Bi-Directional Digital I/O Board for PCI Low Profile

DIO-96D2-LPCI

This product is a Low Profile size PCI bus-compliant interface board that extends the input/output function of bi-directional digital signal.   This board has up to 96 unisolated TTL-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.

* 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 TTL-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).

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.

Specification

Item		Specification
I/O		
	I/O format	Unisolated TTL-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}=24mA(Max.) I_{OH}=-15mA(Max.)
Common		
	I/O address	Any 32-byte boundary (Common to I/O part)
	Power consumption	5VDC 950mA (Max.)
	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 (33bit, 33MHz, Universal key shapes supported *2)
	Dimension (mm)	121.69(L) x 63.41 (H)
	Connector	68 pin 0.8mm pitch connector x 2 HDRA-E68W1LFDT+ [mfd. by HONDA TSUSHIN KOGYO CO., LTD.] or equivalent to it
	Weight	100g
Certification		RoHS,CE,VCCI

*1   Data "0" and "1" correspond to the High and Low levels, respectively.
*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
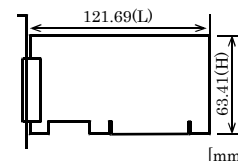
[mm]
The standard outside dimension (L) is the distance from the end of the board to the outer surface of the slot cover.

Support Software

Windows version of digital I/O driver API-DIO(98/PC) / API-DIO(WDM)
[Stored on the bundled Disk 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.
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 Disk 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.
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(Option)
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)
Terminal Unit for Cables   : DTP-64(PC) *1
Screw Terminal (M3 x 96)   : EPD-96A *1
Screw Terminal (M3.5 x 96)   : EPD-96 *1
Screw Terminal (M3 x 68)   : EPD-68A *2

*1   DIO-68M/96F optional cable is required separately.
*2   PCB68PS-0.5P or PCB68PS-1.5P optional cable is required separately.
*3   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-96D2-LPCI] …1
First step guide … 1
Disk *1 [API-PAC(W32)] …1
Standard size bracket …1
Serial number label…1
Product Registration Card & Warranty Certificate…1
*1   The Disk contains the driver software and User's Guide.

Using the On-board Connectors

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

- Connector used
  68 pin 0.8mm pitch connector
  HDRA-E68W1LFDT+
  [mfd. by HONDA TSUSHIN KOGYO CO., LTD.]
  or equivalent to it

- Applicable connector
  HDRA-E68MA1
  [mfd. by HONDA TSUSHIN KOGYO CO., LTD.]
  or equivalent to it
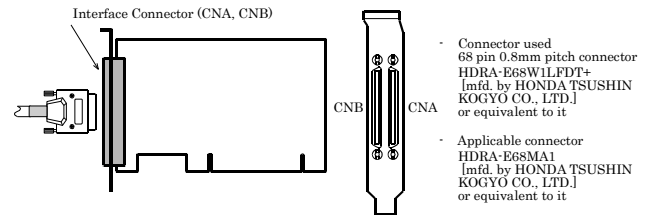
*   Please refer to page 2 for more information on the supported cable and accessories.

Connector Pin Assignment
<Pin Assignments of Interface Connector (CNA, CNB) for DIO-96D2-LPCI>
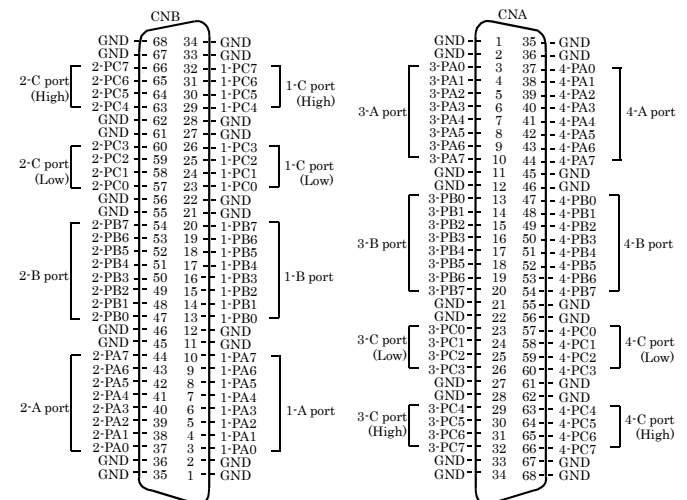
1-PA0 - 4-PC7	96 I/O signal pins. Connect signals from the external device to these pins.
GND	Connected to slot GND

< Pin assignments for connecting to the DIO-68M/96F used >
The figure below shows the correspondence between the option cable pins and signals.

