

ARTISAN®
TECHNOLOGY GROUP

Your **definitive** source for quality pre-owned equipment.

Artisan Technology Group
(217) 352-9330 | sales@artisantg.com | artisantg.com

Full-service, independent repair center
with experienced engineers and technicians on staff.

We buy your excess, underutilized, and idle equipment
along with credit for buybacks and trade-ins.

Custom engineering
so your equipment works exactly as you specify.

- Critical and expedited services
- In stock / Ready-to-ship
- Leasing / Rentals / Demos
- ITAR-certified secure asset solutions

Expert team | Trust guarantee | 100% satisfaction

All trademarks, brand names, and brands appearing herein are the property of their respective owners.

Visit our website - *Click HERE*

Bus master transfer / multi functions AIO board for PCI

ADA16-32/2(PCI)F



* Specifications, color and design of the products are subject to change without notice.

This product is a multi-function, PCI bus compliant interface board that incorporates high-precision analog inputs, high-precision analog outputs, digital inputs, digital outputs, and a counter function.

The board includes an event controller for integrated management of control signals by hardware and a bus master data transfer function for transferring large volumes of data at high speed. Together, these features provide all you need to build a high-performance PC-based measurement and control system.

You can use the driver library (API-PAC(W32)) supplied with the board to write Windows application programs in any programming language (such as Visual Basic, Visual C++, etc.) that supports the calling of Win32 API functions.

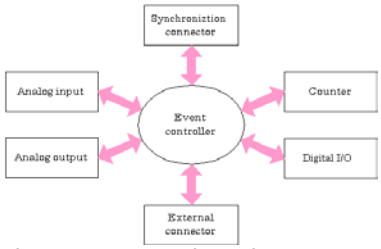
It can also collect data easily without a program when the data logger software [C-LOGGER] stored on the bundled disk is used. With plug-ins for the dedicated libraries, the board also supports MATLAB and LabVIEW.

Features

Multi-function
The board contains analog inputs (16-bit, 32ch), analog outputs (16-bit, 2ch), digital inputs (8ch), digital outputs (8ch), and counters (32-bit binary, 2ch). Combining all these features on one board allows complex systems to be implemented even on PCs with few spare expansion slots

The event controller can be used to implement a wide range of different sampling control schemes
The board incorporates an event controller for integrated hardware control. The event controller can use the external control signals and the events generated by the board functions to start and stop analog input operation and perform clock control. This enables high-precision synchronization of the various board functions without requiring software. Also, each function can be operated separately.

Overview of event controller



The arrows in the figure indicate the flow of control signals. The main control signals included clock signals and the operation start and stop signals.

Example 1: Synchronize the timing of analog input and analog output based on an external clock signal.

Example 2: Start analog input operation each time the counter reaches a preset value.

Bus master transfer function and combined data I/O function
Bus master data transfer can be used for the analog inputs and outputs either separately or at the same time. This can be used to transfer large volumes of data between the board and PC without placing a load on the CPU.
When using bus master data transfer for analog input data, you can also transfer the analog output, digital input, digital output, and counter data at the same time synchronized with the analog input clock signal. This function ensures reliable data synchronization in the systems you implement.

Buffer memory available for background processing independent of software
The analog inputs and outputs each have their own buffer memory which can be used when not using bus master transfer.
You can also perform analog input and output in the background, independent of software and the current status of the PC.

Software-based calibration
Calibration of analog input/output can be all performed by software. Apart from the adjustment information prepared before shipment, additional adjustment information can be stored according to the use environment.

Synchronization control connector provided for synchronizing operation
A synchronization control connector is provided for synchronized control of multiple boards. You can expand the number of channels simply by adding more boards.
This makes it easy to synchronize operation with other CONTEC boards that have a synchronization control connector.

Filter function for easy connection of external signals
The digital input signals, counter input signals, and the external control signals for analog I/O incorporate a digital filter to prevent problems such as chattering.

