Isolated Digital I/O Board for PCI

PIO-32/32H(PCI)H

This board is a PCI bus-compliant interface board for input/output of digital signals.
The board can input and output digital signals at 24 - 48VDC.
This product can input and output up to 32 channels.
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/C++.

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

Features

Corresponding to the high voltages (24 - 48VDC) I/O.

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 Optocoupler, offering good noise immunity.

You can use 32 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 60VDC, 100mA per signal, max. output.

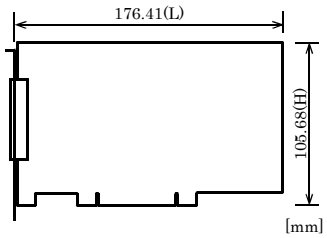
Zener diode connected to output transistors for protection from surge voltage. Overcurrent protective device provided for every eight channels of output transistors.

Specification

Item		Specification
Input		
Input format		Optocoupler 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		15kΩ
Input ON current		1.36mA 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 falling edge (HIGH-to-LOW transition) or rising edge (LOW-to-HIGH transition).
Response time		200μsec within
Output		
Output format		Optocoupler isolated open collector output (Compatible with current sink)(Negative logic *1)
Number of output signal channels		32 channels (One common power supply per 16 channels)
Output rating	Output voltage	60VDC (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 RD68FM(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		500Vrms
External circuit power supply		24 - 48VDC(±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		32bit, 33MHz, Universal key shapes supported *2
Dimension (mm)		176.41 (L) x 105.68(H)
Weight		215g
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 +5V from an expansion slot (it does not work on a machine with a +3.3V 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

Driver Software Library API-PAC(W32) (Bundled)

API-PAC(W32) is the library software that provides the commands for CONTEC hardware products in the form of Windows standard Win32 API functions (DLL). It makes it easy to create high-speed application software taking advantage of the CONTEC hardware using various programming languages that support Win32 API functions, such as Visual Basic and Visual C/C++.
It can also be used by the installed diagnosis program to check hardware operations.
CONTEC provides download services to supply the updated drivers and differential files.
For details, read Help on the bundled Disk or visit the CONTEC's Web site.

Linux version of digital I/O driver API-DIO(LNX) (Supplied: Stored on the API-PAC(W32) Disk)

This driver is used to control CONTEC digital I/O boards (PC cards) from within Linux.
You can control CONTEC I/O boards easily using the shared library used by gcc and Kylix, the device driver (module) for each kernel version, and the board (PC card) configuration program (config).
CONTEC provides download services to supply the updated drivers and differential files.
For details, read Help on the bundled Disk or visit the CONTEC's Web site.

Data acquisition VI library for LabVIEW VI-DAQ (Free download)

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.

Packing List

Board [PIO-32/32H(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)

Relay Terminal Unit for Crimping	: EPD-96 *1
Terminal Unit for Cables	: DTP-64(PC) 1
Relay Terminal Unit for Crimping	: EPD-37A *2
Relay Terminal Unit for Crimping	: EPD-37 *2
Converter Board (96-pin half to two 37-pin female D-SUB)	: CCB-96 *3

*1 A PCB96P or PCB96PS optional cable is required separately.
*2 A PCB96W or PCB96WS optional cable is required separately.
*3 Option cable PCB96P or PCB96PS, and the cable for 37-pin D-SUB are required separately.

