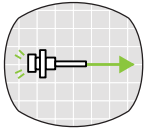


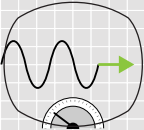
# Analog Input / Output

## ANALOG I/O

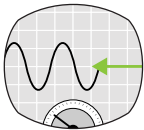
Interface modules that convert analog signals to digital data. Converting analogue signals to data (digital signals) and feeding them to PC allows you to measure external events, whereas converting PC data to analogue signals for output allows you to control external devices.



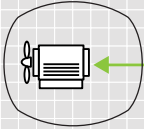
**Application**  
Sensor Measurement through Voltage / Current input signals



**Application**  
Measurement of voltage / current values through their input signals



**Application**  
Output of voltage / current signals



**Application**  
Motor control through the output of voltage / current signals

## Pictograms

### Bus Specifications

**PCI Express**

Product is PCI Express standard compliant and can be used in the computer equipped with PCI Express bus expansion slot.

**PCI**

Product is PCI standard compliant and can be used in the computer equipped with PCI bus expansion slot.

**USB 2.0**

Product is USB standard compliant and can be used in the computer equipped with USB2.0/1.1 ports. Supports USB2.0 high-speed mode(480Mbps).

**Card Bus**

Product supports Cardbus that is a 32-bit PC card standard bus.

### I/O Points

**Analog Input XXch**

Maximum number of channels of analog signals that can be input

**Analog Output XXch**

Maximum number of channels of analog signals that can be output

### Board Size

**Low Profile**

Product is PCI standard/Low Profile compliant. A bracket for standard-size PCI slots is provided.

### Supported Connectors

**96-pin Half Pitch**

**50-pin Mini-Ribbon**

**68-pin 0.8mm Pitch**

**37-pin D-SUB**

Indicates the number of pins and shapes of connectors used for external connection. The supported cables and accessories will vary depending on these specifications.

CONTEC provides a wide variety of cables and accessories to suit your needs.

Cables with connectors on both ends Accessories (Terminal block, etc.) **Q-01**

Cables with a connector on one end Connector set **Q-05**

### Supported softwares

#### Windows Driver

API-TOOL Drivers for Windows are provided. The license-free driver software (both development and runtime) provides commands to interface boards or cards using Windows standard Win32API function (DLL).

#### Linux Driver

API-TOOL Drivers for Linux are provided. The license-free driver software (both development and runtime) that provide commands to interface boards or cards using module-style device drivers and the shared library.

#### C-LOGGER

C-LOGGER can be downloaded from our Web site.

C-LOGGER, is a Windows version of data logger software for CONTEC's analog I/O device products. C-LOGGER provides true data collection and monitoring function, such collected signal data graph drawing, zoom observation, file saving, and dynamic transfer to Excel (spreadsheet program). Once you have an eligible CONTEC's analog I/O device product and C-LOGGER installed on your PC, C-LOGGER allows you to start collecting and monitoring data of interest immediately after setting a set of sampling conditions easily via a setup wizard (interactive program) without any need for annoying programming.

For the details, please visit: <http://www.contec.com/clogger/>

#### MATLAB

ML-DAQ library software for use with MATLAB can be downloaded from our Web site. ML-DAQ is library software which allows you to use CONTEC's analog input / output boards with the MathWorks' MATLAB software. This library along with MATLAB and MATLAB's Data Acquisition Toolbox, allows you to control CONTEC boards using MATLAB and to import measurement data directly into MATLAB's environment for analysis.

For the details, please visit: <http://www.contec.com/mldaq/>

#### LabVIEW

VI-DAQ, a VI library for use with National Instruments' LabVIEW can be downloaded from our Web site. With function format similar to that of LabVIEW's "Data Acquisition VI", VI-DAQ set-up is not complicated therefor simplifying device operation.

For the details, please visit: <http://www.contec.com/mldaq/>

### Points

**Bus Isolated**

Photo-couplers and isolation amplifiers are used to isolate the PC from the external I/O circuit preventing electrical disturbances. Useful when wiring environment is susceptible to noise generation and there is concern about noise or malfunction of the host PC.

**Individual Isolated**

Bus isolation, photo-couplers and isolation amplifiers are used to isolate I/O channels from each other preventing interference between each channel. Implements correct sampling even when channel connection devices have different ground levels.

**High Speed**

Uses high-speed A/D converter (or D/A converter)/for faster analog input (or output) than other products.

**High Precision**

Uses highly precise A/D converter (or D/A converter) for higher precision analog input (or output) than other products.

**Small Signal**

Input range can be set within a micro-signal range ( $\pm 0.125V$ ,  $0-0.25V$ ), Sensor output that has a small surge can be sampled with high precision.

**Onboard Memory**

Product is equipped with data storage buffer memory for analog I/O. It allows for high-speed real-time sampling independent of the processing power of the PC.

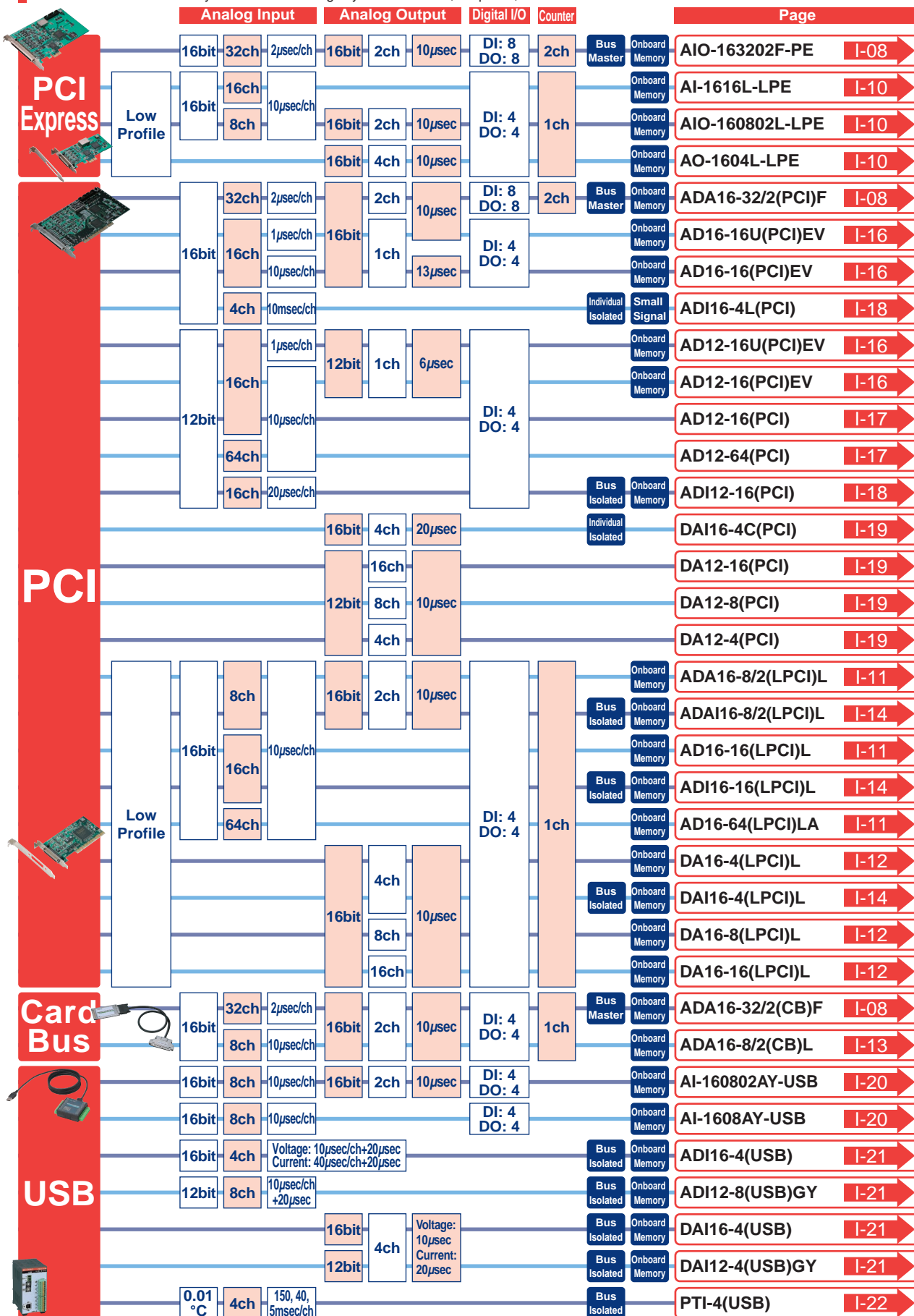
**Bus Master**

Large sampling data can be transferred promptly to PC memory without going through CPU.

# Analog I/O

## Product Lineup

You can choose from a variety of models according to your desired bus, I/O points, and onboard functions.



Box-PCs

Panel-PCs

Flat Panel Displays  
Silicon Disk Drives

Option

Box PCs & Panel PCs with Windows CE

Single Board Computer  
Chassis / Backplane

Analog I/O

Digital I/O

Counter & Motion Controller

Serial Communication  
GPIB Communication

Remote I/O

Expansion Unit / Bus Adapter

Software

Accessories & Cables

Distributed Monitor & Control Network: F&EIT  
Multi-Programmable Display

Wireless LAN

Remote Monitoring Solution

Service & Products

I-02

Lineup

Measurement Products

Multi-function F Series

PCI Express

PCI

PC Card

Low-cost Multi-function L series

PCI Express

PCI

PC Card

Intelligent E series

PCI

Standard

PCI

USB

ISA

# Analog I/O

Box-PCs
Panel-PCs
Flat Panel Displays
Silicon Disk Drives
Option
Box PCs & Panel PCs with Windows CE
Single Board Computer
Chassis / Backplane
<b>Analog I/O</b>
Digital I/O
Counter & Motion Controller
Serial Communication
GPIO Communication
Remote I/O
Expansion Unit / Bus Adapter
Software
Accessories & Cables
Distributed Monitor & Control Network: F&IT
Multi-Programmable Display
Wireless LAN
Remote Monitoring Solution
Service & Products
<b>I-03</b>
Lineup
<b>Measurement Products</b>
Multi-function F Series
PCI Express
PCI
PC Card
Low-cost Multi-function L series
PCI Express
PCI
PC Card
<b>Intelligent E series</b>
PCI
<b>Standard</b>
PCI
USB
ISA

## CONTEC DAQ Solution Products

### Graph Display and Logging

Available for Free Download  
Ships with supported products



for Windows Vista/XP / 2000 / Server2003

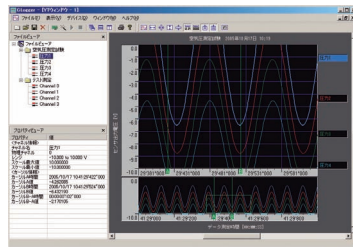


#### HIGH SPEED SAMPLING & GRAPHING

C-LOGGER enhances the performance of hardware, providing high-speed graphing and quick response even when handling large amounts of data.

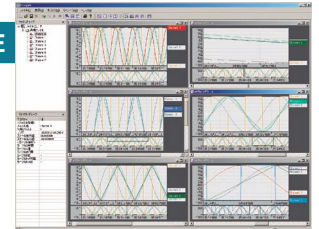
#### Dual-graph display - full-scale and zoom

C-LOGGER has the option of displaying collected data on both full-scale and zoomed graphs. For example, while viewing complete data, an isolated dataset can be viewed by expanding the area and checking details.



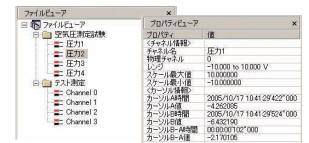
#### MULTI WINDOW INTERFACE

C-LOGGER can display two or more windows at a time allowing the user access to both graph and numeric displays. Each window can be customized as to size and number of channels displayed.



#### File viewer - Property viewer

FILE VIEWER provides a tree display for managing recently collected data and data files. PROPERTY VIEWER displays detailed information on each item of data.



#### OTHER FUNCTIONS

- Configuration Wizard (interactive program) for easy setting of sampling conditions.
- Capable of loading data from saved files.
- Customizable graph display (line colors, background color, label, etc.)



## CONTEC's Complete Lineup of Multi-

Support Events Controller & Bus Master Transfer

### Multi-function F Series



C-LOGGER    MATLAB    LabVIEW

- PCI or CardBus
- Includes 16bit 32ch analog inputs, 16bit 2ch analog outputs, digital I/O, counter
- I/O range settings
- 2µsec/ch high speed converter, 64k data buffer (analog I/O)
- Event controller



Standard Features - Low Cost

### Low cost Multi-function

C-LOGGER    MATLAB    LabVIEW

- Low price
- PCI or CardBus
- Includes 16bit 8-64ch analog inputs, 16bit 2-16ch analog outputs, digital I/O, counter
- Available for Low Profile PCI slots

## PROGRAM DEVELOPMENT TOOLS

Windows/Linux API Programming driver library for



Included free with all products

#### API-TOOL for Windows

Win32 API function commands

#### API-TOOL for Linux

Module device drivers and shared library commands

# Analog I/O

## The Best Measurement, Analysis and Data Acquisition Devices

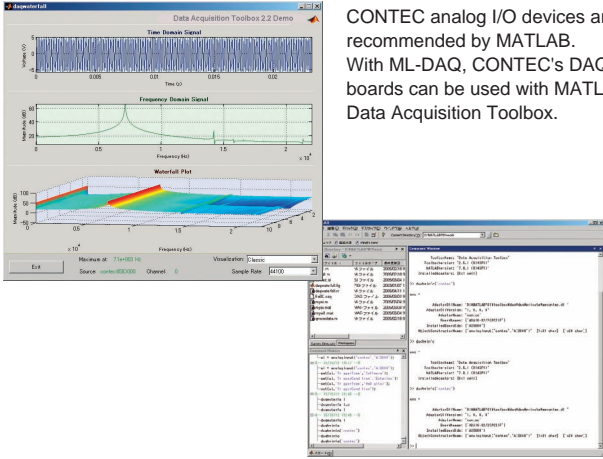
### MATLAB Analysis

MATLAB-compliant data acquisition library

# ML-DAQ



Available for Free Download



CONTEC analog I/O devices are recommended by MATLAB. With ML-DAQ, CONTEC's DAQ boards can be used with MATLAB Data Acquisition Toolbox.