The same systems can be implemented on either desktop or notebook PCs
The "Analog F Series" boards (ADA16-32/2(PCI)F and ADA16-32/2(CB)F) have equivalent functionality. Systems developed on a desktop PC can be ported directly to a notebook PC with minimal changes.

Supported to the data logger software [C-LOGGER]
Supporting the data logger software [C-LOGGER] that enables the graph display of recorded signal data, file saving, and dynamic transfer to the spreadsheet software program "Excel"

Plug-ins for the dedicated libraries, the board also supports MATLAB and LabVIEW.
We offer a dedicated library [ML-DAQ], which allows you to use this product on MATLAB by The MathWorks as well as another dedicated library [VI-DAQ], which allows you to use the product on LabVIEW. These dedicated libraries are available, free of charge (downloadable), on our web site.

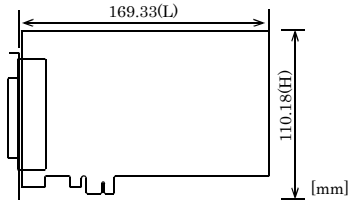
Specifications

Item	Specification
Analog input	
Isolated specification	Un-Isolated
Input type	Single-Ended Input or Differential Input
Number of input channels	32ch (Single-Ended Input), 16ch (Differential Input)
Input range	Bipolar ±10V, ±5V, ±2.5V or Unipolar 0 - +10V, 0 - +5V, 0 - +2.5V
Absolute max. input voltage	±15V
Input impedance	1MΩ or more
Resolution	16bit
Non-Linearity error *1	±5LSB
Conversion speed	2μsec/ch (Max.)
Buffer memory	64k Word FIFO or 64k Word RING
Conversion start trigger	Software, conversion data compare, external trigger, and event controller output.
Conversion stop trigger	Settings include data save complete, conversion data compare, external trigger, event controller output, and software.
External start signal	TTL (Rising or falling edge can be selected by software)
External stop signal	TTL (Rising or falling edge can be selected by software)
External clock signal	TTL (Rising or falling edge can be selected by software)
External status output signal	2 TTL, Sampling clock output
Analog output	
Isolated specification	Un-Isolated
Number of output channels	2ch
Output range	Bipolar ±10V, ±5V, ±2.5V, ±1.25V or Unipolar 0 - +10V, 0 - +5V, 0 - +2.5V
Output current ability	±5mA
Output impedance	1Ω or less
Resolution	16bit
Non-Linearity error *1	±3LSB
Conversion speed	10μsec (Max.)
Buffer memory	64k Word FIFO or 64k Word RING
Conversion start trigger	Software, external trigger, and event controller output.
Conversion stop trigger	Settings include data save complete, external trigger, event controller output, and software.
External start signal	TTL (Rising or falling edge can be selected by software)
External stop signal	TTL (Rising or falling edge can be selected by software)
External clock signal	TTL (Rising or falling edge can be selected by software)
External status output signal	2 TTL, Sampling clock output
Digital I/O	
Number of input channels	Un-Isolated input 8ch (TTL positive logic)
Number of output channels	Un-Isolated output 8ch (TTL positive logic)
Counter	
Number of channels	2ch
Counting system	Up count
Max. count	FFFFFFFFh (Binary data,32bit)
Number of external inputs	2 TTL (Gate/Up)/ch Gate (High level), Up (Rising edge)
Number of external outputs	TTL 1 output/ch, Count match output (positive logic, pulse output)
Bus master section	
DMA channels	2ch (one each for input and output)
Transfer bus width	32bit
Transfer data length	8 PCI Words length (Max.)
FIFO	1K-Word/ch
Scatter/Gather function	64M-Byte/ch
Synchronization bus section	
Control output signal	Selection of output signal with the software when specifying a sync master board.
Control input signal	Selection of sync factor with the software when specifying sync slave boards.
Max. board count for connection	16 boards including the master board
Connector	PS-10PE-D4T1-B1 (JAE) or equivalent x 2
Common section	
I/O address	64 ports x 1,256 ports x 1 region
Interruption level	Errors and various factors, One interrupt request line as INTA
Connector	96-pin half pitch connector [M(male)type] PCR-96LMD [HONDA TSUSHIN KOGYO CO., LTD.] or equivalent
Power consumption	5VDC 1100mA (Max.)
Operating condition	0 - 50°C, 10 - 90%RH (No condensation)
PCI bus specification	32bit, 33MHz, Universal key shapes supported *2
Dimension (mm)	176.41(L) x 105.68(H)
Weight	130g
Standard	VCCI ClassA, CE Marking (EMC Directive Class A), RoHS Directive

