

Isolated Current Source type
Digital I/O Board for PCI
PIO-16/16RL(PCI)H



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

Features

A different external power supply can be used for each common pin as it is shared by 16 channels.

The PCI bus (personal computer) and the I/O interface are isolated from each other by an opto-coupler, offering good noise immunity.

You can use 16 signal channels of the input signals as interrupt inputs.

You can also select the interrupt trigger edge of the input signal.

The board has a digital filter feature to prevent noise or chatter from causing erroneous inputs.

Up to 35 VDC, 100 mA per signal, max. output.

Zener diode connected to output transistors for protection from surge voltage. Overcurrent protective device provided for every eight channels of output transistors.

This board is a PCI bus-compliant interface board for input/output of digital signals.

The board is a current source typed and isolated digital input/output board and can input and output digital signals at 12 - 24 VDC.

This product can input and output up to 16 channels. This product uses opto-coupler isolated input (ready to accept current source output signals) for input and opto-coupler isolated open-collector output (current source type) for output. Using the bundled driver library [API-PAC(W32)], you can create Windows application software for this board in your favorite programming language supporting Win32 API functions, such as Visual Basic or Visual C++.

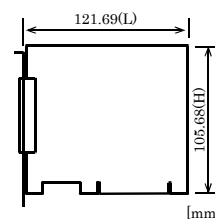
Specification

Item	Specification
Input	
Input format	Opto-isolated input (Compatible with current source output)(Negative logic *1)
Number of input signal channels	16 channels (all available for interrupts)(One common)
Input resistance	4.7kΩ
Input ON current	2.0mA or more
Input OFF current	0.16mA or less
Interrupt	16 interrupt input signals are arranged into a single output of interrupt signal INTA. An interrupt is generated at the falling edge (HIGH-to-LOW transition) or rising edge (LOW-to-HIGH transition).
Response time	200μsec within
Output	
Output format	Opto-isolated open-collector output (Current source type)(Negative logic *1)
Number of output signal channels	16 channels (One common)
Output rating	35 VDC (Max.)
Output current	100mA (par channel) (Max.)
Residual voltage with output on	0.5V or less (Output current≤50mA), 1.0V or less (Output current ≤100mA)
Surge protector	Zener diode RD47FM(NEC) or the equivalence for it
Response time	200μsec within
Common	
I/O address	8 bits x 32 ports
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	5 VDC 150mA(Max.)
Operating condition	0 - 50°C, 10 - 90%RH (No condensation)
Allowable distance of signal extension	Approx. 50 m (depending on wiring environment)
PCI bus specification	32bit, 33MHz, Universal key shapes supported *2
Dimension (mm)	121.69 (L) x 105.68(H)
Weight	130g
Certification	VCCI Class A, CE Marking (EMC Directive Class A, RoHS Directive), UKCA

*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 +3.3 V power supply alone).

Board Dimensions



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) / 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. 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. 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.

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

Packing List

- Board [PIO-16/16RL(PCI)H] ...1
- First step guide ... 1
- Disk *1 [API-PAC(W32)] ... 1
- Serial number label...1
- Product Registration Card & Warranty Certificate...1

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

Accessories

Accessories (Option)

- Screw Terminal (M3 x 37P) : EPD-37A *1*2
- Screw Terminal (M3.5 x 37P) : EPD-37 *1
- General Purpose Terminal : DTP-3C *1
- Screw Terminal : DTP-4C *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.