DIO-68M/96F

For connecting to the board CNB

	[1]	[49]	
-PC7	A48	B48	-PC7
GND	A47	B47	-GND
-PC6	A46	B46	-PC6
GND	A45	B45	-GND
-PC5	A44	B44	-PC5
GND	A43	B43	-GND
-PC4	A42	B42	-PC4
GND	A41	B41	-GND
-PC3	A40	B40	-PC3
GND	A39	B39	-GND
-PC2	A38	B38	-PC2
GND	A37	B37	-GND
-PC1	A36	B36	-PC1
GND	A35	B35	-GND
-PC0	A34	B34	-PC0
GND	A33	B33	-GND
-PB7	A32	B32	-PB7
GND	A31	B31	-GND
-PB6	A30	B30	-PB6
GND	A29	B29	-GND
-PB5	A28	B28	-PB5
GND	A27	B27	-GND
-PB4	A26	B26	-PB4
GND	A25	B25	-GND
-PB3	A24	B24	-PB3
GND	A23	B23	-GND
-PB2	A22	B22	-PB2
GND	A21	B21	-GND
-PB1	A20	B20	-PB1
GND	A19	B19	-GND
-PB0	A18	B18	-PB0
GND	A17	B17	-GND
-PA7	A16	B16	-PA7
GND	A15	B15	-GND
-PA6	A14	B14	-PA6
GND	A13	B13	-GND
-PA5	A12	B12	-PA5
GND	A11	B11	-GND
-PA4	A10	B10	-PA4
GND	A09	B09	-GND
-PA3	A08	B08	-PA3
GND	A07	B07	-GND
-PA2	A06	B06	-PA2
GND	A05	B05	-GND
-PA1	A04	B04	-PA1
GND	A03	B03	-GND
-PA0	A02	B02	-PA0
GND	A01	B01	-GND
	[48]	[96]	

1-C port (High), 1-C port (Low), 1-B port, 1-A port (CNB side, columns A)
2-C port (High), 2-C port (Low), 2-B port, 2-A port; 3-C port (High), 3-C port (Low), 3-B port, 3-A port (columns B)

For connecting to the board CNA

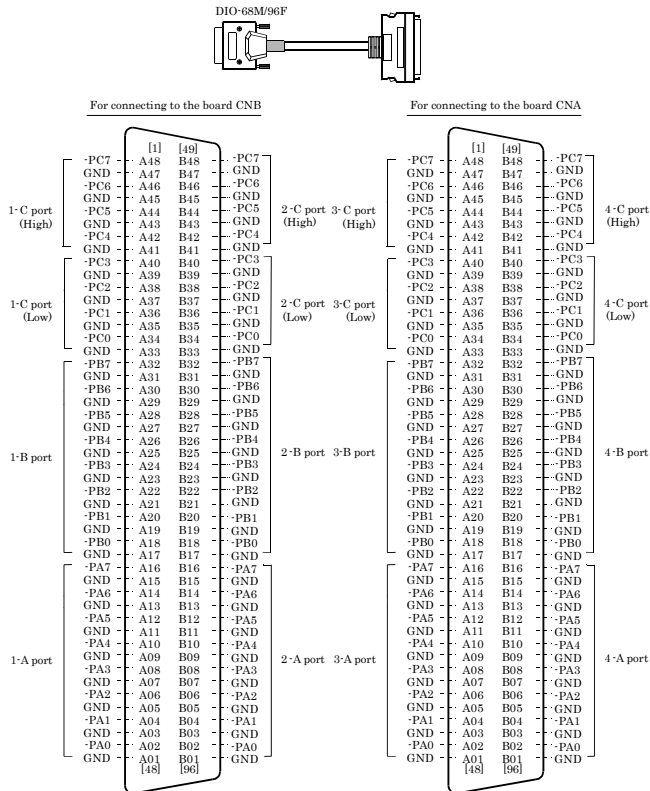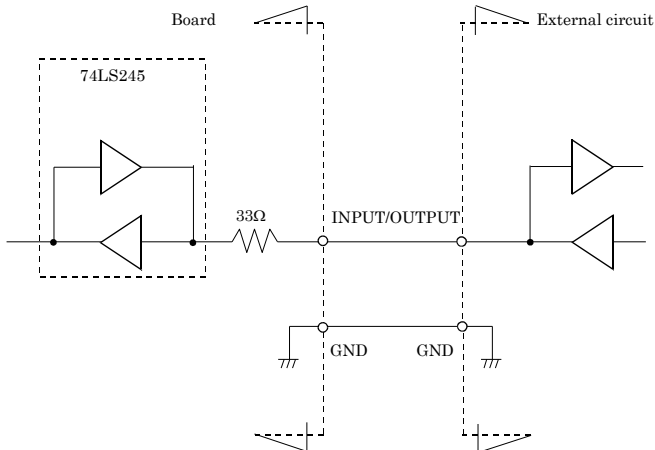|	[1]	[49]	
-PC7	A48	B48	-PC7
GND	A47	B47	-GND
-PC6	A46	B46	-PC6
GND	A45	B45	-GND
-PC5	A44	B44	-PC5
GND	A43	B43	-GND
-PC4	A42	B42	-PC4
GND	A41	B41	-GND
-PC3	A40	B40	-PC3
GND	A39	B39	-GND
-PC2	A38	B38	-PC2
GND	A37	B37	-GND
-PC1	A36	B36	-PC1
GND	A35	B35	-GND
-PC0	A34	B34	-PC0
GND	A33	B33	-GND
-PB7	A32	B32	-PB7
GND	A31	B31	-GND
-PB6	A30	B30	-PB6
GND	A29	B29	-GND
-PB5	A28	B28	-PB5
GND	A27	B27	-GND
-PB4	A26	B26	-PB4
GND	A25	B25	-GND
-PB3	A24	B24	-PB3
GND	A23	B23	-GND
-PB2	A22	B22	-PB2
GND	A21	B21	-GND
-PB1	A20	B20	-PB1
GND	A19	B19	-GND
-PB0	A18	B18	-PB0
GND	A17	B17	-GND
-PA7	A16	B16	-PA7
GND	A15	B15	-GND
-PA6	A14	B14	-PA6
GND	A13	B13	-GND
-PA5	A12	B12	-PA5
GND	A11	B11	-GND
-PA4	A10	B10	-PA4
GND	A09	B09	-GND
-PA3	A08	B08	-PA3
GND	A07	B07	-GND
-PA2	A06	B06	-PA2
GND	A05	B05	-GND
-PA1	A04	B04	-PA1
GND	A03	B03	-GND
-PA0	A02	B02	-PA0
GND	A01	B01	-GND
	[48]	[96]	

