes	-
	PCE-3B06-02A1E	-	Yes	-	-	Yes	Yes	-	Yes	-
	PCE-3B03A-00A1E	-	Yes	-	-	-	-	-	-	Yes
	PCE-3B03-01A1E	-	Yes	-	-	-	-	-	-	Yes
	PCE-3B12-08A1E	-	Yes	-	Yes	-	-	-	-	-
	PCE-4B13-08A1E	-	Yes	-	Yes	-	-	-	-	-
	PCE-4B12-03A1E	-	Yes	-	Yes	-	-	-	-	-
	PCE-4B13-00A1E	-	Yes	-	Yes	-	-	-	-	-

# ATX Motherboards



Model Name		AIMB-784	AIMB-705	AIMB-785
Processor System	CPU	4th Gen Intel® Core™ i7/i5/i3	6th Gen Intel® Core™ i7/i5/i3/Pentium®	6th Gen Intel® Core™ i7/i5/i3/Pentium®
	Socket	LGA1150	LGA1151	LGA1151
	Max. Speed	3.7 GHz/3.5 GHz/3.2 GHz/3.1 GHz/ 3.0 GHz/2.9 GHz/2.7 GHz/2.4 GHz/ 2.3 GHz/2.0 GHz	3.7 GHz/3.4 GHz/3.2 GHz/2.4 GHz/ 2.3 GHz	3.7 GHz/3.4 GHz/3.2 GHz/2.7 GHz/ 2.4 GHz/2.3 GHz
	Chipset	Q87	Intel® H110	Q170
Expansion Slot	PCIe x16	1 (Gen3)	1 (Gen3)	1 (Gen3)
	PCIe x4	1 (Gen2)	1 (Gen2)	3 (Gen3)
	PCIe x1	1 (Gen2)	-	-
	PCI	4	5	3
Memory	Technology	Dual Channel DDR3 1333/1600 MHz	Dual Channel DDR4 1866/2133 MHz	Dual Channel DDR4 1866/2133 MHz
	Max. Capacity	32 GB	32 GB	64 GB
	Socket	4 x 240-pin DIMM	2 x 288-pin DIMM	4 x 288-pin DIMM
Graphics	Controller	Intel® HD Graphics	Intel® HD Graphics	Intel® HD Graphics
	VRAM	Shared system memory up to 1 GB	Shared system memory is subject to OS	Shared system memory is subject to OS
Ethernet	Interface	10/100/1000 Mbps	10/100/1000 Mbps	10/100/1000 Mbps
	Controller	GbE LAN1: Intel® I217LM, GbE LAN2: Intel® I211AT	GbE LAN1: Intel® I219V GbE LAN2: Intel® I211AT (for G2 version)	GbE LAN1: Intel® i219LM, GbE LAN2: Intel® i211AT
SATA	Max. Data Transfer Rate	600 MB/s	600 MB/s	600 MB/s
	Channel	6 (SW RAID)	4	6 (SW RAID)
I/O Interface	VGA	1	1	1
	DVI	2	1 (for G2 version)	2
	USB	13 (4 USB 3.0 and 9 USB 2.0)	9 (4 USB 3.0 and 5 USB 2.0)	13 (6 USB 3.0 and 7 USB 2.0)
	Serial	6	6	6
	Parallel	1	1	1
	PS/2	2	2	1
	Ethernet (GbE)	2	2 for G2 version; 1 for VG version	2
	Audio	Mic-in, Line-out	Mic-in, Line-out	Mic-in, Line-out

# Server-grade Motherboards



Model Name		ASMB-584	ASMB-585	ASMB-784	ASMB-785
Form Factor		Micro ATX	Micro ATX	ATX	ATX
Processor System	CPU	Intel® Xeon® E3 v3 and 4th Gen. Core™ i3/i5/i7 Series	Intel® Xeon® E3-1200 v5 and 6th Gen. Core™ i3/i5/i7 Series	Intel® Xeon® E3 v3 and 4th Gen. Core™ i3/i5/i7 Series	Intel® Xeon® E3-1200 v5 and 6th Gen. Core™ i3/i5/i7 Series
	Socket	1 x socket 1150	1 x socket 1151	1 x socket 1150	1 x socket 1151
	Max. Speed	3.5 GHz	3.6 GHz	3.5 GHz	3.6 GHz
	Chipset	Intel® C226	Intel® C236	Intel® C226	Intel® C236
Expansion Slot	PCI	1*	-	3	3
	PCIe x16	-	1 (Gen3 x16 link)	1 (switchable to two x8)	1 (switchable to two x8)
	PCIe x8	2 (x16 slot with x8 link)	-	2 (switchable to one x16)	2 (switchable to one x16)
	PCIe x4	1	3 (2 Gen3 x4 link, 1 Gen3 x1 link)	-	2
	PCIe x1	-	-	2	-
Memory	Technology	DDR3 ECC/non-ECC Unbuffer 1066/1333/1600 MHz	DDR4 ECC/non-ECC Unbuffer 1600/1866/2133 MHz	DDR3 ECC/non-ECC Unbuffer 1066/1333/1600 MHz	DDR4 ECC/non-ECC Unbuffer 1600/1866/2133 MHz
	Max. Capacity	32 GB ECC/Non-ECC UDIMM	64 GB ECC/Non-ECC UDIMM	32 GB ECC/Non-ECC UDIMM	64 GB ECC/Non-ECC UDIMM
	Socket	4 x 240-pin DIMM	4 x 288-pin DIMM	4 x 240-pin DIMM	4 x 288-pin DIMM
Graphics	Controller	Intel® GT2-HD Graphics	Intel® GT2-HD Graphics	Intel® GT2-HD Graphics	Intel® GT2-HD Graphics
	VRAM	1 GB maximum shared memory	1 GB maximum shared memory	1 GB maximum shared memory	1 GB maximum shared memory
	DVI	1	2	2	2
	Dual Display	Yes	Yes	Yes	Yes
Ethernet	Interface	10/100/1000 Mbps Gigabit Ethernet	10/100/1000 Mbps Gigabit Ethernet	10/100/1000 Mbps Gigabit Ethernet	10/100/1000 Mbps Gigabit Ethernet
	Controller	1 x Intel® I217LM, 1 x Intel® I210AT	1 x Intel® I219LM, 3 x Intel® I210AT	1 x Intel® I217LM + 3 x Intel® I210AT	1 x Intel® I219LM + 3 x Intel® I210AT
	Connector	RJ-45 x 2	RJ-45 x 4	RJ-45 x 4	RJ-45 x 4
TPM		Optional	Optional	Optional	Optional
SATA	Max. Data Transfer Rate	600 MB/s	600 MB/s	600 MB/s	600 MB/s
	Channel	6	7	6	6
Rear I/O	VGA/DVI/HDMI/DP	1 / 1 / - / 2	1 / 2 / - / -	1 / 2 / - / -	1 / 2 / - / -
	Ethernet	2	4	4	4
	USB	4 (2 USB 3.0; 2 USB 2.0)	4 (USB 3.0)	4 (2 USB 3.0; 2 USB 2.0)	4 (USB 3.0)
	Audio	Mic-in, Line-out	Mic-in, Line-out	-	Mic-in, Line-out
	Serial	-	1 (RS-232)	1 (RS-232)	1 (RS-232)
Internal Connector	USB	9 (2 USB 3.0; 6 USB 2.0; 1 USB 2.0 Type A)	9 (2 USB 3.0; 6 USB 2.0; 1 USB 2.0 Type A)	9 (2 USB 3.0; 6 USB 2.0; 1 USB 2.0 Type A)	9 (2 USB 3.0; 6 USB 2.0; 1 USB 2.0 Type A)
	Audio	1	1	1	1
	Serial	2	3	1	3
	Parallel	1	-	1	1
	SATA	6	7	6	6
	GPIO	8 bit GPIO	8 bit GPIO	8 bit GPIO	8 bit GPIO
Watchdog Timer	Output	System reset	System reset	System reset	System reset
	Interval	Programmable 1~255 sec	Programmable 1~255 sec	Programmable 1~255 sec	Programmable 1~255 sec

\* ASMB-584 A2 version has removed PCI slot for 1U & 2U chassis with riser.



Model Name		ASMB-813	ASMB-823
Form Factor		ATX	ATX
Processor System	CPU	Intel® Xeon® E5-1600 v3/ 2600 v3 Series	Intel® Xeon® E5-2600 v3 Series
	Socket	1 x socket 2011-R3	2 x socket 2011-R3
	Max. Speed	2.5 GHz	2.5 GHz
	Chipset	Intel® C612	Intel® C612
Expansion Slot	PCI	-	-
	PCIe x16	2/0	4
	PCIe x8	1/5	2
	PCIe x4	1	1 (x8 slot with x4 link)
	PCIe x1	1	-
Memory	Technology	DDR4 REG 2133/1866/1600/1333 MHz DIMM	DDR4 REG 2133/1866/1600/1333 MHz DIMM
	Max. Capacity	256 GB REG DIMM	192 GB REG DIMM
	Socket	8 x 288-pin DIMM	6 x 288-pin DIMM
Graphics	Controller	AST1400/AST2400	AST1400/AST2400
	VRAM	DDR3 64MB	DDR3 64MB
Ethernet	Interface	10/100/1000 Mbps Gigabit Ethernet	10/100/1000 Mbps Gigabit Ethernet
	Controller	2 x Intel® I210AT	2 x Intel® I210AT
	Connector	RJ-45 x 3 (1 for IPMI function)	RJ-45 x 3 (1 sharing IPMI function)
TPM		Optional	Optional
SATA	Max. Data Transfer Rate	600MB/s for SATA3	600MB/s for SATA3
	Channel	8 for SATA3	9 for SATA3
Rear I/O	VGA/DVI/HDMI/DP	1 / - / - / -	1 / - / - / -
	Ethernet	2	2
	USB	4 (USB 3.0), 2 (USB 2.0)	4 (USB 3.0)
	Audio	-	-
	Serial	1 (RS-232)	-
	PS/2	2	-
Internal Connector	USB	5 (2 USB3.0, 2 USB2.0, 1 USB 2.0 Type-A)	5 (2 USB3.0, 2 USB2.0, 1 USB 2.0 Type-A)
	Audio	1	1
	Serial	1	1
	SATA	8	9
	GPIO	8 bit GPIO	8 bit GPIO
Watchdog Timer	Output	System reset	System reset
	Interval	Programmable, 1 ~ 255 sec	Programmable, 1 ~ 255 sec

