PCI Express-compliant
Bi-Directional Digital I/O (Low Profile)

DIO-48D-LPE

DIO-48D-LPE is PCI Express-compliant interface board enables LVTTL level bi-directional digital I/O.   Users can use up to 48 channels including both input and output (eight channels, six groups).   This product is compatible with Low Profile size slot and Standard size slot is available with the included bracket. With the included driver library "API-PAC(W32)", users can configure the application software for Windows using the programming languages that support Win32API functions.

Driver Library [API-PAC]: Included

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

Features

48-point two-way digital I/O i8225 Mode 0-compliant.

200nsec high-speed response with non-isolated LVTTL level I/O.

All 48 input points can be used as interrupts, allow/forbid interrupts and select interruption trigger edge in bit unit.

Digital filtering function to prevent input error caused by noise and/or chattering.

Input/output switching can be set via application software.

It supports to a Low Profile PCI Express slot and a standard PCI Express slot (bracket is included).

Equipped with function equivalent to those of PCI bus-compliant board PIO-48D(PCI), PIO-48D(LPCI)H and CardBus-compliant PIO-48D(CB)H.

Connector pin assignment when using cable DIO-68M/96F is compatible with that of PIO-48D(PCI) when using PCB96P-** and PCB96PS-**P series(optional cables).

Specifications

Item	Specification
I/O	
I/O format	Unisolated LVTTL-level I/O (Positive logic) *1
Number of /O channels	48 channels (all available for interrupts)
Interrupt	48 interrupt input signals are arranged into a single output of interrupt signal INT. An interrupt is generated at the falling edge (HIGH-to-LOW transition) or rising edge (LOW-to-HIGH transition).
Response time	Within 200nsec
Rated output current	I_{OL}=8mA (Max.) I_{OH}=-8mA (Max.)
Common	
Built-in power	None
Allowable distance of signal extension	Approx. 1.5m (depending on wiring environment)
Interruption level	1 level use
Max. board count for connection	16 boards including the master board
I/O address	Any 32-byte boundary (Common to I/O part)
Power consumption (Max)	3.3VDC 300mA
Operating condition	0 - 50°C, 10 - 90%RH (No condensation)
Bus specification	PCI Express Base Specification Rev. 1.0a x 1
Physical Dimensions (mm)	121.69 (L) x 67.90 (H)
Connector used	68 pin 0.8mm pitch connector HDRA-E68LFDT+ [HONDA TSUSHIN KOGYO CO., LTD.] or equivalent
Weight	60g

*1: Data [1] = High level, Data [0] = Low level .

Physical Dimension

121.69(L)

67.90(H)

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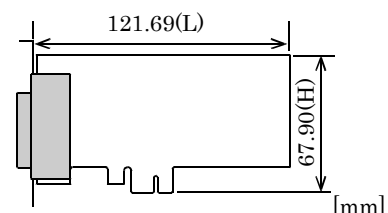
The standard outside dimension (L) is
the distance from the end of the board to
the outer surface of the slot cover.

Supported Software

Driver Software Package API-PAC(W32) (Included)
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++.
It can also be used by the installed diagnosis program to check hardware operations. CONTEC provides download services (at http://www.contec.com/apipac/) to supply the updated drivers and differential files.
For details, read Help on the included CD-ROM or visit the CONTEC Web site.
< Operating environment >
OS: Windows XP, Server 2003, 2000, Me, 98, etc..
Language: Visual C++ .NET, Visual C# .NET, Visual Basic .NET, Visual Basic, Delphi, C++Builder etc.

Linux version of analog I/O driver API-AIO (LNX)
(Supplied: Stored on the API-PAC(W32) CD-ROM)
This driver is used to control CONTEC analog I/O boards (cards) from within Linux. Users can control CONTEC I/O boards easily using the shared library called from the user application, the device driver (module) for kernel version, and the board (card) configuration program(config). CONTEC provides download services (at http://www.contec.com/apipac/) to supply the updated drivers and differential files.
For details, read Help on the bundled CD-ROM or visit the CONTEC's Web site.
< Operating environment >
OS: RedHatLinux, TurboLinux, etc..
    (For details on supported distributions, refer to Help available after installation.)
Adaptation language: gcc, etc..

■**Data acquisition VI library for LabVIEW VI-DAQ**
 -Available at 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.
See http://www.contec.com/vidaq/ for details and download of VI-DAQ.