4-C port (High), 4-C port (Low), 4-B port, 4-A port

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

Example Connection 1 (Using PCA68PS-**P)

Connection Example Using 1-PA0 for Input and 2-PA0 for Output

Input
Laminate side — External circuit +5V
74LS245 or equivalent — 33Ω — 1-PA0(3 pin) — Signal source — 10kΩ
GND — GND(2 pin) — Cable

Output
Laminate side — External circuit +5V
74LS245 or equivalent — 33Ω — 2-PA0(37 pin) — Target — 6.8kΩ
GND — GND(36 pin) — Cable

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

Connection Example Using 1-PA0 for Input and 2-PA0 for Output

Input
96-pin connector side — External circuit +5V
74LS245 or equivalent — 33Ω — 1-PA0(A02 pin) — Signal source — 10kΩ
GND — GND(A01 pin) — Cable

Output
96-pin connector side — External circuit +5V
74LS245 or equivalent — 33Ω — 2-PA0(B02 pin) — Target — 6.8kΩ
GND — GND(B01 pin) — Cable

Connecting I/O Signals

The I/O circuits of interface blocks of the DIO-96D2-LPCI are illustrated in Figure below.   Signals are TTL levels and positive logic.   Each of the signal is pulled up.

I/O Circuit

Board — External circuit
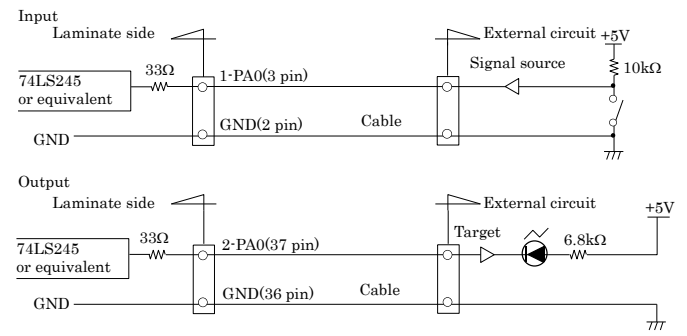74LS245
33Ω — INPUT/OUTPUT
GND   GND

⚠ 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.
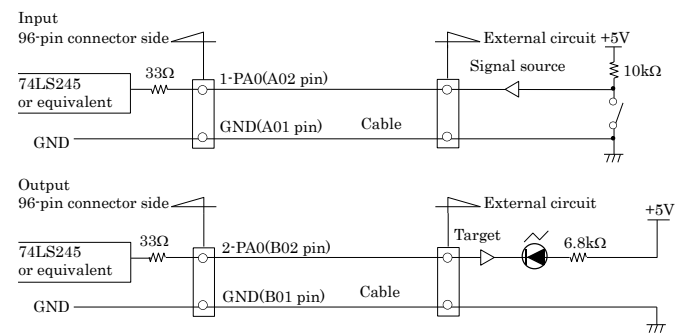
Block Diagram

PCI BUS — Control circuit — Interrupt control

TTL transceiver — 1-A port (8 points)
TTL transceiver — 1-B port (8 points)
TTL transceiver — 1-C port (High) (4 points)
TTL transceiver — 1-C port (Low) (4 points)
TTL transceiver — 2-A port (8 points)
TTL transceiver — 2-B port (8 points)
TTL transceiver — 2-C port (High) (4 points)
TTL transceiver — 2-C port (Low) (4 points)
TTL transceiver — 3-A port (8 points)
TTL transceiver — 3-B port (8 points)
TTL transceiver — 3-C port (High) (4 points)
TTL transceiver — 3-C port (Low) (4 points)
TTL transceiver — 4-A port (8 points)
TTL transceiver — 4-B port (8 points)
TTL transceiver — 4-C port (High) (4 points)
TTL transceiver — 4-C port (Low) (4 points)

DIO-96D2-LPCI