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

Cable & Connector

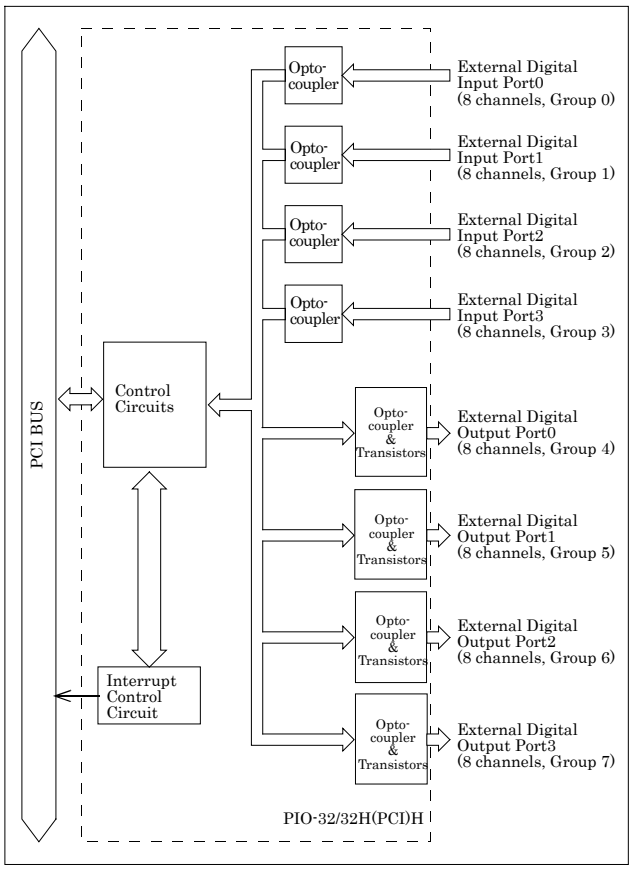
Cable (Option)

Shield Cable with 96-Pin Half-Pitch Connector at Both Ends (Mold Type)	: PCB96PS-0.5P (0.5m)
	: PCB96PS-1.5P (1.5m)
	: PCB96PS-3P (3m)
	: PCB96PS-5P (5m)
Flat Cable with 96-Pin Half-Pitch Connectors at Both Ends	: PCB96P-1.5 (1.5m)
	: PCB96P-3 (3m)
	: PCB96P-5 (5m)
Shield Cable with 96-Pin Half-Pitch Connector at One End (Mold Type)	: PCA96PS-0.5P (0.5m)
	: PCA96PS-1.5P (1.5m)
	: PCA96PS-3P (3m)
	: PCA96PS-5P (5m)
Flat Cable with 96-Pin Half-Pitch Connector at One End	: PCA96P-1.5 (1.5m)
	: PCA96P-3 (3m)
	: PCA96P-5 (5m)
Distribution Shield Cable with 96-Pin Half-Pitch Connector (96Pin→37Pin x 2)	: PCB96WS-1.5P (1.5m)
	: PCB96WS-3P (3m)
	: PCB96WS-5P (5m)
Distribution Flat Cable with 96-Pin Half-Pitch Connector (96Pin→37Pin x 2)	: PCB96W-1.5 (1.5m)
	: PCB96W-3 (3m)
	: PCB96W-5 (5m)

Connector (Option)