Optional Cable & Connector

Shielded Cable for CardBus Digital I/O Card:
DIO-68M/96F (0.5m)

Shield Cable with One 68-Pin Connector:
PCA68PS-0.5P (0.5m)
PCA68PS-1.5P (1.5m)

Accessories

Terminal Unit for Relay Terminal Banks: EPD-96   *1
Screw Terminal: DTP-64(PC)   *1

*1 DIO-68M/96F optional cable is required separately.

Packing List

Board [DIO-48D-LPE] …1
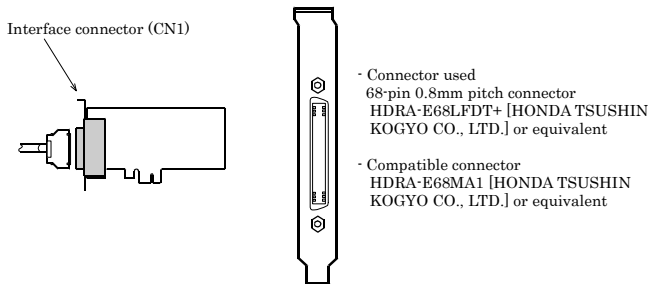
First step guide …1

CD-ROM *1 [API-PAC(W32)] …1

Standard-sized bracket …1

*1 The CD-ROM contains the driver software and User's Guide.

Connector Wiring

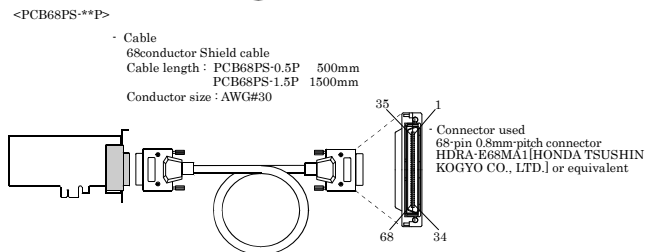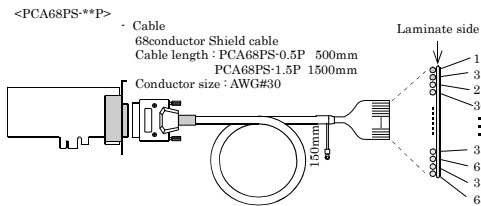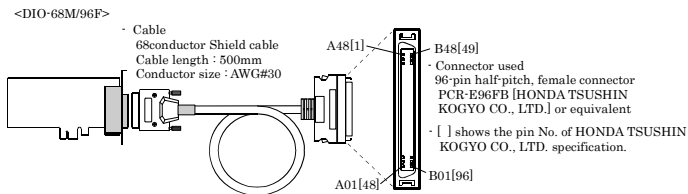### ◆Connector shape and optional cable connection

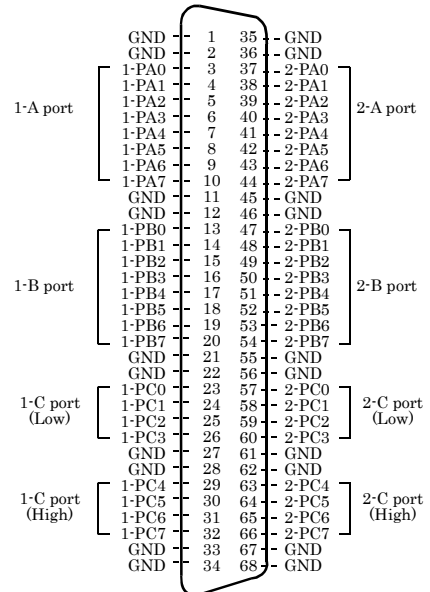The on-board interface connector (CN1) is used when connecting this product and the external devices.

Interface connector (CN1)

- Connector used
  68-pin 0.8mm pitch connector
  HDRA-E68LFDT+ [HONDA TSUSHIN
  KOGYO CO., LTD.] or equivalent

- Compatible connector
  HDRA-E68MA1 [HONDA TSUSHIN
  KOGYO CO., LTD.] or equivalent

◆Interface Connector (CN1) Shape

This shows the connection example of this product and optional cables (DIO-68M/96F or PCA68PS-**P, PCB68PS-**P)