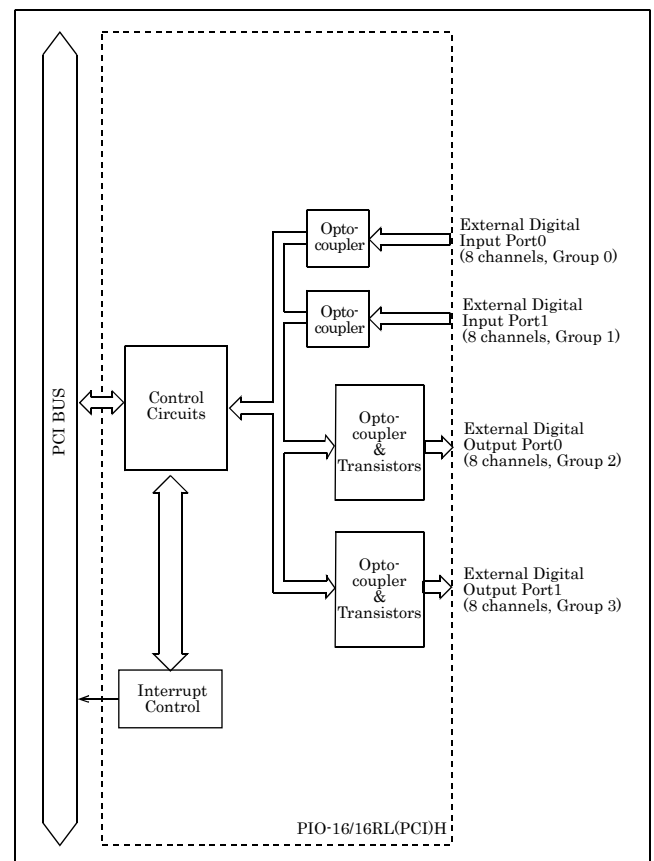
* Check the CONTEC's Web site for more information on these options.

Cable & Connector

Cable (Option)

- Flat Cable with a 37-Pin D-SUB Connectors at 2 Ends : PCB37P-1.5 (1.5m)
: PCB37P-3 (3m)
: PCB37P-5 (5m)
- Shielded Cable with a 37-Pin D-SUB Connectors at 2 Ends : PCB37PS-0.5P (0.5m)
: PCB37PS-1.5P (1.5m)
: PCB37PS-3P (3m)
: PCB37PS-5P (5m)
- Flat Cable with a 37-Pin D-SUB Connector : PCA37P-1.5 (1.5m)
: PCA37P-3 (3m)
: PCA37P-5 (5m)
- Shielded Cable with a 37-Pin D-SUB Connector : PCA37PS-0.5P (0.5m)
: PCA37PS-1.5P (1.5m)
: PCA37PS-3P (3m)
: PCA37PS-5P (5m)

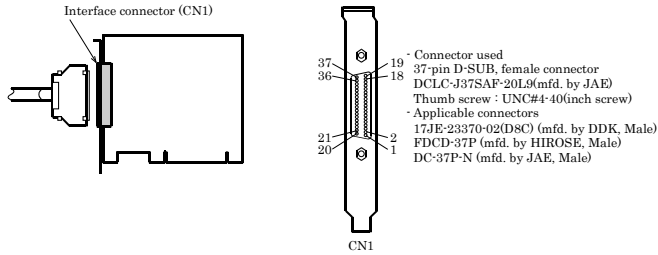
Block Diagram



Using the On-board Connectors

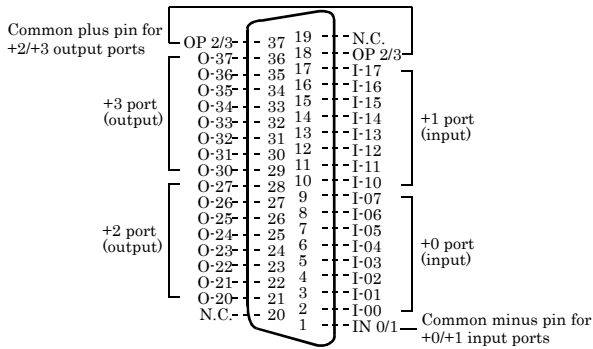
Connecting a Device to a Connector

To connect an external device to this board, plug the cable from the device into the interface connector shown below.



