

Bi-Directional Digital I/O
Board for PCI Express Low Profile
DIO-96D-LPE



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

Features

This board can be used to input/output 96 points bi-directional digital corresponding to the equivalence to the i8255 mode 0.

This board has up to 96 unisolated LVTTTL-level input/output channels whose response speed is 200μsec that is powered by to the equivalence to the mode 0 of i8255 device for general-purpose. You can select the input/output by the application software in eight signals units (in four signals unit for some inputs/outputs).

You can use up to 96channels of the input signals as interrupt events.

You can use up to 96channels of the input signals as interrupt events and also disable or enable the interrupt in bit units and select the edge of signals, at which to generate an interrupt.

- This product has a digital filter function to prevent wrong recognition of input signals from carrying noise or a chattering.

This product has a digital filter function to prevent wrong recognition of input signals by noise or chattering is provided. All input terminals can be added a digital filter, and the setting can be performed by software.

Windows/Linux compatible driver libraries are attached.

Using the attached driver library API-PAC(W32) makes it possible to create applications of Windows/Linux. In addition, a diagnostic program by which the operations of hardware can be checked is provided.

Support for both of Low Profile and standard size slots

Support for both of Low Profile and standard size slots (interchangeable with a bundled bracket).

Functions and connectors are compatible with PCI compatible board DIO-96D2-LPCI.

The functions same with PCI compatible board DIO-96D2-LPCI are provided. In addition, as there is compatibility in terms of connector shape and pin assignments, it is easy to migrate from the existing system.

LabVIEW is supported by a plug-in of dedicated library VI-DAQ.

Using the dedicated library VI-DAQ makes it possible to create each application for LabVIEW.

This product is a PCI Express bus-compliant interface board that extends the input/output function of bi-directional digital signal. This board has up to 96 unisolated LVTTTL-level input/output channels that is powered by the equivalence to the mode 0 of i8255 chips, and you can use up to 96 channels of the input signals as interrupt inputs. You can select the input/output by the application software in eight signals units (in four signals unit for some inputs/outputs). Additionally, the digital filter function is equipped with this product. Windows/Linux driver is bundled with this product.

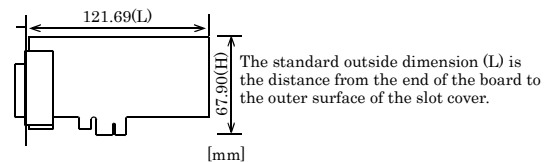
Using the dedicated library VI-DAQ makes it possible to create each application for LabVIEW.

Specification

Item	Specification
I/O	
I/O format	Unisolated LVTTTL-level I/O (Positive logic)
Number of I/O channels	96 channels (all available for interrupts)
Interrupt	96 interrupt input signals are arranged into a single output of interrupt signal INT. An interrupt is generated at the falling edge (HIGH-to-LOW transition) or rising edge (LOW-to-HIGH transition).
Response time	200nsec within
Rated output current	I _{OL} =8mA(Max.) I _{OI} =-8mA(Max.)
Common	
I/O address	Any 32-byte boundary (Common to I/O part)
Power consumption (Max.)	3.3VDC 300mA
Operating condition	0 - 50°C, 10 - 90%RH (No condensation)
Allowable distance of signal extension	Approx. 1.5m (depending on wiring environment)
Bus specification	PCI Express Base Specification Rev. 1.0a x1
Dimension (mm)	121.69(L) x 67.90(H)
Connector	68 pin 0.8mm pitch connector x 2 HDRA-E68W1LFDT+ [mfd. by HONDA TSUSHIN KOGYO CO., LTD.] or equivalent to it
Weight	60g

*1 "Data 0" and "1" correspond to the High and Low levels, respectively.

Board Dimensions



Support Software

Windows version of digital I/O driver API-DIO(98/PC) / API-DIO(WDM)

[Stored on the bundled CD-ROM driver library API-PAC(W32)]

The API-DIO(98/PC) 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.

< Operating environment >

OS Windows Vista, XP, Server 2003, 2000
Adaptation language Visual Basic, Visual C++, Visual C#, Delphi, C++ Builder

You can download the updated version from the CONTEC's Web site (<http://www.contec.com/apipac/>). 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-DIO(LNX)

[Stored on the bundled CD-ROM driver library API-PAC(W32)]

The API-DIO(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.

< Operating environment >

OS RedHatLinux, TurboLinux
(For details on supported distributions, refer to Help available after installation.)

Adaptation language gcc

You can download the updated version from the CONTEC's Web site (<http://www.contec.com/apipac/>). 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.

See <http://www.contec.com/vidaq/> for details and download of VI-DAQ.