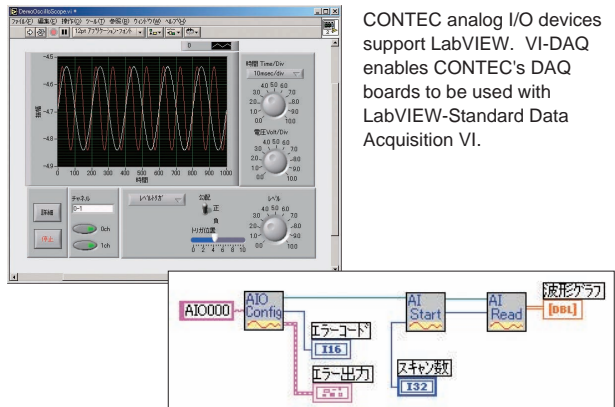
### LabView Data Acquisition

LabVIEW-compliant data acquisition library

# VI-DAQ



Available for Free Download



CONTEC analog I/O devices support LabVIEW. VI-DAQ enables CONTEC's DAQ boards to be used with LabVIEW-Standard Data Acquisition VI.

## function Analog Input/Output Devices

### L Series



### USB I/O Terminal USB Module

LabVIEW



16MB Data Memory, expansion accessories

### Intelligent E series



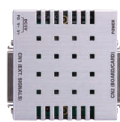
C-LOGGER    MATLAB    LabVIEW

- Option of 12 or 16bit, 1μsec to 10μsec converter, PCI
- 16ch analog inputs, 1ch analog output, digital I/O
- I/O range settings
- Optional 16ch expansion, sampling boards



### Terminals, Cables and Accessories

Buffers, amplifiers



BNC Terminals



Alligator Clip cables



Terminal Units



Visit our website



CONTEC DAQ Solution

<http://www.contec.com/daq/>

Box-PCs

Panel-PCs

Flat Panel Displays

Silicon Disk Drives

Option

Box PCs & Panel PCs with Windows CE

Single Board Computer

Chassis / Backplane

Analog I/O

Digital I/O

Counter & Motion Controller

Serial Communication

GPB Communication

Remote I/O

Expansion Unit / Bus Adapter

Software

Accessories & Cables

Distributed Monitor & Control Network: F&EIT

Multi-Programmable Display

Wireless LAN

Remote Monitoring Solution

Service & Products

I-04

Lineup

Measurement Products

Multi-function F Series

PCI Express

PCI

PC Card

Low-cost Multi-function L series

PCI Express

PCI

PC Card

Intelligent E series

PCI

Standard

PCI

USB

ISA



# Analog I/O

High-Quality Hardware and Support Software Tailored for Your Needs

If you want to use a PC for measurement, CONTEC is your choice!

If you want to begin measuring right away but do not want to go through all the trouble...

**PC Measurement Software**

**Free Download Service**

We provide various free measurement software for Windows at our Web site. You can easily introduce a PC-based measurement system with a purpose-specific configuration and detailed implementation procedure.

Board x Cable x Terminal Block

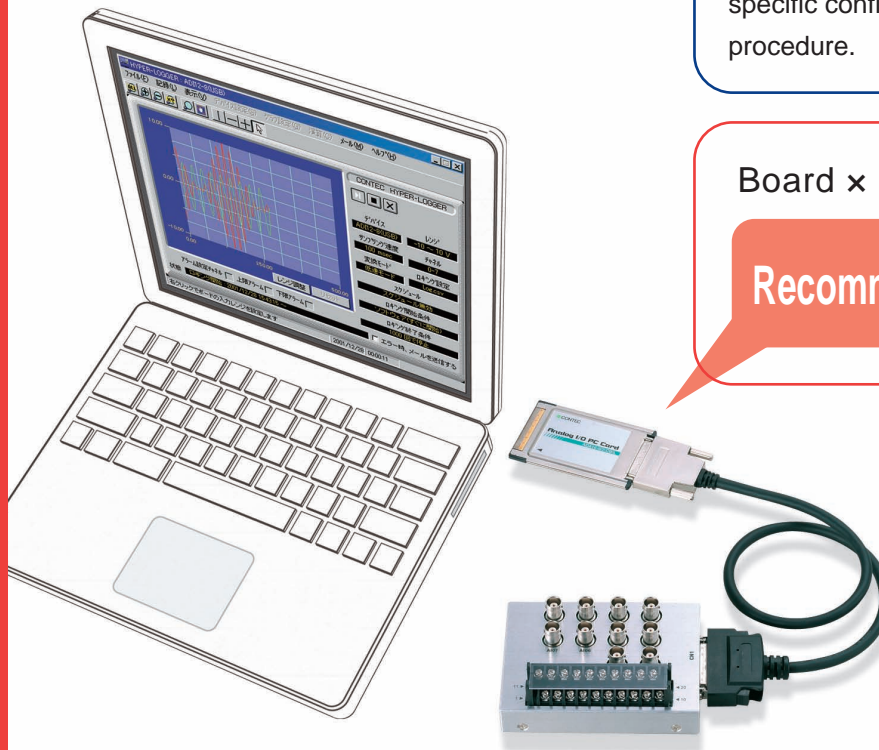
**Recommended Combination**

**For Laptop PC**

- 8-channel Analog input  
16bit, 10μsec/ch
- 2-channel Analog output  
16bit, 10μsec

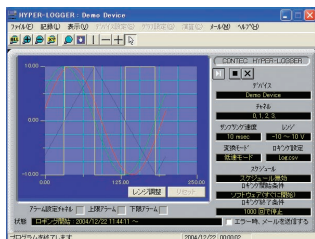
PC card : ADA16-8/2(CB)L  
Cable : ADC-68M/50M  
BNC terminal unit : ATP-8L

I-10



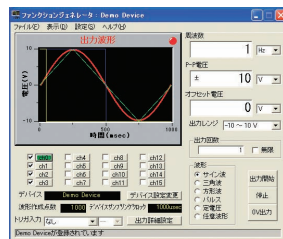
- Box-PCs
- Panel-PCs
- Flat Panel Displays
- Silicon Disk Drives
- Option
- Box PCs & Panel PCs with Windows CE
- Single Board Computer
- Chassis / Backplane
- Analog I/O**
- Digital I/O
- Counter & Motion Controller
- Serial Communication
- GPB Communication
- Remote I/O
- Expansion Unit / Bus Adapter
- Software
- Accessories & Cables
- Distributed Monitor & Control Network: F&IT
- Multi-Programmable Display
- Wireless LAN
- Remote Monitoring Solution
- Service & Products
- I-05**
- Lineup
- Measurement Products**
- Multi-function F Series
- PCI Express
- PCI
- PC Card
- Low-cost Multi-function L series
- PCI Express
- PCI
- PC Card
- Intelligent E series
- PCI
- Standard
- PCI
- USB
- ISA

Special Site <http://www.contec.com/pcmeasure/>



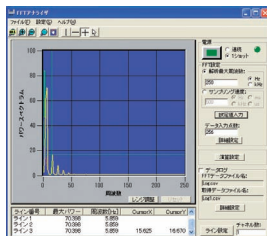
### HYPER-LOGGER

High-speed sampling and historical file saving



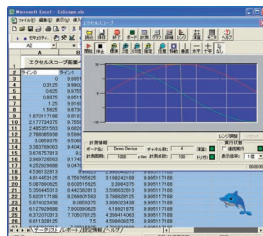
### Function Generator

Outputs sine curve, triangular wave, square wave, low voltage and arbitrary wave form



### FFT Analyzer

FFT Analyzer  
FFT/DFT analysis and filtering  
Graph display of power spectrum / amplitude spectrum and file saving



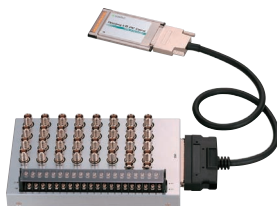
### Excel Scope

Displays graphs, logs to Excel spreadsheets, operation and report output

### For Laptops

#### High-speed / multiple channels

- 32-channel Analog input  
16bit, 2μsec/ch
- 2-channel Analog output  
16bit, 10μsec

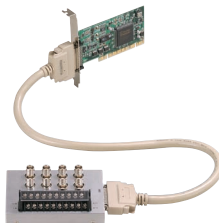


PC card : ADA16-32/2(CB)F  
Cable : ADC-68M/96F  
BNC terminal unit : ATP-32F

### For Desktops (PCI)

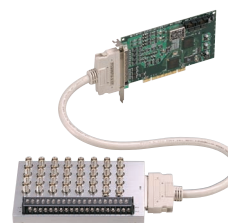
#### High-speed / multiple channels

- 8-channel Analog input  
16bit, 10μsec/ch
- 2-channel Analog output  
16bit, 10μsec



Low-profile PCI : ADA16-8/2(LPCI)L  
Cable : PCB50PS  
BNC terminal unit : ATP-8L

- 32-channel Analog input  
16bit, 2μsec/ch
- 2-channel Analog output  
16bit, 10μsec



PCI board : ADA16-32/2(PCI)F  
Cable : PCB96PS  
BNC terminal unit : ATP-32F

### Provided with PCI boards and PC cards

## If you want to create your own programs...

API Function Library

### API-PAC(W32)

### API-TOOLS for Windows

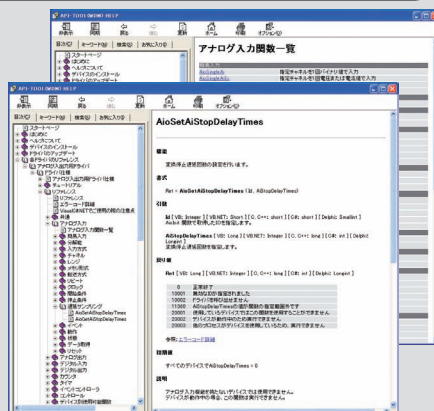
Commands to add-on boards (cards) are provided via Win32 API functions (DLL).

### API-TOOLS for Linux

Commands to add-on boards (cards) are provided via module-style device drivers and the shared library.

Free Downloads

Run time is license free



Box-PCs

Panel-PCs

Flat Panel Displays

Silicon Disk Drives

Option

Box PCs & Panel PCs with Windows CE

Single Board Computer

Chassis / Backplane

Analog I/O

Digital I/O

Counter & Motion Controller

Serial Communication

GPB Communication

Remote I/O

Expansion Unit / Bus Adapter

Software

Accessories & Cables

Distributed Monitor & Control Network: F&IT

Multi-Programmable Display

Wireless LAN

Remote Monitoring Solution

Service & Products

I-06

Lineup

Measurement Products

Multi-function F Series

PCI Express

PCI

PC Card

Low-cost Multi-function L series

PCI Express

PCI

PC Card

Intelligent E series

PCI

Standard

PCI

USB

ISA

# Analog I/O Multi-function F series

- Box-PCs
- Panel-PCs
  - Flat Panel Displays
  - Silicon Disk Drives
- Option
  - Box PCs & Panel PCs with Windows CE
  - Single Board Computer
  - Chassis / Backplane
- Analog I/O
- Digital I/O
  - Counter & Motion Controller
  - Serial Communication
  - GPIB Communication
- Remote I/O
  - Expansion Unit / Bus Adapter
- Software
  - Accessories & Cables
  - Distributed Monitor & Control Network: F&EIT
  - Multi-Programmable Display
- Wireless LAN
  - Remote Monitoring Solution
- Service & Products

I-07

- Lineup
- Measurement Products
  - Multi-function F Series
  - PCI Express
  - PCI
  - PC Card
- Low-cost Multi-function L series
  - PCI Express
  - PCI
  - PC Card
- Intelligent E series
  - PCI
- Standard
  - PCI
  - USB
  - ISA

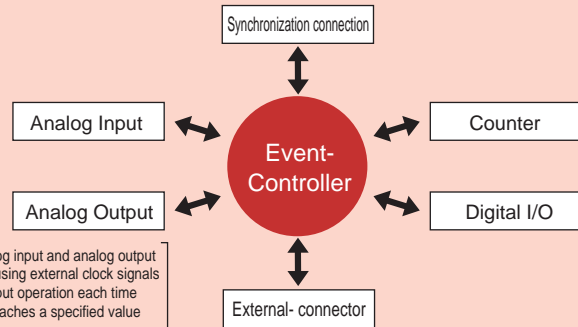
## Features of CONTEC's F series

### 1. Multi-function

Analog input / output, digital input / output and counter functions, for computers with limited numbers of expansion slots to be used in configuring complicated systems.

### 2. Event controller for diverse sampling control

Provides central management (via hardware) for start/stop/clock control of analog input/output operations. Easily combines event functions and external control signal inputs for high level synchronous control that is independent of controlling software. Individual operation of each function is also possible.



Arrows indicate the flow of control signals. Major control signals include operation start, operation stop and clock signals.

Ex.1: Conducting both analog input and analog output with the same timing using external clock signals  
 Ex.2: Starting the analog input operation each time the counter reading reaches a specified value

### 3. Bus master transfer and complex data input

Both analog input and output utilize bus master transfer (either individually or concurrently), allowing bulk data transfer between the host computer and the board with no additional load on the CPU. Simultaneous transfer is available for data using bus master transfer (analog & digital input, digital output and count data) if they are synchronized with the analog input clock signals. This function enables synchronization between various data in the system.

### 4. Buffer memory for software independent background processing

Both analog input and output feature onboard buffer memory for use when bus master transfer is not used. This function allows input/output in be performed in the background without depending on system operation status of either the host computer or the software.

### 5. Setup and adjustment performed via software

Setup and adjustment, such as those concerning the range of analog input and output is done via software, eliminating the need to change jumper settings. It can also recognize any adjustment information that is different from that set at the factory. This allows for optimum settings for individual applications. Note: software range setting available only on PCI boards

### 6. Synchronous control connector (ADA16-32/2(PCI)F, AIO-163202F-PE)

CONTEC's ADA16-32/2(PCI)F and AIO-163202F-PE are equipped with a synchronous control connector capable of synchronizing control of multiple boards, enabling channel through a increase of the number of boards. This synchronous operation is easily configured.