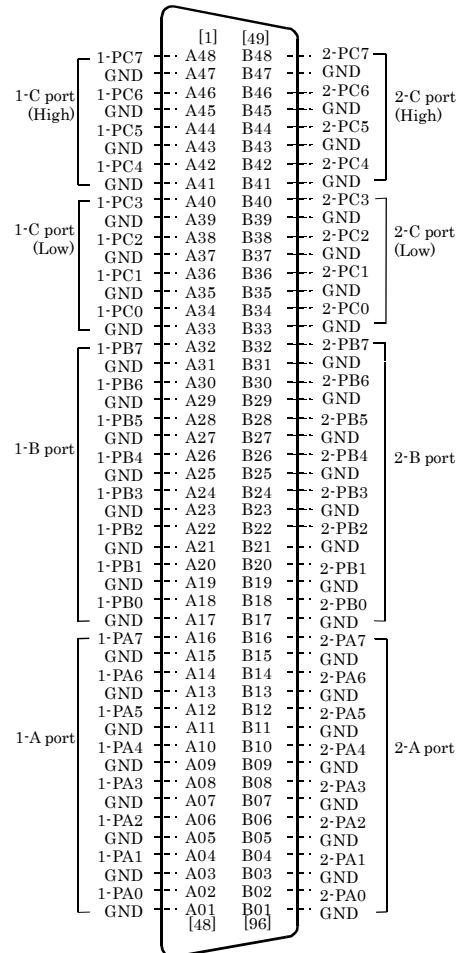<DIO-68M/96F>
- Cable
  68conductor Shield cable
  Cable length : 500mm
  Conductor size : AWG#30

A48[1]   B48[49]
- Connector used
  96-pin half-pitch, female connector
  PCR-E96FB [HONDA TSUSHIN
  KOGYO CO., LTD.] or equivalent
- [ ] shows the pin No. of HONDA TSUSHIN
  KOGYO CO., LTD. specification.

A01[48]   B01[96]

<PCA68PS-**P>
- Cable
  68conductor Shield cable
  Cable length : PCA68PS-0.5P 500mm
  PCA68PS-1.5P 1500mm
  Conductor size : AWG#30

Laminate side
1
35
2
36
150mm
33
67
34
68

<PCB68PS-**P>
- Cable
  68conductor Shield cable
  Cable length : PCB68PS-0.5P 500mm
  PCB68PS-1.5P 1500mm
  Conductor size : AWG#30

35   1
- Connector used
  68-pin 0.8mm-pitch connector
  HDRA-E68MA1[HONDA TSUSHIN
  KOGYO CO., LTD.] or equivalent
68   34

◆Connector Pin Assignment
■Pin Assignments of Interface Connector (CN1)

1-A port				2-A port
GND	1		35	GND
GND	2		36	GND
1-PA0	3		37	2-PA0
1-PA1	4		38	2-PA1
1-PA2	5		39	2-PA2
1-PA3	6		40	2-PA3
1-PA4	7		41	2-PA4
1-PA5	8		42	2-PA5
1-PA6	9		43	2-PA6
1-PA7	10		44	2-PA7
GND	11		45	GND
GND	12		46	GND
1-PB0	13		47	2-PB0
1-PB1	14		48	2-PB1
1-PB2	15		49	2-PB2
1-PB3	16		50	2-PB3
1-PB4	17		51	2-PB4
1-PB5	18		52	2-PB5
1-PB6	19		53	2-PB6
1-PB7	20		54	2-PB7
GND	21		55	GND
GND	22		56	GND
1-PC0	23		57	2-PC0
1-PC1	24		58	2-PC1
1-PC2	25		59	2-PC2
1-PC3	26		60	2-PC3
GND	27		61	GND
GND	28		62	GND
1-PC4	29		63	2-PC4
1-PC5	30		64	2-PC5
1-PC6	31		65	2-PC6
1-PC7	32		66	2-PC7
GND	33		67	GND
GND	34		68	GND

1-B port / 2-B port; 1-C port (Low) / 2-C port (Low); 1-C port (High) / 2-C port (High)

■Signal assignment with the DIO-68M/96F used (96-pin connector side)

