

Non-isolation type low price high precision analog output board for Low Profile PCI
DA16-4(LPCI)L



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

Features

Rich set of basic functions

Compact system providing high-precision analog outputs. This product is a control signal(3 points) of analog output(16bits, 4ch), analog output. Digital inputs (four channels), digital outputs (four channels), and a counter (32-bit one channel).

Substantial control functions

Capable of analog output in time-based mode or external-signal synchronous mode.

Filter function facilitating external signal connection

Digital filters provided for external control analog output signals, preventing chattering

Buffer memory

The analog outputs each have their own buffer memory. You can also perform analog output in the background, independent of software and the current status of the PC.

Software-based calibration function

Calibration of analog 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.

Exchangeable low-profile and standard PCI slots

Support for both of low-profile and standard PCI slots (interchangeable with a bundled bracket).

Windows/Linux compatible device drivers

Using the device driver API-TOOL provided on the CONTEC Web site, it possible to create applications of Windows/Linux. In addition, a diagnostic program by which the operations of hardware can be checked is provided.

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

This product supports a Low Profile size slot and if replaced with the supplied bracket, supports a standard size slot, too.

The card can make your space-saving PC into a cost-effective analog input system.

Windows/Linux device driver is supported with this product.

- * The contents in this document are subject to change without notice.
- * Visit the CONTEC website to check the latest details in the document.
- * The information in the data sheets is as of March, 2025.

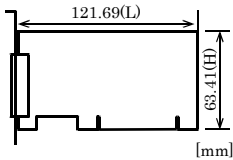
Specifications

Function specification

Item	Specification
Analog output	
Isolated specification	Unisolated
Number of output channels	4ch
Output range	Bipolar ±10V
Absolute max. output current	±3mA
Output impedance	1Ω or less
Resolution	16bit
Non-Linearity error *1	±5LSB
Conversion speed	10μsec
Buffer memory	1k Word
Conversion start trigger	Software / external trigger
Conversion stop trigger	Number of sampling times / external trigger/software
External start signal	TTL level (Rising or falling edge can be selected by software) Digital filter (10sec can be selected by software)
External stop signal	TTL level (Rising or falling edge can be selected by software) Digital filter (10sec can be selected by software)
External clock signal	TTL level (Rising or falling edge can be selected by software) Digital filter (10sec can be selected by software)
Digital I/O	
Number of input channels	Unisolated input 4ch (TTL level positive logic)
Number of output channels	Unisolated output 4ch (TTL level positive logic)
Response time	200nsec (Max.)
Counter	
Number of channels	1ch
Counting system	Up count
Max. count	FFFFFFFFh (Binary data,32bit)
Number of external inputs	2 TTL level levels (Gate/Up)/ch Gate (High level), Up (Rising edge)
Number of external outputs	TTL level Count match output (positive logic, pulse output)
Response frequency	10MHz (Max.)
Common section	
I/O address	64 ports
Interruption level	Errors and various factors, One interrupt request line as INTA
Connector	10250-52A2[L]3[M]
Power consumption	5VDC 540mA (Max.)
Operating condition	0 - 50°C, 10 - 90%RH (No condensation)
PCI bus specification	32bit, 33MHz, Universal key shapes supported *2
Dimension (mm)	121.69 (L) x 63.41 (H)
Weight	60g
Standard	VCCI Class A, CE Marking (EMC Directive Class A, RoHS Directive), UKCA

*1 The non-linearity error means an error of approximately 0.1% occurs over the maximum range at 0DC and 50DC ambient temperature.
 *2 This board requires power supply at +5V from an expansion slot (it does not work on a machine with a +3.3V power supply alone).

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

For more details on the supported OS, applicable languages, or to download the latest version of software, visit the CONTEC Web site.