### 7. Filtering for facilitation in the connection of external signals

External analog input/output, digital input/output and counter input/output are equipped with a digital filter for the prevention of chatter.

### 8. Wide array of terminal blocks and cables to meet your demand

For combinations, see page Q-01

We provide a variety of analog input and relay terminal blocks [and cables] to suit for your specific application.

- **BNC terminal unit**  
ATP-32F



- **Alligator Clip cable**  
BNC-W60



- **BNC cable**  
BNC-B100 (1m)  
BNC-B200 (2m)  
BNC-B300 (3m)



- **Terminal unit**  
EPD-96A



#### Example 1



ADA16-32/2(PCI)F + PCB96PS-0.5P (Cable with connectors on both sides) + ATP-32F (BNC terminal)

#### Example 2



ADA16-32/2(CB)F + ADC-68M/96F + ATP-32F

Please see page Q-01 for optional accessories and cables/connectors, and page P-01 for supported software.

Multi-Function I/O F series

# Analog I/O

## PCI Express

96-pin Half Pitch | Analog Input 32ch | Analog Output 2ch | Digital I/O 8 | Counter 2ch | F series | High Precision | High Speed | Memory on Board | Bus Master

Windows Diver | Linux Diver | C-LOGGER | MATLAB | LabVIEW

### High Speed 16-bit Multi-function A/D AIO-163202F-PE

- Event Controller for diverse sampling control
- Bus Master Transfer alleviates the load on host computer's CPU
- 64k data buffer memory enables background processing



Soon to be RoHS-compliant

## PCI

96-pin Half Pitch | Analog Input 32ch | Analog Output 2 | Digital I/O 8 | Counter 2ch | F series | High Precision | High Speed | Memory on Board | Bus Master | CE

Windows Diver | Linux Diver | C-LOGGER | MATLAB | LabVIEW

### High Speed 16-bit Multi-function A/D ADA16-32/2(PCI)F

- Event Controller for diverse sampling control
- Bus Master Transfer alleviates the load on host computer's CPU
- 64k data buffer memory enables background processing



Soon to be RoHS-compliant

## Card Bus

68-pin 0.8mm Pitch | Analog Input 32ch | Analog Output 2ch | Digital I/O 4 | Counter 1ch | F series | High Precision | High Speed | Memory on Board | Bus Master | CE

Windows Diver | Linux Diver | C-LOGGER | MATLAB | LabVIEW

### High Speed 16-bit Multi-function A/D ADA16-32/2(CB)F

- Event Controller for diverse sampling control
- Bus Master Transfer alleviates the load on host computer's CPU
- 64k data buffer memory enables background processing



Soon to be RoHS-compliant

\*This card cannot be used with another card requiring external connections when used on a PC with 2 TYPE II PC card slots. For simultaneous use, the other card must be a PC card (excluding memory card) that does not require an external connector.

\* Optional cable ADC-68M/96F is required.

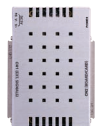
This product reduces signal-crosstalk in case of inputted analog signals are low response speed.

Buffer Amplifier Box for Analog Input Boards (32ch type) ATBA-32F



Soon to be RoHS-compliant

Buffer Amplifier Box for Analog Input Boards (8ch type) ATBA-8F



Soon to be RoHS-compliant

Accessories (Optional): AC adapter (Input: 90 - 264VAC, Output: 5VDC 2.0A): POA200-20

Model	AIO-163202F-PE	ADA16-32/2(PCI)F	ADA16-32/2(CB)F
Channels	32 single-ended, 16 differential		
Range	Bipolar: ±10V, ±5V, ±2.5V or Unipolar: 0~+10V, 0~+5V, 0~+2.5V		Bipolar: ±10V
Impedance	1MΩ or more		
Resolution	16bit		
Conversion Speed	2μsec/ch (Max.)		
Conversion Accuracy*	±5LSB		
Buffer Memory	64k-word FIFO or 64k-word RING		
Channels	2ch		
Range	Bipolar: ±10V, ±5V, ±2.5V, ±1.25V or Unipolar: 0~+10V, 0~+5V, 0~+2.5V		Bipolar: ±10V
Impedance	1Ω or less		
Resolution	16bit		
Conversion Speed	10μsec (Max.)		
Conversion Accuracy	±3LSB		
Buffer Memory	64K-word FIFO or 64K-word RING		
Input	8 LVTTTL level (positive logic)	8 TTL level (positive logic)	4 LVTTTL level (positive logic)
Output	8 LVTTTL level (positive logic)	8 TTL level (positive logic)	4 LVTTTL level (positive logic)
Channels	2ch		
Counting System	32-bit Up count		
Max. count	32-bit (binary data)		
Interrupts	1		
I/O Address	64 portsx1, 256 portsx1 occupation		
Power Consumption (Max.)	3.3VDC 500mA, 12VDC 300mA	5VDC 1100mA	3.3VDC 600mA
Bus / Dimensions (mm)	PCI Express Base Specification Rev. 1.0a x1 / 169.33(L) x 110.18(H)	PCI (32bit, 33MHz, 5V or 3.3V*) / 176.41(L)x105.68(H)	PC Card Standard compliant CardBus / TYPE II
Connector	PCR-96LMD [HONDA Tsushin Kogyo] or equivalent		68-pin 0.8mm Pitch
Software	-		
Accessories	ATBA-32F*3*7, ATBA-8F*3*5*7, ATP-8*3*5*6, ATP-32F*3, DTP-64(PC)*3, EPD-96A*3, EPD-96*3		ATBA-32F*4*7, ATBA-8F*4*5*7, ATP-8*4*5*6, ATP-32F*4, DTP-64(PC)*4, EPD-68A*8, EPD-96A*4, EPD-96*4
Cables / Connectorss	PCA96PS-0.5P/1.5P, PCB96PS-0.5P/1.5P, PCA96P-1.5, PCB96P-1.5, CN5-H96F		PCA68PS-0.5P/1.5P, PCB68PS-0.5P/1.5P, ADC-68M/96F

\*1: When using a signal source with a high-speed built-in operational amplifier  
 \*3: Requires use of optional cable PCB96PS. (0.5m is recommended)  
 \*5: Maximum of 8 analog input channels available  
 \*7: Optional AC adapter POA200-20 is required.  
 \*2: +5V power must be supplied from PCI bus slot.  
 \*4: Optional cable ADC-68M/96F is required.  
 \*6: Able to use up to four digital inputs, four digital outputs and one counter I/O input  
 \*8: Optional cable PCB68PS is required.

As shown on the side of product's images, Pbfree is a CONTEC original marking for lead-free products.

- Box-PCs
- Panel-PCs
- Flat Panel Displays
- Silicon Disk Drives
- Option
- Box PCs & Panel PCs with Windows CE
- Single Board Computer
- Chassis / Backplane
- Analog I/O
- Digital I/O
- Counter & Motion Controller
- Serial Communication
- GPIB Communication
- Remote I/O
- Expansion Unit / Bus Adapter
- Software
- Accessories & Cables
- Distributed Monitor & Control Network: F&EIT
- Multi-Programmable Display
- Wireless LAN
- Remote Monitoring Solution
- Service & Products

- Lineup
- Measurement Products
- Multi-function F Series
- PCI Express
- PCI
- PC Card
- Low-cost Multi-function L series
- PCI Express
- PCI
- PC Card
- Intelligent E series
- PCI
- Standard
- PCI
- USB
- ISA





# Analog I/O

Please see page Q-01 for optional accessories and cables/connectors, and page P-01 for supported software.

Low-cost Multi-function L series

**PCI Express**

Low Profile 50-pin Mini-Ribbon Analog Input 8ch Analog Output 2ch Digital I/O 4 Counter 1ch L series High Precision Memory on Board  
Windows Driver Linux Driver C-LOGGER MATLAB



Low-cost 16-bit Multi-function A/D  
**AIO-160802L-LPE**

**NEW**

- On-board control mechanism provides analog input / output, timed input / output and input/output that is synchronized with external signals
- Buffer memory enables background processing to be executed independently of the software
- Software for analog input / output correction
- Low Profile PCI - compliant (includes bracket for use in standard PCI slot)

**PCI Express**

Low Profile 50-pin Mini-Ribbon Analog Input 16ch Analog Output - Digital I/O 4 Counter 1ch L series High Precision Memory on Board  
Windows Driver Linux Driver C-LOGGER MATLAB



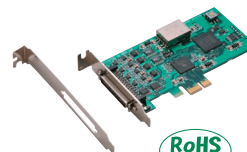
Low-cost 16-bit Multi-function A/D  
**AI-1616L-LPE**

**NEW**

- On-board control mechanism provides analog input / output, timed input / output and input/output that is synchronized with external signals
- Buffer memory enables background processing to be executed independently of the software
- Software for analog input correction
- Low Profile PCI - compliant (includes bracket for use in standard PCI slot)

**PCI Express**

Low Profile 50-pin Mini-Ribbon Analog Input - Analog Output 4ch Digital I/O 4 Counter 1ch L series High Precision Memory on Board  
Windows Driver Linux Driver C-LOGGER MATLAB



Low-cost 16-bit Multi-function A/D  
**AO-1604L-LPE**

- On-board control mechanism provides analog input / output, timed input / output and input/output that is synchronized with external signals
- Buffer memory enables background processing to be executed independently of the software
- Software for analog output correction
- Low Profile PCI - compliant (includes bracket for use in standard PCI slot)

Model	AIO-160802L-LPE	AI-1616L-LPE	AO-1604L-LPE
Analog Input	Channels	8 single-ended 16 single-ended	16 single-ended
	Range	Bipolar: ±10V	-
	Impedance	1MΩ or more	-
	Resolution	16bit	-
	Conversion Speed	10μsec/ch (Max.)	-
	Conversion Accuracy*1	±5LSB	-
	Buffer Memory	1k word	-
Analog Output	Channels	2ch	4ch
	Range	Bipolar: ±10V	Bipolar: ±10V
	Impedance	1Ω or less	1Ω or less
	Resolution	16bit	16bit
	Conversion Speed	10μsec (Max.)	10μsec (Max.)
	Conversion Accuracy*1	±5LSB	±5LSB
	Buffer Memory	1k-word	1k word
Digital I/O	Input	4 LVTTTL level (positive logic)	-
	Output	4 LVTTTL level (positive logic)	-
Counter	Channels	1ch	-
	Counting System	32-bit Up count	-
	Max. count	32-bit (binary data)	-
Interrupts	1		
I/O Address	Any 64-byte boundary		
Power Consumption (Max.)	3.3VDC 400mA, 12VDC 200mA	3.3VDC 400mA, 12VDC 120mA	3.3VDC 400mA, 12VDC 250mA
Bus / Dimensions (mm)	PCI Express Base Specification Rev.1.0a x1 / 121.69(L)x67.90(H)		
Connector	10250-52A2JL [3M] or equivalent		
Options	Software	-	
	Accessories	ATBA-8L*1+2*3*4, ATBA-16L*1+2*3, EPD-50A*1, ATP-8L*1+5	
	Cables / Connectors	PCB50PS-0.5P/1.5P, PCA50PS-0.5P/1.5P	

\*1: Requires use of optional cable PCB50PS-0.5P or PCB50PS-1.5P  
 \*2: Only for AIO-160802L-LPE, AI-1616L-LPE.  
 \*3: Optional AC adapter "POA200-20" is required.  
 \*4: Maximum of 8 analog input channels are available for AI-1616L-LPE.  
 \*5: Maximum of 8 analog input channels and 2 analog output channels available  
 Driver Library [API-PAC(W32)] included

Note:

Box-PCs

Panel-PCs

Flat Panel Displays

Silicon Disk Drives

Option

Box PCs & Panel PCs with Windows CE

Single Board Computer

Chassis / Backplane

Analog I/O

Digital I/O

Counter & Motion Controller

Serial Communication

GPB Communication

Remote I/O

Expansion Unit / Bus Adapter

Software

Accessories & Cables

Distributed Monitor & Control Network: F&EIT

Multi-Programmable Display

Wireless LAN

Remote Monitoring Solution

Service & Products

I-10

Lineup

Measurement Products

Multi-function F Series

PCI Express

PCI

PC Card

Low-cost Multi-function L series

PCI Express

PCI

PC Card

Intelligent E series

PCI

Standard

PCI

USB

ISA

As shown on the side of product's images, RoHS compliant is a CONTEC original marking for RoHS-compliant products.

# Analog I/O

Low-cost Multi-function L series

Please see page Q-01 for optional accessories and cables/connectors, and page P-01 for supported software.

