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Find the *Contec DIO-1616T-PE* at our website: ***Click HERE***

Digital I/O board for PCI Express

DIO-1616T-PE



This product is a PCI Express bus-compliant interface board used to provide a digital signal I/O function on a PC.
The < DIO-1616T-PE > features 16 unisolated TTL level inputs and 16 unisolated open-collector outputs. You can use 16 input signals as interrupt inputs. In addition, the digital filter function to prevent wrong recognition of input signals is provided.
Windows/Linux driver is bundled with this product.
Possible to be used as a data recording device for LabVIEW, with dedicated libraries.

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

Features

Unisolated TTL level input, unisolated open-collector output
The < DIO-1616T-PE > has the 16ch of unisolated TTL level input and 16ch of unisolated open-collector output whose response speed is 200nsec.
The output rating is max. 30VDC, 40mA per ch.

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

This product has a digital filter to prevent wrong recognition of input signals from carrying noise or a chattering.
This product has a digital filter to prevent wrong recognition of input signals from carrying noise or a chattering. 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 Window/Linux. In addition, a diagnostic program by which the operations of hardware can be checked is provided.

Functions and connectors are compatible with PCI compatible board PIO-16/16T(PCI)H.
The functions same with PCI compatible board PIO-16/16T(PCI)H 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.

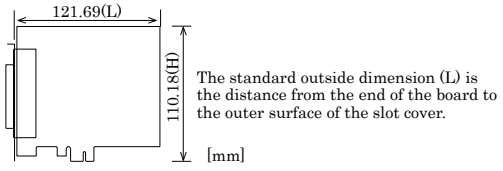
LabVIEW is supported by a plug-in of dedicated library VI-DAQ.
Using the dedicated library VI-DAQ makes it possible to make a LabVIEW application.

Specifications

Item		Specification
Input		
Input format		Unisolated TTL level input (Negative logic *1)
Number of input signal channels		16ch (all available for interrupts) (1 common)
Input resistance		10kΩ (1 TTL level load)
Interrupt		16 interrupt input signals are arranged into a single output of interrupt signal INTA. An interrupt is generated at the rising edge (HIGH-to-LOW transition) or falling edge (LOW-to-HIGH transition).
Response time		Within 200nsec
Output		
Output format		Unisolated open-collector output (Negative logic *1)
Number of output signal channels		16ch (1 common)
Output rating	Output voltage	30VDC (Max.)
	Output current	40mA (par channel) (Max.)
Response time		Within 200nsec (Variable with pull-up resistance)
Common		
External supply capable current (Max.)		5VDC 350mA
Allowable distance of signal extension		Approx. 1.5m (depending on wiring environment)
I/O address		Any 32-byte boundary
Interruption level		1 level use
Max. board count for connection		16 boards including the master board
Power consumption (Max.)		3.3VDC 400mA
Operating condition		0 - 50°C, 10 - 90%RH (No condensation)
Bus specification		PCI Express Base Specification Rev. 1.0a x1
Dimension (mm)		121.69(L) x 110.18(H)
Connector		37-Pin D-SUB connector [F(female)type] DCLC-J37SAF-20L9 [mfd by JAE] or equivalent to it
Weight		80g
Certification		RoHS,CE,VCCI

*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(WDM) / API-DIO(98/PC)
[Stored on the bundled Disk driver library API-PAC(W32)]

The API-DIO(WDM) / 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

Flat Cable with 37-Pin D-sub Connectors at either Ends
: PCB37P-1.5 (1.5m)
Shield Cable with 37-Pin D-sub Connector
at either Ends (Mold Type) : PCB37PS-0.5P (0.5m)
: PCB37PS-1.5P (1.5m)
Flat Cable with 37-Pin D-sub Connector at One End
: PCA37P-1.5 (1.5m)
Shield Cable with 37-Pin D-sub Connector
at One End (Mold Type) : PCA37PS-0.5P (1.5m)
: PCA37PS-1.5P (1.5m)
D-SUB37P Male Connector Set (5 Pieces) : CN5-D37M

Accessories

Screw Terminal Unit (M3 x 37P) : PCB37P-1.5 (1.5m)
Screw Terminal Unit (M3.5 x 37P) : EPD-37 *1
General Purpose Terminal (M3 x 37P) : DTP-3A *1
Screw Terminal (M2.6 x 37P) : DTP-4A *1
Signal Monitor / Output Accessory for Digital I/O (32P)
: CM-32(PC)E *1

