Digital Input Board with Opto-Isolation for PCI

PI-32L(PCI)H

This product is a PCI-compliant interface board used to provide a digital signal input function on a PC.
This product can input digital signals at 12 - 24VDC.

PI-32L(PCI)H features 32 opto-coupler isolated inputs. You can use 32 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.
* 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 May, 2018.

Features

Opto-coupler isolated input (compatible with current sink output) and opto-coupler isolated open-collector output (current sink type)
PI-32L(PCI)H has the 32ch of opto-coupler isolated input (compatible with current sink output) whose response speed is 200µsec. Common terminal provided per 16channels, capable of supporting a different external power supply. Supporting driver voltages of 12 - 24 VDC for I/O.

Opto-coupler bus isolation
As the PC is isolated from the input and output interfaces by opto-couplers, this product has excellent noise performance.

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.

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.

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.

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

Packing List

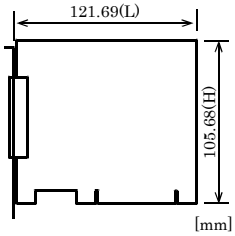
Board [PI-32L(PCI)H] ...1
First step guide ... 1
Disk *1 [API-PAC(W32)] ...1
Warranty Certificate ...1
Serial Number Label...1

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

Specification

Item		Specification
Input section		
	Input format	Opto-coupler isolated input (Compatible with current sink output)(Negative logic *1)
	Number of input signal channels	32 channels (all available for interrupts) (One common power supply per 16 channels)
	Input resistance	4.7kΩ
	Input ON current	2.0mA or more
	Input OFF current	0.16mA or less
	interrupt	32 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	200µsec within
Common section		
	I/O address	Any 32-byte boundary
	Interruption level	1 level use
	Max. board count for connection	16 boards including the master board
	Dielectric strength	1000Vrms
	External circuit power supply	12 - 24VDC(±10%)
	Power consumption	5VDC 200mA (Max.)
	Operating condition	0 - 50°C, 10 - 90%RH (No condensation)
	Allowable distance of signal extension	Approx. 50m (depending on wiring environment)
	PCI bus specification	33bit, 33MHz, Universal key shapes supported *2
	Dimension (mm)	121.69(L) x 105.68(H)
	Weight	130g
	Standard	VCCI Class A, CE Marking (EMC Directive Class A, RoHS Directive)

*1 Data "0" and "1" correspond to the High and Low levels, respectively.
*2 This board requires power supply at +5 V from an expansion slot (it does not work on a machine with a +3.3V power supply alone).



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(WDM)/ API-DIO(98/PC)
[Stored on the bundled disk driver library API-PAC(W32)]
The API-DIO(WDM) 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 *1useful for checking operation is provided.

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.

For more details on the supported OS, applicable language and new information, please visit the CONTEC's Web site.

LabVIEW-support data acquisition library DAQfast for LabVIEW (Available for downloading (free of charge) from the CONTEC web site.)
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.

For more details on the library and download of DAQfast for LabVIEW, please visit the CONTEC's Web site.

Data acquisition 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.

For more details on the library and download of VI-DAQ, please visit the CONTEC's Web site.

Cable & Connector (Option)

Flat Cable with a 37-Pin D-type Connectors on 2Ends

PCB37P-1.5 (1.5m)
PCB37P-3 (3m)
PCB37P-5 (5m)

Shielded cable with two 37-pin D- Type connectors

PCB37PS-0.5P (0.5m)
PCB37PS-1.5P (1.5m)
PCB37PS-3P (3m)
PCB37PS-5P (5m)

Flat Cable with a 37-pin D-type Connector

PCA37P-1.5 (1.5m)
PCA37P-3 (3m)
PCA37P-5 (5m)

Shielded Cable with Two 37-pin D-Type Connectors

PCA37PS-0.5P (0.5m)
PCA37PS-1.5P (1.5m)
PCA37PS-3P (3m)
PCA37PS-5P (5m)

Accessories (Option)

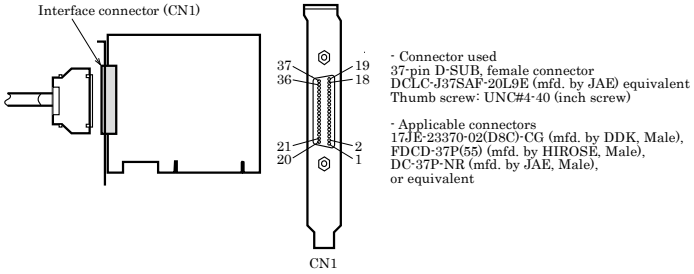
Screw Terminal (M3 x 37P)	EPD-37A *1*2
Screw Terminal (M3.5 x 37P)	EPD-37 *1
General Purpose Terminal (M3 x 37P)	DTP-3A *1
Screw Terminal (M2.5 x 37P)	DTP-4C *1
Signal Monitor for Digital I/O (32Bits)	CM-32L *1

*1 A PCB37P or PCB37PS 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.