- Box-PCs
- Panel-PCs
- Flat Panel Displays
- Silicon Disk Drives
- Option
- Box PCs & Panel PCs with Windows CE
- Single Board Computer
- Chassis / Backplane
- Analog I/O**
- Digital I/O
- Counter & Motion Controller
- Serial Communication
- GPIO Communication
- Remote I/O
- Expansion Unit / Bus Adapter
- Software
- Accessories & Cables
- Distributed Monitor & Control Network: F&EIT
- Multi-Programmable Display
- Wireless LAN
- Remote Monitoring Solution
- Service & Products

**PCI** Low Profile 50-pin Mini-Ribbon Analog Input 8ch Analog Output 2ch Digital I/O 4 Counter 1ch L series High Precision Memory on Board CE

Windows Driver Linux Diver C-LOGGER MATLAB LabVIEW

## Low-cost 16-bit Multi-function A/D ADA16-8/2(LPCI)L

- On-board control mechanism provides analog input / output, timed input / output and input/output that is synchronized with external signals
- 1k data buffer memory enables background processing
- Software for analog input / output correction
- Low Profile PCI - compliant (includes bracket for use in standard PCI slot)



Soon to be RoHS-compliant

**PCI** Low Profile 50-pin Mini-Ribbon Analog Input 16ch Analog Output - Digital I/O 4 Counter 1ch L series High Precision Memory on Board CE

Windows Driver Linux Diver C-LOGGER MATLAB LabVIEW

## Low-Cost 16-bit Analog to Digital Input AD16-16(LPCI)L

- On-board control mechanism provides analog input / output, timed input / output and input/output that is synchronized with external signals
- 1k data buffer memory enables background processing
- Software for analog input / output correction
- Low Profile PCI - compliant (includes bracket for use in standard PCI slot)



Soon to be RoHS-compliant

**PCI** Low Profile 68-pin 0.8mm Pitch Analog Input 64ch Analog Output - Digital I/O 4 Counter 1ch L series High Precision Memory on Board CE

Windows Driver Linux Diver C-LOGGER MATLAB LabVIEW

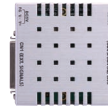
## Low-Cost 16-bit Analog to Digital Input AD16-64(LPCI)LA

- 64ch single-ended or 32ch differential inputs
- On-board control mechanism provides analog input / output, timed input / output and input/output that is synchronized with external signals
- Software for analog input / output correction
- Low Profile PCI - compliant (includes bracket for use in standard PCI slot)



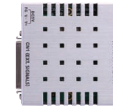
Soon to be RoHS-compliant

Buffer Amplifier Box for Analog Input Boards (16ch type) ATBA-16L



**Pb Free**  
Soon to be RoHS-compliant

Buffer Amplifier Box for Analog Input Boards (8ch type) ATBA-8L



**Pb Free**  
Soon to be RoHS-compliant

Accessories (Optional): AC adapter (Input: 90 - 264VAC, Output: 5VDC 2.0A): POA200-20

Model	ADA16-8/2(LPCI)L	AD16-16(LPCI)L	AD16-64(LPCI)LA	
Analog Input	Channels	8 single-ended	16 single-ended	64 single-ended or 32 differential
	Range	Bipolar: ±10V		
	Impedance	1MΩ or more		
	Resolution	16bit		
	Conversion Speed	10μsec/ch (Max.)		
	Conversion Accuracy <sup>*1</sup>	±5LSB		
	Buffer Memory	1k-word		
Analog Output	Channels	2ch	-	-
	Range	Bipolar: ±10V		
	Impedance	1Ω or less		
	Resolution	16bit		
	Conversion Speed	10μsec (Max.)		
	Conversion Accuracy <sup>*1</sup>	±3LSB		
	Buffer Memory	1k-word		
Digital I/O	Input	4 TTL level (positive logic)		
	Output	4 TTL level (positive logic)		
Counter	Channels	1ch		
	Counting System	32-bit Up count		
Interrupts	Max. count	32-bit (binary data)		
		1		
I/O Address	Any 64-byte boundary			
Power Consumption (Max.)	5VDC 380mA	5VDC 260mA	5VDC 450mA	
Bus / Dimensions (mm)	PCI (32bit, 33MHz, 5V or 3.3V <sup>**2</sup> ) / 121.69(L)×63.41(H)			
Connector	10250-52A2JL [3M] or equivalent			
Options	Software	HDRA-E68W1LFDT-SL [HONDA Tsushin Kogyo] or equivalent		
	Accessories	ATBA-8L <sup>*3</sup> , ATBA-16L <sup>*3</sup> , ATP-8L <sup>*3</sup> , EPD-50A <sup>*3</sup>	ATBA-8L <sup>*3</sup> , ATBA-16L <sup>*3*4</sup> , ATP-8L <sup>*3*4</sup> , EPD-50A <sup>*3</sup>	ATP-32F <sup>*5*6</sup> , ATP-8 <sup>*4*5*6</sup> , DTP-64(PC) <sup>*5*6</sup> , EPD-68A <sup>*6*7</sup> , EPD-96A <sup>*5*6</sup> , EPD-96 <sup>*5*6</sup>
	Cables / Connectors	PCB50PS-0.5P/1.5P, PCA50PS-0.5P/1.5P		PCA68PS-0.5P/1.5P, ADC-68M96F, PCB68PS-0.5P, 1.5P

Note: <sup>\*1</sup>: When using a signal source with a high-speed built-in operational amplifier  
<sup>\*2</sup>: +5V power must be supplied from PCI bus slot.  
<sup>\*3</sup>: Requires use of optional cable PCB50PS-0.5P/1.5P  
<sup>\*4</sup>: Maximum of 8 analog input channels available  
<sup>\*5</sup>: Optional cable ADC-68M96F is required.  
<sup>\*6</sup>: AD16-64(LPCI)LA requires two cables and accessories each for two connectors.  
<sup>\*7</sup>: Requires use of optional cable PCB68PS

As shown on the side of product's images, Pbfree is a CONTEC original marking for lead-free products.

- I-11**
- Lineup
- Measurement Products
- Multi-function F Series
- PCI Express
- PCI
- PC Card
- Low-cost Multi-function L series
- PCI Express
- PCI**
- PC Card
- Intelligent E series
- PCI
- Standard
- PCI
- USB
- ISA

**PCI** Low Profile 50-pin Mini-Ribbon Analog Input - Analog Output 4ch Digital I/O 4 Counter 1ch L series High Precision Memory on Board CE

Windows Driver Linux Driver MATLAB LabVIEW



Soon to be RoHS-compliant

## Low-Cost 16-Bit Digital to Analog Output DA16-4(LPCI)L

- Low Profile PCI - compliant (includes bracket for use in standard PCI slot)
- On-board control mechanism provides analog output, timed output and output that is synchronized with external signals
- 1k data buffer memory enables background processing.
- Software for analog input / output correction

Box-PCs

Panel-PCs

Flat Panel Displays

Silicon Disk Drives

Option

Box PCs & Panel PCs with Windows CE

Single Board Computer

Chassis / Backplane

Analog I/O

Digital I/O

Counter & Motion Controller

Serial Communication

GPIO Communication

Remote I/O

Expansion Unit / Bus Adapter

Software

Accessories & Cables

Distributed Monitor & Control Network: F&IT

Multi-Programmable Display

Wireless LAN

Remote Monitoring Solution

Service & Products

Lineup

Measurement Products

Multi-function F Series

PCI Express

PCI

PC Card

Low-cost Multi-function L series

PCI Express

PCI

PC Card

Intelligent E series

PCI

Standard

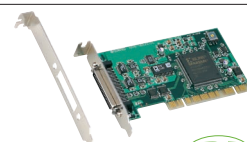
PCI

USB

ISA

**PCI** Low Profile 50-pin Mini-Ribbon Analog Input - Analog Output 8ch Digital I/O 4 Counter 1ch L series High Precision Memory on Board

Windows Driver Linux Driver MATLAB LabVIEW



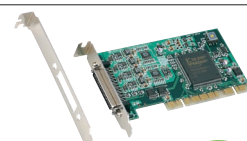
Soon to be RoHS-compliant

## Low-Cost 16-Bit Digital to Analog Output DA16-8(LPCI)L

- On-board control mechanism provides analog output, timed output and output that is synchronized with external signals
- Filter function can simplify the connection of external signal
- Software for analog input / output correction
- Low Profile PCI - compliant (includes bracket for use in standard PCI slot)
- Plug-ins for the dedicated libraries, the board also supports MATLAB and LabVIEW

**PCI** Low Profile 50-pin Mini-Ribbon Analog Input - Analog Output 16ch Digital I/O 4 Counter 1ch L series High Precision Memory on Board

Windows Driver Linux Driver MATLAB LabVIEW



Soon to be RoHS-compliant

## Low-Cost 16-Bit Digital to Analog Output DA16-16(LPCI)L

- On-board control mechanism provides analog output, timed output and output that is synchronized with external signals
- Filter function can simplify the connection of external signal
- Software for analog input / output correction
- Low Profile PCI - compliant (includes bracket for use in standard PCI slot)
- Plug-ins for the dedicated libraries, the board also supports MATLAB and LabVIEW

Model	DA16-4(LPCI)L	DA16-8(LPCI)L	DA16-16(LPCI)L
Analog Input	Channels	-	-
	Range	-	-
	Impedance	-	-
	Resolution	-	-
	Conversion Speed	-	-
	Conversion Accuracy*1	-	-
	Buffer Memory	-	-
Analog Output	Channels	4ch	8
	Range	Bipolar: ±10V	
	Impedance	1Ω or less	
	Resolution	16bit	
	Conversion Speed	10μsec (Max.)	
	Conversion Accuracy*1	±3LSB	±5LSB
	Buffer Memory	1k-word	
Digital I/O	Input	4 TTL level (positive logic)	
	Output	4 TTL level (positive logic)	
Counter	Channels	1ch	
	Counting System	32-bit Up count	
	Max. count	32-bit (binary data)	
Interrupts	1 interrupt		
I/O Address	Any 64-byte boundary		
Power Consumption (Max.)	5VDC 440mA	5VDC 850mA	5VDC 1100mA
Bus / Dimensions (mm)	PCI (32bit, 33MHz, 5V or 3.3V <sup>*2</sup> ) / 176.41(L)x105.68(H)		
Connector	10250-52A2JL [3M] or equivalent		
Options	Software	-	
	Accessories	ATP-8L <sup>*3*4</sup> , EPD-50A <sup>*3</sup>	EPD-50A <sup>*3</sup>
	Cables / Connectors	PCB50PS-0.5P/1.5P, PCA50PS-0.5P/1.5P	

Note:

- \*1: When using a signal source with a high-speed built-in operational amplifier
- \*2: +5V power must be supplied from PCI bus slot.
- \*3: Requires use of optional cable PCB50PS-0.5P/1.5P
- \*4: Maximum of 2 analog output channels available

As shown on the side of product's images, Pbfree is a CONTEC original marking for lead-free products.



# Analog I/O Low-cost Multi-function L series

**Card Bus**

68-pin  
0.8mm Pitch

Analog Input  
8ch

Analog Output  
2ch

Digital I/O  
4

Counter  
1ch

L series

High Precision

Memory on Board

Windows Driver

Linux Driver

C-LOGGER

MATLAB

LabVIEW

## Low-cost 16-bit Multi-function A/D ADA16-8/2(CB)L

- On-board control mechanism provides analog input / output, timed input / output and input/output that is synchronized with external signals
- 1k data buffer memory enables background processing.
- Software for analog input / output correction

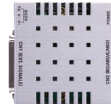


Soon to be RoHS-compliant

\*This card cannot be used with another card requiring external connections when used on a PC with 2 TYPEII PC card slots. For simultaneous use, the other card must be a PC card (excluding memory card) that does not require an external connector.

Box-PCs
Panel-PCs
Flat Panel Displays
Silicon Disk Drives
Option
Box PCs & Panel PCs with Windows CE
Single Board Computer
Chassis / Backplane
<b>Analog I/O</b>
Digital I/O
Counter & Motion Controller
Serial Communication
GPIB Communication
Remote I/O
Expansion Unit / Bus Adapter
Software
Accessories & Cables
Distributed Monitor & Control Network: F&IT
Multi-Programmable Display
Wireless LAN
Remote Monitoring Solution
Service & Products
<b>I-13</b>
Lineup
Measurement Products
Multi-function F Series
PCI Express
PCI
PC Card
Low-cost Multi-function L series
PCI Express
PCI
<b>PC Card</b>
Intelligent E series
PCI
Standard
PCI
USB
ISA

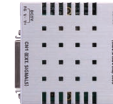
Buffer Amplifier Box for Analog Input Boards (16ch type)  
ATBA-16L



Soon to be RoHS-compliant



Buffer Amplifier Box for Analog Input Boards (8ch type)  
ATBA-8L



Soon to be RoHS-compliant



Accessories (Optional):

AC adapter  
(Input: 90 - 264VAC, Output: 5VDC 2.0A):  
POA200-20

Model	ADA16-8/2(CB)L	
Analog Input	Channels	8 single-ended
	Range	Bipolar: $\pm 10V$
	Impedance	1M $\Omega$ or more
	Resolution	16bit
	Conversion Speed	10 $\mu$ sec/ch (Max.)
	Conversion Accuracy*1	$\pm 5LSB$
	Buffer Memory	1k-word
Analog Output	Channels	2ch
	Range	Bipolar: $\pm 10V$
	Impedance	1 $\Omega$ or less
	Resolution	16bit
	Conversion Speed	10 $\mu$ sec (Max.)
	Conversion Accuracy*1	$\pm 3LSB$
	Buffer Memory	1k-word
Digital I/O	Input	4 LVTTTL level (positive logic)
	Output	4 LVTTTL level (positive logic)
Counter	Channels	1ch
	Counting System	32-bit Up count
	Max. count	32-bit (binary data)
Interrupts		1 interrupt
I/O Address		Any 64-byte boundary
Power Consumption (Max.)		3.3VDC 500mA
Bus / Dimensions (mm)		PC Card Standard correspondent CardBus / TYPE II
Connector		68-pin 0.8mm Pitch
Options	Software	-
	Accessories	ATBA-8L*2, ATBA-16L*2, ATP-8L*2, EPD-50A*2, EPD-68A*3
	Cables / Connectors	PCA50PS-0.5P/1.5P, ADC-68M/50M, PCB68PS-0.5P, 1.5P

\*1: When using a signal source with a high-speed built-in operational amplifier  
\*2: Optional cable ADC-68M/50M is required.  
\*3: Requires use of optional cable PCB68PS

Note:

As shown on the side of product's images, Pbfree is a CONTEC original marking for lead-free products.