*1 A PCB37P-1.5 or PCB37PS-0.5P, 1.5P 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

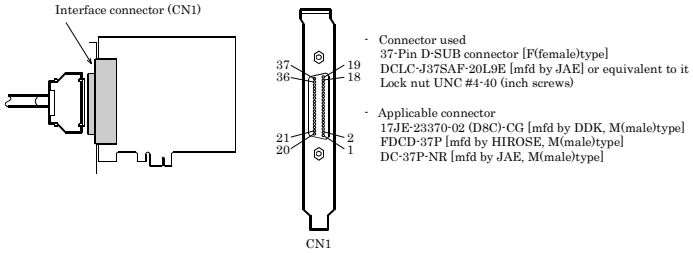
Board [DIO-1616T-PE] …1
First step guide … 1
Serial number label … 1
Product Registration Card & Warranty Certificate … 1
Disk *1 [API-PAC(W32)] …1

*1 The Disk contains the driver software and User's Guide.

How to connect the connectors

Connector shape

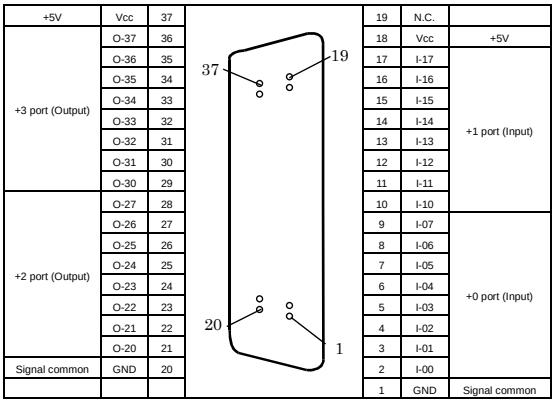
The on-board interface connector (CN1) is used when connecting this product and the external devices.



* Please refer to chapter 1 for more information on the supported cable and accessories.

Connector Pin Assignment

Pin Assignments of Interface Connector (CN1)



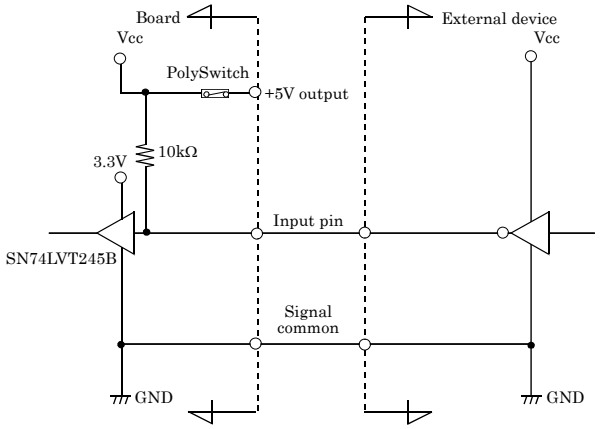
+5V	Vcc	37	19	N.C.	
	O-37	36	18	Vcc	+5V
	O-36	35	17	I-17	
	O-35	34	16	I-16	
+3 port (Output)	O-34	33	15	I-15	
	O-33	32	14	I-14	+1 port (Input)
	O-32	31	13	I-13	
	O-31	30	12	I-12	
	O-30	29	11	I-11	
	O-27	28	10	I-10	
	O-26	27	9	I-07	
	O-25	26	8	I-06	
+2 port (Output)	O-24	25	7	I-05	
	O-23	24	6	I-04	+0 port (Input)
	O-22	23	5	I-03	
	O-21	22	4	I-02	
	O-20	21	3	I-01	
Signal common	GND	20	2	I-00	
			1	GND	Signal common

I-00 - I-17	16 input signal pins. Connect output signals from the external device to these pins.
O-20 - O-37	16 output signal pins. Connect these pins to the input signal pins of the external device.
Vcc	This pin outputs power at +5V. Max. electrical current is 350mA.
GND	This pin is connected to the slot's GND.
N.C.	This pin is left unconnected.

How to Connect Input Signals

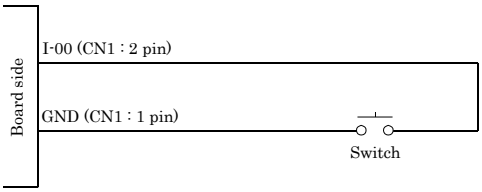
The input circuit of interface is illustrated in the below figure. External digital signals given to signal inputs are TTL levels. The individual input signals are passed to the personal computer as negative logic signals. As each of the signal inputs is pulled up internally, the output of a relay contact or semiconductor switch can be connected directly between the signal input and the signal common pin.

