Digital Input Board with Opto-Isolation for PCI Express

DI-128L-PE

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

This product is a PCI Express bus-compliant interface board used to provide a digital signal I/O function on a PC.

The product features 64 unisolated TTL level inputs and 64 unisolated open-collector outputs. You can use 16 input signals as interrupt inputs. In addition, the digital filter function to prevent wrong recognition of input signals is provided.

Windows/Linux drivers are available.

Possible to be used as a data recording device for LabVIEW, with dedicated libraries.

*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 December, 2022.

Features

Optocoupler isolated inputs (compatible with current sink output)
This product has the 128 channels of Optocoupler isolated input (compatible with current sink output) whose response speed is 200µsec. Common terminal provided per 16 channels, capable of supporting a different external power supply. Supporting driver voltages of 12 - 24 VDC for I/O.

Optocoupler bus isolation
As the PC is isolated from the input and output interfaces by Optocoupler, this product has excellent noise performance.

You can use 16 input signals as interrupt request signals.
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 drivers are available.
By using the digital I/O driver, each Windows/Linux application can be created. 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.

Functions and connectors are compatible with PCI compatible board PI-128L(PCI)H.
The functions same with PCI compatible board PI-128L(PCI)H are provided. In addition, as there is compatibility in terms of connector shape and pin assignments, it is easy to migrate from the existing system.

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

Included Items

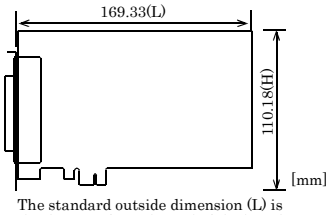
Board (DI-128L-PE) ...1
Setup Guide ... 1
Warranty Certificate ...1
Serial Number Label ...1

Specification

Item		Specification
Input		
	Input format	Optocoupler isolated input (Compatible with current sink output)(Negative logic *1)
	Number of input signal channels	128 channels (16 channels available for interrupts) (1 common per 16 channels unit)
	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 rising edge (HIGH-to-LOW transition) or falling edge (LOW-to-HIGH transition) (set by software).
	Response time	Within 200µsec
Common		
	Allowable distance of signal extension	Approx. 50m (depending on wiring environment)
	I/O address	Any 32-byte boundary
	Interruption level	1 level use
	Max. board count for connection	16 boards including the master board
	Isolated Power	250Vrms
	External circuit power supply	12 - 24VDC(±10%)
	Power consumption (Max.)	3.3VDC 600mA
	Operating condition	0 - 50°C, 10 - 90%RH (No condensation)
	Bus specification	PCI Express Base Specification Rev. 1.0a x1
	Dimension (mm)	169.33(L) x 110.18(H)
	Connector	100 pin 0.8mm pitch connector [F (female) type] x 2 HDRA-E100W1LFDT1EC-SL+[HONDA TSUSHIN KOGYO CO., LTD.] or equivalent to it
	Weight	215g
Standard		VCCI Class A, CE Marking (EMC Directive Class A, RoHS Directive), UKCA

*1 Data "0" corresponds at the High level and data "1" correspond at the Low level.

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

The name of the documents	Contents	How to get
Digital I/O Driver software API-DIO(WDM)	Driver software of digital input and output for Windows.	Download (ZIP)
Digital I/O Driver software API-DIO(LNX)	Driver software of digital input and output for Linux.	Download (tgz)
LabVIEW-support data acquisition library DAQfast for LabVIEW	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.	Download (ZIP)