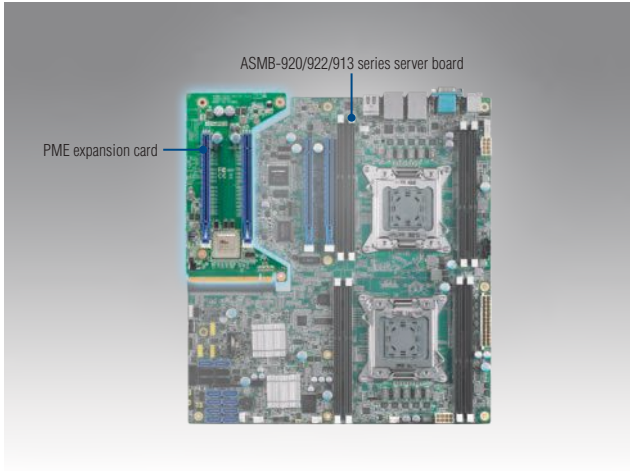
# Server-grade Motherboards



Model Name		ASMB-913	ASMB-923
Form Factor		EATX	EATX
Processor System	CPU	Intel® Xeon® E5-2600 v3 Series	Intel® Xeon® E5-2600 v3 Series
	Socket	2 x socket 2011-R3	2 x socket 2011-R3
	Max. Speed	2.5 GHz	2.5 GHz
	Chipset	Intel® C612	Intel® C612
Expansion Slot	PCI	-	-
	PCIe x16	4 (1 for PME)	4
	PCIe x8	-	2
	PCIe x4	-	1
	PCIe x1	-	-
Memory	Technology	DDR4 REG 2133/1866/1600/1333 MHz DIMM	DDR4 REG 2133/1866/1600/1333 MHz DIMM
	Max. Capacity	512 GB REG DIMM	256 GB REG DIMM
	Socket	16 x 288-pin DIMM	8 x 288-pin DIMM
Graphics	Controller	AST1400/AST2400	AST1400/AST2400
	VRAM	DDR3 64MB	DDR3 64MB
Ethernet	Interface	10/100/1000 Mbps Gigabit Ethernet	10/100/1000 Mbps Gigabit Ethernet
	Controller	4 x Intel® I210AT	2 x Intel® I210AT
	Connector	RJ-45 x 4 (1 sharing IPMI function)	RJ-45 x 3 (1 for IPMI function)
TPM		Optional	Optional
SATA	Max. Data Transfer Rate	600MB/s for SATA3	600MB/s for SATA3
	Channel	8 for SATA3	10 for SATA3
Rear I/O	VGA/DVI/HDMI/DP	1 / - / - / -	1 / - / - / -
	Ethernet	4	2
	USB	2 (USB 3.0)	2 (USB 3.0), 2 (USB 2.0)
	Audio	-	-
	Serial	1 (RS-232)	1 (RS-232)
	PS/2	-	2
Internal Connector	USB	7 (4 USB3.0, 2 USB2.0, 1 USB 2.0 Type-A)	7 (2 USB3.0, 4 USB2.0, 1 USB 2.0 Type-A)
	Audio	1	1
	Serial	1	1
	SATA	8	10
	GPIO	8 bit GPIO	8 bit GPIO
Watchdog Timer	Output	System reset	System reset
	Interval	Programmable, 1 ~ 255 sec	Programmable, 1 ~ 255 sec

# PME Expansion Cards

## Various Selections Supporting PCI, PCI-X, PCIe x1/x4/x8/x16



### Features

- Auto-configured by BIOS
- ASMB-920/922/913 series plus PME forms a standard EATX motherboard compatible with EATX chassis
- Multiple options for all demands

#### Note:

1. To enable PME function, it must to install processor both into CPU0 & CPU1 socket of ASMB-920 series.
2. To enable PME function, a processor must be installed in the CPU0 socket of ASMB-922 & 913 series.

## Introduction

Advantech's PME (Powerful Modular Expansion) design allows versatile expansion module options for the ASMB-920/922/913 series motherboard. PME expansion cards are an economical, effective solution for a range of applications, providing function expansion for a range of PCIe modules. In addition to meeting standard industrial specifications, Advantech's PME modules fit just about anywhere. They are easy to assemble, and provide a simple upgrade path.

## Specifications

Model Name		ASMB-FF3PX	ASMB-FF20F	ASMB-FF208	ASMB-FF3P8	ASMB-FF404*
Expansion Slots	Total PCI/PCI-X/PCIe slots	3	2	2	3	4
	Slot location E1	-	-	-	-	PCIe x8 (Gen3 x4 link)
	Slot location 1	PCI 33/66 MHz	PCIe x16 (Gen3 x16 link)	PCIe x16 (Gen1 x8 link)	PCI 33/66 MHz	PCIe x8 (Gen3 x4 link)
	Slot location 2	PCI-X 100 MHz	-	-	PCIe x8 (Gen3 x4 link)	PCIe x8 (Gen3 x4 link)
	Slot location 3	PCI-X 100 MHz	PCIe x16 (Gen3 x16 link)	PCIe x16 (Gen1 x8 link)	PCIe x8 (Gen3 x8 link)	PCIe x8 (Gen3 x4 link)
Fit Motherboard		ASMB-920/922/913 series				
Environment	Temperature	Operating			Non-operating	
		System: 0 ~ 40 °C Board: 0 ~ 60 °C			-40 ~ 85 °C	
	Humidity	0% ~ 90%			5% ~ 95% (Non condensing)	
Physical Characteristics	Dimensions	101 x 193 mm	101 x 193 mm	101 x 193 mm	101 x 193 mm	111 x 193 mm

## Front View



ASMB-FF3PX-12A1E



ASMB-FF20F-02A1E



ASMB-FF208-02A1E



ASMB-FF3P8-12A1E



ASMB-FF404-04A1E<sup>Note 3</sup>

## Ordering Information

Part Number	Description
ASMB-FF3PX-12A1E	PME card with 2 PCI-X and 1 PCI slots
ASMB-FF20F-02A1E	PME card with 2 PCIe x16 slots (x16 link)
ASMB-FF3P8-12A1E	PME card with 1 PCIe x8 slot (x8 link) and 1 PCIe x8 slot (x4 link) and 1 PCI slot
ASMB-FF208-02A1E	PME card with 2 PCIe x16 slots (x8 link)
ASMB-FF404-04A1E	PME card with 4 PCIe x8 slots (x4 link)

#### Note:

1. To enable PME function, it must to install processor both into CPU0 & CPU1 socket of ASMB-920 series.
2. To enable PME function, it need to install a processor into CPU0 socket of ASMB-922 & 913 series.
3. Only HPC-7400 chassis can support ASMB-920/922/913 series + ASMB-FF404.

# AIMB Riser Cards



Model Name		AIMB-RP10P-01A1E	AIMB-RF10F-01A1E	AIMB-RP30P-03A1E	AIMB-RP3PF-21A1E	AIMB-RP3P8-12A1E
Interface		PCI	PCIe x 16	PCI	PCIe x16/PCI	PCIe x16/PCI
Expansion Slots		1 PCI	1 PCIe x 16	3 PCI	1 PCIe x16 + 2 PCI	2 PCIe x8 + 1 PCI
Chassis	1U	Yes	Yes	-	-	-
	2U	-	-	-	Yes	Yes
ATX	AIMB-785	-	Yes	-	-	-
	AIMB-784	-	Yes	-	-	-
	AIMB-705	Yes	-	Yes	Yes	-

\*Note: AIMB-RP3P8-12A1E is not compatible with ACP-2010MB/2320MB, IPC-603MB chassis unless changing the riser card bracket to P/N: 1950014302N001.



Model Name		AIMB-R4104-01A1E	AIMB-R430P-03A2E	AIMB-R4301-03A1E	AIMB-R431F-21A1E	AIMB-R43PF-21A1E
Interface		PCIe x4	PCIe x4	PCIe x4	PCIe x16/PCIe x4	PCIe x16/PCIe x4
Expansion Slots		1 PCIe x4	3 PCI	3 PCIe x1	1 PCIe x16 + 2 PCIe x1	1 PCIe x16 + 2 PCI
Chassis	1U	Yes	-	-	-	-
	2U	-	Yes	Yes	Yes	Yes
ATX	AIMB-785	Yes	Yes	Yes	Yes	Yes
	AIMB-784	-	-	-	□	Yes

Yes: Fully compatible

□: Only the PCIe x 16 and PCIe x1 (bottom slot) connectors work.

△: Only one PCIe x1 connector works (bottom slot).

# ASMB Riser Cards



Model Name		ASMB-RF3X8-21A1E	ASMB-RF348-21A1E
Interface		PCIe x16	PCIe x16 for slot 6
Expansion Slots	Spec.	2 * PCI-X 64bit 133/100MHz + 1 * PCIe x8	1 * PCIe x8 + 2 * PCIe x4
	Top Slot	3.3V PCI-X 64bit 133/100MHz	PCIe x16 (x8 link)
	Middle Slot	3.3V PCI-X 64bit 133/100MHz	PCIe x8 (x4 link)
	Bottom Slot	PCIe x8 slot (x8 link)	PCIe x8 (x4 link)
Chassis	2U	HPC-7280	HPC-7280
		ACP-2010MB/2320MB	ACP-2010MB/2320MB
		HPC-7242MB	HPC-7242MB
Motherboard	ASMB-584	X	*△ (Note3)
	ASMB-585	YES	*△ (Note1)
	ASMB-781	YES	*△ (Note1)
	ASMB-782	X	*△ (Note2)
	ASMB-784	YES	*△ (Note1)
	ASMB-785	YES	*△ (Note1)
	ASMB-820	YES	YES
	ASMB-822	YES	YES
	ASMB-823	YES	YES
	ASMB-813	YES	YES
	ASMB-920	YES	YES
	ASMB-922	YES	YES
	ASMB-923	X	* (Note3)
	ASMB-913	YES	YES

Yes: Fully compatible

△: Conditional Compatible

\*△ Note 1: PCIe x16 slot of ASMB-781/784/785/585 motherboard can split as x8 x8 mode. When install ASMB-RF348-21A1E riser card, it supports one PCIe x4 (bottom slot) and one PCIe x8 (top slot). The middle of PCIe x4 of riser card doesn't work.

\*△ Note 2: PCIe x16 slot of ASMB-782 motherboard is x8 link only. When install ASMB-RF348-21A1E riser card, it only supports one PCI-E x4 slot (bottom).

\*△ Note 3: PCIe x16 slot of ASMB-584/923 motherboard is x8 link and can split as x4 x4 mode. When install ASMB-RF348-21A1E riser card, it supports two PCIe x4 (bottom and middle slot) and the top of PCIe x8 slot doesn't work.