Input Circuit



* I-xx represents an input pin.
One polyswitch is connected for Vcc(+5V) terminal.

Connecting to the Switch

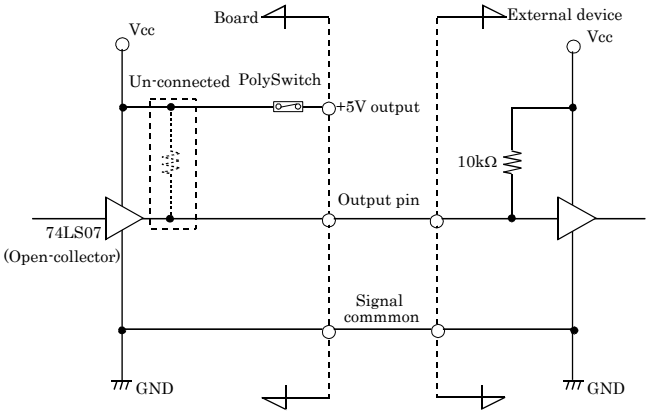


When the switch is ON, the corresponding bit contains 1.
When the switch is OFF, by contrast, the bit contains 0.

How to Connect Output Signals

The output circuit of interface is illustrated in the below figure. Signal outputs are open-collector outputs; individual output signals are sent to the external device as negative logic signals. Note that each signal output must be pulled up at the external device as it is not pulled up internally.

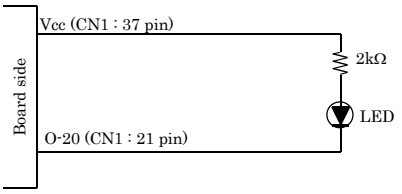
Output Circuit



* O-xx represents an output pin.
One polyswitch is connected for Vcc(+5V) terminal.

⚠ CAUTION
When the PC is turned on, all output are reset to OFF.

Connecting to the LED

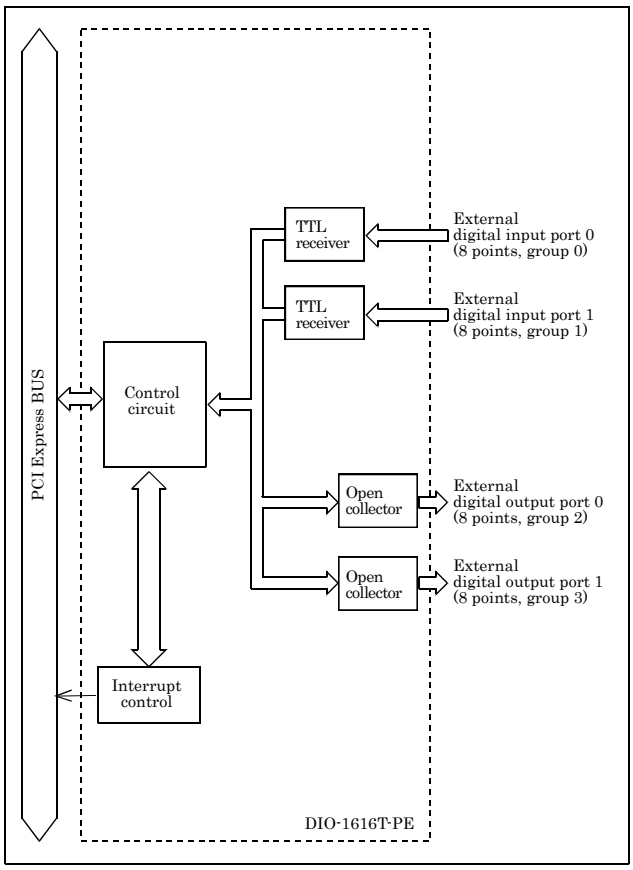


When "1" is output to a relevant bit, the corresponding LED comes on.
When "0" is output to the bit, in contrast, the LED goes out.

A Protection Function of the +5V Outputs

A protection function, which prevents excessive current flow from the +5V outputs, is attached to this board. In case of accidental short of the +5V output and GND, for example, the function works, and the board operation may become impossible temporarily. In such a case, you should turn the PC off and wait for several minutes before you use the board again.

Block Diagram



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