Bi-Directional Digital I/O Board for PCI Express
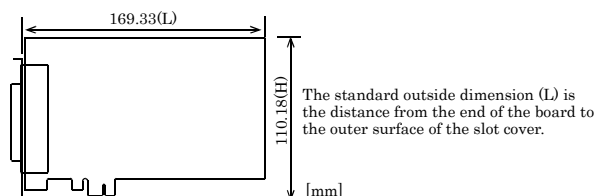# DIO-48D-PE

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 48 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 48 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 drivers are available.
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 TTL-level input/output 48 points bi-directional digital corresponding to to the equivalence to the i8255 mode 0.

This board has up to 48 unisolated TTL-level input/output channels whose response speed is 200nsec 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 48channels of the input signals as interrupt events.

You can use up to 48channels 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 drivers are available

By using the digital I/O driver, each Windows/Linux application can be created.   In addition, a diagnostic program by which the operations of hardware can be checked is provided.

Functions are compatible with PCI compatible board DIO-48D2-PCI.

The functions same with PCI compatible board DIO-48D2-PCI 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.

Specification

Item		Specification
I/O		
	I/O format	Unisolated TTL-level I/O (Positive logic) *1
	Number of I/O channels	48 channels (all available for interrupts)
	Pull-up registance	10kΩ
	Interrupt	48 interrupt input signals are arranged into a single output of interrupt signal INTA. An interrupt is generated at the rising edge (LOW-to-HIGH transition).
	Response time	Within 200nsec
	Rated output current	I_{OL}=24mA (Max.) I_{OH}=-15mA (Max.)
Common		
	External supply capable current (Max.)	5VDC 350mA
	I/O address	Any 32-byte boundary (Common to I/O part)
	Power consumption (Max)	3.3VDC 1000mA
	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)	169.33 (L) x 110.18(H)
	Connector	
	CN1	96 pin half pitch connector [M (male) type] PCR-E96LMD+ [mfd. by HONDA TSUSHIN KOGYO CO., LTD.] or equivalent to it
	CN2,3	50 pin IC pitch pin header connector PS-50PE-D4T1-B1A [mfd.by JAE] or equivalent to it
	Weight	140g
Certification		VCCI Class A, CE Marking (EMC Directive Class A, RoHS Directive), UKCA

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

Board Dimensions

169.33(L)

110.18(H)

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

[mm]

Support Software

You should use CONTEC support software according to your purpose and development environment.

The name of the documents	Contents	How to get
Digital I/O Driver software API-DIO(WDM)	Driver software of digital input and output for Windows.	Download (ZIP)
Digital I/O Driver software API-DIO(LNX)	Driver software of digital input and output for Linux.	Download (tgz)
LabVIEW-support data acquisition library DAQfast for LabVIEW	This is a data collection library to use in the LabVIEW by National Instruments. With Polymorphic VI, our design enables a LabVIEW user to operate seamlessly. Our aim is that the customers to perform easily, promptly what they wish to do.	Download (ZIP)

* Download the software from the CONTEC website.

Option

Item	Model	Description
Cable	PCB96PS-0.5P (0.5m) PCB96PS-1.5P (1.5m)	Shield Cable with 96-Pin Half-Pitch Connector at Both Ends (Mold Type)
	PCB96P-1.5 (1.5m)	Flat Cable with 96-Pin Half-Pitch Connectors at Both Ends
	PCA96PS-0.5P (0.5m) PCA96PS-1.5P (1.5m)	Shield Cable with 96-Pin Half-Pitch Connector at One End (Mold Type)
	PCA96P-1.5 (1.5m)	Flat Cable with 96-Pin Half-Pitch Connector at One End
Accessories	EPD-96A *1*2	Screw Terminal Unit (M3 x 96P)
	EPD-96 *1	Screw Terminal Unit (M3.5 x 96P)
	DTP-64A *1	Terminal Unit for Cables (M3 x 96P)

*1   A PCB96P or PCB96PS optional cable is required separately.

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

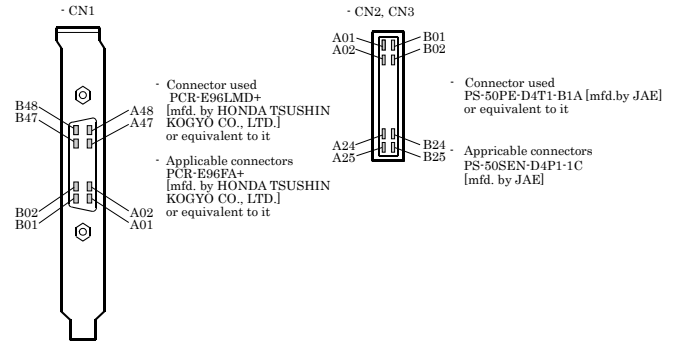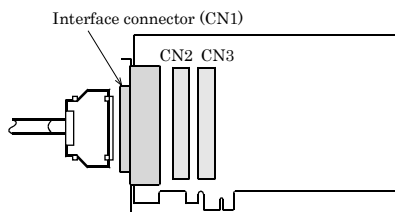*   Check the CONTEC's Web site for more information on these options.