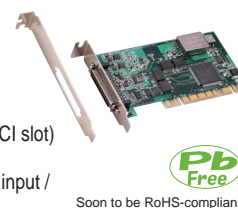
- Box-PCs
- Panel-PCs
- Flat Panel Displays
- Silicon Disk Drives
- Option
- Box PCs & Panel PCs with Windows CE
- Single Board Computer
- Chassis / Backplane
- Analog I/O**
- Digital I/O
- Counter & Motion Controller
- Serial Communication
- GPB Communication
- Remote I/O
- Expansion Unit / Bus Adapter
- Software
- Accessories & Cables
- Distributed Monitor & Control Network: F&EIT
- Multi-Programmable Display
- Wireless LAN
- Remote Monitoring Solution
- Service & Products

**PCI** Low Profile 50-pin Mini-Ribbon Analog Input 8ch Analog Output 2ch Digital I/O 4 Counter 1ch L series High Precision Memory on Board

Windows Driver Linux Driver C-LOGGER MATLAB LabVIEW

### Isolated Low-Cost 16-Bit Multi-function Analog I/O ADA16-8/2(LPCI)L

- Low Profile PCI - compliant (includes bracket for use in standard PCI slot)
- Isolation between PC signal and external analog / digital signals
- On-board control mechanism provides analog input / output, timed input / output and input/output that is synchronized with external signals
- 1k data buffer memory enables background processing.
- Software for analog input / output correction

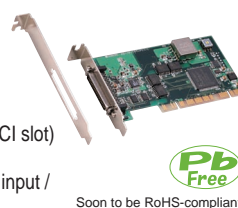


**PCI** Low Profile 50-pin Mini-Ribbon Analog Input 16ch Analog Output - Digital I/O 4 Counter 1ch L series High Precision Memory on Board

Windows Driver Linux Driver C-LOGGER MATLAB LabVIEW

### Isolated Low-Cost 16-Bit Analog Input ADI16-16(LPCI)L

- Low Profile PCI - compliant (includes bracket for use in standard PCI slot)
- Isolation between PC signal and external analog / digital signals
- On-board control mechanism provides analog input / output, timed input / output and input/output that is synchronized with external signals
- 1k data buffer memory enables background processing.
- Software for analog input / output correction

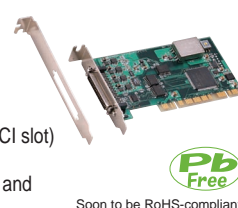


**PCI** Low Profile 50-pin Mini-Ribbon Analog Input - Analog Output 4ch Digital I/O 4 Counter 1ch L series High Precision Memory on Board

Windows Driver Linux Driver MATLAB LabVIEW

### Isolated Low-Cost 16-Bit Analog Output DAI16-4(LPCI)L

- Low Profile PCI - compliant (includes bracket for use in standard PCI slot)
- Isolation between PC signal and external analog / digital signals
- On-board control mechanism provides analog output, timed output and output that is synchronized with external signals
- 1k data buffer memory enables background processing.
- Software for analog input / output correction

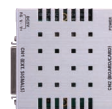


Buffer Amplifier Box for Analog Input Boards (16ch type) ATBA-16L



Soon to be RoHS-compliant

Buffer Amplifier Box for Analog Input Boards (8ch type) ATBA-8L



Soon to be RoHS-compliant

Accessories (Optional): AC adapter (Input: 90 - 264VAC, Output: 5VDC 2.0A): POA200-20

Model	ADA16-8/2(LPCI)L	ADI16-16(LPCI)L	DAI16-4(LPCI)L
Analog Input	Isolation type	Bus isolation	
	Channels	8 single-ended	16 single-ended
	Range	Bipolar: ±10V	
	Impedance	1MΩ or more	
	Resolution	16bit	
	Conversion Speed	10μsec/ch (Max.)	
	Conversion Accuracy*1	±16LSB	
Buffer Memory	1k-word		
Analog Output	Channels	2ch	4ch
	Range	Bipolar: ±10V	
	Impedance	1Ω or less	
	Resolution	16bit	16bit
	Conversion Speed	10μsec (Max.)	10μsec (Max.)
	Conversion Accuracy*1	±5LSB	±5LSB
Buffer Memory	1k word		
Digital I/O	Input	4 TTL level (positive logic)	
	Output	4 TTL level (positive logic)	
Counter	Channels	1ch	
	Counting System	32-bit Up count	
	Max. count	32-bit (binary data)	
Interrupts	1		
I/O Address	Any 64-byte boundary		
Power Consumption (Max.)	5VDC 680mA	5VDC 400mA	5VDC 800mA
Bus / Dimensions (mm)	PCI (32bit, 33MHz, 5V or 3.3V*2) / 121.69(L)×63.41(H)		
Connector	10250-52A2JL [3M] or equivalent		
Options	Software	-	
	Accessories	ATBA-8L*3, ATBA-16L*3, ATP-8L*3, EPD-50A*3	
	Cables / Connectors	PCB50PS-0.5P/1.5P, PCA50PS-0.5P/1.5P	

\*1: When using a signal source with a high-speed built-in operational amplifier \*2: +5V power must be supplied from PCI bus slot.  
 \*3: Requires use of optional cable PCB50PS-0.5P/1.5P \*4: Maximum of 8 analog input channels available  
 \*5: Maximum of 2 analog output channels available

As shown on the side of product's images, Pbfree is a CONTEC original marking for lead-free products.

# Analog I/O Intelligent E series

Box-PCs
Panel-PCs
Flat Panel Displays
Silicon Disk Drives
Option
Box PCs & Panel PCs with Windows CE
Single Board Computer
Chassis / Backplane
<b>Analog I/O</b>
Digital I/O
Counter & Motion Controller
Serial Communication
GPB Communication
Remote I/O
Expansion Unit / Bus Adapter
Software
Accessories & Cables
Distributed Monitor & Control Network: F&EIT
Multi-Programmable Display
Wireless LAN
Remote Monitoring Solution
Service & Products
<b>I-15</b>
Lineup
Measurement Products
Multi-function F Series
PCI Express
PCI
PC Card
Low-cost Multi-function L series
PCI Express
PCI
PC Card
<b>Intelligent E series</b>
PCI
Standard
PCI
USB
ISA

## Features of E series

### 1. Bulk buffer memory

Data bulk buffer memory (FIFO or ring buffer) capable of storing up to 262,144 bits of data, enabling high speed sampling to be executed independently of the processing power of the PC. Either FIFO or ring format can be selected as memory type.

### 2. Diverse sampling control

Sampling start / stop can be controlled via software, by using the signal change of specified channels or by utilizing external digital signals as a trigger. Consecutive samplings can be synchronized with the onboard timer or with external pulse signals.

### 3. Interrupt events

Interrupt events can be generated by factors such as sampling termination, changes in external signal or sampling errors allowing board status to be monitored with no additional load on the host computer,

### 4. Analog output

Independent 1-channel analog output (digital to analog conversion)

### 5. Digital input / output

4 points of TTL level digital input and 4 points of digital output

### Dedicated function upgrades

A variety of functions can be added by using available add-on function boards

#### ● Channel expansion

Allows an analogue E Series 16 channel single-ended / 8 channel differential board to provide 32 single-ended channels / 16 differential channels

#### ● Insulation Amplifier

Provides both bus and channel-to-channel insulation

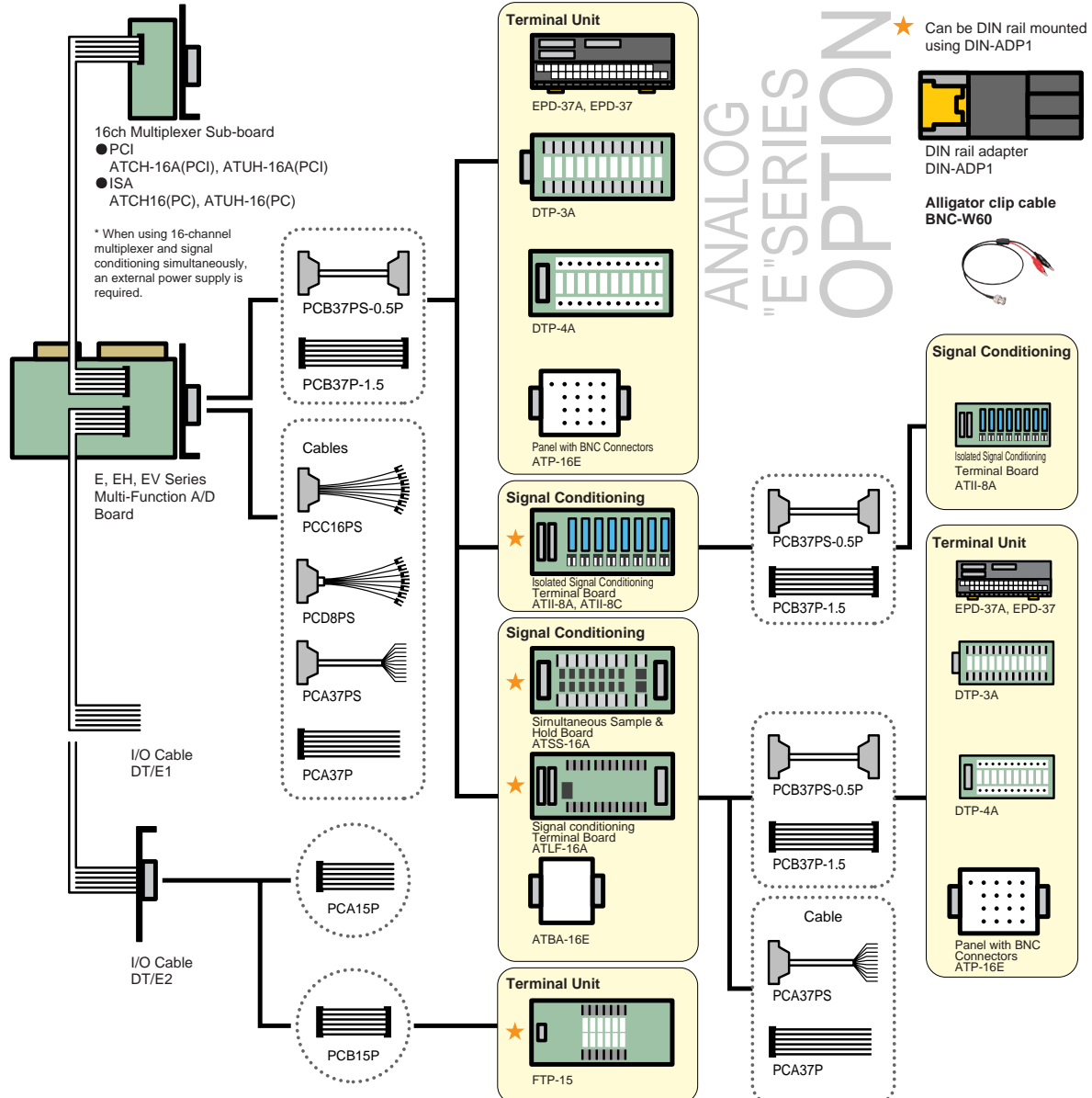
#### ● Concurrent sampling

Allows 16 channels to be sampled in the same timing

#### ● Low Pass Filter

Can lower commercial power frequency and provide wide area filtering (antialiasing)

## Accessories & Cables for E series



PCI

37-pin D-SUB

Analog Input 16ch

Analog Output 1ch

Digital I/O 4

Counter —

E series

High Speed

Memory on Board

CE

16ch Multiplexer Sub-Board  
**ATUH-16A(PCI)**  
16 single-ended or 8 differential inputs can be added

Soon to be RoHS-compliant

High Speed Multi-function A/D  
**AD12-16U(PCI)EV**

- High-speed, high precision converter performs A/D conversion at 1 microsecond per channel (Max.) with a 12-bit resolution
- 16MB data buffer memory (FIFO or ring buffer) enables sampling to be executed independently of the processing power of the PC

PCI

37-pin D-SUB

Analog Input 16ch

Analog Output 1ch

Digital I/O 4

Counter —

E series

High Precision

High Speed

Memory on Board

CE

16ch Multiplexer Sub-Board  
**ATUH-16A(PCI)**  
16 single-ended or 8 differential inputs can be added

Soon to be RoHS-compliant

High Speed 16-bit Multi-function A/D Input  
**AD16-16U(PCI)EV**

- High-speed, high precision converter performs A/D conversion at 1 microsecond per channel (Max.) with a 16-bit resolution
- 16MB data buffer memory (FIFO or ring buffer) enables sampling to be executed independently of the processing power of the PC

PCI

37-pin D-SUB

Analog Input 16ch

Analog Output 1ch

Digital I/O 4

Counter —

E series

Memory on Board

CE

16ch Multiplexer Sub-Board  
**ATCH-16A(PCI)**  
16 single-ended or 8 differential inputs can be added

Soon to be RoHS-compliant

Multi-function A/D Input  
**AD12-16(PCI)EV**

- A/D conversion at 10 microsecond per channel (Max.) with a 12-bit resolution
- 16MB data buffer memory (FIFO or ring buffer) enables sampling to be executed independently of the processing power of the PC

PCI

37-pin D-SUB

Analog Input 16ch

Analog Output 1ch

Digital I/O 4

Counter —

E series

High Speed

Memory on Board

CE

16ch Multiplexer Sub-Board  
**ATCH-16A(PCI)**  
16 single-ended or 8 differential inputs can be added

Soon to be RoHS-compliant

16-bit Multi-function A/D Input  
**AD16-16(PCI)EV**

- High precision converter performs A/D conversion at 10 microsecond per channel (Max.) with a 16-bit resolution
- 16MB data buffer memory (FIFO or ring buffer) enables sampling to be executed independently of the processing power of the PC

Model	AD12-16U(PCI)EV	AD16-16U(PCI)EV	AD12-16(PCI)EV	AD16-16(PCI)EV
Input channels	16 single-ended, 8 differential			
Output channels	1ch			
Resolution	12bit	16bit	12bit	16bit
Analog Input	Range	±10V, ±5V, ±2.5V, 0~+5V, 0~+10V (jumper selectable)	±10V, ±5V, 0~+10V, 0~+5V (jumper selectable)	±10V, 0~+10V
	Gain	-	-	x1, x2, x4, x8
	Conversion Speed	1µsec/ch (Max.)		10µsec/ch (Max.)
	Conversion Accuracy*3	±3LSB*1	±5LSB*1+4	±2LSB (Gain: x1, x2), ±4LSB (Gain: ±4, ±8)*1+2
Analog Output	Impedance	1MΩ or more		
	Range	±10V, ±5V, 0~+10V (jumper selectable)	±10V, 0~+10V (jumper selectable)	±10V, ±5V, 0~+10V
	Rating	±5mA		
Trigger	Conversion Speed	6µsec (Max.)	10µsec (Max.)	6µsec (Max.)
	Conversion Accuracy	±1/2LSB*1	±3LSB*1	±1/2LSB*1
	Impedance	1Ω or less		
Timer	Start Trigger: 3 modes, Stop Trigger: 4 modes			
Isolation type	-			
Interrupts	1			
I/O Address	Any 32-byte boundary			
Power Consumption (Max.)*4	5VDC 1000mA			
Bus / Dimensions (mm)	PCI (32bit, 33MHz, 5V or 3.3V*5) / 176.41(L)x105.68(H)			
Connector	CN1(AIO): 37-pin female D-type, CN2(DIO): 16-pin male Header			
Options	Software: -			
Accessories	ATBA-16E*6, ATP-16*6, ATP-16E*6, ATII-8A*6, ATII-8C*6, ATLF-8A*6, ATSS-16*6, DTP-3A*6, DTP-4A*6, EPD-37A*6, EPD-37*6, FTP-1*7, ATCH-16A(PCI), ATUH-16A(PCI)			
Cables / Connectors	PCA37P-1.5, PCA37PS-0.5P/1.5P, PCB37PS-0.5P/1.5P, PCA15P-1.5, PCB15P-1.5*8, PCC16PS, PCD8PS, DT/E1, DT/E2, CN5-D37M			

Note: \*1: When operating temperature is close to 0°C or 50°C (operating extremes) the non-linearity error may increase. A ±0.1% LSB non-linearity error (max.) is possible.  
 \*2: When using a signal source with a high-speed built-in operational amplifier  
 \*3: An error of about 0.02% of the maximum range value may occur with an un-isolated bipolar setting of ±5V or an un-isolated unipolar setting of 0~+5V.  
 \*4: If an external device requires the board to supply +5VDC from the CN1 or CN2 connectors, the power consumption of the board will be larger.  
 \*5: +5V power must be supplied from PCI bus slot (Can not work with 3.3V only)  
 \*6: Requires use of optional cable PCB37P or PCB37PS  
 \*7: Requires use of optional cables DT/E2 and PCB15P  
 \*8: PCB15P is a cable for FTP-15 terminal panel.