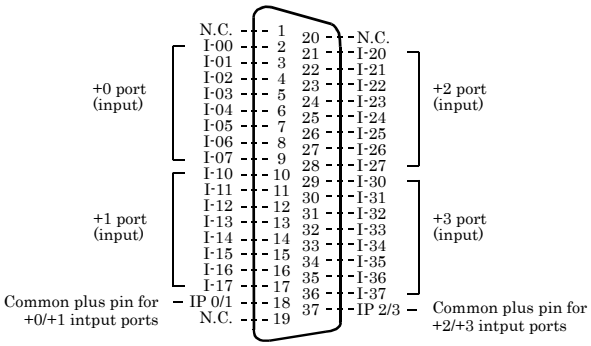
On-board connector wiring

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)

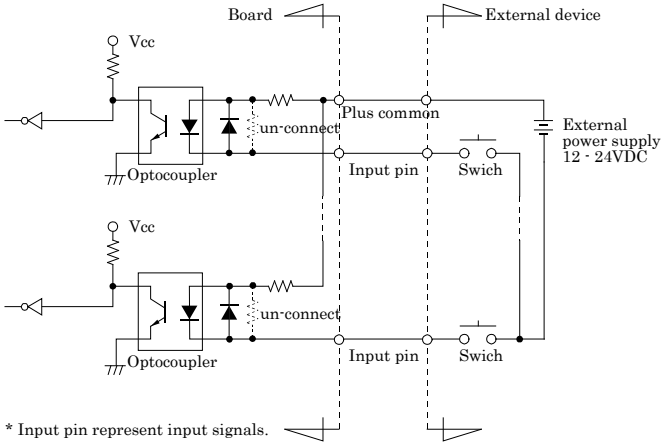


I-00 - I-37	32 input signal pins. Connect output signals from the external device to these pins.
IP 0/1 - IP 2/3	Connect the positive side of the external power supply. These pins are common to 16 input signal pins.
N.C.	This pin is left unconnected.

Connecting Input Signals

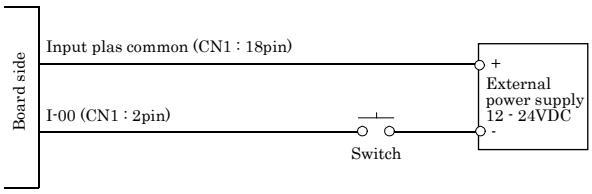
Connect the input signals to a device which can be current-driven, such as a switch or transistor output device.
The connection requires an external power supply to feed currents.
The board inputs the ON/OFF state of the current-driven device as a digital value.

Input Circuit



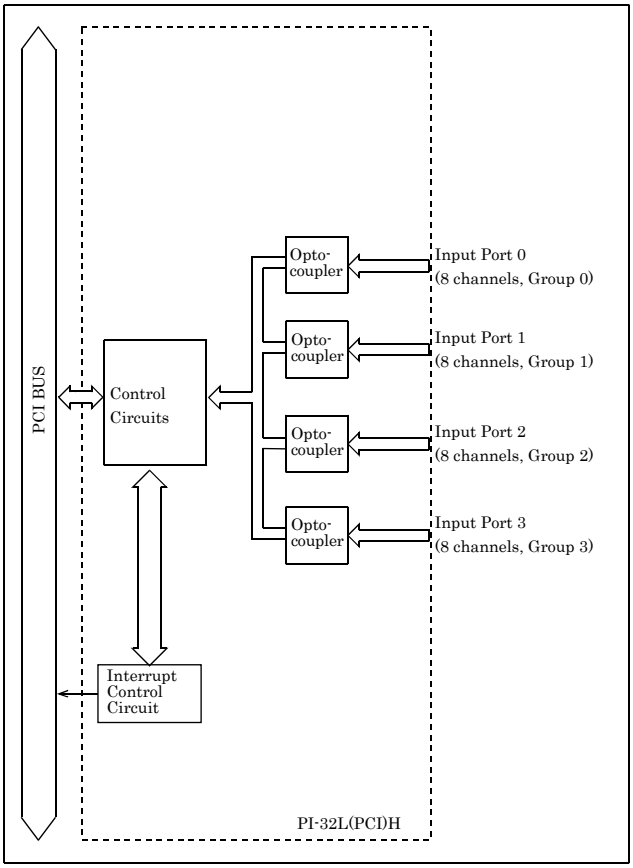
The input circuits of interface blocks of the PI-32L(PCI)H is illustrated in Figure. The signal inputs are isolated by opto-couplers (ready to accept current sinking output signals). The board therefore requires an external power supply to drive the inputs. The power requirement for each input pin is about 5.1 mA at 24 VDC (about 2.6 mA at 12 VDC).

Connecting a Switch



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

Block Diagram



Differences between the PI-32L(PCI)H and PI-32L(PCI)

The PI-32L(PCI)H is connector-pin compatible with the conventional PI-32L(PCI) but has the following differences from it:

(1) Different in the number of input signals available to interrupt requests
PI-32L(PCI)H : All of 32 channels
PI-32L(PCI) : 4 channels

(2) Different in the expression to calculate the digital filter time (n: setting value)
PI-32L(PCI)H : $2^n / (8 \times 10^6)$
PI-32L(PCI) : $2^n / (16 \times 10^6)$

(3) Different in interrupt level resource allocation
PI-32L(PCI)H : Automatically allocates on interrupt level.
PI-32L(PCI) : Uses a jumper switch to select whether to allocate interrupt levels.

(4) Different in board dimensions
PI-32L(PCI)H : 121.69(L) x 105.68(H) mm
PI-32L(PCI) : 176.41(L) x 106.68(H) mm