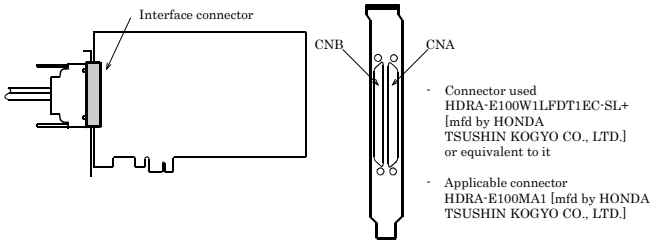
Optional Products

Item	Model	Description
Cable *1	PCB100PS-0.5 (0.5m) PCB100PS-1.5 (1.5m) PCB100PS-3 (3m) PCB100PS-5 (5m)	Shielded Cable With Two 100pin Connector
	PCB100/96PS-1.5 (1.5m) PCB100/96PS-3 (3m) PCB100/96PS-5 (5m)	Connection Conversion Shield Cable (100P→96P)
	PCA100P-1.5 (1.5m) PCA100P-3 (3m)	Flat Cable with One 100-Pin Connector
	PCB100WS-1.5 (1.5m) PCB100WS-3 (3m) PCB100WS-5 (5m)	Connection Conversion Shield Cable (100P→37P D-SUB x 2)
Accessories	EPD-100A *2*4*7	Screw Terminal Unit (M3 x 100P)
	EPD-96A *2*5*7	Screw Terminal Unit (M3 x 96P)
	EPD-96 *2*5	Screw Terminal Unit (M3.5 x 96P)
	DTP-64A *2*5	Terminal Unit for Cables (M3 x 96P)
	CCB-96 *2*5	Connector Conversion card (96-Pin→37-Pin x 2)
	EPD-37A *3*6*7	Screw Terminal Unit (M3 x 37P)
	EPD-37 *3*6	Screw Terminal Unit (M3.5 x 37P)
	DTP-3C *3*6	General Purpose Terminal (M3 x 37P)
	DTP-4C *3*6	Screw Terminal (M2.6 x 37P)
	CM-64L *2*5	Signal Monitor / Output Accessory for Digital I/O (64P)
	CM-32L *3*6	Signal Monitor for Digital I/O

*1 If using both the CNA and CNB connectors, two cable sets are required.
*2 If using both the CNA and CNB connectors, two each of the terminal block and cable sets are required.
*3 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.
*4 PCB100PS optional cable is required separately.
*5 PCB100/96PS optional cable is required separately.
*6 PCB100WS optional cable is required separately.
*7 "Spring-up" type terminal is used to prevent terminal screws from falling off.

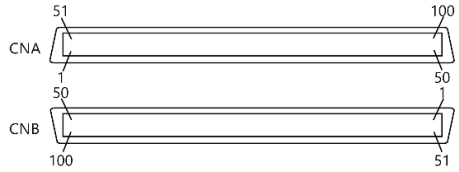
Using the On-board Connectors

Connecting a Device to a Connector



- Connector used
  HDRA-E100W1LFDT1EC-SL+
  [mfd by HONDA
  TSUSHIN KOGYO CO., LTD.]
  or equivalent to it
- Applicable connector
  HDRA-E100MA1 [mfd by HONDA
  TSUSHIN KOGYO CO., LTD.]

Connector Pin Assignment



CN B						CN A					
Function	Signal Name	Pin No.	Pin No.	Signal Name	Function	Function	Signal Name	Pin No.	Pin No.	Signal Name	Function
Common plus pin for +E/+F input ports	P-E/F	100	50	P-A/B	Common plus pin for +A/+B input ports		N.C.	1	51	N.C.	
	P-E/F	99	49	P-A/B			N.C.	2	52	N.C.	
	I-F7	98	48	I-B7			N.C.	3	53	N.C.	
	I-F6	97	47	I-B6			N.C.	4	54	N.C.	
	I-F5	96	46	I-B5			N.C.	5	55	N.C.	
+F port (Input)	I-F4	95	45	I-B4	+B port (Input)		N.C.	6	56	N.C.	
	I-F3	94	44	I-B3			*I-00	7	57	I-40	
	I-F2	93	43	I-B2			*I-01	8	58	I-41	
	I-F1	92	42	I-B1			*I-02	9	59	I-42	
	I-F0	91	41	I-B0		+0 port (Input)	*I-03	10	60	I-43	+4 port (Input)
	I-E7	90	40	I-A7			*I-04	11	61	I-44	
	I-E6	89	39	I-A6			*I-05	12	62	I-45	
	I-E5	88	38	I-A5			*I-06	13	63	I-46	
+E port (Input)	I-E4	87	37	I-A4	+A port (Input)		*I-07	14	64	I-47	
	I-E3	86	36	I-A3			*I-10	15	65	I-50	
	I-E2	85	35	I-A2			*I-11	16	66	I-51	
	I-E1	84	34	I-A1			*I-12	17	67	I-52	
	I-E0	83	33	I-A0		+1 port (Input)	*I-13	18	68	I-53	+5 port (Input)
	N.C.	82	32	N.C.			*I-14	19	69	I-54	
	N.C.	81	31	N.C.			*I-15	20	70	I-55	
	N.C.	80	30	N.C.			*I-16	21	71	I-56	
	N.C.	79	29	N.C.			*I-17	22	72	I-57	
	N.C.	78	28	N.C.		Common plus pin for +0/+1 input ports	P-0/1	23	73	P-4/5	Common plus pin for +4/+5 input ports
	N.C.	77	27	N.C.			P-0/1	24	74	P-4/5	
	N.C.	76	26	N.C.			N.C.	25	75	N.C.	
	N.C.	75	25	N.C.			N.C.	26	76	N.C.	