As shown on the side of product's images, Pbfree is a CONTEC original marking for lead-free products.

- Box-PCs
- Panel-PCs
- Flat Panel Displays
- Silicon Disk Drives
- Option
- Box PCs & Panel PCs with Windows CE
- Single Board Computer
- Chassis / Backplane
- Analog I/O
- Digital I/O
- Counter & Motion Controller
- Serial Communication
- GPB Communication
- Remote I/O
- Expansion Unit / Bus Adapter
- Software
- Accessories & Cables
- Distributed Monitor & Control Network: F&EIT
- Multi-Programmable Display
- Wireless LAN
- Remote Monitoring Solution
- Service & Products

- Lineup
- Measurement Products
- Multi-function F Series
- PCI Express
- PCI
- PC Card
- Low-cost Multi-function L series
- PCI Express
- PCI
- PC Card
- Intelligent E series
- PCI
- Standard
- PCI
- USB
- ISA



# Analog I/O Standard

- Box-PCs
- Panel-PCs
- Flat Panel Displays
- Silicon Disk Drives
- Option
- Box PCs & Panel PCs with Windows CE
- Single Board Computer
- Chassis / Backplane
- Analog I/O
- Digital I/O
- Counter & Motion Controller
- Serial Communication
- GPIB Communication
- Remote I/O
- Expansion Unit / Bus Adapter
- Software
- Accessories & Cables
- Distributed Monitor & Control Network: F&EIT
- Multi-Programmable Display
- Wireless LAN
- Remote Monitoring Solution
- Service & Products

PCI

96-pin Half Pitch

Analog Input  
**16ch**

Analog Output  
—

Digital I/O  
**4**

Counter  
—

CE

Windows Driver

Linux Driver

LabVIEW



## Analog to Digital AD12-16(PCI)

- Sampling Control function enables data input via onboard program timer or an external clock
- Independent programmable timer and TTL-level external trigger

PCI

96-pin Half Pitch

Analog Input  
**64ch**

Analog Output  
—

Digital I/O  
**4**

Counter  
—

CE

Windows Driver

Linux Driver

LabVIEW



## Analog to Digital AD12-64(PCI)

- Sampling Control function enables data input via onboard program timer or an external clock
- Independent programmable timer and TTL-level external trigger

- I-17
- Lineup
  - Measurement Products
  - Multi-function F Series
  - PCI Express
  - PCI
  - PC Card
  - Low-cost Multi-function L series
  - PCI Express
  - PCI
  - PC Card
  - Intelligent E series
  - PCI
  - Standard
  - PCI
  - USB
  - ISA

Model	AD12-16(PCI)	AD12-64(PCI)	
Input channels	16 single-ended, 8 differential	64 single-ended, 32 differential	
Resolution	12bit		
Analog Input	Range	±10V, ±5V, ±2.5V, ±1.25V, 0~+10V, 0~+5V, 0~+2.5V, 0~+1.25V (each channel is settable by software)	
	Gain	-	
	Conversion Speed <sup>*1</sup>	10µsec/ch (Max.)	
	Conversion	±10V, ±5V, 0~+10V, 0~+5V: ±2LSB	
Accuracy <sup>*2</sup>	±2.5V, ±1.25V, 0~+2.5V: ±4LSB, 0~+1.25V: ±8LSB		
	Impedance	1MΩ or more	
Trigger	1 TTL level input		
Isolation type	-		
Timer	0.5µsec~17min (selectable in 250nsec intervals)		
Digital I/O	General I/O: Input 4, Output 4 (TTL positive logic)		
Interrupts	Request Events: 8 modes		
	Request Levels: One interrupt request signal as INTA		
I/O Address	Any 32-byte boundary		
Power Consumption (Max.)	5VDC 700mA		
Bus / Dimensions (mm)	PCI (32bit, 33MHz, 5V) / 176.41(L) × 106.68(H)		
Connector	PCR-E96LMD [HONDA Tsushin Kogyo] or equivalent		
Options	Software	-	
	Accessories	EPD-96A*3, EPD-96*3	
	Cables / Connectors	PCA96P-1.5, PCB96P-1.5, PCA96PS-0.5P/1.5P, PCB96PS-0.5P/1.5P, CN5-H96F	

<sup>\*1</sup>: Actual conversion speed depends upon operating system and drivers.  
<sup>\*2</sup>: When using a signal source with a high-speed built-in operational amplifier  
<sup>\*3</sup>: Requires use of optional cable PCB96P or PCB96PS

Note:

As shown on the side of product's images, Pbfree is a CONTEC original marking for lead-free products.

**PCI** 37-pin D-SUB Analog Input 16ch Analog Output — Digital I/O 4 Counter — Bus Isolated Memory on Board CE

Windows Driver Linux Driver LabVIEW

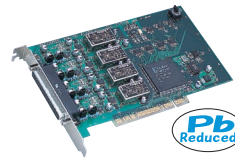


**12-bit Isolated Analog to Digital ADI12-16(PCI)**

- Isolation between PC signal and external analog / digital signals
- 256KB data buffer memory (FIFO or ring buffer)
- Variety of triggers available for starting/stopping data input.
- 16 single-ended or 8 differential inputs (Current input = 8 max)

**PCI** 37-pin D-SUB Analog Input 4ch Analog Output — Digital I/O — Counter — Individual Isolated High Precision Small Signal

Windows Driver Linux Driver LabVIEW

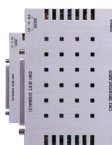


**16-bit Isolated Analog to Digital (Sensor Input) ADI16-4L(PCI)**

- Independent isolated channels allow different ground levels for individual input
- Measures low level voltage with discontinuity detection circuit for thermocouple input
- Onboard temperature sensor can be used for cold-junction reference during thermocouple measurement

This product reduces signal-crosstalk in case of inputted analog signals are low response speed.

Buffer Amplifier Box for Analog Input Boards (16ch type)\* ATBA-16E



\* Accessories (Optional): AC adapter (Input: 90 - 264VAC, Output: 5VDC 2.0A): POA200-20



Soon to be RoHS-compliant

Model	ADI12-16(PCI)	ADI16-4L(PCI)
Input channels	16 single-ended, 8 differential	4 differential
Resolution	12bit	16bit
Range	±10V, 0~+10V, 4~20mA *1	±1.25V, ±0.125V, 0~+2.5V, 0~+0.25V
Gain	x1, x2, x4, x8 (software selectable)	-
Conversion Speed	20µsec/ch (Max.)	10msec/ch (Max.) *3
Analog Input	±2LSB (input gain: x1, x2) at voltage input *2 ±4LSB (input gain: x4, x8) at voltage input *2 ±3LSB (input gain: x1) at current input *2	±15LSB
Impedance	Voltage input: 1MΩ or more, Current input: 250Ω	1MΩ or more
Digital trigger	1 opto-isolated input (share one of digital input)	-
Conversion start trigger	Software command, Analog level, External digital input	-
Conversion stop trigger	Storage complete/Software/Converted data comparison/Insulated external input digital signal	-
Trigger	-	1 opto-isolated input (for sink current output)
Isolation type	Bus isolation	Individual isolation
Timer	-	0.5µsec-17min (selectable in 250nsec intervals)
Digital I/O	4 opto-isolated input (for sink current output), 4 Opto-Isolated Open Collector Output (Current sinking type)	-
Interrupts	Request Events: 13 modes Request Levels: One interrupt (Enable or Disable is selectable)	Request Events: 8 modes Request Levels: One interrupt request signal as INTA
I/O Address	Any 16-byte boundary	Any 32-byte boundary
Power Consumption (Max.)	5VDC 1200mA	5VDC 1200mA
Bus / Dimensions (mm)	PCI (32bit, 33MHz, 5V) / 176.41(L) x 106.68(H)	
Connector	CN1(AIO): 37-pin female D-type CN2(DIO): 16-pin male Header	37-pin female D-type
Options	Software: ACX-PAC(W32) Ver.4.11 Accessories: ATBA-16E*5, ATLF-8*4*5, ATII-8A*4*5, ATP-16*5, DTP-3A*5, DTP-4A*5, EPD-37A*5, EPD-37*5, FTP-15*6 Cables / Connectors: PCA37P-1.5, PCB37P-1.5, PCA37PS-0.5P/1.5P, PCB37PS-0.5P/1.5P, PCA15P, PCB15P*7, DT/E1, DT/E2, PCC16PS, PCD8PS, CN5-D37M, PCA37P-1.5, PCB37P-1.5, PCA37PS-0.5P/1.5P, PCB37PS-0.5P/1.5P, CN5-D37M	DTP-3A*5, DTP-4A*5, EPD-37A*5, EPD-37*5

Note:

\*1: At 4~20mA current loop mode, x1 input gain can be used. \*2: When using a signal source with a high-speed built-in operational amplifier  
\*3: Actual conversion speed depends upon operating system and drivers. \*4: External power supply is required. \*5: Requires use of optional cable PCB37P or PCB37PS  
\*6: Requires use of optional cable DT/E2 and PCB15P \*7: PCB15P is a cable for FTP-15 terminal panel.

As shown on the side of product's images, PbFree (Pb Free) is a CONTEC original marking for lead-free products.

As shown on the side of product's images, PbReduced (Pb Reduced) is a CONTEC original marking for reduced lead products.

Box-PCs
Panel-PCs
Flat Panel Displays
Silicon Disk Drives
Option
Box PCs & Panel PCs with Windows CE
Single Board Computer
Chassis / Backplane
Analog I/O
Digital I/O
Counter & Motion Controller
Serial Communication
GPIB Communication
Remote I/O
Expansion Unit / Bus Adapter
Software
Accessories & Cables
Distributed Monitor & Control Network: F&EIT
Multi-Programmable Display
Wireless LAN
Remote Monitoring Solution
Service & Products

Lineup
Measurement Products
Multi-function F Series
PCI Express
PCI
PC Card
Low-cost Multi-function L series
PCI Express
PCI
PC Card
Intelligent E series
PCI
Standard
PCI
USB
ISA

# Analog I/O Standard

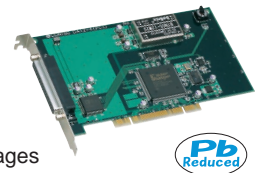
Box-PCs
Panel-PCs
Flat Panel Displays
Silicon Disk Drives
Option
Box PCs & Panel PCs with Windows CE
Single Board Computer
Chassis / Backplane
<b>Analog I/O</b>
Digital I/O
Counter & Motion Controller
Serial Communication
GPIO Communication
Remote I/O
Expansion Unit / Bus Adapter
Software
Accessories & Cables
Distributed Monitor & Control Network: F&EIT
Multi-Programmable Display
Wireless LAN
Remote Monitoring Solution
Service & Products

**PCI** 37-pin D-SUB Analog Input Analog Output Digital I/O Counter CE

Windows Driver Linux Driver LabVIEW

## Digital to Analog Output DA12-4(PCI)

- 4 channels for converting digital signals to analog voltages
- Updates output voltage through use of sampling clock
- Independent, TTL-level external trigger input function



**PCI** 37-pin D-SUB Analog Input Analog Output Digital I/O Counter CE

Windows Driver Linux Driver LabVIEW

## Digital to Analog Output DA12-8(PCI)

- 8 channels for converting digital signals to analog voltages
- Updates output voltage through use of sampling clock
- Independent, TTL-level external trigger input function



**PCI** 37-pin D-SUB Analog Input Analog Output Digital I/O Counter CE

Windows Driver Linux Driver LabVIEW

## Digital to Analog Output DA12-16(PCI)

- 16 channels for converting digital signals to analog voltages
- Updates output voltage through use of sampling clock
- Independent, TTL-level external trigger input function

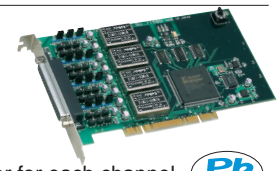


**PCI** 37-pin D-SUB Analog Input Analog Output Digital I/O Counter CE

Windows Driver Linux Driver LabVIEW

## 16-bit Isolated Digital to Analog Output DAI16-4C(PCI)

- Independent high-precision digital to analog converter for each channel
- Small FIFO available
- Input range for each channel can be set independently