# Industrial Computer Chassis



Model Name		IPC-3012	IPC-3026	IPC-6806S	IPC-6606/6608	
Form Factor Support		PICMG 1.3 Half-size SBC	PICMG 1.0/1.3 Half-size SBC	PICMG 1.0/1.3 Half-size SBC	PICMG 1.0/1.3 Full-size SBC	
Drive Bay	Slim Optical Drive	-	-	-	-	
	2.5"	-	-	-	-	
	3.5"	External	-	1	1	1 / 1
		Internal	2	0	1	1 / -
	5.25"	-	-	-	1 / 2	
Front I/O	USB	2	2	2	2 / 2	
	PS/2	-	-	-	- / -	
Cooling	No. of Fans	2	1	1	1 / 1	
	CFM	27	44.6	53	53 / 85	
Power Supply	AC	250W Flex ATX	150W Flex ATX	250W Flex ATX	250W PS/2 300W PS/2	
	AC Redundant	-	-	-	-	
No. of Slots for add-on cards		2	4	4	5 / 7	
No. of Full-size Cards		-	-	-	6 / 8	
Passive Backplane Options	PICMG 1.0	-	Yes	Yes	Yes	
	PICMG 1.3	Yes	Yes	Yes	Yes	
Dimensions (W x H x D)	mm	232 x 90 x 232	150 x 222 x 270	191 x 178 x 290	173 x 254 x 396/ 173 x 315 x 410	
Weight	kg	3.24	4.4	5.6	9 / 11	

# Industrial Computer Chassis



Model Name		IPC-6025	IPC-5122	IPC-7130	
Form Factor Support		PICMG 1.0/1.3 Full-size SBC	Micro ATX	ATX / Micro ATX	
Drive Bay	Slim Optical Drive	-	1	-	
	2.5"	-	-	-	
	3.5"	External	1	1	2
		Internal	1	1	1
	5.25"	-	-	1	
Front I/O	USB	2	2	2	
	PS/2	-	-	-	
Cooling	No. of Fans	1	1	1 + 1	
	CFM	46.6	85	73.8 + 21.2	
Power Supply	AC	270W Flex ATX	300W PS/2 400W PS/2	300W PS/2 400W PS/2	
	AC Redundant	-	-	350W Mini RPS 500W Mini RPS	
No. of Slots for add-on cards		4	4	7	
No. of Full-size Cards		5 / 5	-	7	
Dimensions (W x H x D)	mm	111 x 212 x 420	157 x 360 x 340	200 x 320 x 480	
	Weight	kg	4.7	6.5	12.8



Model Name		IPC-5120/7120	IPC-7132	IPC-7220	
Form Factor Support		Micro ATX / ATX	PICMG 1.3 Full-size SBC/ ATX / Micro ATX	ATX / Micro ATX	
Drive Bay	Slim Optical Drive	- / -	-	-	
	2.5"	-	-	-	
	3.5"	External	1 / 1	1	1
		Internal	1 / 1	2	1
	5.25"	1 / 1	1	2	
Front I/O	USB	Front I/O chassis	2	2	
	PS/2		-	-	
Cooling	No. of Fans	1 + 1	1	1	
	CFM	85 / 10	85	85	
Power Supply	AC	250W Flex ATX 350W Flex ATX	300W PS/2 400W PS/2	300W PS/2 400W PS/2	
	AC Redundant	-	-	350W Mini RPS 500W Mini RPS	
No. of Slots for add-on cards		4 / 7	9	7	
No. of Full-size Cards		-	10	7	
Dimensions (W x H x D)	mm	320 x 164 x 316.5/ 380 x 164 x 316.5	200 x 330 x 430	200 x 320 x 480	
	Weight	kg	6.54 / 7.01	9.96	14

# Industrial Computer Chassis



Model Name		1U Rackmount		2U Rackmount		
		IPC-120	IPC-603	ACP-2000/IPC-602	ACP-2010/2320	
Form Factor Support		PICMG 1.3 Half-size SBC	ATX/MicroATX	PICMG 1.0/1.3 Full-Size SBC	ATX/MicroATX	
Drive Bay	Slim Optical Drive	-	1	1 / -	- / 1	
	2.5"	2 (Internal)	-	-	-	
	3.5"	Hot-swap	-	-	-	- / 2 (SAS/SATA)
		External	-	-	2 / 1	1 / -
		Internal	-	1	- / 1	2
5.25"	-	-	- / 1	1 / -		
Front I/O	USB	2	0	2	2	
	PS/2	-	-	1	1	
Cooling	No. of Fans	1	2	2	2 / 3	
	CFM	6.5	47	2 x 47/ 2 x 40	2 x 47/ 2 x 47 + 1 x 28	
Power Supply	AC	250W Flex ATX 300W Flex ATX	350W Flex ATX	250W PS/2 300W PS/2 400W PS/2 500W PS/2	250W Flex ATX 300W Flex ATX	
	AC Redundant	-	-	300W 1+1 RPS / -	250W 1+1	
No. of Slots		3	3	6 / 6	3 / 3	
No. of Full-size Cards*		0	0	4 / 4	3 / 3	
Dimensions (W x H x D)	mm	480 x 44 x 300	482 x 88 x 308	482 x 88 x 451	482 x 88 x 480	
Weight	kg	3.1	6.4	11.5/11.3	10.7/11.7	

\* Depending on system configuration, board components or CPU cooler may reduce number of possible full-size cards.



Model Name		4U Rackmount				
		IPC-610-H	ACP-4020	ACP-4000	ACP-4340	
Form Factor Support		PICMG1.0/1.3 Full size SBC ATX/Micro-ATX	PICMG1.0/1.3 Full-size SBC ATX/Micro-ATX	PICMG1.0/1.3 Full-size SBC ATX/Micro-ATX	PICMG1.0/1.3 Full size SBC ATX/Micro-ATX	
Drive Bay	Slim Optical Drive	-	1	-	1	
	2.5"	-	1 (Internal)	-	1 (Internal)	
	3.5"	Hot-swap	-	-	-	4 (SAS/SATA)
		External	1	2	1	-
		Internal	-	-	-	-
5.25"	3	-	3	-		
Front I/O	USB	2	2 (USB 3.0)	2	2 (USB 3.0)	
	PS/2	1	-	1	-	
Cooling	No. of Fans	2	2	2	2	
	CFM	85	2 x 53	2 x 85	1 x 74 + 1 x 56	
Power Supply	AC	300W PS/2 400W PS/2	300W PS/2 400W PS/2 500W PS/2	300W PS/2 400W PS/2 500W PS/2	400W PS/2 500W PS/2 700W PS/2	
	AC Redundant	350W Mini RPS 500W Mini RPS	-	350W Mini RPS 500W Mini RPS	350W Mini RPS 500W Mini RPS	
	DC	300W 48V	300W 48V	300W 48V	-	
No. of Slots		15	15	15	15	
No. of Full-size Cards*		15	0	11	15	
Dimensions (W x H x D)	mm	482 x 177 x 479	482 x 177 x 348	482 x 177 x 479	482 x 177 x 478	
Weight	kg	15	8.5	15.2	12.5	

\* Depending on system configuration, board components or CPU cooler may reduce number of possible full-size cards.

# Industrial Computer Chassis



Model Name		4U Rackmount		6U Rackmount	
		ACP-4D00	IPC-623	IPC-622	
Form Factor Support		PICMG 1.3/PCI Half-sized SBC	PICMG 1.0/1.3 Full size SBC	PICMG 1.0/1.3 Full size SBC	
Drive Bay	Slim Optical Drive	-	-	-	
	2.5"	-	-	-	
	3.5"	Hot-swap	-	-	-
		External	1 / each node	1	-
	Internal	-	1	2	
5.25"	-	3	4		
Front I/O	USB	2 (USB 2.0) + 2 (USB 3.0) / each node	-	4	
	PS/2	-	-	-	
Cooling	No. of Fans	1 / each node	3	4	
	CFM	1 x 58 per node	114	4 x 58	
Power Supply	AC	250W Flex ATX 300W Flex ATX	400W 500W	400W PS/2 500W PS/2 700W PS/2	
	AC Redundant	-	460W 1+1 570W 2+1 810W 3+1	500W Mini RPS 750W Mini RPS	
	DC	-	-	-	
No. of Slots		6 / each node	20	20	
No. of Full-size Cards*		0	20	20	
Dimensions (W x H x D)	mm	430 x 177 x 350	482 x 177 x 657	482 x 266 x 464	
Weight	kg	15	26	30	

\* Depending on system configuration, board components or CPU cooler may reduce number of possible full-size cards.

# Server-grade Chassis



Height (1U = 1.75")		1U		2U	
Model Name		HPC-7120	HPC-7140	HPC-7242	HPC-7282
Form Factor Support		MicroATX/ATX/EATX	Micro ATX, ATX	Micro ATX, ATX	Micro ATX, ATX
No. of slots / No. of full-height cards		1/0	1/0	3/3	7/0
Drive Bay	Slim ODD Bay	-	1 (ODD should be purchased separately)	1 (ODD should be purchased separately)	1 (ODD should be purchased separately)
	5.25" (front-accessible)	-	-	-	-
	3.5" (hot-swappable)	-	4	4 (3.5" / 2.5")	8
	3.5" (internal)	-	-	-	2
	2.5" (hot-swappable)	2	Optional	4 (3.5" / 2.5")	Optional
	2.5" (internal)	-	-	2	-
Cooling	Chassis Fan	4 (4cm / 28.6CFM)	4 (4cm / 24CFM)	1 (8 cm/47CFM) + 2 (6 cm/28CFM)	3 (8cm / 52.6 CFM)
	Air Filter	-	-	Yes	-
Front I/O Interface	USB 3.0	-	-	2	-
	USB 2.0	2	2	-	2
Environment	Operating Temperature	0 ~ 40 °C (32 ~ 104 °F)	0 ~ 35 °C (32 ~ 95 °F)	0 ~ 40 °C (32 ~ 104 °F)	0 ~ 40 °C (32 ~ 104 °F)
	Non-Operating Temperature	-40 ~ 70 °C (-40 ~ 158 °F)	-40 ~ 70 °C (-40 ~ 158 °F)	-40 ~ 70 °C (-40 ~ 158 °F)	-40 ~ 70 °C (-40 ~ 158 °F)
	Operating Humidity	10 ~ 95% @ 40 °C non-condensing	10 ~ 95% @ 40 °C non-condensing	10 ~ 95% @ 40 °C non-condensing	10 ~ 95% @ 40 °C non-condensing
	Non-operating Humidity	10 ~ 95% @ 60 °C non-condensing	10 ~ 95% @ 60 °C non-condensing	10 ~ 95% @ 60 °C non-condensing	10 ~ 95% @ 60 °C non-condensing
Physical Characteristics	Dimensions (W x H x D)	438 x 43 x 478 mm (17.24" x 1.7" x 18.82")	437 x 43.5 x 503 mm (17.2" x 1.7" x 19.85")	482 x 88 x 525 mm (19" x 3.46" x 20.67")	437 x 88.9 x 533.4 mm (17.2" x 3.5" x 21")

