Negative-Common Opto-Isolated
Digital Input for PCI
DI-128RL-PCI

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

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

This product is a negative-common typed PCI bus-compliant interface board used to provide a digital signal I/O function on a PC. This product can input and output digital signals at 12 - 24VDC.

This product features 128 opto-coupler isolated inputs (compatible with current source output signals). You can use 16 input signals as interrupt inputs. Equipped with 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 August, 2023.

Features

Opto-coupler isolated input (compatible with current source output signals)
This product has the opto-coupler isolated input 128 channels (compatible with current source output signals) 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 and output interfaces by opto-couplers, this product has excellent noise performance.

You can use 16 input signals as interrupt request signal
You can use 16 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.
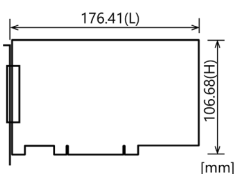
Equipped with digital filter to prevent wrong recognition of input signals from carrying noise or a chattering
This product has a digital filter to prevent wrong recognition of input signals from carrying noise or a chattering. All input terminals can be added a digital filter, and the setting can be performed by software.

Included Items

Product [DI-128RL-PCI] ...1
Please read the following ... 1

External Dimensions

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

Specifications

Function specifications

Item		Specifications
Input	Type	Opto-isolated input (corresponding to the current source output)(Positive logic *1)
	Number of Channels	128ch (16 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 16 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	250Vrms
	External circuit power supply	12 - 24VDC (±10%)
	Power consumption	5VDC 150mA (Max.)
	PCI bus specification	32bit, 33MHz, Universal key shapes supported *2
	Dimension (mm)	176.41(L) x 106.68(H) *4*5
	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), FCC Class A, UKCA

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/

Optional Products

Product Name	Model type	Description
Shield Cable with 100-Pin Connector at Both Ends	PCB100PS-0.5	0.5m
	PCB100PS-1.5	1.5m
	PCB100PS-3	3m
	PCB100PS-5	5m
Connection Conversion Shield Cable (100Pin→96Pin)	PCB100/96PS-1.5	1.5m
	PCB100/96PS-3	3m
	PCB100/96PS-5	5m
Distribution Shield Cable with 100-Pin Connector	PCA100P-1.5	1.5m
	PCA100P-3	3m
Distribution Shield Cable with 100-Pin Connector (100Pin→37Pin x 2)	PCB100WS-1.5	1.5m
	PCB100WS-3	3m
	PCB100WS-5	5m
Screw Terminal Unit (M3 x 100P)	EPD-100A	*1 *2 *5
Screw Terminal Unit (M3 x 96P)	EPD-96A	*1 *3 *5
Screw Terminal Unit (M3.5 x 96P)	EPD-96	*3 *5
Screw Terminal Unit (M3 x 37P)	EPD-37A	*1 *4 *6
Screw Terminal Unit (M3.5 x 96P)	EPD-37	*4 *6
Digital I/O 64CH Series Terminal Panel (M3 x 96P)	DTP-64A	*3 *5
Termination Panel (M3)	DTP-3C	*4 *6
Termination Panel (M2.5)	DTP-4C	*4 *6
Connector Conversion Board (96-Pin→37-Pin x 2)	CCB-96	*3 *5

*1   "Spring-up" type terminal is used to prevent terminal screws from falling off.

*2   PCB100PS optional cable is required separately.

*3   PCB100/96PS optional cable is required separately.

*4   PCB100WS optional cable is required separately

*5   If using both the CNA and CNB connectors, two each of the terminal block and cable sets are required.

*6   If using both the CNA and CNB connectors, two cable sets are required.
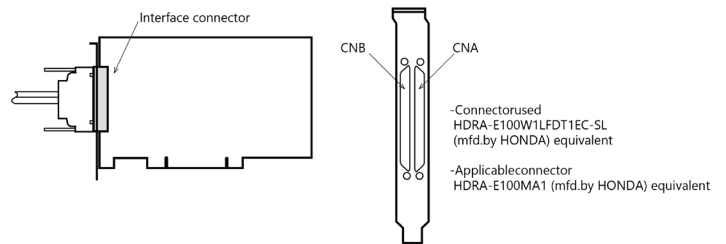   You will also require sufficient terminal blocks for the number of I/O points you are using.