Packing List

Board [DIO-48D-PE] …1
Setup Guide … 1
Standard-sized bracket …1
Serial number label…1
Warranty Certificate…1

How to connect the connectors

Connector shape and optional cable connection
To connect an external device to this board, plug the cable from the device into the interface connector (CN1 or CN2 and CN3) shown below.

Interface connector (CN1)
CN2 CN3

- CN1
- CN2, CN3

- Connector used PCR-E96LMD+ [mfd. by HONDA TSUSHIN KOGYO CO., LTD.] or equivalent to it
- Applicable connectors PCR-E96FA+ [mfd. by HONDA TSUSHIN KOGYO CO., LTD.] or equivalent to it

- Connector used PS-50PE-D4T1-B1A [mfd.by JAE] or equivalent to it
- Appricable connectors PS-50SEN-D4P1-1C [mfd. by JAE]

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

⚠ CAUTION

CN2 and CN3 are designed assuming the connection to any other board or device in the same PC (system).

For connecting CN2 or CN3 to a device outside the PC, use an adjacent expansion slot as required.

The 96-pin connector (CN1) and 50-pin connectors (CN2 and CN3) are mutually exclusive.   Use either of them at a time.

Connector Pin Assignment
Pin Assignments of Interface Connector (CN1)

* The numbers in square brackets [ ] are pin numbers designated by HONDA TSUSHIN KOGYO CO., LTD.
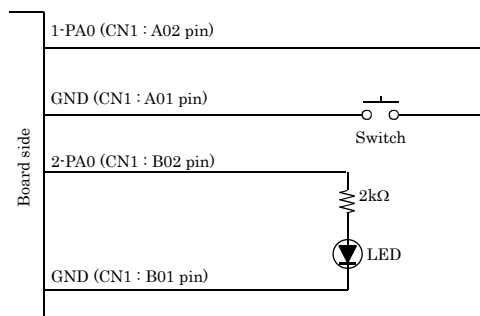
Connecting I/O Signals

The I/O circuits of interface blocks of this board are illustrated in the below Figure.   Signals are TTL levels and positive logic.

I/O Circuit
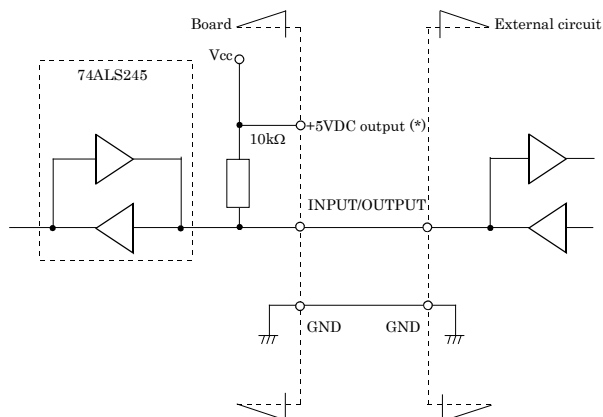
(*)   Only CN2 and CN3 has +5VDC output pin.   Current to be able to supplied is within 350mA (total).

Example of Connection

When switch is "ON", the corresponding bit is "0".   When switch is "OFF" in contrast, the corresponding bit is "1".
When "1" is output to a relevant bit, the corresponding LED comes on.   When "0" is output to the bit, in contrast, the LED goes out.

About the Protection Feature

The +5VDC output of the board is provided with a PolySwitch-based protection feature.   If the +5VDC output is accidentally connected to GND, the protection feature works and it may disable the board temporarily.   In that case, turn the PC off, wait for a few minutes, then turn the PC back on.

Block Diagram
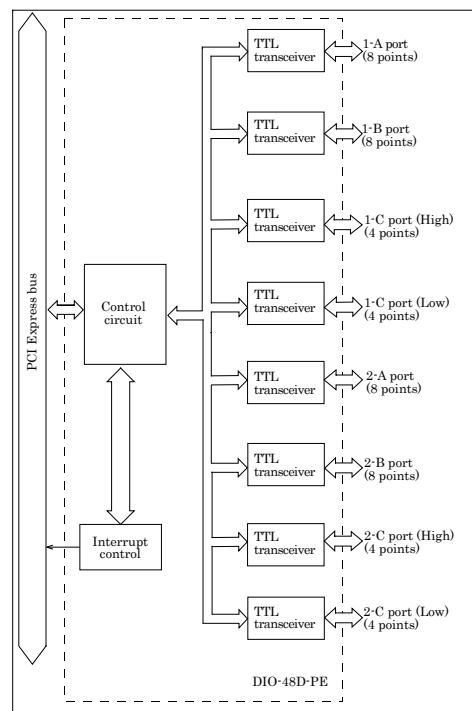
Difference from DIO-48D2-PCI

The functions same with conventional product of DIO-48D2-PCI are provided with the DIO-48D-PE.   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-48D2-PCI.
There are some differences in specifications as shown below.

	DIO-48D2-PCI	DIO-48D-PE
Power consumption	5VDC 600mA (Max.)	3.3VDC 1000mA (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)	176.41(L) x 106.68(H)	169.33 (L) x 110.18(H)