# Server-grade Chassis



Height (1U = 1.75")		3U / Tower		4U / Tower	
Model Name		HPC-7320	HPC-7400	HPC-7442	HPC-7483
Form Factor Support		Micro ATX, ATX, EATX	Micro ATX, ATX, EATX	Micro ATX, ATX, EATX	Micro ATX, ATX, EATX
No. of slots / No. of full-height cards		7/6	12/12	7/7	10/10
Drive Bay	Slim ODD Bay	1 (ODD should be purchased separately)	-	1 (ODD should be purchased separately)	-
	5.25" (front-accessible)	-	2	-	3
	3.5" (hot-swappable)	2 (3.5" / 2.5")	-	4 can upgrade to 8 (3.5" / 2.5")	8 (3.5" or 2.5")
	3.5" (internal)	2	2 rear-accessible (3.5" / 2.5")	1	0
	2.5" (hot-swappable)	2 (3.5" / 2.5")	-	4 can upgrade to 8 (3.5" / 2.5")	0
	2.5" (internal)	-	2 rear-accessible (3.5" / 2.5")	-	2
Cooling	Chassis Fan	2 (8cm/141.9CFM) + 1 (6cm/27.72CFM)	3 (8cm/141.9CFM)	1 (12 cm /114 CFM) + 1 (8 cm/55 CFM)	3 (12 cm/140 CFM)
	Air Filter	Yes	Yes	Yes	-
Front I/O Interface	USB 3.0	2	2	2	2
	USB 2.0	-	-	-	-
Environment	Operating Temperature	0 ~ 40 °C (32 ~ 104 °F)	0 ~ 40 °C (32 ~ 104 °F)	0 ~ 40 °C (32 ~ 104 °F)	0 ~ 40 °C (32 ~ 104 °F)
	Non-Operating Temperature	-40 ~ 70 °C (-40 ~ 158 °F)	-40 ~ 70 °C (-40 ~ 158 °F)	-40 ~ 70 °C (-40 ~ 158 °F)	-40 ~ 70 °C (-40 ~ 158 °F)
	Operating Humidity	10 ~ 95% @ 40 °C non-condensing	10 ~ 95% @ 40 °C non-condensing	10 ~ 95% @ 40 °C non-condensing	10 ~ 95% @ 40 °C non-condensing
	Non-operating Humidity	10 ~ 95% @ 60 °C non-condensing	10 ~ 95% @ 60 °C non-condensing	10 ~ 95% @ 60 °C non-condensing	10 ~ 95% @ 60 °C non-condensing
Physical Characteristics	Dimensions (W x H x D)	426.4 x 132.2 x 480 mm (16.79" x 5.2" x 18.9")	482 x 177 x 448 mm (19" x 7.0" x 17.6")	482 x 177 x 600 mm (19" x 7.0" x 23.6")	435 x 177 x 673 mm (17.12" x 7.0" x 26.49")



Height (1U = 1.75")		2U		3U
Model Name		HPC-8212	HPC-8224	HPC-8316
Form Factor Support		Micro ATX, ATX, EATX	Micro ATX, ATX, EATX	Micro ATX, ATX, EATX
No. of slots / No. of full-height cards		6/2 (optional)	6/2 (optional)	6/6
Drive Bay	Slim ODD Bay	-	-	-
	5.25" (front-accessible)	-	-	-
	3.5" (hot-swappable)	12	-	16
	3.5" (internal)	-	-	-
	2.5" (hot-swappable)	-	24	2 (SE/SA version)
	2.5" (internal)	-	-	2 (TE/TA version)
Cooling	Chassis Fan	4	4	4
	Air Filter	-	-	-
Front I/O Interface	USB 3.0	-	-	2
	USB 2.0	2	2	-
Environment	Operating Temperature	0 ~ 40 °C (32 ~ 104 °F)	0 ~ 40 °C (32 ~ 104 °F)	0 ~ 40 °C (32 ~ 104 °F)
	Non-Operating Temperature	-40 ~ 70 °C (-40 ~ 158 °F)	-40 ~ 70 °C (-40 ~ 158 °F)	-40 ~ 70 °C (-40 ~ 158 °F)
	Operating Humidity	10 ~ 95% @ 40 °C non-condensing	10 ~ 95% @ 40 °C non-condensing	10 ~ 95% @ 40 °C non-condensing
	Non-operating Humidity	10 ~ 95% @ 60 °C non-condensing	10 ~ 95% @ 60 °C non-condensing	10 ~ 95% @ 60 °C non-condensing
Physical Characteristics	Dimensions (W x H x D)	438 x 88.4 x 620 mm (17.24" x 3.5" x 24.4")/ 438 x 88.4 x 540 mm (17.24" x 3.5" x 21.3")	438 x 88.4 x 620 mm (17.24" x 3.5" x 24.4")/ 438 x 88.4 x 540 mm (17.24" x 3.5" x 21.3")	435 x 132 x 620 mm (17.13" x 5.2" x 24.41") / 435 x 132 x 540 mm (17.13" x 5.2" x 21.26")

# Serial Communication Cards

## Serial Communication Cards



Bus		PCI Express						
Model Name		PCI-1602	PCI-1604	PCI-1610	PCI-1612	PCI-1620	PCI-1622	PCI-1680U
Number of Ports		2	2	4	4	8	8	2
Communication Interfaces	RS-232	V	V	V	V	V	V	-
	RS-422	V		-	V	-	V	-
	RS-485	V		-	V	-	V	-
	CAN	-	-	-	-	-	-	V
Driver		Windows 7 , 8 , 10 and Linux						
Protection	ESD	15KV (air), 8KV (contact)						8KV (air), 4KV (contact)
	Isolation (V <sub>DC</sub> )	3,000	3,000	3,000	3,000	-	3,000	1,000



Bus		PCI Express						
Model Name		PCIE-1602	PCIE-1604	PCIE-1610	PCIE-1612	PCIE-1620	PCIE-1622	PCIE-1680
Number of Ports		2	2	4	4	8	8	2
Communication Interfaces	RS-232	V	V	V	V	V	V	-
	RS-422	V		-	V	-	V	-
	RS-485	V		-	V	-	V	-
	CAN	-	-	-	-	-	-	V
Driver		Windows 7 , 8 , 10 and Linux						
Protection	ESD	15KV (air), 8KV (contact)						
	Isolation (V <sub>DC</sub> )	3,000	3,000	-	3,000	-	3,000	2,500



Bus		PCI Express	
Model Name		PCE-USB4	PCE-USB8
Host controller		4 x Renesas μPD720202	
Number of USB3.0 Ports		4	8
Driver		Windows 7 , 8 , 10 and Linux(In box)	
Max. Current per port		1,500mA	

## PC/104 Communication Modules



Bus		PC/104						
Model Name		PCM-3680	PCM-3660	PCM-3610	PCM-3612	PCM-3614	PCM-3618	PCM-3641
Ports		2	2	2	2	4	8	4
Communication Interfaces	Ethernet	-	V	-	-	-	-	-
	RS-232	-	-	V	-	-	-	V
	RS-422	-	-	V	V	V	V	-
	RS-485	-	-	V	V	V	V	-
	CAN	V	-	-	-	-	-	-
Protection	ESD	8KV (air), 4KV (contact)						
	Isolation (V <sub>DC</sub> )	2,500	-	2,500	-	-	-	-

## PCI-104 Communication Modules



Bus		PCI-104	
Model Name		PCM-3680I	PCM-3612I
Ports		2	4
Communication Interfaces	Current Loop	-	-
	RS-232	-	V
	RS-422	-	V
	RS-485	-	V
	CAN	V	-
Protection	ESD	8KV (air), 4KV (contact)	15KV (air), 8KV (contact)
	Isolation (V <sub>DC</sub> )	2,500	-

# Analog I/O & Multifunction Cards



Category		Multifunction							
Bus		PCI							
Model		PCI-1710U/ UL	PCI-1710HGU	PCI-1711U/ UL	PCI-1712/L	PCI-1716/L	PCI-1706U/ UL	PCI-1718HDU	
Analog Input	General Spec.	Resolution (bit)	12	12	12	12	16	16	12
		Channels	16 SE/8 Diff.	16 SE/8 Diff.	16 SE	16 SE/8 Diff.	16 SE/8 Diff.	8 Diff.	16 SE/8 Diff.
		FIFO (samples)	4,096	4,096	1,024	1,024	1,024	8,192	1,024
		Sampling Rate (S/s)	100	100	100	1	250	250	100
	Input Ranges	Unipolar Inputs (V)	0 ~ 10, 0 ~ 5, 0 ~ 2.5, 0 ~ 1.25	0 ~ 10, 0 ~ 1, 0 ~ 0.1, 0 ~ 0.01	-	0 ~ 10, 0 ~ 5, 0 ~ 2.5, 0 ~ 1.25	0 ~ 10, 0 ~ 5, 0 ~ 2.5, 0 ~ 1.25	-	0 ~ 10, 0 ~ 5, 0 ~ 2.5, 0 ~ 1.25
		Bipolar Inputs (V)	±10, 5, 2.5, 1.25, 0.625	±10, 5, 1, 0.5, 0.1, 0.05, 0.01, 0.005	±10, 5, 2.5, 1.25, 0.625	±10, 5, 2.5, 1.25, 0.625	±10, 5, 2.5, 1.25, 0.625	±10, 5, 2.5, 1.25	±10, 5, 2.5, 1.25, 0.625
		Configurable Per-Channel	✓	✓	✓	✓	✓	✓	✓
	Trigger Modes	Pacer/Software/External Pulse	✓	✓	✓	✓	✓	✓	✓
		Analog Slope	-	-	-	✓	-	✓	-
		Advanced Trigger	-	-	-	✓	-	✓	-
	Data Transfer Modes	Software	✓	✓	✓	✓	✓	✓	✓
		DMA	-	-	-	Bus-mastering	Bus-mastering	✓	-
	Analog Output	Resolution (bit)	12	12	12	12	16	12	12
		Channels	2 (PCI-1710U only)	2	2 (PCI-1711U only)	2 (PCI-1712 only)	2 (PCI-1716 only)	2 (PCI-1706U only)	1
FIFO (sample)		-	-	-	32,768	-	-	-	
Output Range (V)		0 ~ 5, 0 ~ 10	0 ~ 5, 0 ~ 10	0 ~ 5, 0 ~ 10	0 ~ 5, 0 ~ 10, ±5, ±10	0 ~ 5, 0 ~ 10, ±5, ±10	0 ~ 5, 0 ~ 10, ±5, ±10, 0 ~ 20 mA, 0 ~ 24 mA, 4 ~ 20 mA	0 ~ 5, 0 ~ 10	
Output Rate		Static update	Static update	Static update	1 MS/s	Static update	Static update	Static update	
DMA Transfer		-	-	-	✓	-	-	-	
Digital I/O	Input Channels	16	16	16	16 (shared)	16	16 (shared)	16	
	Output Channels	16	16	16		16		16	
Timer/Counter	Channels	1	1	1	3	1	2	1	
	Resolution (bit)	16	16	16	16	16	32	16	
	Max. Input Frequency (Hz)	10 M	10 M	10 M	10 M	10 M	10 M	10 M	
Isolation Voltage		-	-	-	-	-	-	-	
Auto Calibration		-	-	-	✓	✓	✓	-	
BoardID Switch		✓	✓	✓	-	✓	✓	✓	
Dimensions (mm)		175 x 100	175 x 100	175 x 100	175 x 100	175 x 100	175 x 100	175 x 100	
Connector		68-pin SCSI	68-pin SCSI	68-pin SCSI	68-pin SCSI	68-pin SCSI	68-pin SCSI	DB37	
DAQ/Navii Driver	Windows 10/ 8/ 7	✓	✓	✓	✓	✓	✓	✓	
	Linux	-	-	-	-	-	-	-	
	LabVIEW Driver	✓	✓	✓	✓	✓	✓	✓	

\* All channels should be set to the same range.