Name	Contents	How to get
Windows Version Analog I/O Driver software API-AIO(WDM)	Driver software of analog input and output for Windows	Download from the CONTEC website *1
Linux Version Analog I/O Driver software API-AIO(LNX)	Driver software of analog input and output for Linux.	Download from the CONTEC website *1
Development Support Tools and Support Software	In addition to device drivers, we offer a variety of software for convenient use of our devices.	Download from the CONTEC website *2

- *1 Download the files from the following URL
<https://www.contec.com/download/>
- *2 For compatible software, search for this product on the Contec website and see the product page.
<https://www.contec.com/>

Cable

Cable (Option)

Shield Cable with 50-Pin Mini-Ribbon Connectors

- at either Ends : PCB50PS-0.5P (0.5m)
- : PCB50PS-1.5P (1.5m)

Shield Cable with 50-Pin Mini-Ribbon Connector

- at one End : PCA50PS-0.5P (0.5m)
- : PCA50PS-1.5P (1.5m)

Accessories

Accessories (Option)

- Screw Terminal Unit (M3 x 50P) : EPD-50A *1 *6
- BNC Terminal Unit (for analog input 8ch) : ATP-8L *1*5

- *1 PCB50PS-0.5P or PCB50PS-1.5P optional cable is required separately.
- *5 Capable of using the analog input of up to 8ch, and analog output of up to 2ch.
- *6 "Spring-up" type terminal is used to prevent terminal screws from falling off.
- * Check the CONTEC's Web site for more information on these options.

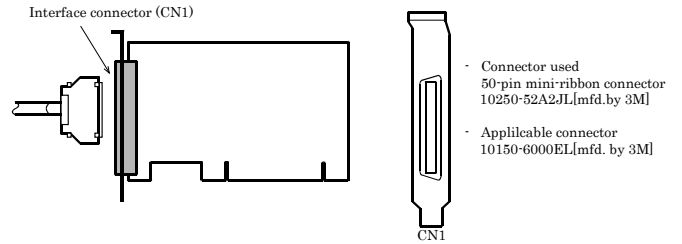
Packing List

- Board [DA16-4(LPCI)L] ... 1
- First step guide ... 1
- Disk [API-PAC(W32)] ... 1
- Standard size bracket ... 1
- Serial Number Label ... 1

Physical Dimensions

Connector shape

To connect an external device to this board, plug the cable from the device into the interface connector (CN1) shown below.



* Please refer to page 2 for more information on the supported cable and accessories.

Connector Pin Assignment
Pin Assignments of Interface Connector(CN1)

Analog Output 02	AO 02	50	25	- AO 00	Analog Output 00
Analog Ground (for AO)	AGND	49	24	- AGND	Analog Ground (for AO)
Analog Output 03	AO 03	48	23	- AO 01	Analog Output 01
Analog Ground (for AO)	AGND	47	22	- AGND	Analog Ground (for AO)
Non Connect	N.C.	46	21	- N.C.	Non Connect
Non Connect	N.C.	45	20	- N.C.	Non Connect
Non Connect	N.C.	44	19	- N.C.	Non Connect
Non Connect	N.C.	43	18	- N.C.	Non Connect
Non Connect	N.C.	42	17	- N.C.	Non Connect
Non Connect	N.C.	41	16	- N.C.	Non Connect
Non Connect	N.C.	40	15	- N.C.	Non Connect
Non Connect	N.C.	39	14	- N.C.	Non Connect
Non Connect	N.C.	38	13	- N.C.	Non Connect
Non Connect	N.C.	37	12	- N.C.	Non Connect
AO External Start Trigger Input	AO START	36	11	- N.C.	Non Connect
AO External Stop Trigger Input	AO STOP	35	10	- N.C.	Non Connect
AO External Sampling Clock Input	AO EXCLK	34	9	- N.C.	Non Connect
Digital Ground	DGND	33	8	- DGND	Digital Ground
Digital Output 00	DO 00	32	7	- DI 00	Digital Input 00
Digital Output 01	DO 01	31	6	- DI 01	Digital Input 01
Digital Output 02	DO 02	30	5	- DI 02	Digital Input 02
Digital Output 03	DO 03	29	4	- DI 03	Digital Input 03
Digital Ground	DGND	28	3	- DGND	Digital Ground
Counter UP Clock Input	CNT UPCLK	27	2	- CNT GATE	Counter Gate Control Input
Reserved	Reserved	26	1	- CNT OUT	Counter Output