Common plus pin for +C/+D input ports	P-C/D	74	24	P-8/9	Common plus pin for +8/+9 input ports		N.C.	27	77	N.C.	
	P-C/D	73	23	P-8/9			N.C.	28	78	N.C.	
	I-D7	72	22	I-97			N.C.	29	79	N.C.	
	I-D6	71	21	I-96			N.C.	30	80	N.C.	
	I-D5	70	20	I-95			N.C.	31	81	N.C.	
+D port (Input)	I-D4	69	19	I-94	+9 port (Input)		N.C.	32	82	N.C.	
	I-D3	68	18	I-93			I-20	33	83	I-60	
	I-D2	67	17	I-92			I-21	34	84	I-61	
	I-D1	66	16	I-91			I-22	35	85	I-62	
	I-D0	65	15	I-90		+2 Port (Input)	I-23	36	86	I-63	+6 port (Input)
	I-C7	64	14	I-87			I-24	37	87	I-64	
	I-C6	63	13	I-86			I-25	38	88	I-65	
	I-C5	62	12	I-85			I-26	39	89	I-66	
+C port (Input)	I-C4	61	11	I-84	+8 port (Input)		I-27	40	90	I-67	
	I-C3	60	10	I-83			I-30	41	91	I-70	
	I-C2	59	9	I-82			I-31	42	92	I-71	
	I-C1	58	8	I-81			I-32	43	93	I-72	
	I-C0	57	7	I-80		+3 Port (Input)	I-33	44	94	I-73	+7 Port (Input)
	N.C.	56	6	N.C.			I-34	45	95	I-74	
	N.C.	55	5	N.C.			I-35	46	96	I-75	
	N.C.	54	4	N.C.			I-36	47	97	I-76	
	N.C.	53	3	N.C.			I-37	48	98	I-77	
	N.C.	52	2	N.C.		Common plus pin for+2/+3 input ports	P-2/3	49	99	P-6/7	Common plus pin for+6/+7 input ports
	N.C.	51	1	N.C.			P-2/3	50	100	P-6/7	

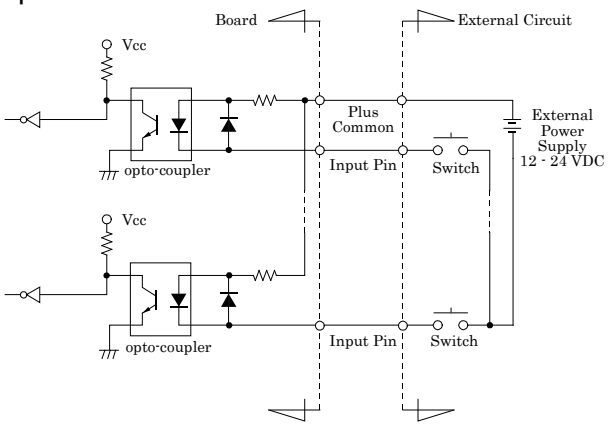
* I-00 - I-17 can be used as interrupt signal.

Signal name	Description
I-00 - I-F7	128 channels input signal. Connect output signals from the external device to these pins.
P-0/1 - P-E/F	Connect the positive side of the external power supply. These pins are common to 16 channels input signal.
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.

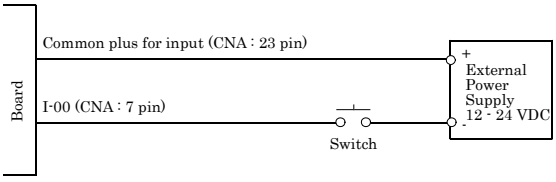
Input Circuit



** I-xx shows input pins.

The signal inputs are isolated by 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 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.

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.