*   Visit the CONTEC website for the latest optional products.

Component Name

No.	Name
1	Interface Connector (page エラー! ブックマークが定義されていません。)
2	Board ID Setting Switch

Connecting an Interface Connector

Interface connector

CNB   CNA

-Connector used
HDRA-E100W1LFDT1EC-SL
(mfd.by HONDA) equivalent

-Applicable connector
HDRA-E100MA1 (mfd.by HONDA) equivalent

Layout on the Interface Connector(CNA, CNB)

CNB

	N.C.	100	50	N.C.	
	N.C.	99	49	N.C.	
+F port (Input)	I-F7	98	48	I-B7	+B port (Input)
	I-F6	97	47	I-B6	
	I-F5	96	46	I-B5	
	I-F4	95	45	I-B4	
	I-F3	94	44	I-B3	
	I-F2	93	43	I-B2	
	I-F1	92	42	I-B1	
	I-F0	91	41	I-B0	
+E port (Input)	I-E7	90	40	I-A7	+A port (Input)
	I-E6	89	39	I-A6	
	I-E5	88	38	I-A5	
	I-E4	87	37	I-A4	
	I-E3	86	36	I-A3	
	I-E2	85	35	I-A2	
	I-E1	84	34	I-A1	
	I-E0	83	33	I-A0	
Common minus pin for +E/+F input ports	N-E/F	82	32	N-A/B	Common minus pin for +A/+B input ports
	N-E/F	81	31	N-A/B	
	N-E/F	80	30	N-A/B	
	N-E/F	79	29	N-A/B	
	N-E/F	78	28	N-A/B	
	N-E/F	77	27	N-A/B	
	N.C.	76	26	N.C.	
	N.C.	75	25	N.C.	
	N.C.	74	24	N.C.	
	N.C.	73	23	N.C.	
+D port (Input)	I-D7	72	22	I-97	+9 port (Input)
	I-D6	71	21	I-96	
	I-D5	70	20	I-95	
	I-D4	69	19	I-94	
	I-D3	68	18	I-93	
	I-D2	67	17	I-92	
	I-D1	66	16	I-91	
	I-D0	65	15	I-90	
+C port (Input)	I-C7	64	14	I-87	+8 port (Input)
	I-C6	63	13	I-86	
	I-C5	62	12	I-85	
	I-C4	61	11	I-84	
	I-C3	60	10	I-83	
	I-C2	59	9	I-82	
	I-C1	58	8	I-81	
	I-C0	57	7	I-80	
Common minus pin for +C/+D input ports	N-C/D	56	6	N-8/9	Common minus pin for +8/+9 input ports
	N-C/D	55	5	N-8/9	
	N-C/D	54	4	N-8/9	
	N-C/D	53	3	N-8/9	
	N-C/D	52	2	N-8/9	
	N-C/D	51	1	N-8/9	

CNA

Common minus pin for +0/+1 input ports	N-0/1	1	51	N-4/5	Common minus pin for +4/+5 input ports
	N-0/1	2	52	N-4/5	
	N-0/1	3	53	N-4/5	
	N-0/1	4	54	N-4/5	
	N-0/1	5	55	N-4/5	
	N-0/1	6	56	N-4/5	
+0 port (Input)	I-00	7	57	I-40	+4 port (Input)
	I-01	8	58	I-41	
	I-02	9	59	I-42	
	I-03	10	60	I-43	
	I-04	11	61	I-44	
	I-05	12	62	I-45	
	I-06	13	63	I-46	
	I-07	14	64	I-47	
+1 port (Input)	I-10	15	65	I-50	+5 port (Input)
	I-11	16	66	I-51	
	I-12	17	67	I-52	
	I-13	18	68	I-53	
	I-14	19	69	I-54	
	I-15	20	70	I-55	
	I-16	21	71	I-56	
	I-17	22	72	I-57	
	N.C.	23	73	N.C.	
	N.C.	24	74	N.C.	
	N.C.	25	75	N.C.	
	N.C.	26	76	N.C.	
Common minus pin for +2/+3 input ports	N-2/3	27	77	N-6/7	Common minus pin for +6/+7 input ports
	N-2/3	28	78	N-6/7	
	N-2/3	29	79	N-6/7	
	N-2/3	30	80	N-6/7	
	N-2/3	31	81	N-6/7	
	N-2/3	32	82	N-6/7	
+2 port (Input)	I-20	33	83	I-60	+6 port (Input)
	I-21	34	84	I-61	
	I-22	35	85	I-62	
	I-23	36	86	I-63	
	I-24	37	87	I-64	
	I-25	38	88	I-65	
	I-26	39	89	I-66	
	I-27	40	90	I-67	
+3 port (Input)	I-30	41	91	I-70	+7 port (Input)
	I-31	42	92	I-71	
	I-32	43	93	I-72	
	I-33	44	94	I-73	
	I-34	45	95	I-74	
	I-35	46	96	I-75	
	I-36	47	97	I-76	
	I-37	48	98	I-77	
	N.C.	49	99	N.C.	
	N.C.	50	100	N.C.	

