Digital Input Board with Opto-Isolation for PCI
PI-64L(PCI)H

This product is a PCI bus-compliant interface board for input of digital signals.   This product can input digital signals at 12 - 24VDC.

PI-64L(PCI)H features 64 opto-coupler isolated inputs (supporting current sink output).   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 device driver is supported with this product.

*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 July, 2023.

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

Features

Opto-coupler isolated input (supporting current sink output)
PI-64L(PCI)H has the 64ch of opto-coupler isolated input (supporting current sink output) whose response time 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 PCI bus (PC) is isolated from the input interfaces by opto-couplers, this product has excellent noise performance.

32 input signals can be used as interrupt request signals
You can use 32 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 support device driver
Using the device driver API-TOOL 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.

Equipped with 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.

Included Items

Product [PI-64L(PCI)H] ...1

Please read the following ... 1

Hardware specifications

Function Specifications

| Item		Specifications
Input	Type	Opto-Isolated Input (for current sinking output) (Negative logic *1)
	Number of Channels	64ch (32 channels available for interrupts) (One common power supply per 16 channels)
	Input resistance	4.7kΩ
	Current required to turn ON	2.0mA or more
	Current required to turn OFF	0.16mA or less
	Interrupts	Combine 32 interrupt signals to one interrupt request signal as the INTA. Either rising edge or falling edge of input signal can generate interrupt.
	Response time	200μsec within
Common	Connecting distance	50m (Typ.)(depending on wiring environment)
	I/O address	Any 32-byte boundary
	Interruption level	1 level use
	Boards in one system	Maximum of 16 boards can be install in a same system.
	Isolated voltage	500Vrms
	External circuit power supply	12 - 24VDC (±10%)
	Power consumption	5VDC 250mA (Max.)
	PCI bus specification	32bit, 33MHz, Universal key shapes supported *2
	Dimension (mm)	176.41(L) x 105.68(H)
	Weight	215g

*1   Data "0" and "1" correspond to the High and Low levels, respectively.
*2   This product 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).

Installation Environment Requirements

Item	Specifications
Operating ambient temperature	0 - +50℃
Operating ambient humidity	10 - 90%RH (No condensation)
Floating dust particles	Not to be excessive
Corrosive gases	None
Standard	VCCI Class A, CE Marking (EMC Directive Class A, RoHS Directive), UKCA

Physical Dimensions

176.41(L)

105.68(H)

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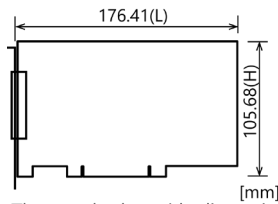
The standard outside dimension (L) is the distance from the end of the board to the outer surface of the slot cover.

Component Name

Built-in power setting function

PIO/PI/PO-xx(PCI)H

SW1 BOARD ID

②

①

INTERNAL POWER (+12V) ・ EXTERNAL POWER (+12V→+24V)

Built-in power setting function

No.	Name
1	Interface Connector
2	Board ID Setting Switch

⚠ CAUTION

There is no printing guide of built-in power setting function in PI-64L(PCI)H and PO-64L(PCI)H.

Support Software

You can use CONTEC support software according to your purpose and development environment.
For more details on the supported OS, applicable languages, or to download the latest version of software, visit the CONTEC Web site.

Name	Contents	How to get
Windows Version Digital I/O Driver software API-DIO(WDM)	The Windows device driver is provided as a form of Windows API functions. Various sample programs such as C# and Visual Basic .NET , Visual C++, Python etc. and diagnostic program useful for checking operation is provided.	Download from the CONTEC website *1
Linux Version Digital I/O Driver software API-DIO(LNX)	The Linux device driver is provided as a shared library. The software includes various sample programs such as gcc (C, C++) and Python programs, as well as a configuration tool to configure the device settings.	Download from the CONTEC website *1
Software Development Tool Kits (SDK) and Support Software	In addition to the device drivers, we offer many software programs for using CONTEC devices in an easier manner.	Download from the CONTEC website *2

*1 Download the files from the following URL.

https://www.contec.com/download/

*2 For supported software, search the CONTEC website for this product and view the product page.

https://www.contec.com/

Connecting an Interface Connector

To connect an external device to this product, plug the cable from the device into the interface connector (CN1) shown below.