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

Connector Pin Assignment



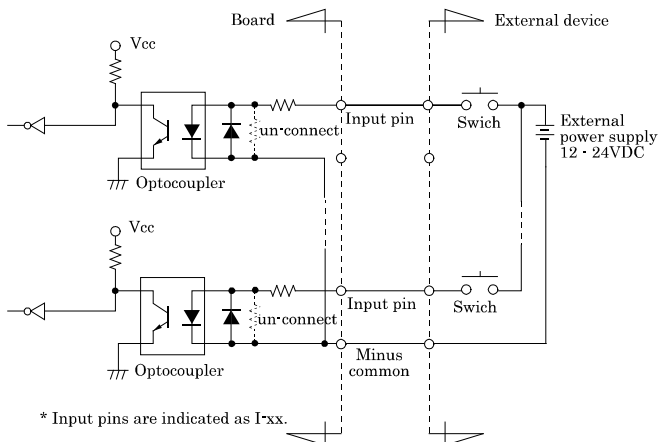
I-00 - I-17	16 input signal pins. Connect output signals from the external device to these pins.
O20 - O37	16 output signal pins. Connect these pins to the input signal pins of the external device.
IN 0/1	Connect the negative side of the external power supply. These pins are common to 16 input signal pins.
OP 2/3	Connect the positive side of the external power supply. These pins are common to 16 output 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.

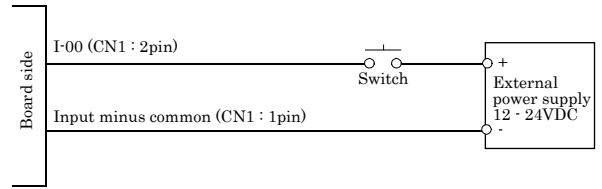
Input Circuit



The input circuits of interface blocks of this product are illustrated in above Figure.

The signal inputs are isolated by opto-couplers (corresponding to the current source output). The board therefore requires an external power supply to drive the inputs. The power requirement for each input pin is about 5.1mA at 24VDC (about 2.6mA at 12VDC).

Connecting a Switch



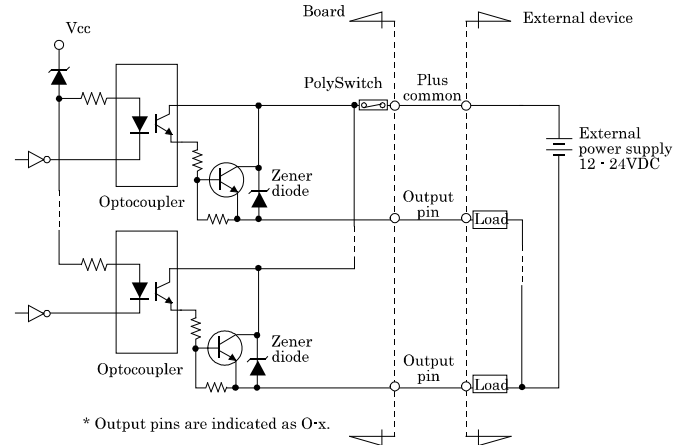
When the switch is ON, the corresponding bit contains 1.
When the switch is OFF, by contrast, the bit contains 0.

Connect the output signals to a current-driven controlled device such as a relay or LED.

The connection requires an external power supply to feed currents.

The board controls turning on/off the current-driven controlled device using a digital value.

Output Circuit



The output circuits of interface blocks of this product are illustrated in above Figure. The signal output section is an opto-coupler isolated open-collector output (current source type). Driving the output section requires an external power supply.

The rated output current per channel is 100mA at maximum. A zener diode is connected to the output transistor for protection from surge voltages. A PolySwitch-based overcurrent protector is provided for every eight output transistors. When the overcurrent protector works, the output section of the board is temporarily disabled. If this is the case, turn of the power to the PC and the external power supply and wait for a few minutes, then turn them on back.

CAUTION

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

Connection to the LED