Cable & Connector

Cable(Optional)

Cable with 68-Pin D-sub Connector at either Ends (Mold Type)
: PCB68PS-0.5P (0.5m)
: PCB68PS-1.5P (1.5m)

Shield Cable with One 68-Pin Connector

: PCA68PS-0.5P (0.5m)
: PCA68PS-1.5P (1.5m)

Shielded Cable for CardBusDigital I/O Card

: DIO-68M/96F (0.5m)

* If using both the CNA and CNB connectors, two cable sets are required.

Accessories

Accessories (Option)

Screw Terminal Unit (M3 x 68P) : EPD-68A *1*3
Screw Terminal Unit (M3 x 96P) : EPD-96A *2*3
Screw Terminal Unit (M3.5 x 96P) : EPD-96 *2
Terminal Unit for Cables (M2.5 x 96P) : DTP-64(PC) *2

*1 PCB68PS-0.5P or PCB68PS-1.5P optional cable is required separately.

*2 DIO-68M/96F optional cable is required separately.

*3 "Spring-up" type terminal is used to prevent terminal screws from falling off.

*4 If using both the CNA and CNB connectors, two each of the accessories and cable sets are required.

* Check the CONTEC's Web site for more information on these options.

Packing List

Board [DIO-96D-LPE] ... 1

First step guide ... 1

CD-ROM *1 [API-PAC(W32)] ... 1

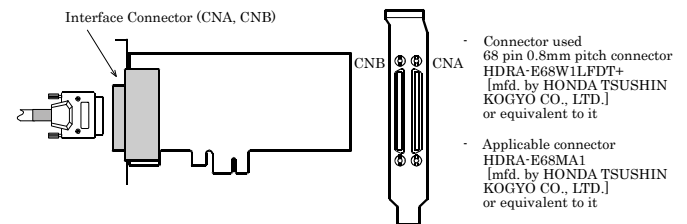
Standard-sized bracket ... 1

*1 The CD-ROM contains the driver software and User's Guide.

How to connect the connectors

Connecting a Device to a Connector

The on-board interface connector (CNA, CNB) is used when connecting this product and the external devices.



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

Connector Pin Assignment

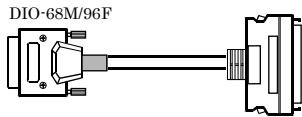
Pin Assignments of Interface Connector (CNA, CNB)

GND 68	34 GND	GND 1	35 GND
GND 67	33 GND	GND 2	36 GND
2-PC7 66	32 1-PC7	3-PA0 3	37 4-PA0
2-PC6 65	31 1-PC6	3-PA1 4	38 4-PA1
2-PC5 64	30 1-PC5	3-PA2 5	39 4-PA2
2-PC4 63	29 1-PC4	3-PA3 6	40 4-PA3
GND 62	28 GND	3-PA4 7	41 4-PA4
GND 61	27 GND	3-PA5 8	42 4-PA5
2-PC3 60	26 1-PC3	3-PA6 9	43 4-PA6
2-PC2 59	25 1-PC2	3-PA7 10	44 4-PA7
2-PC1 58	24 1-PC1	GND 11	45 GND
2-PC0 57	23 1-PC0	GND 12	46 GND
GND 56	22 GND	3-PB0 13	47 4-PB0
GND 55	21 GND	3-PB1 14	48 4-PB1
2-PB7 54	20 1-PB7	3-PB2 15	49 4-PB2
2-PB6 53	19 1-PB6	3-PB3 16	50 4-PB3
2-PB5 52	18 1-PB5	3-PB4 17	51 4-PB4
2-PB4 51	17 1-PB4	3-PB5 18	52 4-PB5
2-PB3 50	16 1-PB3	3-PB6 19	53 4-PB6
2-PB2 49	15 1-PB2	3-PB7 20	54 4-PB7
2-PB1 48	14 1-PB1	GND 21	55 GND
2-PB0 47	13 1-PB0	GND 22	56 GND
GND 46	12 GND	3-PC0 23	57 4-PC0
GND 45	11 GND	3-PC1 24	58 4-PC1
2-PA7 44	10 1-PA7	3-PC2 25	59 4-PC2
2-PA6 43	9 1-PA6	3-PC3 26	60 4-PC3
2-PA5 42	8 1-PA5	GND 27	61 GND
2-PA4 41	7 1-PA4	GND 28	62 GND
2-PA3 40	6 1-PA3	3-PC4 29	63 4-PC4
2-PA2 39	5 1-PA2	3-PC5 30	64 4-PC5
2-PA1 38	4 1-PA1	3-PC6 31	65 4-PC6
2-PA0 37	3 1-PA0	3-PC7 32	66 4-PC7
GND 36	2 GND	GND 33	67 GND
GND 35	1 GND	GND 34	68 GND

* I-00 - I-17 can be used as interrupt signal.