<b>I-19</b>
Lineup
Measurement Products
Multi-function F Series
PCI Express
PCI
PC Card
Low-cost Multi-function L series
PCI Express
PCI
PC Card
Intelligent E series
PCI
Standard
<b>PCI</b>
USB
ISA

Model	DA12-4(PCI)	DA12-8(PCI)	DA12-16(PCI)	DAI16-4C(PCI)
Output channels	4	8	16	4
Resolution	12bit			16bit
Analog Output	Range	±10V, ±5V, 0~+10V (each channel software selectable)		±10V, 0~+10V, 0~20mA
	Rating	±5mA		Voltage output: ±5mA, Current output: Max. 500Ω
	Conversion Speed	10µsec/ch (Max.)		20µsec/ch (Max.)
	Conversion Accuracy*1	±3LSB		±5LSB (±15LSB only when current is 0~20mA)
	Impedance	10Ω or less		Voltage output: 10Ω or less
Trigger	1 TTL level input			1 opto-isolated input (for sink current output)
Isolation type	-			Individual isolation
Timer	0.5µsec~17min (selectable in 250nsec intervals)			
Digital I/O	-			
Interrupts	Request Events: 8 modes, Request Levels: 1			Request Events: 9 modes, Request Levels: 1
I/O Address	Any 32-byte boundary			
Power Consumption (Max.)	5VDC 600mA	5VDC 800mA	5VDC 1400mA	5VDC 2200mA
Bus / Dimensions (mm)	PCI (32bit, 33MHz, 5V) / 176.41(L) x 106.68(H)			
Connector	37-pin female D-type			
Software	-			
Options	Accessories	DTP-3A*2, DTP-4A*2, EPD-37A*2, EPD-37*2, ATP-16*2		DTP-3A*2, DTP-4A*2, EPD-37A*2, EPD-37*2
	Cables / Connectors	PCA37P-1.5, PCB37P-1.5, PCA37PS-0.5P/1.5P, PCB37PS-0.5P/1.5P, PCC16PS, CN5-D37M		PCA37P-1.5, PCB37P-1.5, PCA37PS-0.5P/1.5P, PCB37PS-0.5P/1.5P, CN5-D37M

\*1: Actual conversion speed depends upon operating system and drivers.  
\*2: Requires use of optional cable PCB37P or PCB37PS

Note:

As shown on the side of product's images, Pbfree is a CONTEC original marking for lead-free products.

Standard **Analog I/O**

**USB 2.0**

Analog Input	Analog Output	Digital I/O	Counter	High Precision	Memory on Board
8ch	2ch	4	-		

Windows Driver C-LOGGER MATLAB LabVIEW

**8 Channels 16-Bit USB Multifunction A/D Terminal**

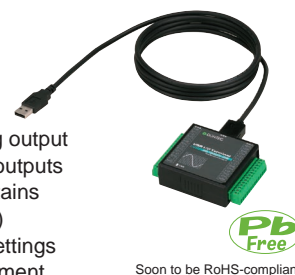
**AIO-160802AY-USB**



14 pin screw-type terminal connector (6 in one)



- Eight 16-bit analog input channels, 2 16-bit analog output channels, 4 LVTTTL digital inputs, 4 LVTTTL digital outputs
- Bus-powered for convenience and portability Contains
- 1k-Word data buffer memory (FIFO or Ring buffer)
- Analog input adjustable via software, no jumper settings required, information depending on user's environment
- Screw-type connectors for easy wiring



Soon to be RoHS-compliant

- Box-PCs
- Panel-PCs
- Flat Panel Displays
- Silicon Disk Drives
- Option
- Box PCs & Panel PCs with Windows CE
- Single Board Computer
- Chassis / Backplane

**Analog I/O**

- Digital I/O
- Counter & Motion Controller
- Serial Communication
- GPIB Communication
- Remote I/O
- Expansion Unit / Bus Adapter
- Software
- Accessories & Cables
- Distributed Monitor & Control Network: F&IT
- Multi-Programmable Display

Wireless LAN

Remote Monitoring Solution

Service & Products

**I-20**

Lineup

- Measurement Products
- Multi-function F Series
- PCI Express
- PCI
- PC Card
- Low-cost Multi-function L series
- PCI Express
- PCI
- PC Card
- Intelligent E series
- PCI
- Standard
- PCI
- USB
- ISA

**USB 2.0**

Analog Input	Analog Output	Digital I/O	Counter	High Precision	Memory on Board
8ch	-	4	-		

Windows Driver C-LOGGER MATLAB LabVIEW

**8 Channels 16-Bit USB Analog Input Terminal**

**AI-1608AY-USB**

14 pin screw-type terminal connector (6 in one)



- Eight 16-bit analog input channels, 4 LVTTTL digital inputs, 4 LVTTTL digital outputs
- Bus-powered for convenience and portability Contains
- 1k-Word data buffer memory (FIFO or Ring buffer)
- Analog input adjustable via software, no jumper settings required, information depending on user's environment
- Screw-type connectors for easy wiring



Soon to be RoHS-compliant

Model	AIO-160802AY-USB	AI-1608AY-USB
Analog Input	Channels	8 single-ended
	Range	Bipolar: ±10V
	Impedance	1MΩ or more
	Resolution	16bit
	Conversion Speed	10μsec/ch (Max.)
	Conversion Accuracy*1	±12LSB
	Buffer Memory	1k-word
Analog Output	Channels	2ch
	Range	Bipolar: ±10V
	Impedance	1Ω or less
	Resolution	16bit
	Conversion Speed	10μsec (Max.)
	Conversion Accuracy	±12LSB
Digital I/O	Input	4 LVTTTL level (positive logic) *2*3
	Output	4 LVTTTL level (positive logic)
Counter	Channels	-
	Counting System	-
Interrupts	Max. count	-
	I/O Address	-
USB Speed	12Mbps <Full Speed>, 480Mbps <High Speed> *4	
Power Consumption (Max.)	5VDC 450mA	5VDC 400mA
Bus / Dimensions (mm)	USB Specification 2.0/1.1 / 64(W)×62(D)×24(H)	
Connector	14-pin (screw-terminal) plug header	
Included Cable	USB cable 1.8m	
Options	Software	-
	Applicable Module	-
	Applicable Power Supply	CN6-Y14

Note:

- \*1: This numerical displays the conversion speed for A/D converter. The minimum executable sampling cycle depends on the operating condition
- \*2: You cannot use both the DI00 / DI01 / DI02-pin of digital input feature and the external start / stop signal / external clock input simultaneously.
- \*3: Each input accept TTL (5VDC) level signals.
- \*4: The USB transfer speed depends on the host PC environment used (OS and USB host controller).
- \*5: A part of buffer memory is used by inside status data. An effective analog input data region depends on the number of the using channels.

As shown on the side of product's images, Pbfree is a CONTEC original marking for lead-free products.



# Analog I/O Standard

Box-PCs
Panel-PCs
Flat Panel Displays
Silicon Disk Drives
Option
Box PCs & Panel PCs with Windows CE
Single Board Computer
Chassis / Backplane
<b>Analog I/O</b>
Digital I/O
Counter & Motion Controller
Serial Communication
GPIO Communication
Remote I/O
Expansion Unit / Bus Adapter
Software
Accessories & Cables
Distributed Monitor & Control Network: F&EIT
Multi-Programmable Display
Wireless LAN
Remote Monitoring Solution
Service & Products

**USB 2.0**

Analog Input	Analog Output	Digital I/O	Counter	Bus Isolated	Memory on Board
4ch	—	—	—	—	—

Windows Driver LabVIEW



Isolated Analog to Digital (USB cable & AC adapter included)

## ADI16-4(USB)

- Onboard 256K data memory
- Voltage input and current input are both supported.
- Expansion of input channels possible with use of extension modules (3 sets max)
- Sample development and utility debugging software included

**USB 2.0**

Analog Input	Analog Output	Digital I/O	Counter	Bus Isolated	Memory on Board	CE
8ch	—	—	—	—	—	—

Windows Driver LabVIEW



Isolated Analog to Digital (USB cable & AC adapter included)

## ADI12-8(USB)GY

- Onboard 256K data memory
- Screwless connectors for easy wiring - no special tools needed
- Expansion of input channels possible with use of extension modules (3 sets max)
- Sample development and utility debugging software included

**USB 2.0**

Analog Input	Analog Output	Digital I/O	Counter	Bus Isolated	Memory on Board
—	4ch	—	—	—	—

Windows Driver LabVIEW



Isolated Digital to Analog (USB cable & AC adapter included)

## DAI16-4(USB)

- Able to store 256K of conversion data and output desired wave form cyclically.
- Screwless connectors for easy wiring - no special tools needed
- Expansion of output channels possible with use of extension modules (3 sets max.)
- Sample development and utility debugging software included

**USB 2.0**

Analog Input	Analog Output	Digital I/O	Counter	Bus Isolated	Memory on Board	CE
—	4ch	—	—	—	—	—

Windows Driver LabVIEW



Isolated Digital to Analog (USB cable & AC adapter included)

## DAI12-4(USB)GY

- Able to store 256K of conversion data and output desired wave form cyclically.
- Screwless connectors for easy wiring - no special tools needed
- Expansion of output channels possible with use of extension modules (3 sets max.)
- Sample development and utility debugging software included

# I-21

Lineup
Measurement Products
Multi-function F Series
PCI Express
PCI
PC Card
Low-cost Multi-function L series
PCI Express
PCI
PC Card
Intelligent E series
PCI
Standard
PCI
<b>USB</b>
ISA

Model	ADI16-4(USB)	ADI12-8(USB)GY	DAI16-4(USB)	DAI12-4(USB)GY
Isolation type	Bus Isolation		Bus Isolated Voltage Input	
Input channels	4 differential		8 differential	
Output channels	-		4ch	
Resolution	16bit		16bit	
Input Range	Voltage	Bipolar: ±10V	-	
	Current	0~20mA	-	
Output Type	-		Voltage / Current (bus signal isolated)	
Output Range	Voltage	-	Unipolar: 0~+10V, 0~+5V (Current output: ±5mA)	Bipolar: ±10V, ±5V Unipolar: 0~+10V, 0~+5V (Current output: 5mA)
	Current	-	0~20mA	
Conversion Accuracy	Voltage Range: ±8LSB, Current Range: ±20LSB		±3LSB	
Conversion Speed (Max.)	Voltage Input: Channels×10µsec/ch + 20µsec <sup>*3</sup> , Current Input: Channels×40µsec/ch + 20µsec <sup>*3</sup>		Channels×10µsec/ch + 20µsec <sup>*3</sup>	
Buffer Memory	256K data (262,144 data)			
Sampling Timer	10µsec~1,073,741,824µsec			
Connector	FK-MC1.5/12-ST-3.81 [PHOENIX CONTACT]	FK-MC0.5/12-ST-2.5 [PHOENIX CONTACT]	FK-MC1.5/12-ST-3.81 [PHOENIX CONTACT]	FK-MC0.5/12-ST-2.5 [PHOENIX CONTACT]
USB Speed	12Mbps <Full Speed>, 480Mbps <High Speed>			
Power Consumption (Max.)	5VDC 600mA <sup>*1</sup>		5VDC 800mA <sup>*1</sup>	5VDC 700mA <sup>*1</sup>
Dimensions (mm)	50.4(W)×64.7(D)×94.0(H)			
Weight (main unit)	100g			
Included AC Adapter (POA-AD22)	AC90~264V, DC5.0V±5%, 2.0A(Max.), Cable length: approx. 1.4m			
Included cable length	USB cable 1.8m			
Options	Software	-		
	Applicable Module <sup>*2</sup>	ADI16-4(FIT)GY	ADI12-8(FIT)GY	DAI16-4(FIT)GY
	Applicable Power Supply <sup>*2</sup>	POA200-20, POW-AD13GY, POW-AD22GY, POW-DD10GY, POW-DD43GY		

\*1: Please use attached AC adapter or optional power supply unit. \*2: Please refer to P-04 or visit our web site for the details of the Applicable Module.  
 \*3: This numerical indicates the conversion speed for A/D converter.  
 [ADI16-4(USB)] The minimum executable sampling cycle is from approx. 200µsec (single channel sampling) to 1msec (16 channel sampling), depends on internal processing time of this module.  
 [ADI12-8(USB)GY] The minimum executable sampling cycle is from approx. 600µsec (single channel sampling) to 2msec (32 channel sampling), depends on internal processing time of this module.  
 \*4: This numerical indicates the settling time of D/A converter.  
 [DAI16-4(USB)] The minimum executable output cycle is from approx. 200µsec (single channel sampling) to 1msec (16 channel sampling), depends on internal processing time of this module.  
 [DAI12-4(USB)GY] The minimum executable output cycle is from approx. 400µsec (single channel sampling) to 1msec (16 channel sampling), depends on internal processing time of this module.