\*\* SS: Single DMA channel, Single A/D channel scan; SM: Single DMA channel, Multiple A/D channel scan



Category		Multifunction				
Bus		PCI	ISA			
Model		PCI-1742U	PCL-812PG	PCL-818L	PCL-818HD	
Analog Input	General Spec.	Resolution (bit)	16	12	12	12
		Channels	16 SE/8 Diff.	16 SE	16 SE/8 Diff	16 SE/8 Diff
		FIFO (samples)	1,024	-	-	1,024
		Sampling Rate (S/s)	1 M	30 k	40 k	100 k
	Input Ranges	Unipolar Inputs (V)	0 ~ 10, 0 ~ 5 0 ~ 2.5, 0 ~ 1.25	-	-	0 ~ 10, 0 ~ 5, 0 ~ 2.5, 0 ~ 1.25
		Bipolar Inputs (V)	±10, 5, 2.5, 1.25, 0.625	±10, 5, 2.5, 1.25, 0.625, 0.3125	±10, 5, 2.5, 1.25, 0.625	±10, 5, 2.5, 1.25, 0.625
		Configurable Per-Channel	✓	✓	✓	✓
	Trigger Modes	Pacer/Software/External Pulse	✓	✓	✓	✓
		Analog Slope	-	-	-	-
		Advanced Trigger	-	-	-	-
	Data Transfer Modes	Software	✓	✓	✓	✓
		DMA	Bus-mastering	SS**	SM**	SM**
Analog Output	Resolution (bit)	16	12	12	12	
	Channels	2	2	1	1	
	FIFO (samples)	-	-	-	-	
	Output Range (V)	0 ~ 5, 0 ~ 10, ±5, ±10	0 ~ 5, 0 ~ 10	0 ~ 5, 0 ~ 10	0 ~ 5, 0 ~ 10, ±10	
	Output Rate	Static update	Static update	Static update	Static update	
	DMA Transfer	-	-	-	-	
Digital I/O	Input Channels	16	16	16	16	
	Output Channels	16	16	16	16	
Timer/Counter	Channels	1	1	1	1	
	Resolution (bit)	16	16	16	16	
	Max. Input Frequency (Hz)	10 M	2 M	10 M	10 M	
Isolation Voltage		-	-	-	-	
Auto Calibration		✓	-	-	-	
BoardID Switch		✓	-	-	-	
Dimensions (mm)		175 x 100	185 x 100	155 x 100	185 x 100	
Connector		68-pin SCSI	5 x 20-pin	DB37	DB37	
DAQ/NAVI Driver	Windows 10/ 8/ 7	✓	-	✓	✓	
	Linux	-	-	-	-	
	LabVIEW Driver	✓	✓	✓	✓	

\* All channels should be set to the same range.

\*\* SS: Single DMA channel, Single A/D channel scan; SM: Single DMA channel, Multiple A/D channel scan

# Analog I/O & Multifunction Cards



Category		Multifunction					
Bus		PC/104		PCI-104	PCIe		
Model		PCM-3718HG	PCM-3718H/ PCM-3718HG	PCM-3810I	PCIe-1810	PCIe-1816/1816H	
Analog Input	General Spec.	Resolution (bit)	12	12	12	12	16
		Channels	16 SE/8 Diff.	16 SE/8 Diff.	16 SE/8 Diff.	16 SE/8 Duff.	16 SE/8 Duff.
		FIFO (samples)	-	1,024 (3718HO only)	4,096	4,096	4,096
		Sampling Rate (S/sec)	100 k	30k/ 100k	250 k	800 k	1M / 5M
	Input Ranges	Unipolar Inputs (V)	0 ~ 10, 0 ~ 1 0 ~ 0.1, 0 ~ 0.01	0 ~ 10, 0 ~ 5 0 ~ 2.5, 0 ~ 1.25	0 ~ 10, 0 ~ 5, 0 ~ 2.5, 0 ~ 1.25	0 ~ 10, 0 ~ 5, 0 ~ 2.5, 0 ~ 1.25	0 ~ 10, 0 ~ 5, 0 ~ 2.5, 0 ~ 1.25
		Bipolar Inputs (V)	±10, 5, 1, 0.5, 0.1, 0.05, 0.01, 0.005	±10, 5, 2.5, 1.25, 0.625	±10, 5, 2.5, 1.25, 0.625	±10, ±5, 2.5, 1.25, 0.625	±10, ±5, 2.5, 1.25, 0.625
		Configurable Per-Channel	✓	✓	✓	✓	✓
	Trigger Modes	Pacer/Software/External Pulse	✓	✓	✓	✓	✓
		Analog Slope	-	-	-	✓	✓
		Advanced Trigger	-	-	✓	Start/ Stop/ Delay to Start/ Delay to Stop	Start/ Stop/ Delay to Start/ Delay to Stop
	Data Transfer Modes	Software			✓	✓	✓
		DMA	SS**	SS**	-	Bus-mastering	Bus-mastering
	Analog Output	Resolution (bit)	-	12	12	12	16
		Channels	-	1 (3718HO only)	2	2 (Waveform Output)	2 (Waveform Output)
Onboard FIFO		-	-	-	4,096 samples	4,096 samples	
Output Range (V)		-	0 ~ 5, 0 ~ 10	0 ~ 5, 0 ~ 10, ±5, ±10	0 ~ 5, 0 ~ 10, ±5, ±10	0 ~ 5, 0 ~ 10, ±5, ±10	
Output Rate		-	Static update	250 kS/s	500 kS/s/s	3 MS/s	
DMA Transfer		-	-	-	Bus-mastering	Bus-mastering	
Digital I/O	Input Channels	16 (shared)	16 (shared)	16 (shared)	24 (shared)	24 (shared)	
	Output Channels						
Timer/Counter	Channels	1	1	3	2	2	
	Resolution (bit)	16	16	16	32	32	
	Max. Input Frequency (Hz)	10 M	10 M	10 M	10 M	10 M	
Isolation Voltage		-	-	-	-	-	
Auto Calibration		-	-	✓	✓	✓	
BoardID Switch		-	-	-	✓	✓	
Dimensions (mm)		96 x 90	96 x 90	96 x 90	168 x 100	168 x 100	
Connector		2 x 20-pin	2 x 20-pin	50-pin/26-pin box header	68-pin SCSI	68-pin SCSI	
DAQ/Analog Driver	Windows 10/ 8/ 7	✓	✓	✓	✓	✓	
	Linux	-	-	✓	-	-	
	LabVIEW Driver	✓	✓	✓	✓	✓	

\* 80 kHz on Pentium 4-based (or upper) system

\*\* SS: Single DMA channel, Single A/D channel scan



Category			Analog Input					Analog Output			
Bus			PCI			ISA	PCI				
Model			PCI-1713U	PCI-1714U	PCI-1714UL	PCI-1715U	PCI-1747U	PCL-813B	PCI-1720U	PCI-1721	
Analog Input	General Spec.	Resolution (bit)	12	12	12	12	16	12	-	-	
		Channels	32 SE/16 Diff.	4 SE	4 SE	32 SE/16 Diff.	64 SE/32 Diff.	32 SE	-	-	
		FIFO (sample)	4,096	32,768	8,192	1,024	1,024	-	-	-	
		Sampling Rate (S/s)	100 k	30 M	10 M	500 k	250 k	25 k	-	-	
	Input Ranges	Unipolar Inputs (V)	0 ~ 10, 0 ~ 5, 0 ~ 2.5, 0 ~ 1.25	-	-	0 ~ 10, 0 ~ 5, 0 ~ 2.5, 0 ~ 1.25	0 ~ 10, 0 ~ 5, 0 ~ 2.5, 0 ~ 1.25	0 ~ 10, 0 ~ 5, 0 ~ 2.5, 0 ~ 1.25	-	-	
		Bipolar Inputs (V)	±10, 5, 2.5, 1.25, 0.625	±5, 2.5, 1, 0.5	±5, 2.5, 1, 0.5	±10, 5, 2.5, 1.25, 0.625	±10, 5, 2.5, 1.25, 0.625	±5, 2.5, 1.25, 0.625	-	-	
		Configurable Per-Channel	✓	✓	✓	✓	✓	✓	-	-	
	Trigger Modes	Pacer/Software/External Pulse	✓	✓	✓	✓	Pacer/Software	Software	-	-	
		Analog Slope	-	✓	✓	-	-	-	-	-	
		Advanced Trigger	-	✓	✓	-	-	-	-	-	
	Data Transfer Modes	Software	✓	✓	✓	✓	✓	✓	-	-	
		DMA	-	Bus-mastering	Bus-mastering	Bus-mastering	Bus-mastering	-	-	-	
	Analog Output	Resolution (bit)		-	-	-	-	-	-	12	12
		Channels		-	-	-	-	-	-	4	4 (Waveform Output)
FIFO (sample)		-	-	-	-	-	-	-	1,024		
Output Range (V)		-	-	-	-	-	-	0 ~ 5, 0 ~ 10, ±5, ±10, 0 ~ 20 mA, 4 ~ 20 mA	0 ~ 5, 0 ~ 10, ±5, ±10, 0 ~ 20 mA, 4 ~ 20 mA		
Output Rate		-	-	-	-	-	-	Static update	10 MS/s		
DMA Transfer		-	-	-	-	-	-	-	Bus-mastering		
Digital I/O	Input Channels		-	-	-	-	-	-	-	16 (shared)	
	Output Channels		-	-	-	-	-	-	-		
Timer/Counter	Channels		-	-	-	-	-	-	-	1	
	Resolution (bit)		-	-	-	-	-	-	-	16	
	Max. Input Frequency (Hz)		-	-	-	-	-	-	-	10 M	
Isolation Voltage			2,500 V <sub>DC</sub>	-	-	2,500 V <sub>DC</sub>	-	500 V <sub>DC</sub>	2,500 V <sub>DC</sub>	-	
Auto Calibration			-	✓	✓	-	✓	-	-	✓	
BoardID Switch			-	✓	✓	✓	✓	-	✓	✓	
Dimensions (mm)			175 x 100	175 x 100	175 x 100	175 x 100	175 x 100	219 x 100	175 x 100	175 x 100	
Connector			DB37	4 x BNC	4 x BNC	DB37	68-pin SCSI	DB37	DB37	68-pin SCSI	
DAQ/Navit Driver	Windows 10/ 8/ 7		-	✓	✓	✓	✓	✓	✓	✓	
	Linux		-	✓	✓	✓	✓	-	-	✓	
	LabVIEW Driver		✓	✓	✓	✓	✓	✓	✓	✓	