Half Pitch 96-Pin Female Connector Set (5 Pieces)	: CN5-H96F

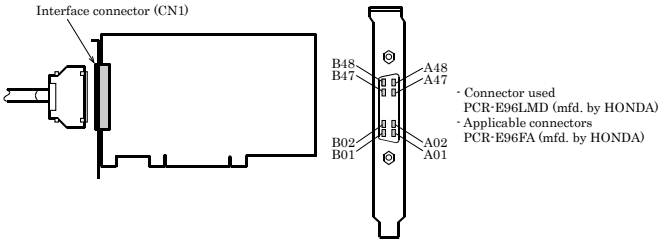
Block Diagram



Using the On-board Connectors

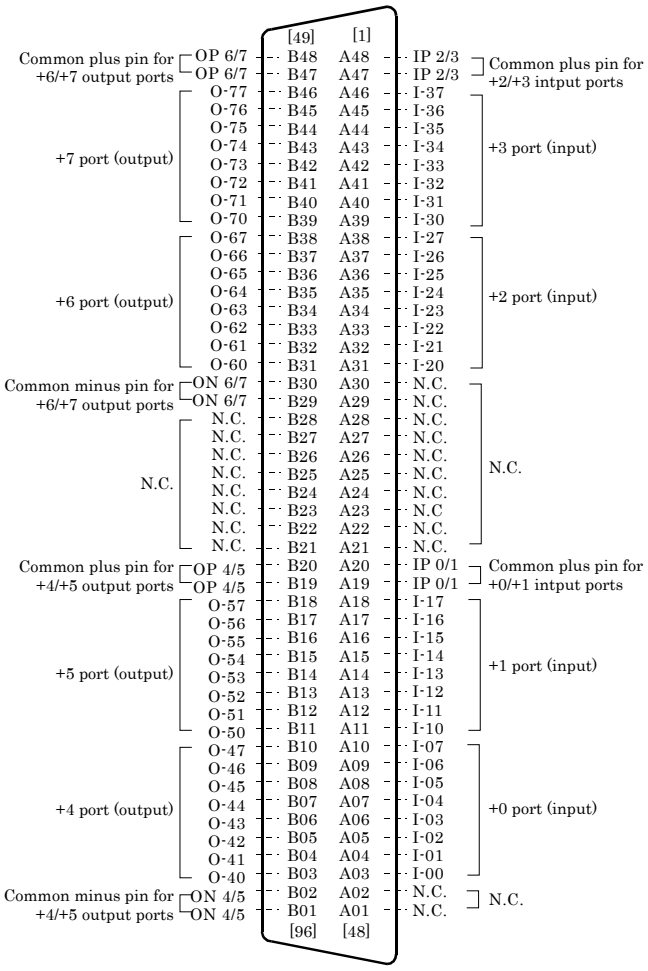
Connecting a Device to a Connector

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



Connector Pin Assignment

Pin Assignments of Interface Connector



* I-00 - I-37 can be used as interrupt signal.

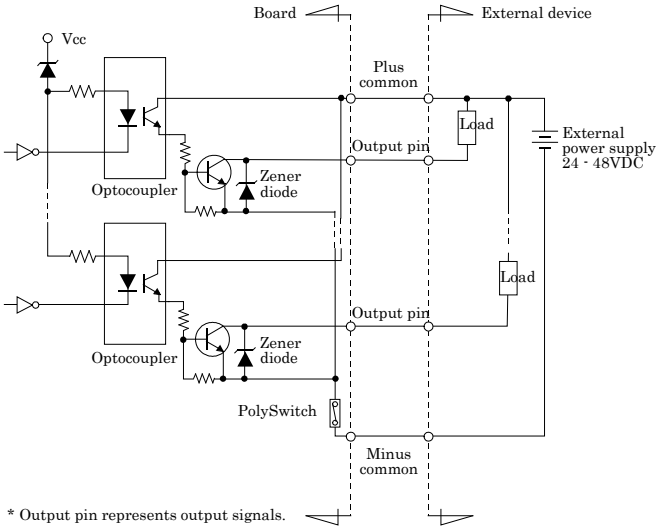
The numbers in square brackets [ ] are pin numbers designated by HONDA TSUSHIN KOGYO CO., LTD.

I-00 - I-37	32 input signal pins. Connect output signals from the external device to these pins.
O-40 - O-77	32 output signal pins. Connect these pins to the input signal pins of the external device.
IP 0/1 - IP 2/3	Connect the positive side of the external power supply. These pins are common to 16 input signal pins.
OP 4/5 - OP 6/7	Connect the positive side of the external power supply. These pins are common to 16 output signal pins.
ON 4/5 - ON 6/7	Connect the negative 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

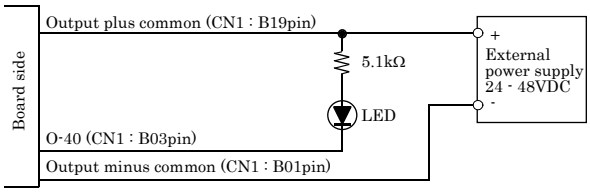
Connect the input signals to a device which can be current-driven, such as a switch or transistor output device. The connection requires an external power supply to feed currents.
The board inputs the ON/OFF state of the current-driven device as a digital value.