**USB 2.0**

Analog Input	Analog Output	Digital I/O	Counter	Bus Isolated
4	-	-	-	

Windows Driver



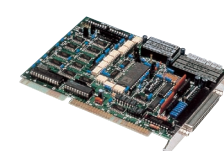
**Pt100 Temperature Sensor Input Module (AC adapter & USB cable included)**  
**PTI-4(USB)**

- IEC/JIS-compliant platinum resistance temperature sensor (Pt100, JPt100) can be used.
- Supports acquisition of resistance and temperature, averaging and alarm output for temperature measurement
- Expansion of input channels possible with use of extension modules (5 sets max.)
- Sample development and utility debugging software included



Model	PTI-4(USB)
Channels	4
Compatible	Pt100 (JIS C1604-1997, IEC 751 1983), JPt100 (JIS C1604-1989)
Wiring Method	3-lead type, 4-lead type
Temperature Measurement Range	Pt100: -200~850°C, JPt100: -200~510°C
Accuracy	Temperature 0~50°C ±0.3°C*1 Temperature 15~35°C ±0.15°C*1
Resolution	0.01°C
Conversion Speed	Selectable from 150 ms/40 ms/5 ms per channel
Output Current for Temperature Detection	1mA
Isolation type	Across platinum RTD & power supply: Photocoupler isolation Across platinum RTD input channel: No isolation
Connector	FK-MC0.5/9-ST-2.5 [PHOENIX CONTACT]
Number of Writes to Flash ROM	100,000 (Max.)
USB Speed	12Mbps (Full Speed), 480Mbps (High Speed)
Power Consumption (Max.)	5VDC(±5%) 800mA *2
Dimensions (mm)	50.4(W)×64.7(D)×94.0(H) (Exclusive of any protrusions)
Weight (main unit)	200g
Included AC adapter (POA-AD22)	AC90~264V, DC5.0V±5% 2.0A (Max.), Cable length: 1.4m
Included Cable	an 1.8m USB cable
Software	-
Applicable Module *3	PTI-4(FIT)GY
Options	Applicable Power Supply *3 POA200-20, POW-AD13GY, POW-AD22GY, POW-DD10GY, POW-DD43GY
Note:	*1: When conversion speed is set to 150ms *2: Please use attached AC adapter or optional power supply unit. *3: Please refer to P-04 or visit our web site for the details of the Applicable Module.

- Box-PCs
- Panel-PCs
- Flat Panel Displays
- Silicon Disk Drives
- Option
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- Single Board Computer
- Chassis / Backplane
- Analog I/O
- Digital I/O
- Counter & Motion Controller
- Serial Communication
- GPB Communication
- Remote I/O
- Expansion Unit / Bus Adapter
- Software
- Accessories & Cables
- Distributed Monitor & Control Network: F&EIT
- Multi-Programmable Display
- Wireless LAN
- Remote Monitoring Solution
- Service & Products

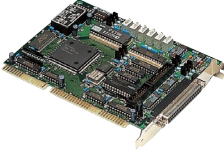


ISA	Model	Analog to Digital Input Board	Individual Isolation Analog to Digital Input Board	Isolation Analog to Digital Input Board
		<b>AD12-16(PC)</b>	<b>ADI12-8CL(PC)H</b>	<b>ADI12-16(PC)</b>
				
<b>SPECIFICATIONS</b>				
Input channels		16 single-ended or 8 differential	8ch	16 single-ended or 8 differential
Resolution		12bit		
Input specifications	Range	±5V, 0~5V, 0~10V	0~5V, 1~5V, 0~20mA, 4~20mA	±10V, ±5V, 0~10V, 4~20mA
	Gain	-		
	Conversion speed	20µsec/ch	1200µsec/ch	25µsec/ch
	Conversion Accuracy*1	±2LSB	±3LSB	
Trigger	Impedance	1MΩ or more	1MΩ or more (Current input: 250Ω)	
	Trigger	1 TTL level	1 opto-isolated input (share 1 of digital input)	1 opto-isolated input (shared signal of Rising-edge or digital input)
Isolation type		-	Individual isolation	Bus isolation
Timer		2~7×10 <sup>13</sup> µsec	-	
Digital I/O		1 TTL level input/output (Negative logic)	2 opto-isolated input (Negative logic) 4 opto-isolated Open Collector Output (Negative logic)	2 opto-isolated input, 4 opto-isolated output (Negative logic)
Interrupts	Request Causes	External trigger / Timer / Conversion end	External trigger / Conversion end	External trigger or A/D Conversion end
	Request Level	One of IRQ 3~7, 9	One of IRQ 3~7, 9~12, 14 or 15	
I/O address		Any 16-byte boundary	Any 4-byte boundary	
Power consumption (Max.)		5VDC 700mA	5VDC 500mA	5VDC 850mA
Bus / Dimensions (mm)		XT Bus / 143.0(L)×107.0(H) viz. 5.5"(L)×4.25"(H)	AT Bus / 163.0(L)×122.0(H) viz. 6.5"(L)×4.75"(H)	
Connector		37-pin female D-type		
Options	Software	API-PAC(W32)		
	Accessories	DTP-3A*2, DTP-4A*2, EPD-37A*2, EPD-37*2		
	Cables / Connectors	PCA37P, PCB37P, PCA37PS, PCB37PS		
CE marking		○	-	○

\*1: Conversion Accuracy: A value in the table is linearity error at 25°C.  
 \*2: Requires use of optional cable PCB37P or PCB37PS

- Lineup
- Measurement Products
- Multi-function F Series
- PCI Express
- PCI
- PC Card
- Low-cost Multi-function L series
- PCI Express
- PCI
- PC Card
- Intelligent E series
- PCI
- Standard
- PCI
- USB
- ISA

# Analog I/O Standard

Box-PCs
Panel-PCs
Flat Panel Displays
Silicon Disk Drives
Option
Box PCs & Panel PCs with Windows CE
Single Board Computer
Chassis / Backplane
<b>Analog I/O</b>
Digital I/O
Counter & Motion Controller
Serial Communication
GPIB Communication
Remote I/O
Expansion Unit / Bus Adapter
Software
Accessories & Cables
Distributed Monitor & Control Network: F&EIT
Multi-Programmable Display
Wireless LAN
Remote Monitoring Solution
Service & Products
Lineup
Measurement Products
Multi-function F Series
PCI Express
PCI
PC Card
Low-cost Multi-function L series
PCI Express
PCI
PC Card
Intelligent E series
PCI
<b>Standard</b>
PCI
USB
<b>ISA</b>

Model	12-bit Multi-Function A/D		16-Bit Multi-Function A/D
	AD12-16(PC)EH	AD12-16U(PC)EH	AD16-16(PC)EH
			
<b>SPECIFICATIONS</b>			
Input channels	16 single-ended or 8 differential		
Output channels	1		
Resolution	12bit		16 bit
Input specifications	Range	±10V, 0~10V	±2.5V, ±5V, 0~5V, 0~10V
	Gain	x1, x2, x4, x8 (software selectable)	-
	Conversion speed	10µsec/ch (Max.)	1µsec/ch (Max.)
	Conversion accuracy *1	±2LSB (x1, x2), ±4LSB (x4, x8)	±3LSB
Output specifications	Impedance	1MΩ or more	
	Range	±5V, ±10V, 0~10V	
	Rating	Drive current ± 5mA (Max.)	
	Conversion speed	6µsec/ch	13µsec/ch
Trigger	Conversion accuracy *1	±1/2LSB	
	Impedance	1Ω or less	
Timer	Start Trigger: 3 modes, Stop Trigger: 4 modes		
Isolation type	-		
Digital I/O	2~7 × 10 <sup>13</sup> µsec		
Interrupts	General DI/O: 4 TTL level input, 4 TTL level output (positive logic), Sampling Control DIO: 3 TTL level input, 1 TTL level output (positive logic)		
	Request Events	Up to 16 events	
I/O address	Request Levels: One of IRQ 5, 7, 9, 10, 11, 12 or 15		
Power consumption	Any 16-byte boundary		
Bus / Dimensions (mm)	5VDC 800mA (max)	5VDC 1700mA (max)	5VDC 1000mA (max)
Connectors	AT Bus / 163.0(L) × 122.0(H)		
	AT Bus / 174.0(L) × 122.0(H)		
Options	AT Bus / 163.0(L) × 122.0(H)		
	Software	API-PAC(W32)	
Accessories	CN1(AIO): 37-pin female D-type CN2(DIO): 16-pin male header		
	DTP-3A <sup>*2</sup> , DTP-4A <sup>*2</sup> , EPD-37A <sup>*2</sup> , EPD-37 <sup>*2</sup> , ATSS-16 <sup>*2</sup> , ATII-8A <sup>*2</sup> , ATLF-8 <sup>*2</sup> , FTP-15 <sup>*3</sup> , ATP-16E <sup>*5</sup> , ATCH-16(PC)	DTP-3A <sup>*2</sup> , DTP-4A <sup>*2</sup> , EPD-37A <sup>*2</sup> , EPD-37 <sup>*2</sup> , ATSS-16 <sup>*2</sup> , ATII-8A <sup>*2</sup> , ATLF-8 <sup>*2</sup> , FTP-15 <sup>*3</sup> , ATP-16E <sup>*5</sup> , ATUH-16(PC)	DTP-3A <sup>*2</sup> , DTP-4A <sup>*2</sup> , EPD-37A <sup>*2</sup> , EPD-37 <sup>*2</sup> , ATSS-16 <sup>*2</sup> , ATII-8A <sup>*2</sup> , ATLF-8 <sup>*2</sup> , FTP-15 <sup>*3</sup> , ATP-16E <sup>*5</sup> , ATCH-16(PC)
Cables / Connectors	PCA37P, PCB37P, PCA37PS, PCB37PS, PCA15P <sup>*4</sup> , PCB15P <sup>*4</sup> , PCC16PS, PCD8PS, DT/E1, DT/E2		
CE mark	○	○	○

\*1: Conversion Accuracy: Value is linearity error at 25°C.  
 \*2: Requires use of optional cable PCB37P or PCB37PS  
 \*3: Requires use of optional cable DT/E2 and PCB15P  
 \*4: Optional PCB15P cable is required when using FTP-15 terminal panel.  
 \*5: Requires use of optional cable PCB37P-0.5P or PCB37PS-1.5P

## Options

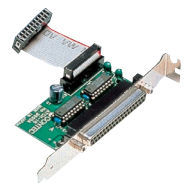
### 16ch Multiplexer Sub-Board

When used with CONTEC's Intelligent E Series Analog boards, these multiplexers can double the number of available channels to 32 single-ended or 16 differential

\* Multiplexers occupy one chassis slot.

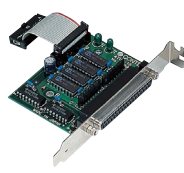
### ATCH-16(PC)

**For use with**  
 AD12-16(PC)EH  
 AD16-16(PC)EH



### ATUH-16(PC)



**For use with**  
 AD12-16U(PC)EH  
 AD16-16U(PC)EH






- Box-PCs
- Panel-PCs
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- Silicon Disk Drives
- Option
- Box PCs & Panel PCs with Windows CE
- Single Board Computer
- Chassis / Backplane
- Analog I/O**
- Digital I/O
- Counter & Motion Controller
- Serial Communication
- GPIB Communication
- Remote I/O
- Expansion Unit / Bus Adapter
- Software
- Accessories & Cables
- Distributed Monitor & Control Network: F&EIT
- Multi-Programmable Display
- Wireless LAN
- Remote Monitoring Solution
- Service & Products

**I-24**

- Lineup
- Measurement Products
- Multi-function F Series
- PCI Express
- PCI
- PC Card
- Low-cost Multi-function L series
- PCI Express
- PCI
- PC Card
- Intelligent E series
- PCI
- Standard
- PCI
- USB
- ISA

ISA	Model	Opto-Isolated Digital to Analog Board	Opto-Isolated Digital to Analog Board
		DAI12-4C(PC)	DAI12-8C(PC)
			
<b>SPECIFICATIONS</b>			
Input channels		-	
Output channels		4ch	8ch
Resolution		12bit	
Output specification	Output range	0~5V, 4~20mA	
	Output rating	±5mA (voltage output)	
	Conversion speed	24µsec/ch	
	Conversion Accuracy*1	± 2LSB	
Output Impedance		1Ω or less (voltage output)	
Trigger		-	
Isolation		Bus isolation	
Timer		-	
Digital I/O		2 opto-isolated input, 4 opto-isolated output (Negative logic)	
Interrupt	Request Causes	-	
	Request Level	-	
I/O address		Any 4-byte boundary	
Bus / Dimensions (mm)		5VDC 1200mA	5VDC 1600mA
Bus / Dimension (mm)		AT Bus / 163.0(L) x 122.0(H)	
Connector		37-pin female D-type	
Option	Software	API-PAC(W32)	
	Accessories	DTP-3A*2, DTP-4A*2, EPD-37A*2, EPD-37*2	
	Cables / Connector	PCA37P, PCB37P, PCA37PS, PCB37PS	
CE marking		○	○

\*1: Conversion Accuracy: A value in the table is linearity error at 25°C.  
 \*2: Requires use of optional cable PCB37P or PCB37PS.

ISA	Model	Digital to Analog Output Board	Digital to Analog Output Board	16-Bit Digital to Analog Output Board
		DA12-4(PC)	DA12-8L(PC)	DA16-4D(PC)
				
<b>SPECIFICATIONS</b>				
Input channels		-		
Output channels		4ch	8ch	4ch
Resolution		12bit	16 bit	16 bit
Output specification	Output range	±5V, ±10V, 0~10V	±5V, ±10V, 0~10V, 4~20mA (1ch)	±10V, 0~10V
	Output rating	±5mA	±5mA (voltage output)	±5mA
	Conversion speed	5µsec/ch	10µsec/ch	13µsec/ch
	Conversion Accuracy*1	±1LSB	±3LSB	±3LSB
Output Impedance		1Ω or less	1Ω or less (voltage output)	1Ω or less
Trigger		1 TTL level input	-	-
Isolation type		-		
Timer		2~7 x 10 <sup>13</sup> µsec	-	-
Digital I/O		1 TTL level input/output (Negative logic)	4 TTL level input/output (Positive logic)	-
Interrupt	Request Causes	External trigger / Timer	-	DMA Transmission end
	Request Level	One of IRQ 3~7, 9	-	One of IRQ 3~7, 9~12, 14 or 15
I/O address		Any 16-byte boundary	Any 4-byte boundary	Any 8-byte boundary
Power consumption (Max.)		5VDC 1200mA	5VDC 830mA	5VDC 980mA
Bus / Dimensions (mm)		XT Bus / 143.0(L) x 107.0(H)	AT Bus / 163.0(L) x 122.0(H)	-
Connector		37-pin female D-type		
Option	Software	API-PAC(W32)		
	Accessories	DTP-3A*2, DTP-4A*2, EPD-37A*2, EPD-37*2		
	Cables / Connector	PCA37P, PCB37P, PCA37PS, PCB37PS		
CE marking		○	○	○

\*1: Conversion Accuracy: A value in the table is linearity error at 25°C.  
 \*2: Requires use of optional cable PCB37P or PCB37PS.