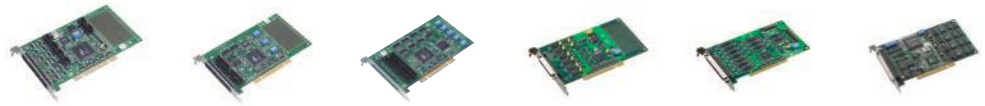
\* 80 KHz on Pentium 4-based (or upper) system

\*\* SS: Single DMA channel, Single A/D channel scan

# Digital I/O & Counter Cards



Category		Analog Output				
Bus		PCI			ISA	
Model		PCI-1723	PCI-1724U	PCI-1727U	PCL-726	PCL-728
Analog Output	Resolution (bit)	16	14	14	12	12
	Channels	8	32	12	6	2
	FIFO (sample)	-	-	-	-	-
	Output Range (V)	±10, 0 ~ 20 mA, 4 ~ 20 mA	±10, 0 ~ 20 mA	±10, 0~20 mA	0 ~ 5, 0 ~ 10, ±5, ±10, 4 ~ 20 mA	0 ~ 5, 0 ~ 10, ±5, ±10, 0 ~ 20 mA, 4 ~ 20 mA
	Output Rate	Static update	Static update	Static update	Static update	Static update
	DMA Transfer	-	-	-	-	-
Digital I/O	Input Channels	16 (shared)	-	16	16	-
	Output Channels		-	16	16	-
Isolation Voltage		-	1,500 V <sub>DC</sub>	-	-	2,500 V <sub>DC</sub>
Auto Calibration		✓	-	-	-	-
BoardID Switch		✓	✓	✓	-	-
Dimensions (mm)		175 x 100	175 x 100	175 x 100	337 x 112	185 x 120
Connector		68-pin SCSI	DB62	2 x 2-pin, DB37	4 x 20-pin	2 x DB9
DAQNavi Driver	Windows 10/8/7	✓	✓	✓	-	-
	Linux	-	✓	✓	-	-
	LabVIEW Driver	✓	✓	✓	✓	✓



Category		Non-Isolated Digital I/O					
Bus		PCI					
Model		PCI-1735U	PCI-1737U	PCI-1739U	PCI-1751	PCI-1753	PCI-1755
TTL DI/O	Input Channels	32	24 (shared)	48 (shared)	48 (shared)	96 (shared)	32 (shared)
	Output Channels	32					
	Output Channel	Sink Current	24 mA @ 0.5V	24 mA @ 0.4 V	24 mA @ 0.4 V	24 mA @ 0.4 V	24 mA @ 0.44 V
Source Current		15 mA @ 2.0V	15 mA @ 2.4 V	15 mA @ 2.4 V	15 mA @ 2.4 V	24 mA @ 3.76 V	15 mA @ 2.0V
Timer/ Counter	Channels	3	-	-	3	-	3
	Resolution (bit)	16	-	-	16	-	16
	Max. Input Frequency (Hz)	10 M	-	-	10 M	-	10 M
Advanced Function	Pattern Match	-	-	-	-	✓	✓
	Change of State	-	-	-	-	✓	✓
	BoardID Switch	✓	✓	✓	✓	✓	✓
	Channel-Freeze Function	-	-	-	-	-	✓
	Output Status Read Back	✓	✓	✓	✓	✓	-
	Dry/Wet Contact*	-	✓	✓	✓	✓	-
Dimensions (mm)		175 x 100	175 x 100	175 x 100	175 x 100	175 x 100	175 x 100
Connector		5 x 20-pin	1 x 50-pin	2 x 50-pin	68-pin SCSI	100-pin SCSI	100-pin SCSI-II
DAQNavi Driver	Windows 10/8/7	✓	✓	✓	✓	✓	-
	Linux	-	-	-	✓	-	-
LabVIEW Driver		✓	✓	✓	✓	✓	✓

\* Dry/wet contact can be mixed at the same time within one group.

# Digital I/O & Counter Cards



Category		Non-Isolated Digital I/O						
Bus		ISA				PC/104	PCI-104	
Model		PCL-720+	PCL-722	PCL-724	PCL-731	PCM-3724	PCM-3753I	
TTL D/I/O	Input Channels	32	144 (shared)	24 (shared)	48 (shared)	48 (shared)	96 (shared)	
	Output Channels	32						
	Output Channel	Sink Current	24 mA @ 0.5 V	24 mA @ 0.4 V	24 mA @ 0.4 V	24 mA @ 0.4 V	24 mA @ 0.5 V	24 mA @ 0.4 V
		Source Current	15 mA @ 2.0 V	-15 mA @ 2.4 V	15 mA @ 2.4 V	15 mA @ 2.4 V	15 mA @ 2.0 V	15 mA @ 2.4 V
Timer/Counter	Channels	3	-	-	-	-	-	
	Resolution (bit)	16	-	-	-	-	-	
	Max. Input Frequency (Hz)	1 M	-	-	-	-	-	
Advanced Function	Pattern Match	-	-	-	-	-	✓	
	Change of State	-	-	-	-	-	✓	
	BoardID Switch	-	-	-	-	-	-	
	Channel-Freeze Function	-	-	-	-	-	-	
	Output Status Read Back	-	✓	✓	✓	✓	✓	
	Dry/Wet Contact*	-	-	-	-	-	-	
Dimensions (mm)		185 x 100	334 x 100	125 x 100	185 x 100	96 x 90	96 x 90	
Connector		5 X 20-pin	6 x 50-pin	1 x 50-pin	2 x 50-pin	2 x 50-pin	4 x 50-pin	
DAQNavit Driver	Windows 10/8/7	-	-	-	-	✓	✓	
	Linux	-	-	-	-	-	-	
LabVIEW Driver		✓	✓	✓	✓	✓	✓	

\* Dry/wet contact can be mixed at the same time within one group.



Category		Isolated Digital I/O					Non-isolated Digital I/O		
Bus		PCI Express							
Model		PCIE-1730	PCIE-1752	PCIE-1754	PCIE-1756	PCIE-1760	PCIE-1751	PCIE-1753	
TTL D/I/O	Input Channels	16	-	-	-	-	48 (shared)	96 (shared)	
	Output Channels	16	-	-	-	-			
	Output Channel	Sink Current	24 mA @ 0.5 V	-	-	-	-	15 mA @ 0.8 V	15 mA @ 0.8 V
		Source Current	15 mA @ 2.4 V	-	-	-	-	15 mA @ 2.0 V	15 mA @ 2.0 V
Isolated D/I/O	Input	Channels	16	-	64	32	8	-	-
		Isolation Voltage (V <sub>oc</sub> )	2,500	-	2,500	2,500	2,500	-	-
		Input Range	10 ~ 30	-	10 ~ 30	10 ~ 30	4.5 ~ 12	-	-
	Output	Channels	16 (Sink)	64 (Sink)	-	32 (Sink)	6 x Form A 2 x Form C	-	-
		Isolation Voltage	2,500 V <sub>oc</sub>	2,500 V <sub>oc</sub>	-	2,500 V <sub>oc</sub>	2,500 V <sub>oc</sub>	-	-
		Output Range	5 ~ 40 V <sub>oc</sub>	5 ~ 40 V <sub>oc</sub>	-	5 ~ 40 V <sub>oc</sub>	1 A @ 125 V <sub>ac</sub> 2 A @ 30 V <sub>ac</sub>	-	-
		Max. Sink Current	500 mA	500 mA	-	500 mA	-	-	-
	Timer/Counter	Channels	-	-	-	-	8 x UP CTR 2 x PWM	3	-
Resolution (bit)		-	-	-	-	16	32	-	
Max. Input Frequency (Hz)		-	-	-	-	500	10 M	-	
Advanced Function	Pattern Match	-	-	-	-	✓	✓	✓	
	Change of State	-	-	-	-	✓	✓	✓	
	BoardID Switch	✓	✓	✓	✓	✓	✓	✓	
	Channel-Freeze Function	✓	✓	-	✓	-	-	-	
	Output Status Read Back	✓	✓	-	✓	✓	✓	✓	
	Dry/Wet Contact*	✓	-	-	-	-	✓	✓	
Dimensions (mm)		168 x 100	168 x 100	168 x 100	168 x 100	168 x 100	168 x 100	168 x 100	
Connector		1 x DB37 4 x 20-pin	100-pin SCSI	100-pin SCSI	100-pin SCSI	1 x DB37	68-pin SCSI	68-pin SCSI	
DAQnavi Driver	Windows 10/8/7	✓	✓	✓	✓	✓	✓	✓	
	Linux	-	-	-	-	✓	-	-	
	LabVIEW Driver	✓	✓	✓	✓	✓	✓	✓	

\* Dry/wet contact can be mixed at the same time within one group.