Port	1- side	[1]	[49]	2- side	Port
1-C port (High)	1-PC7	A48	B48	2-PC7	2-C port (High)
	GND	A47	B47	GND	
	1-PC6	A46	B46	2-PC6	
	GND	A45	B45	GND	
	1-PC5	A44	B44	2-PC5	
	GND	A43	B43	GND	
	1-PC4	A42	B42	2-PC4	
	GND	A41	B41	GND	
1-C port (Low)	1-PC3	A40	B40	2-PC3	2-C port (Low)
	GND	A39	B39	GND	
	1-PC2	A38	B38	2-PC2	
	GND	A37	B37	GND	
	1-PC1	A36	B36	2-PC1	
	GND	A35	B35	GND	
	1-PC0	A34	B34	2-PC0	
	GND	A33	B33	GND	
1-B port	1-PB7	A32	B32	2-PB7	2-B port
	GND	A31	B31	GND	
	1-PB6	A30	B30	2-PB6	
	GND	A29	B29	GND	
	1-PB5	A28	B28	2-PB5	
	GND	A27	B27	GND	
	1-PB4	A26	B26	2-PB4	
	GND	A25	B25	GND	
	1-PB3	A24	B24	2-PB3	
	GND	A23	B23	GND	
	1-PB2	A22	B22	2-PB2	
	GND	A21	B21	GND	
	1-PB1	A20	B20	2-PB1	
	GND	A19	B19	GND	
	1-PB0	A18	B18	2-PB0	
	GND	A17	B17	GND	
1-A port	1-PA7	A16	B16	2-PA7	2-A port
	GND	A15	B15	GND	
	1-PA6	A14	B14	2-PA6	
	GND	A13	B13	GND	
	1-PA5	A12	B12	2-PA5	
	GND	A11	B11	GND	
	1-PA4	A10	B10	2-PA4	
	GND	A09	B09	GND	
	1-PA3	A08	B08	2-PA3	
	GND	A07	B07	GND	
	1-PA2	A06	B06	2-PA2	
	GND	A05	B05	GND	
	1-PA1	A04	B04	2-PA1	
	GND	A03	B03	GND	
	1-PA0	A02	B02	2-PA0	
	GND	A01	B01	GND	
		[48]	[96]		

How to Connect Input/Output Signals

The I/O circuits of interface blocks of this board are illustrated in the image below. Signals are LVTTL levels and positive logic. None of the signals is pulled up.

◆Input/Output circuit
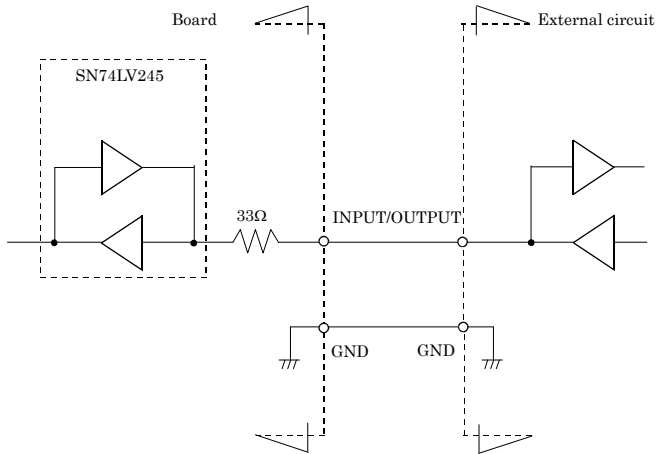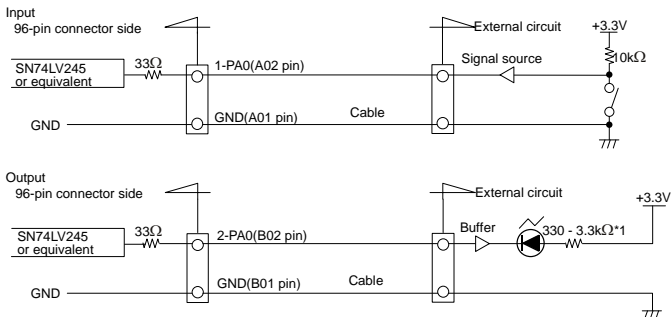

⚠ CAUTION

Be careful of not to short the outputs to digital ground as this may cause a fault.

If connecting pull-up resistors to the outputs, use a resistor of approximately 10kΩ and pull-up to the 5V power supply, or use a resistor of approximately 4.7kΩ and pull-up to the 3.3V power supply.

◆Example Connection 1 (Using DIO-68M/96F)

*   Resistor value should be adjusted according to the specification of the LED to use and the desired intensity level.

◆Example Connection 2
(Using PCA68PS-**P, PCB68PS-**P)
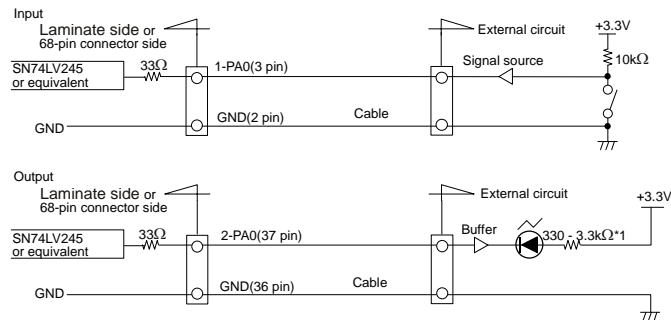
*   Resistor value should be adjusted according to the specification of the LED to use and the desired intensity level.

Block Diagram