Input Circuit



The input circuits of interface blocks of this board are illustrated in the image above.
The signal inputs are isolated by the Optocoupler (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 3.2mA at 48VDC (about 1.6mA at 24VDC).

Connecting a Switch

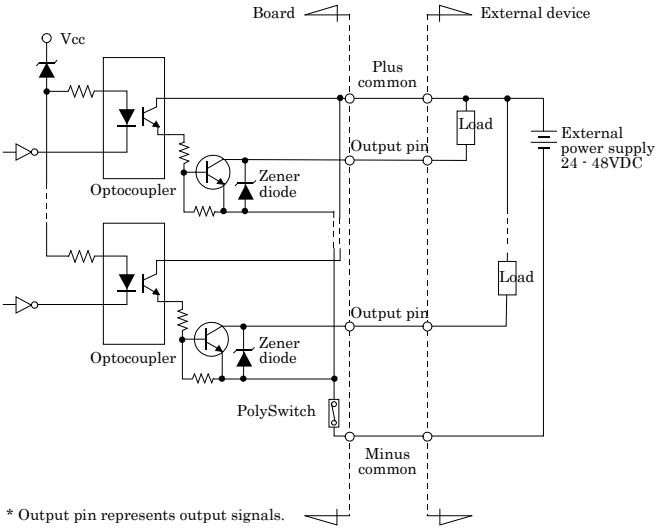


When "1" is output to a relevant bit, the corresponding LED comes on.
When "0" is output to the bit, in contrast, the LED goes out.

Connecting Output Signals

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.

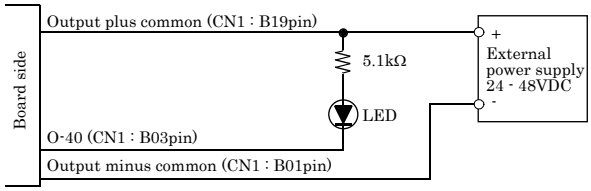
Output Circuit



The output circuits of interface blocks of this board are illustrated in the image above. The signal output section is an Optocoupler isolated, open-collector output (current sink type). Driving the output section requires an external power supply. The rated output current per channel is 100mA at maximum. The output section can also be connected to a TTL level input as it uses a low-saturated transistor for output. The residual voltage (low-level voltage) between the collector and emitter with the output on is 0.5V or less at an output current within 50mA or at most 1.0V at an output current within 100mA. 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.

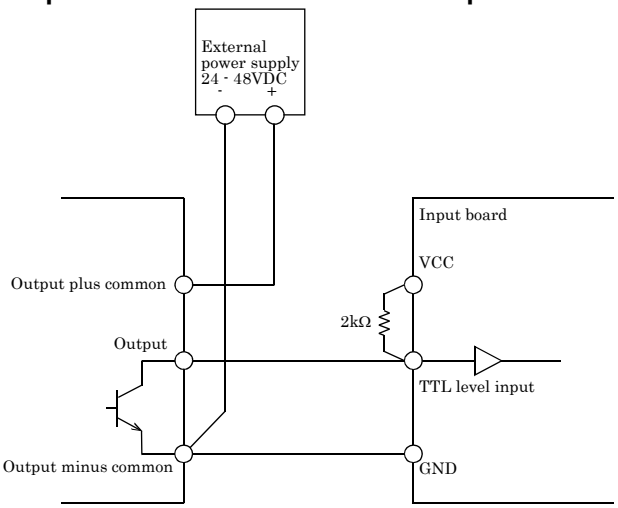
⚠ CAUTION
When the PC is turned on, all output are reset to OFF.

Connection to the LED



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.

Example of Connection to TTL Level Input



Connecting the Sink Type Output and Sink Output Support Input

The following example shows a connection between a sink type output (output board) and a sink output support input (input board). Refer to this connection example when you connect such boards to each other.