# Digital I/O & Counter Cards



Category		Isolated Digital I/O						
Bus		PCI						
Model		PCI-1730U	PCI-1733	PCI-1734	PCI-1750	PCI-1752U	PCI-1754	
TTL D/I/O	Input Channels	16	-	-	-	-	-	
	Output Channels	16	-	-	-	-	-	
	Output Channel	Sink Current	24 mA @ 0.5 V	-	-	-	-	-
		Source Current	15 mA @ 2.4 V	-	-	-	-	-
Isolated D/I/O	Input	Channels	16	32	-	16	-	64
		Isolation Voltage	2,500 V <sub>DC</sub>	2,500 V <sub>DC</sub>	-	2,500 V <sub>DC</sub>	-	2,500 V <sub>DC</sub>
		Input Range	5 ~ 30 V <sub>DC</sub>	5 ~ 30 V <sub>DC</sub>	-	5 ~ 50 V <sub>DC</sub>	-	10 ~ 50 V <sub>DC</sub>
	Output	Channels	16 (Sink)	-	32 (Sink)	16 (Sink)	64 (Sink)	-
		Isolation Voltage	2,500 V <sub>DC</sub>	-	2,500 V <sub>DC</sub>	2,500 V <sub>DC</sub>	2,500 V <sub>DC</sub>	-
		Output Range	5 ~ 40 V <sub>DC</sub>	-	5 ~ 40 V <sub>DC</sub>	5 ~ 40 V <sub>DC</sub>	5 ~ 40 V <sub>DC</sub>	-
		Max. Sink Current	300 mA	-	200 mA	200 mA	200 mA	-
Timer/Counter	Channels	-	-	-	1	-	-	
	Resolution (bit)	-	-	-	16	-	-	
	Max. Input Frequency (Hz)	-	-	-	1 M	-	-	
Advanced Function	Pattern Match	-	-	-	-	-	-	
	Change of State	-	-	-	-	-	-	
	BoardID Switch	-	-	-	-	✓	-	
	Channel-Freeze Function	✓	-	-	-	✓	-	
	Output Status Read Back	✓	-	✓	-	✓	-	
	Dry/Wet Contact*	✓	✓	-	✓	-	-	
Dimensions (mm)		175 x 100	175 x 100	175 x 100	175 x 100	175 x 100	175 x 100	
Connector		1 x DB37 4 x 20-pin	1 x DB37	1 x DB37	1 x DB37	100-pin SCSI	100-pin SCSI	
DAONavi Driver	Windows 10/8/7	✓	✓	✓	✓	✓	✓	
	Linux	✓	-	-	✓	✓	-	
	LabVIEW Driver	✓	✓	✓	✓	✓	✓	

\* Dry/wet contact can be mixed at the same time within one group.



Category		Isolated Digital I/O							
Bus		PCI							
Model		PCI-1756	PCI-1758UDI	PCI-1758UDO	PCI-1758UDIO	PCI-1760U	PCI-1761	PCI-1762	
TTL D/I/O	Input Channels	-	-	-	-	-	-	-	
	Output Channels	-	-	-	-	-	-	-	
	Output Channel	Sink Current	-	-	-	-	-	-	-
		Source Current	-	-	-	-	-	-	-
Isolated D/I/O	Input	Channels	32	128	-	64	8	8	16
		Isolation Voltage (V <sub>DC</sub> )	2,500	2,500	-	2,500	2,500	3,750	2,500
		Input Range (V <sub>DC</sub> )	10 ~ 50	5 ~ 25	-	5 ~ 25	4.5 ~ 12	5 ~ 50	10 ~ 50
	Output	Channels	32 (Sink)	-	128	64	6 x Form A 2 x Form C	4 x Form A 4 x Form C	16**
		Isolation Voltage (V <sub>DC</sub> )	2,500	-	2,500	2,500	2,500	2,500	2,500
		Output Range	5 ~ 40 V <sub>DC</sub>	-	5 ~ 40 V <sub>DC</sub>	5 ~ 40 V <sub>DC</sub>	1 A @ 125 V <sub>AC</sub> 2 A @ 30 V <sub>DC</sub>	8 A @ 250 V <sub>AC</sub> 2 A @ 30 V <sub>DC</sub>	0.25 A @ 250 V <sub>AC</sub> 2 A @ 30 V <sub>DC</sub>
		Max. Sink Current	200 mA	-	90 mA	90 mA			
Timer/Counter	Channels	-	-	-	-	8 x Up CTR 2 x PWM	-	-	
	Resolution (bit)	-	-	-	-	16 (2,500 Isolation)	-	-	
	Max. Input Frequency (Hz)	-	-	-	-	500 for Up CTR	-	-	
Advanced Function	Pattern Match	-	-	-	-	✓	-	-	
	Change of State	-	-	-	-	✓	-	-	
	BoardID Switch	✓	✓	✓	✓	✓	✓	✓	
	Channel-Freeze Function	✓	-	-	-	-	-	✓	
	Output Status Read Back	✓	-	✓	✓	✓	✓	✓	
	Dry/Wet Contact*	-	-	-	-	-	-	-	
Dimensions (mm)		175 x 100	175 x 100	175 x 100	175 x 100	175 x 100	175 x 100	175 x 100	
Connector		100-pin SCSI	Dual 100-pin mini-SCSI	Dual 100-pin mini-SCSI	Dual 100-pin mini-SCSI	1 x DB37	1 x DB37	1 x DB62	
DAQ/Analog Driver	Windows 10/8/7	✓	✓	✓	✓	✓	✓	✓	
	Linux	-	✓	✓	✓	-	✓	✓	
	LabVIEW Driver	✓	✓	✓	✓	✓	✓	✓	

\* Dry/wet contact can be mixed at the same time within one group.

# Digital I/O & Counter Cards



Category		Isolated Digital I/O					Counter			
Bus		ISA		PC/104		PCI-104	PCI	ISA	PC/104	
Model		PCL-725	PCL-735	PCM-3725	PCM-3730	PCM-3730I	PCI-1780U	PCL-836	PCM-3780	
TTL DI/O	Input Channels	-	-	8	16	-	8	16	24	
	Output Channels	-	-	8	16	-	8	16	(shared)	
	Output Channel	Sink Current	-	-	-	0.5 V @ 8 mA	-	24 mA @ 0.5 V	8 mA @ 0.5 V	24 mA @ 0.5 V
		Source Current	-	-	-	0.4 mA @ 2.4 V	-	15 mA @ 2.4 V	0.4 mA @ 2.4 V	15 mA @ 2.0 V
Isolated DI/O	Input	Channels	8	-	8	8	16	-	-	
		Isolation Voltage (V <sub>DC</sub> )	1,500	-	2,500	2,500	2,500	-	-	
		Input Range (V <sub>DC</sub> )	5 ~ 24	-	10 ~ 50	5 ~ 24	5 ~ 30	-	-	
	Output	Channels	4 x Form A 4 x Form C	12 x Form C	8 x Form C	8	16	-	-	
		Isolation Voltage (V <sub>DC</sub> )	1,000	1,000	2,000	2,500	2,500	-	-	
		Output Range	0.5A @ 120 V <sub>AC</sub> 1A @ 30 V <sub>DC</sub>	1A @ 125 V <sub>AC</sub> 2A @ 30 V <sub>DC</sub>	0.25A @ 240 V <sub>DC</sub> 1A @ 30 V <sub>DC</sub>	5 ~ 40 V <sub>DC</sub>	5 ~ 30 V <sub>DC</sub>	-	-	
		Max. Sink Current				200 mA	300 mA	-	-	
Timer/Counter	Channels	-	-	-	-	-	8 x CTR	6 x CTR 3 x PWM	2	
	Resolution (bit)	-	-	-	-	-	16	16	16	
	Max. Input Frequency (Hz)	-	-	-	-	-	20 M	10 M	20 M	
Advanced Function	Pattern Match	-	-	-	-	-	-	-	-	
	Change of State	-	-	-	-	-	-	-	-	
	BoardID Switch	-	-	-	-	-	-	-	-	
	Channel-Freeze Function	-	-	-	-	-	-	-	-	
	Output Status Read Back	-	-	-	-	-	-	-	-	
Dry/Wet Contact*		-	-	-	-	-	-	-	-	
Dimensions (mm)		147 x 95	155 x 100	96 x 90	96 x 90	96 x 90	175 x 100	185 x 100	96 x 90	
Connector		1 x DB37	1 x DB37	1 x 20-pin 1 x 50-pin	3 x 20-pin	2 x 20-pin	68-pin SCSI	1 x DB37 2 x 20-pin	1 x 50-pin 1 x 20-pin	
DAQNavi Driver	Windows 10/8/7	-	-	✓	✓	✓	✓	-	✓	
	Linux	-	-	-	-	-	-	-	-	
LabVIEW I/O Driver		✓	✓	✓	✓	✓	✓	✓	✓	

\* Dry/wet contact can be mixed at the same time within one group.

\*\* Jumper selectable Form A/Form B-type relay output

# USB Modules



Category		Multifunction				Analog Input	
Bus		USB					
Model		USB-4702	USB-4704	USB-4711A	USB-4716	USB-4718	
Analog Input	General Spec.	Resolution (bit)	12 bits	14 bits	12 bits	16 bits	
		Channels	8 S.E./4 Diff.	8 S.E./4 Diff.	16 S.E./8 Diff.	16 S.E./8 Diff.	8 Diff.
		FIFO (samples)	512 samples	512 samples	1,024 samples	1,024 samples	-
		Sampling Rate (S/sec)	10 K (shared)	48 K (shared)	150 K (shared)	200 K (shared)	10 S/s (shared)
	Input Ranges	Unipolar Inputs (V)	-	-	-	0 ~ 10, 0 ~ 5, 0 ~ 2.5, 0 ~ 1.25	J,K,T,E,R,S,B types
Bipolar Inputs (V)		S.E.: ±10 Diff.: ±1, ±1.25, ±2, ±2.5, ±4, ±5, ±10, ±20	S.E.: ±10 Diff.: ±1, ±1.25, ±2, ±2.5, ±4, ±5, ±10, ±20	±10, ±5, ±2.5, ±1.25, ±0.625	±10, ±5, ±2.5, ±1.25, ±0.625	-	
Trigger Modes	Pacer/Software/External Pulse	✓	✓	✓	✓	Software	
Analog Output	Resolution (bit)	12	12	12	16	-	
	Channels	2	2	2	2	-	
	Output Range (V)	0~5	0~5	0 ~ 5, 0 ~ 10, ±5, ±10	0 ~ 5, 0 ~ 10, ±5, ±10	-	
	Output Rate	Static update	Static update	Static update	Static update	-	
Digital I/O	Input Channels	8	8	8	8	8 (Isolated)	
	Output Channels	8	8	8	8	8 (Isolated)	
Timer/Counter	Channels	1	1	1	1	-	
	Resolution (bit)	32	32	32	32	-	
	Max. Input Frequency (Hz)	5 M	5 M	1 k	1 k	-	
Isolation Voltage		-	-	-	-	2,500 V <sub>DC</sub>	
BoardID Switch		Software	Software	Software	Software	Software	
Dimensions (mm)		70 x 70	132 x 80 x 32	132 x 80 x 32	132 x 80 x 32	132 x 80 x 32	
Connector		1 x DB37	Onboard screw terminal	Onboard screw terminal	Onboard screw terminal	Onboard screw terminal	
DAQnavi Driver	Windows 7/8/10	✓	✓	✓	✓	✓	
	Linux	✓	✓	✓	✓	✓	
	LabVIEW Driver	✓	✓	✓	✓	✓	