1-PA0	- 96 I/O signal pins. Connect signals from the external device to these pins.
4-PC7	
GND	Connected to slot GND

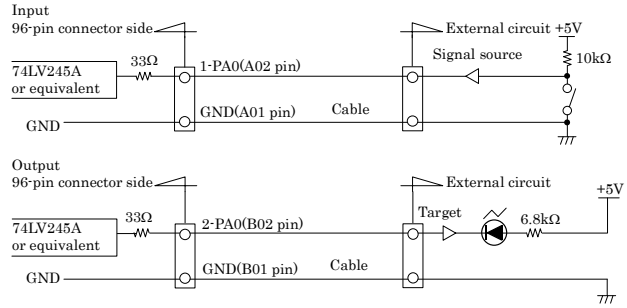
Pin assignments for connecting to the DIO-68M/96F used



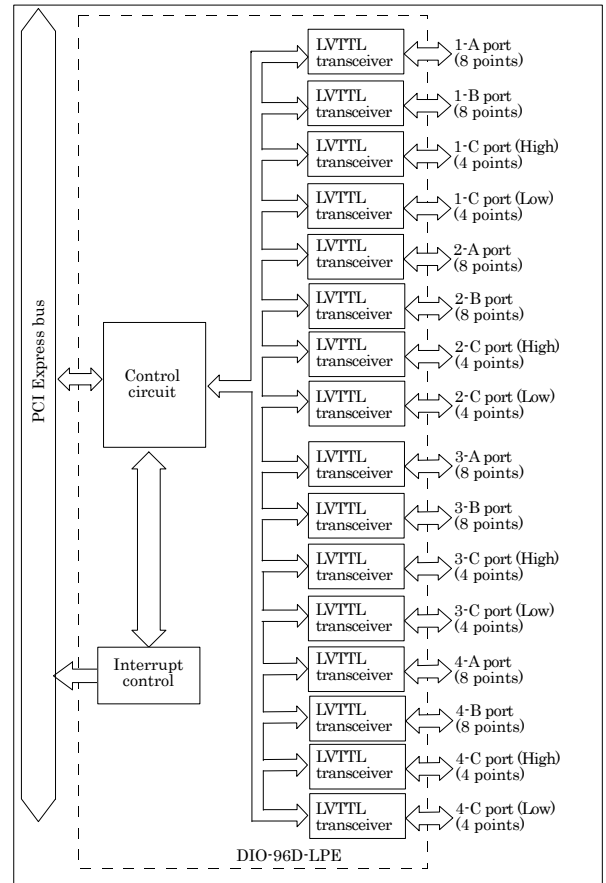
1-PC7 A48 GND A47 1-PC6 A46 GND A45 1-PC5 A44 GND A43 1-PC4 A42 GND A41	B48 2-PC7 B47 GND B46 2-PC6 B45 GND B44 2-PC5 B43 GND B42 2-PC4 B41 GND	3-PC7 A48 GND A47 3-PC6 A46 GND A45 3-PC5 A44 GND A43 3-PC4 A42 GND A41	B48 4-PC7 B47 GND B46 4-PC6 B45 GND B44 4-PC5 B43 GND B42 4-PC4 B41 GND
1-PC3 A40 GND A39 1-PC2 A38 GND A37 1-PC1 A36 GND A35 1-PC0 A34 GND A33	B40 2-PC3 B39 GND B38 2-PC2 B37 GND B36 2-PC1 B35 GND B34 2-PC0 B33 GND	3-PC3 A40 GND A39 3-PC2 A38 GND A37 3-PC1 A36 GND A35 3-PC0 A34 GND A33	B40 4-PC3 B39 GND B38 4-PC2 B37 GND B36 4-PC1 B35 GND B34 4-PC0 B33 GND
1-PB7 A32 GND A31 1-PB6 A30 GND A29 1-PB5 A28 GND A27 1-PB4 A26 GND A25	B32 2-PB7 B31 GND B30 2-PB6 B29 GND B28 2-PB5 B27 GND B26 2-PB4 B25 GND	3-PB7 A32 GND A31 3-PB6 A30 GND A29 3-PB5 A28 GND A27 3-PB4 A26 B25 GND	B32 4-PB7 B31 GND B30 4-PB6 B29 GND B28 4-PB5 B27 GND B26 4-PB4 B25 GND
1-PB3 A24 GND A23 1-PB2 A22 GND A21 1-PB1 A20 GND A19 1-PB0 A18 GND A17	B24 2-PB3 B23 GND B22 2-PB2 B21 GND B20 2-PB1 B19 GND B18 2-PB0 B17 GND	3-PB3 A24 GND A23 3-PB2 A22 GND A21 3-PB1 A20 GND A19 3-PB0 A18 GND A17	B24 4-PB3 B23 GND B22 4-PB2 B21 GND B20 4-PB1 B19 GND B18 4-PB0 B17 GND
1-PA7 A16 GND A15 1-PA6 A14 GND A13 1-PA5 A12 GND A11 1-PA4 A10 GND A09 1-PA3 A08 GND A07 1-PA2 A06 GND A05 1-PA1 A04 GND A03 1-PA0 A02 GND A01	B16 2-PA7 B15 GND B14 2-PA6 B13 GND B12 2-PA5 B11 GND B10 2-PA4 B09 GND B08 2-PA3 B07 GND B06 2-PA2 B05 GND B04 2-PA1 B03 GND B02 2-PA0 B01 GND	3-PA7 A16 GND A15 3-PA6 A14 GND A13 3-PA5 A12 GND A11 3-PA4 A10 GND A09 3-PA3 A08 GND A07 3-PA2 A06 GND A05 3-PA1 A04 GND A03 3-PA0 A02 GND A01	B16 4-PA7 B15 GND B14 4-PA6 B13 GND B12 4-PA5 B11 GND B10 4-PA4 B09 GND B08 4-PA3 B07 GND B06 4-PA2 B05 GND B04 4-PA1 B03 GND B02 4-PA0 B01 GND