Interface connector (CN1)

B48 B47   A48 A47
B02 B01   A02 A01

- Connector used
PCR-E96LMD (mfd. by HONDA)

- Applicable connectors
PCR-E96FA (mfd. by HONDA)

Layout on the Interface Connector(CN1)

Common plus pin for +6/+7 input ports						Common plus pin for +2/+3 input ports
Common plus pin for +6/+7 input ports	IP-6/7	B48		A48	IP-2/3	Common plus pin for +2/+3 input ports
Common plus pin for +6/+7 input ports	IP-6/7	B47		A47	IP-2/3	Common plus pin for +2/+3 input ports
+7 port (input)	I-77	B46		A46	I-37*	+3 port (input)
+7 port (input)	I-76	B45		A45	I-36*	+3 port (input)
+7 port (input)	I-75	B44		A44	I-35*	+3 port (input)
+7 port (input)	I-74	B43		A43	I-34*	+3 port (input)
+7 port (input)	I-73	B42		A42	I-33*	+3 port (input)
+7 port (input)	I-72	B41		A41	I-32*	+3 port (input)
+7 port (input)	I-71	B40	[49] B48 [1] A48	A40	I-31*	+3 port (input)
+7 port (input)	I-70	B39		A39	I-30*	+3 port (input)
+6 port (input)	I-67	B38		A38	I-27*	+2 port (input)
+6 port (input)	I-66	B37		A37	I-26*	+2 port (input)
+6 port (input)	I-65	B36		A36	I-25*	+2 port (input)
+6 port (input)	I-64	B35		A35	I-24*	+2 port (input)
+6 port (input)	I-63	B34		A34	I-23*	+2 port (input)
+6 port (input)	I-62	B33		A33	I-22*	+2 port (input)
+6 port (input)	I-61	B32		A32	I-21*	+2 port (input)
+6 port (input)	I-60	B31		A31	I-20*	+2 port (input)
N.C.	N.C.	B30		A30	N.C.	N.C.
N.C.	N.C.	B29		A29	N.C.	N.C.
N.C.	N.C.	B28		A28	N.C.	N.C.
N.C.	N.C.	B27		A27	N.C.	N.C.
N.C.	N.C.	B26		A26	N.C.	N.C.
N.C.	N.C.	B25		A25	N.C.	N.C.
N.C.	N.C.	B24		A24	N.C.	N.C.
N.C.	N.C.	B23		A23	N.C.	N.C.
N.C.	N.C.	B22		A22	N.C.	N.C.
N.C.	N.C.	B21		A21	N.C.	N.C.
Common plus pin for +4/+5 input ports	IP-4/5	B20		A20	IP-0/1	Common plus pin for +0/+1 input ports
Common plus pin for +4/+5 input ports	IP-4/5	B19		A19	IP-0/1	Common plus pin for +0/+1 input ports
+5 port (input)	I-57	B18	B01 [96] A01 [48]	A18	I-17*	+1 port (input)
+5 port (input)	I-56	B17		A17	I-16*	+1 port (input)
+5 port (input)	I-55	B16		A16	I-15*	+1 port (input)
+5 port (input)	I-54	B15		A15	I-14*	+1 port (input)
+5 port (input)	I-53	B14		A14	I-13*	+1 port (input)
+5 port (input)	I-52	B13		A13	I-12*	+1 port (input)
+5 port (input)	I-51	B12		A12	I-11*	+1 port (input)
+5 port (input)	I-50	B11		A11	I-10*	+1 port (input)