Category	Isolated USB 2.0 Hub	USB 2.0 Hub
Bus	USB	
Model	USB-4620	USB-4622
Ports	Upstream x 1 (Type B) Downstream x 5 (Type A)	
Compatibility	USB 2.0 Full-speed	USB 2.0 High-speed, USB 2.0 Full-speed, USB 1.0
Transfer Speed(Mbps)	12	480/12/1.5
Supply Current	500 mA max. per channel	
Dimensions(mm)	132 x 80 x 32	
DC Input	10 ~ 30 V <sub>DC</sub>	

# USB Modules



Category		Isolated Digital I/O		Non-isolated Digital I/O		
Bus		USB				
Model		USB-4751	USB-4751L	USB-4750	USB-4761	
TTL D/I/O	Input Channels	48	24	-	-	
	Output Channels			-	-	
	Output Channel	Sink Current	12 mA	12 mA	-	-
		Source Current	12 mA	12 mA	-	-
Isolated D/I/O	Input	Channels	-	-	16	8
		Isolation Voltage (V <sub>DC</sub> )	-	-	2,500	2,500
		Input Range (V <sub>DC</sub> )	-	-	5 ~ 60	5 ~ 30
	Output	Channels	-	-	16	8 x Form C
		Isolation Voltage (V <sub>DC</sub> )	-	-	2,500	2,500
		Output Range (V <sub>DC</sub> )	-	-	5 ~ 40	-
		Max. Sink Current	-	-	100 mA max. per channel	0.25 A @ 250 V <sub>AC</sub> , 2 A @ 30 V <sub>DC</sub>
		Isolation Voltage (V DC)	-	-	2,500	2,500
Timer/ Counter	Channels	2	2	2	-	
	Resolution (bit)	32	32	32	-	
	Max. Input Frequency (Hz)	8 M	8 M	8 M	-	
BoardID Switch		Software				
Dimensions (mm)		132 x 80 x 32	132 x 80 x 32	132 x 80 x 32	132 x 80 x 32	
Connector		2 x opto-22 compatible box header	1 x opto-22 compatible box header	Onboard screw terminal	Onboard screw terminal	
DAQ/Analog Driver	Windows 7/8/10	✓	✓	✓	✓	
	Linux	✓	-	-	✓	
	LabVIEW Driver	✓	✓	✓	✓	

# CompactPCI Enclosures



Model		MIC-3106-00	MIC-3111-00	MIC-3121-00
Power Type		ATX		
Input Voltage		100-240VAC		200-240VAC
Wattage		180W		300W
ON/OFF Switch		Lockable Toggle Switch		
System Slot		1, on the right		
Peripheral Slot		2 Slots	7 Slots	7 Slots
PCI Bus		32-bit 33MHz	32-bit 33MHz	32-bit 33MHz
Dimensions (W x H x D mm)		134 x 177 x 238	234 x 177 x 258	482 x 177 x 310
Weight (kg)		4.33	6.14	9.65
Temperature	Operating	0 ~ 50°C		
	Non-Operating	-20 ~ 60°C		
Humidity (non-condensing)	Operating	10~85% @ 40°C		
	Non-Operating	10~95% @ 40°C		
Vibration (5 ~ 500 Hz)	Operating	2Grms (without HDD)		
	Non-Operating	2G		
Shock (11ms)	Operating	10G		
	Non-Operating	30G		
Regulatory		CE, FCC, CCC, UL, RoHS, BSMI		
Compliance		PICMG 2.0 Rev. 3.0		

## PCI to CPCI Hybrid Box

Model		MIP-3104-AE
Backplane	CPCI interface to chassis	1 for chassis
	PCI Slot	4 Slots
	PCI Slot Power (4 Slot)	12V@2.5A, -12V@0.8A, +5V@4A, +3.3V@3A
Dimensions (W x H x D mm)		142 x 131 x 213
Weight (g)		725



## CompactPCI CPU Options

		L1	L2	H1	H2
Processor	CPU	Intel® Atom™ N455, 1.66GHz	Intel® Atom™ D525, 1.8GHz	Intel® 3rd Gen. Core™ i3-3217UE, 1.6GHz	Intel® 3rd Gen. Core™ i7-3517UE, 1.7 GHz
	Memory	2GB On board	2GB On board	4GB On board	4GB On board
	Storage	1 x CompactFlash Type II 1 x 2.5" SATA HDD	1 x CompactFlash Type II 1 x 2.5" SATA HDD	1 x CFast 1 x 2.5" SATA HDD	1 x CFast 1 x 2.5" SATA HDD
Front I/O	VGA	1 x DB15 port	1 x DB15 port	1 x DB15 port	1 x DB15 port
	Ethernet	2 x 10/100/1000 Mbps, RJ45 connector	2 x 10/100/1000 Mbps, RJ45 connector	2 x 10/100/1000 Mbps, RJ45 connector	2 x 10/100/1000 Mbps, RJ45 connector
	USB 2.0	3 x Type A	3 x Type A	2 x Type A	2 x Type A
	Serial	2 x RS-232, DB9 connector	2 x RS-232, DB9 connector	2 x RS-232, RJ45 connector	2 x RS-232, RJ45 connector
	PS/2	1	1	1	1

# CompactPCI I/O & Communication Cards



Category		CPCI				
Model		MIC-3716/3	MIC-3714/3	MIC-3723/3	MIC-3720	
Analog Input	General Spec.	Resolution (bit)	16	12	-	-
		Channels	16SE/8 Diff	4SE	-	-
		FIFO (samples)	1024	32768	-	-
		Sampling Rate (S/s)	250 K	30 M	-	-
	Input Ranges	Unipolar Inputs (V)	0~10, 0~5, 0~2.5, 0~1.25	-	-	-
		Bipolar Inputs (V)	±10, 5, 2.5, 1.25, 0.625	±5, 2.5, 1, 0.5	-	-
		Configurable Per-Channel	✓	✓	-	-
	Trigger Modes	Pacer/Software/External Pulse	✓	✓	-	-
		Analog Slope	✓	✓	-	-
		Advanced Trigger	✓	✓	-	-
Data Transfer Modes	Software	✓	✓	-	-	
	DMA	Bus-mastering	Bus-mastering	-	-	
Analog Output	Resolution (bit)	16	-	16	12	
	Channels	2	-	8	4	
	FIFO (sample)	-	-	-	-	
	Output Range (V)	0~5, 0~10, ±5, ±10	-	±10, 0~20mA, 4~20mA	0~5, 0~10, ±5, ±10, 0~20mA, 4~20mA	
	Output Rate	Static update	-	Static update	Static update	
	DMA Transfer	-	-	-	-	
Digital I/O	Input Channels	16	-	16 (shared)	-	
	Output Channels					
Timer/Counter	Channels	1	-	-	-	
	Resolution (bit)	16	-	-	-	
	Max. Input Frequency (Hz)	10 M	-	-	-	
Isolation Voltage (V <sub>oc</sub> )		-	-	-	2500	
Auto Calibration		✓	-	✓	-	
BoardID Switch		✓	-	✓	✓	
Dimensions (mm)		160 x 100	160 x 100	160 x 100		
Connector		68-pin SCSI	4 x BNC	68-pin SCSI		
DAQnavi Driver	Windows 10/ 8/ 7	✓	✓	✓	✓	
	Linux	✓	✓	-	-	
	LabVIEW Driver	✓	✓	✓	✓	



Category		CPCI			
Model		MIC-3611/3	MIC-3612	MIC-3620/3	MIC-3680/3
Number of Ports		4	4	8	2
Communication Interfaces	RS-232	-	✓	✓	-
	RS-422	✓	✓	-	-
	RS-485	✓	✓	-	-
	CAN	-	-	-	✓
Protection	ESD (V <sub>oc</sub> )	2,500	-	-	-
	Isolation (V <sub>oc</sub> )	2,000	-	-	2,500
Cable Connector Type		DB9 Male	DB9 Male	Optional	-



Category		CPCI					
Model		MIC-3753/3	MIC-3756/3	MIC-3758/3	MIC-3761/3	MIC-3780/3	
TTL DI/O	Input Channels	72	-	-	-	8	
	Output Channels	(shared)	-	-	-	8	
	Output Channel	Sink Current	24mA@0.44V	-	-	-	24mA@0.5V
		Source Current	24mA@3.76V	-	-	-	15mA@2.4V
Isolated DI/O	Input	Channels	-	32 (sink)	64	8 (sink)	-
		Isolation Voltage (V <sub>oc</sub> )	-	2,500	2,500	3750	-
		Input Range	-	10 ~ 50	5 ~ 25	5 ~ 50	-
	Output	Channels	-	32 (sink)	64	4 x FormA 4 x FormC	-
		Isolation Voltage (V <sub>oc</sub> )	-	2,500	2,500	2,500	-
		Output Range (V <sub>oc</sub> )	-	5 ~ 40	5 ~ 40	3A@250VAC 3A@24VDC	-
		Max. Sink Current	-	200mA	90mA		-
	Timer/Counter	Channels	-	-	-	-	8 x CTR
Resolution (bit)		-	-	-	-	16	
Max. Input Frequency (Hz)		-	-	-	-	20 M	
Advanced Function	Pattern Match	✓	-	-	-	-	
	Change of State	✓	-	-	-	-	
	BoardID Switch	✓	✓	✓	✓	✓	
	Channel-Freeze Function	-	✓	-	-	-	
	Output Status Read Back	✓	✓	✓	✓	-	
	Dry/Wet Contact	✓	-	-	-	-	
Dimensions (mm)		160 x 100	160 x 100	160 x 100	160 x 100	160 x 100	
Connector		1 x 78-pin	1 x 78-pin	Dual 100-pin mini-SCSI	1 x DB37	68-pin SCSI	
DAQNavi Driver	Windows 10/8/7	✓	✓	-	✓	✓	
	Linux	✓	✓	-	-	-	
LabVIEW I/O Driver		✓	✓	-	✓	✓	

Vertrieb durch 

**AMC – Analytik & Messtechnik GmbH Chemnitz**

Heinrich-Lorenz-Str. 55 Tel.: +49/371/38388-0  
 09120 Chemnitz Fax: +49/371/38388-99  
 E-Mail: info@amc-systeme.de Web: www.amc-systeme.de