[] shows the pin No. HONDA TSUSHIN KOGYO CO., LTD. Specification.

Example Connection 2 (Using DIO-68M/96F)



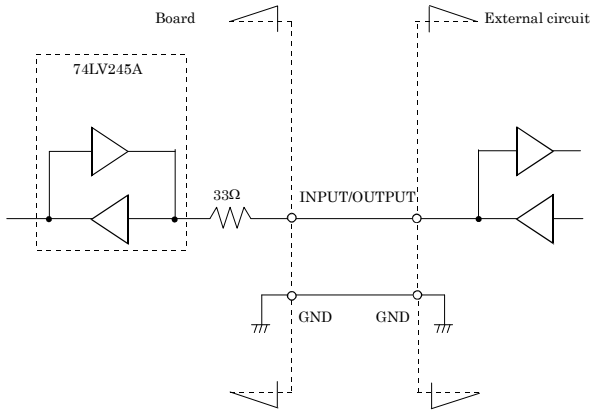
Block Diagram



Connecting I/O Signals

The I/O circuits of interface blocks of the DIO-96D-LPE are illustrated in the below Figure. Signals are LVTTTL-levels and positive logic. Each of the signal is pulled up.

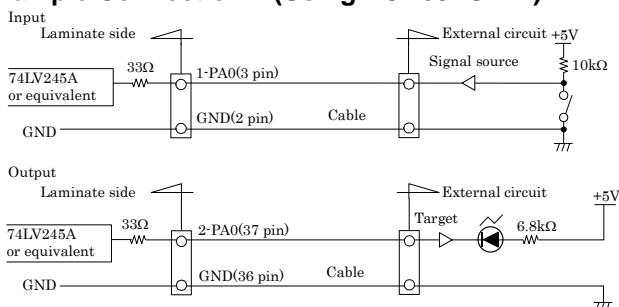
I/O Circuit



CAUTION

Take care not to short the outputs to digital ground as this may cause a fault.
If connecting pull-up resistors to the outputs, use a resistor of approximately 10kΩ and pull-up to the 5V power supply.

Example Connection 1 (Using PCA68PS-**P)



Difference from DIO-96D2-LPCI

The functions same with conventional product of DIO-96D2-LPCI are provided with the DIO-96D-LPE. In addition, as there is compatibility in terms of connector shape and pin assignments, it is easy to migrate from the existing system. So you can use the same operating procedures as DIO-96D2-LPCI.

There are some differences in specifications as shown below.

	DIO-96D2-LPCI	DIO-96D-LPE
I/O	Unisolated TTL-level I/O (Positive logic)	Unisolated LVTTTL-level I/O (Positive logic)
Rated output current	$I_{OL}=24\text{mA(Max.)}$ $I_{OH}=-15\text{mA(Max.)}$	$I_{OL}=8\text{mA(Max.)}$ $I_{OH}=-8\text{mA(Max.)}$
Power consumption	5VDC 950mA(Max.)	3.3VDC 300mA(Max.)
Bus specification	32-bit, 33MHz, Universal key shapes supported (The 5V pin on the bus must supply 5V.)	PCI Express Base Specification Rev. 1.0a x1
Dimension (mm)	121.69(L) x 63.41(H)	121.69(L) x 67.90(H)