Analog Output00 - Analog Output03	Analog output signal. The numbers correspond to channel numbers.
Analog Ground	Common analog ground for analog I/O signals.
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.
Digital Input00 - Digital Input03	Digital input signal.
Digital Output00 - Digital Output03	Digital output signal.
Counter Gate Control Input	Gate control input signal for counter.
Counter Up Clock Input	Count-up clock input signal for counter.
Counter Output	Counter output signal.
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.

CAUTION

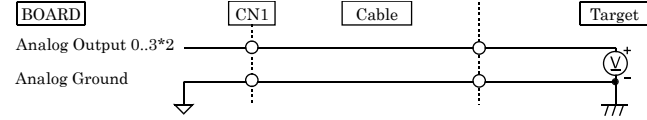
- Do not connect any of the outputs and power outputs to the analog or digital ground. Neither connect outputs to each other. Doing either can result in a fault.
- If analog and digital ground are shorted together, noise on the digital signals may affect the analog signals. Accordingly, analog and digital ground should be separated.
- Leave "Reserved" pins unconnected. Connecting these pins may cause a fault in the board.

Analog Output Signal Connection

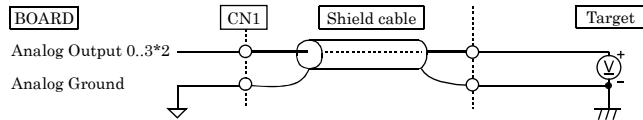
This section shows how to connect the analog output signal by using a flat cable or a shielded cable.

The following figure shows an example of flat cable connection. Connect the signal source and ground to the CN1 analog output.

Analog Output Connection (Flat Cable)



The following figure shows an example of shield cable connection. Use shielded cable if the distance between the signal source and board is long or if you want to provide better protection from noise. For each analog input channel on CN1, connect the core wire to the signal line and connect the shielding to ground.



CAUTION

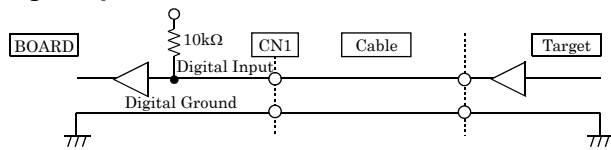
- If the board or the connected wire receives noise, or the distance between the board and the target is long, data may not be outputted properly.
- For analog output signal, the current capacity is $\pm 3\text{mA}$ (Max). Check the specification of the connected device before connecting the board.
- Do not short the analog output signal to analog ground, digital ground, and/or power line. Doing so may damage the board.
- Do not connect an analog output signal to any other analog output, either on the board or on an external device, as this may cause a fault on the board.

Digital I/O signals, Counter signals and Control signals Connection

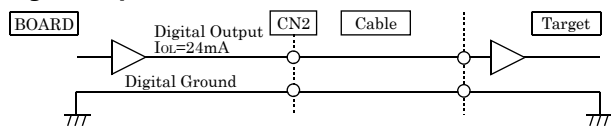
The following sections show examples of how to connect digital I/O signals, counter I/O signals, and other control I/O signals (external trigger input signals, sampling clock input signals, etc.).

All the digital I/O signals and control signals are TTL level signals.

Digital Input Connection



Digital Output Connection



About the counter input control signal

Counter Gate Control Input (refer to the chapter 3 Connector Pin Assignment) acts as an input that validate or invalidate the input of an external clock for the counter. This function enables the control of an external clock input for the counter. The external clock for the counter is effective when input is "High", and invalid when input is "Low". If unconnected, it is a pull-up in the board (card) and remains "High". Therefore the external clock for the counter is effective when the counter gate control input is not connected.

CAUTION

- Do not short the output signals to analog ground, digital ground, and/or power line. Doing so may damage the board.

Block Diagram