*1 The non-linearity error means an error of approximately 0.1% occurs over the maximum range at 0°C and 50°C ambient temperature.

*2 This board requires +5V power supply from expansion slots (it does not operate in the environment of only +3.3V power supply).

Board Dimensions



The standard outside dimension(L) is the distance from the end of the board to the outer surface of the slot cover.

Support Software

Windows version of digital I/O driver API-AIO(WDM)
[Stored on the bundled media driver library API-PAC(W32)]
The API-AIO(WDM) is the Windows version driver library software that provides products in the form of Win32 API functions (DLL). Various sample programs such as Visual Basic and Visual C++, etc and diagnostic program useful for checking operation is provided.

For more details on the supported OS, applicable language and new information, please visit the CONTEC's Web site.

Linux version of digital I/O driver API-AIO(LNX)
[Stored on the bundled media driver library API-PAC(W32)]
The API-AIO(LNX) is the Linux version driver software which provides device drivers (modules) by shared library and kernel version. Various sample programs of gcc are provided.

For more details on the supported OS, applicable language and new information, please visit the CONTEC's Web site.

Data Logger Software C-LOGGER
[Stored on the bundled media driver library API-PAC(W32)]
C-LOGGER is a data logger software program compatible with our analog I/O products. This program enables the graph display of recorded signal data, zoom observation, file saving, and dynamic transfer to the spreadsheet software "Excel". No troublesome programming is required.

For more details on the supported OS, applicable language and new information, please visit the CONTEC's Web site.

Data Acquisition library for MATLAB ML-DAQ
(Available for downloading (free of charge) from the CONTEC web site.)
This is the library software which allows you to use our analog I/O device products on MATLAB by the MathWorks. Each function is offered in accordance with the interface which is integrated in MATLAB's Data Acquisition Toolbox.

For more details on the supported OS, applicable language and new information, please visit the CONTEC's Web site.

Data acquisition VI library for LabVIEW VI-DAQ
(Available for downloading (free of charge) from the CONTEC web site.)
This is a VI library to use in National Instruments LabVIEW. VI-DAQ is created with a function form similar to that of LabVIEW's Data Acquisition VI, allowing you to use various devices without complicated settings.

For more details on the library and download of VI-DAQ, please visit the CONTEC's Web site.

*1 The bus master transmission (analog input and output), the analog input in-range and out-range function and the event controller function of analog F series are not supported. It is impossible to synchronize the ADA16-32/2(PCI)F with another board only when the synchronous connector was used.

Cable & Connector

Cable (Option)

Shield Cable with 96-Pin Half-Pitch Connectors at Both Ends
: PCB96PS-0.5P (0.5m), PCB96PS-1.5P (1.5m)

Flat Cable with 96-Pin Half-Pitch Connectors at Both Ends
: PCB96P-1.5 (1.5m)

Shield Cable with 96-Pin Half-Pitch Connectors at One End
: PCA96PS-0.5P (0.5m), PCA96PS-1.5P (1.5m)

Flat Cable with 96-Pin Half-Pitch Connectors at One End
: PCA96P-1.5 (1.5m)

Accessories

Accessories (Option)