Optional Products

Product Name	Model type	Description
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
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
Distribution Shield Cable with 96-Pin Half-Pitch Connector (96Pin→37Pin x 2)	PCB96WS-1.5P	1.5m
	PCB96WS-3P	3m
	PCB96WS-5P	5m
Screw Terminal Unit (M3 x 96P)	EPD-96A	*1 *2
Screw Terminal Unit (M3.5 x 96P)	EPD-96	*2
Screw Terminal Unit (M3 x 37P)	EPD-37A	*1 *3
Screw Terminal Unit (M3.5 x 37P)	EPD-37	*3
Digital I/O 64CH Series Terminal Panel (M3 x 96P)	DTP-64A	*2
Termination Panel (M3)	DTP-3C	*3
Termination Panel (M2.5)	DTP-4C	*3
Signal Monitor for Digital I/O (64bit)	CM-64L	*2
Signal Monitor for Digital I/O (32bit)	CM-32L	*3
Connection Conversion Board (96P→37P x 2)	CCB-96	*4

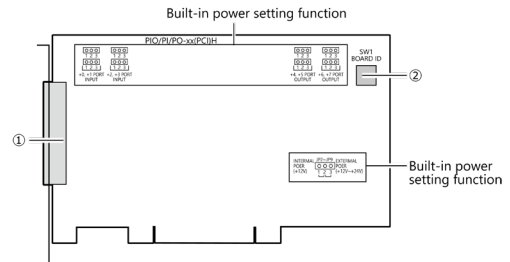*1   "Spring-up" type terminal is used to prevent terminal screws from falling off.
*2   PCB96P or PCB96PS optional cable is required separately.
*3   PCB96WS optional cable is required separately.
*4   "Spring-up" type terminal is used to prevent terminal screws from falling off.

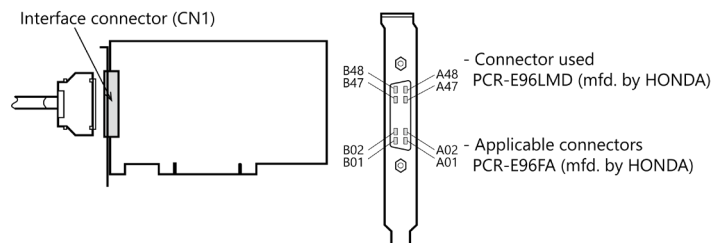Visit the CONTEC website for the latest optional products.

+4 port (input)	I-47	B10		A10	I-07*	+0 port (input)
	I-46	B09		A09	I-06*	
	I-45	B08		A08	I-05*	
	I-44	B07		A07	I-04*	
	I-43	B06		A06	I-03*	
	I-42	B05		A05	I-02*	
	I-41	B04		A04	I-01*	
	I-40	B03		A03	I-00*	
N.C.	N.C.	B02		A02	N.C.	N.C.
	N.C.	B01		A01	N.C.	

* 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.

Signal name	Description
I-00 - I-77	64 input signal pins. Connect output signals from the external device to these pins.
IP-0/1	Connect the positive side of the external power supply. These pins are common to 16 input signal pins.
IP-2/3	Connect the positive side of the external power supply. These pins are common to 16 input signal pins.
IP-4/5	Connect the positive side of the external power supply. These pins are common to 16 input signal pins.
IP-6/7	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.

⚠ **CAUTION**

To perform input/output using this product with the CONTEC device driver, specify logical ports and logical bits when calling each function. For details, refer to the "Relationships between API-TOOL Logical Ports/Bits and Connector Signal Pins" of Reference Manual.
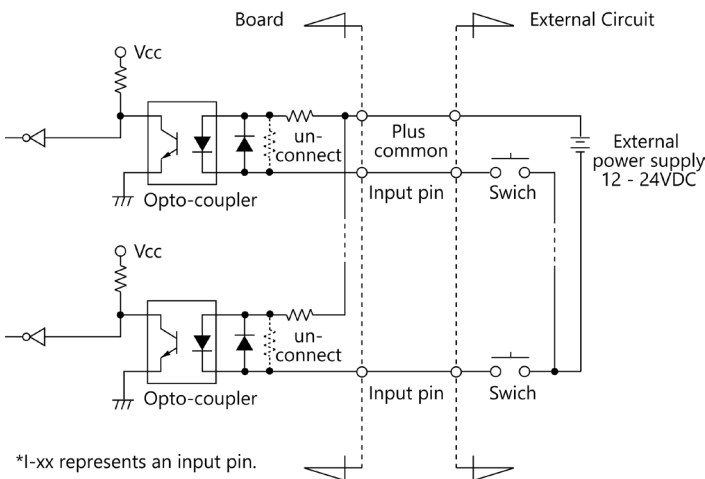
Connecting Input Signals

Input Circuit
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 product inputs the ON/OFF state of the current-driven device as a digital value.