* I-00 - I-17 can be used as all of interrupt signal.

Signal name	Description
I-00 - I-F7	128 input signal pins. Connect output signals from the external device to this pin.
N-0/1	Connect the negative side of the external power supply. This pin is common to 16 input signal pins.
N-2/3	Connect the negative side of the external power supply. This pin is common to 16 input signal pins.
N-4/5	Connect the negative side of the external power supply. This pin is common to 16 input signal pins.
N-6/7	Connect the negative side of the external power supply. This pin is common to 16 input signal pins.
N-8/9	Connect the negative side of the external power supply. This pin is common to 16 input signal pins.
N-A/B	Connect the negative side of the external power supply. This pin is common to 16 input signal pins.
N-C/D	Connect the negative side of the external power supply. This pin is common to 16 input signal pins.
N-E/F	Connect the negative side of the external power supply. This pin is common to 16 input signal pins.

Signal name	Description
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.
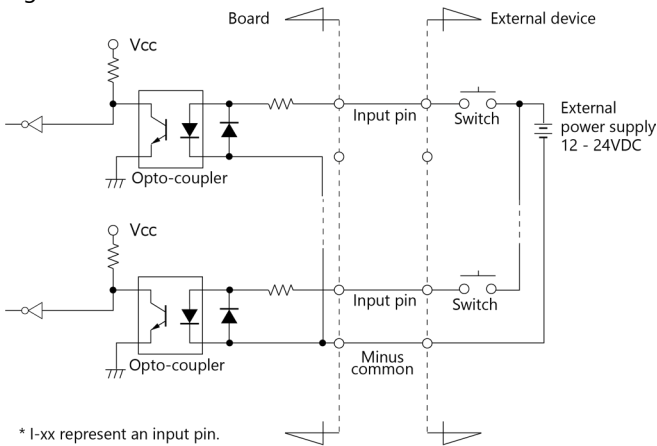
Connecting Input Signals

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 represent an input pin.

The input circuits of interface blocks of the DI-128RL-PCI is illustrated in the figure above.

The signal inputs are isolated by opto-couplers (Compatible with current source output).   This product therefore requires the external power supply to drive the input section of this product. 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)
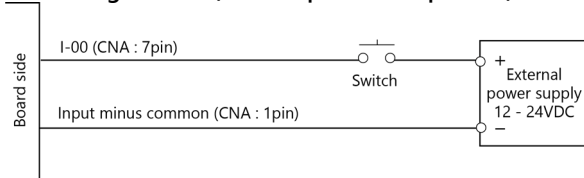
When the switch is ON, the corresponding bit contains 1.
When the switch is OFF, by contrast, the bit contains 0.

Circuit Block Diagram

DI-128RL-PCI

External Digital Input Port0 (8ch, Group0)
External Digital Input Port1 (8ch, Group1)
External Digital Input Port2 (8ch, Group2)
External Digital Input Port3 (8ch, Group3)
External Digital Input Port4 (8ch, Group4)
External Digital Input Port5 (8ch, Group5)
External Digital Input Port6 (8ch, Group6)
External Digital Input Port7 (8ch, Group7)
External Digital Input Port8 (8ch, Group8)
External Digital Input Port9 (8ch, Group9)
External Digital Input PortA (8ch, GroupA)
External Digital Input PortB (8ch, GroupB)
External Digital Input PortC (8ch, GroupC)
External Digital Input PortD (8ch, GroupD)
External Digital Input PortE (8ch, GroupE)
External Digital Input PortF (8ch, GroupF)