Buffer Amplifier Box for Analog Input Boards (32ch type)	: ATBA-32F *1*2
Buffer Amplifier Box for Analog Input Boards (8ch type)	: ATBA-8F *1*2*3
Terminal Unit for Cables (M3 x 96P)	: DTP-64A *1
Screw Terminal Unit (M3.5 x 96P)	: EPD-96 *1
Screw Terminal Unit (M3 x 96P)	: EPD-96A *1*4
BNC Terminal Unit (for analog input 32ch)	: ATP-32F *1

BNC Terminal Unit (for analog input 8ch): ATP-8 *1*3*5

1 PCB96PS- optional cable is required separately (0.5mm is recommended).
*2 An external power supply is necessary (optional AC adaptor POA200-20 prepared.)
*3 The analog input could have 8 channels to be used.
*4 "Spring-up" type terminal is used to prevent terminal screws from falling off.
*5 The digital input can be used up to four points, the digital output up to four points and the counter I/O up to 1 channel.

Packing List

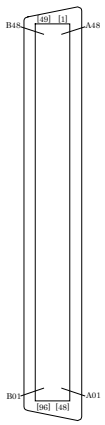
Board [ADA16-32/2(PCI)F] ...1
First step guide ... 1
Disk *1 [API-PAC(W32)] ...1
Synchronization Control Cable (10cm) ...1
Warranty Certificate ...1
Serial number label ...1

*1 The bundled disk contains the driver software and User's Guide

Connector Pin Assignment

Single-Ended Input

N.C	B48		A48	Analog Output 00
N.C	B47		A47	Analog Ground (for AO)
N.C	B46		A46	Analog Output 01
N.C	B45		A45	Analog Ground (for AO)
Analog Input 08	B44		A44	Analog Input 00
Analog Input 24	B43		A43	Analog Input 16
Analog Input 09	B42		A42	Analog Input 01
Analog Input 25	B41		A41	Analog Input 17
Analog Ground (fro AI)	B40		A40	Analog Ground (for AI)
Analog Ground (for AI)	B39		A39	Analog Ground (for AI)
Analog Input 10	B38		A38	Analog Input 02
Analog Input 26	B37		A37	Analog Input 18
Analog Input 11	B36		A36	Analog Input 03
Analog Input 27	B35		A35	Analog Input 19
Analog Ground (for AI)	B34		A34	Analog Ground (for AI)
Analog Ground (for AI)	B33		A33	Analog Ground (for AI)
Analog Input 12	B32		A32	Analog Input 04
Analog Input 28	B31		A31	Analog Input 20
Analog Input 13	B30		A30	Analog Input 05
Analog Input 29	B29		A29	Analog Input 21
Analog Ground (for AI)	B28		A28	Analog Ground (for AI)
Analog Ground (for AI)	B27		A27	Analog Ground (for AI)
Analog Input 14	B26		A26	Analog Input 06
Analog Input 30	B25		A25	Analog Input 22
Analog Input 15	B24		A24	Analog Input 07
Analog Input 31	B23		A23	Analog Input 23
Analog Ground (for AI)	B22		A22	Analog Ground (for AI)
Analog Ground (for AI)	B21		A21	Analog Ground (for AI)
Digital Ground	B20		A20	Digital Ground
N.C	B19		A19	N.C
Digital Output 00	B18		A18	Digital Input 00
Digital Output 01	B17		A17	Digital Input 01
Digital Output 02	B16		A16	Digital Input 02
Digital Output 03	B15		A15	Digital Input 03
Digital Output 04	B14		A14	Digital Input 04
Digital Output 05	B13		A13	Digital Input 05
Digital Output 06	B12		A12	Digital Input 06
Digital Output 07	B11		A11	Digital Input 07
AO Control Signal Output 00	B10		A10	AI Control Signal Output 00
AO Control Signal Output 01	B09		A09	AI Control Signal Output 01
Digital Ground	B08		A08	Digital Ground
AO External Sampling Clock Input	B07		A07	AI External Sampling Clock Input
AO External Stop Trigger Input	B06		A06	AI External Stop Trigger Input
AO External Start Trigger Input	B05		A05	AI External Start Trigger Input
Counter UP Clock Input 01	B04		A04	Counter UP Clock Input 00
Reserved	B03		A03	Reserved
Counter Gate Control Input 01	B02		A02	Counter Gate Control Input 00
Control Output 01	B01		A01	Counter Output 00