*I-xx represents an input pin.

The input circuits of interface blocks of the PI-64L(PCI)H are illustrated in the figure above.
The signal inputs are isolated by opto-couplers (ready to accept current sinking output signals). The product 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 (An Example to use Input I-00)
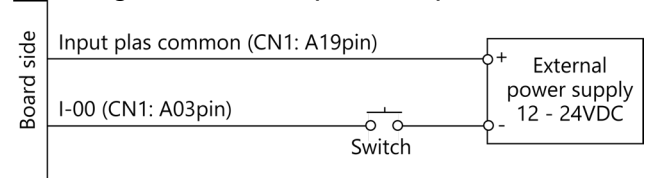
When the switch is ON, the corresponding bit contains 1.
When the switch is OFF, by contrast, the bit contains 0.

Block Diagram
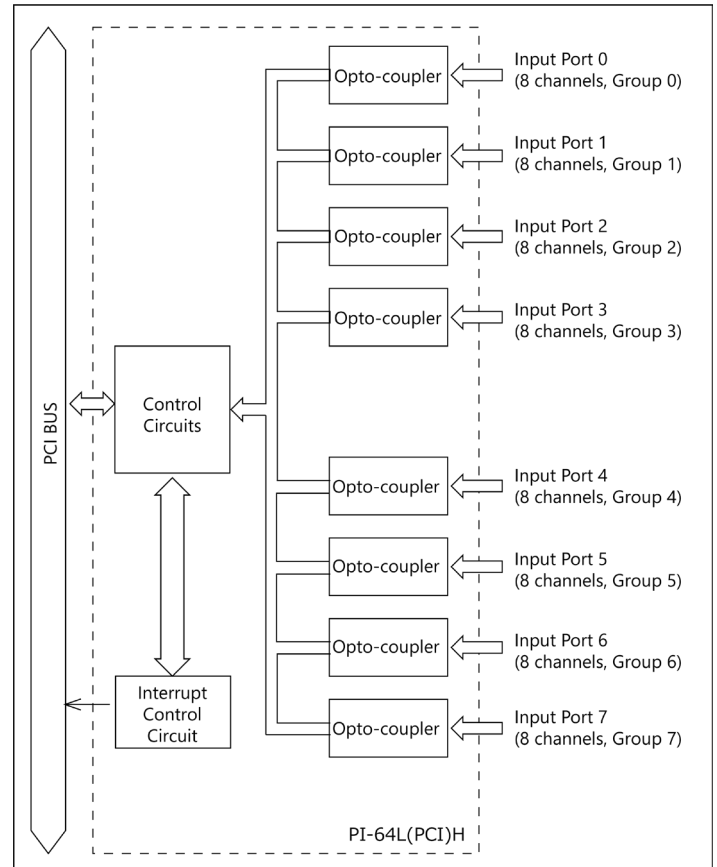
Differences between the PI-64L(PCI)H and PI-64L(PCI)

The PI-64L(PCI)H is connector-pin compatible with the conventional PI-64L(PCI) but has the following differences from it:

(1) Different in the number of input signals available to interrupt requests
PI-64L(PCI)H   :   32 channels
PI-64L(PCI)   :   4 channels

(2) Different in the expression to calculate the digital filter time (n: setting value)
PI-64L(PCI)H   : $2^n / (8 \times 10^6)$
PI-64L(PCI)   : $2^n / (16 \times 10^6)$

(3) Different in interrupt level resource allocation
PI-64L(PCI)H   :   Automatically allocates on interrupt level.
PI-64L(PCI)   :   Uses a jumper switch to select whether to allocate interrupt levels.