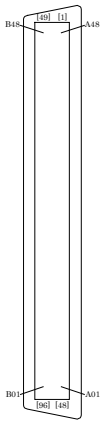


- The numbers in square brackets [ ] are pin numbers designated by HONDA TSUSHIN KOGYO CO.,

Analog Input00 - Analog Input31	Analog input signal. The numbers correspond to channel numbers.
Analog Output00 - Analog Output01	Analog output signal. The numbers correspond to channel numbers.
Analog Ground	Common analog ground for analog I/O signals.
AI External Start Trigger Input	External trigger input for starting analog input sampling.
AI External Stop Trigger Input	External trigger input for stopping analog input sampling.
AI External Sampling Clock Input	External sampling clock input for analog input.
AI Control Signal Output 00	External sampling clock output signal for analog input.
AI Control Signal Output 01	External output signal for analog input status. Not currently connected.
AO External Start Trigger Input	External trigger input for starting analog output sampling.
AO External Stop Trigger Input	External trigger input for stopping analog output sampling.
AO External Sampling Clock Input	External sampling clock input for analog output.
AO Control Signal Output 00	External sampling clock output signal for analog output.
AO Control Signal Output 01	External output signal for analog output status. Not currently connected.
Digital Input00 - Digital Input07	Digital input signal.
Digital Output00 - Digital Output07	Digital output signal.
Counter Gate Control Input00 - Counter Gate Control Input01	Gate control input signal for counter.
Counter Up Clock Input00 - Counter Up Clock Input01	Count-up clock input signal for counter.
Counter Output00 - Counter Output01	Count match output signal for counter.
Digital Ground	Common digital ground for digital I/O signals, external trigger inputs, external sampling clock inputs, and counter I/O signals.
Reserved	Reserved pin
N.C	No connection to this pin.

Differential Input

N.C.	B48		A48	Analog Output 00
N.C.	B47		A47	Analog Ground (for AO)
N.C.	B46		A46	Analog Output 01
N.C.	B45		A45	Analog Ground (for AO)
Analog Input 08[+]	B44		A44	Analog Input 00[+]
Analog Input 08[-]	B43		A43	Analog Input 00[-]
Analog Input 09[+]	B42		A42	Analog Input 01[+]
Analog Input 09[-]	B41		A41	Analog Input 01[-]
Analog Ground (for AI)	B40		A40	Analog Ground (for AI)
Analog Ground (for AI)	B39		A39	Analog Ground (for AI)
Analog Input 10[+]	B38		A38	Analog Input 02[+]
Analog Input 10[-]	B37		A37	Analog Input 02[-]
Analog Input 11[+]	B36		A36	Analog Input 03[+]
Analog Input 11[-]	B35		A35	Analog Input 03[-]
Analog Ground (for AI)	B34		A34	Analog Ground (for AI)
Analog Ground (for AI)	B33		A33	Analog Ground (for AI)
Analog Input 12[+]	B32		A32	Analog Input 04[+]
Analog Input 12[-]	B31		A31	Analog Input 04[-]
Analog Input 13[+]	B30		A30	Analog Input 05[+]
Analog Input 13[-]	B29		A29	Analog Input 05[-]
Analog Ground (for Ai)	B28		A28	Analog Ground (for AI)
Analog Ground (for AI)	B27		A27	Analog Ground (for AI)
Analog Input 14[+]	B26		A26	Analog Input 06[+]
Analog Input 14[-]	B25		A25	Analog Input 06[-]
Analog Input 15[+]	B24		A24	Analog Input 07[+]
Analog Input 15[-]	B23		A23	Analog Input 07[-]
Analog Ground (for AI)	B22		A22	Analog Ground (for AI)
Analog Ground (for AI)	B21		A21	Analog Ground (for AI)
Digital Ground	B20		A20	Digital Ground
N.C.	B19		A19	N.C.
Digital Output 00	B18		A18	Digital Input 00
Digital Output 01	B17		A17	Digital Input 01
Digital Output 02	B16		A16	Digital Input 02
Digital Output 03	B15		A15	Digital Input 03
Digital Output 04	B14		A14	Digital Input 04
Digital Output 05	B13		A13	Digital Input 05
Digital Output 06	B12		A12	Digital Input 06
Digital Output 07	B11		A11	Digital Input 07
AO Control Signal Output 00	B10		A10	AI Control Signal Output 00
AO Control Signal Output 01	B09		A09	AI Control Signal Output 01
Digital Ground	B08		A08	Digital Ground
AO External Sampling Clock Input	B07		A07	AI External Sampling Clock Input
AO External Stop Trigger Input	B06		A06	AI External Stop Trigger Input
AO External Start Trigger Input	B05		A05	AI External Start Trigger Input
Counter UP Clock Input 01	B04		A04	Counter UP Clock Input 00
Reserved	B03		A03	Reserved
Counter Gate Control Input 01	B02		A02	Counter Gate Control Input 00
Counter Output 01	B01		A01	Counter Output 00



- The numbers in square brackets [ ] are pin numbers designated by HONDA TSUSHIN KOGYO CO., LTD.

Analog Input00 - Analog Input15	Analog input signal. The numbers correspond to channel numbers.
Analog Output00 - Analog Output01	Analog output signal. The numbers correspond to channel numbers.
Analog Ground	Common analog ground for analog I/O signals.
AI External Start Trigger Input	External trigger input for starting analog input sampling.
AI External Stop Trigger Input	External trigger input for stopping analog input sampling.
AI External Sampling Clock Input	External sampling clock input for analog input.
AI Control Signal Output 00	External sampling clock output signal for analog input.
AI Control Signal Output 01	External output signal for analog input status. Not currently connected.
AO External Start Trigger Input	External trigger input for starting analog output sampling.
AO External Stop Trigger Input	External trigger input for stopping analog output sampling.
AO External Sampling Clock Input	External sampling clock input for analog output.
AO Control Signal Output 00	External sampling clock output signal for analog output.
AO Control Signal Output 01	External output signal for analog output status. Not currently connected.
Digital Input00 - Digital Input07	Digital input signal.
Digital Output00 - Digital Output07	Digital output signal.
Counter Gate Control Input00 - Counter Gate Control Input01	Gate control input signal for counter.
Counter Up Clock Input00 - Counter Up Clock Input01	Count-up clock input signal for counter.
Counter Output00 - Counter Output01	Count match output signal for counter.
Digital Ground	Common digital ground for digital I/O signals, external trigger inputs, external sampling clock inputs, and counter I/O signals.
Reserved	Reserved pin
N.C.	No connection to this pin.

Artisan Technology Group is an independent supplier of quality pre-owned equipment

Gold-standard solutions

Extend the life of your critical industrial, commercial, and military systems with our superior service and support.

We buy equipment

Planning to upgrade your current equipment? Have surplus equipment taking up shelf space? We'll give it a new home.

Learn more!

Visit us at **artisantg.com** for more info on price quotes, drivers, technical specifications, manuals, and documentation.

Artisan Scientific Corporation dba Artisan Technology Group is not an affiliate, representative, or authorized distributor for any manufacturer listed herein.

We're here to make your life easier. How can we help you today?

(217) 352-9330 | sales@artisantg.com | artisantg.com

ARTISAN® TECHNOLOGY GROUP