This product is a negative-common typed PCI bus-compliant interface board used to provide a digital signal input function on a PC. This product can input 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 driver is bundled with this product. Possible to be used as a data recording device for LabVIEW, with dedicated libraries.

**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 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 input.

Opto-coupler bus isolation
As the PC is isolated from the input interfaces by opto-couplers, 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 compatible driver libraries are attached.
Using the attached driver library API-PAC(W32) 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.

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.

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.

**Specification**

<table>
<thead>
<tr>
<th>Item</th>
<th>Specifications</th>
</tr>
</thead>
<tbody>
<tr>
<td>Input</td>
<td></td>
</tr>
<tr>
<td>Input format</td>
<td>Opto-isolated input (corresponding to the current source output)(Positive logic “1)”</td>
</tr>
<tr>
<td>Number of input signal channels</td>
<td>128 channels (all available for interrupts)</td>
</tr>
<tr>
<td>Input resistance</td>
<td>4.7k</td>
</tr>
<tr>
<td>Input ON current</td>
<td>2.0mA or more</td>
</tr>
<tr>
<td>Input OFF current</td>
<td>0.16mA or less</td>
</tr>
<tr>
<td>Interrupts</td>
<td>16 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).</td>
</tr>
<tr>
<td>Response time</td>
<td>200µsec (Max.)</td>
</tr>
<tr>
<td>Common</td>
<td></td>
</tr>
<tr>
<td>I/O address</td>
<td>Any 32-byte boundary</td>
</tr>
<tr>
<td>Interrupt level</td>
<td>1 level use</td>
</tr>
<tr>
<td>Boards in one system</td>
<td>Maximum of 16 boards can be install in a same system.</td>
</tr>
<tr>
<td>Dielectric strength</td>
<td>250V/mm</td>
</tr>
<tr>
<td>External power supply</td>
<td>12 - 24VDC (±10%)</td>
</tr>
<tr>
<td>Power consumption</td>
<td>5WDC 100mA (Max.)</td>
</tr>
<tr>
<td>Operating condition</td>
<td>0 - 50°C, 10 - 90%RH (No condensation)</td>
</tr>
<tr>
<td>Allowable distance of signal extension</td>
<td>Approx. 50m (depending on wiring environment)</td>
</tr>
<tr>
<td>PCI bus specification</td>
<td>32bit, 33MHz, Universal key shapes supported “2”</td>
</tr>
<tr>
<td>Dimension (mm)</td>
<td>176.41(L) x 106.68(H)</td>
</tr>
<tr>
<td>Weight</td>
<td>215g</td>
</tr>
</tbody>
</table>

*1 Data “0” and “1” correspond to the Low and High 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).
**Support Software**

**Windows version of digital I/O driver API-DIO(WDM) / API-DIO(98/PC)**

[Stored on the bundled CD-ROM driver library API-PAC(W32)]

The API-DIO(WDM) / API-DIO(98/PC) is the Windows version driver library software that provides products in the form of Win32 API functions (DLL). Various sample programs such as Visual Basic and Visual C++, etc and diagnostic program useful for checking operation is provided.

< Operating environment >
OS
- Windows 7, Server 2008, Vista, XP
- Server 2003, 2000

Adaptation language
- Visual Basic, Visual C++, Visual C#
- Delphi, C++ Builder

You can download the updated version from the CONTEC's Web site (http://www.contec.com/apipac/). For more details on the supported OS, applicable language and new information, please visit the CONTEC's Web site.

**Linux version of digital I/O driver API-DIO(LNX)**

[Stored on the bundled CD-ROM driver library API-PAC(W32)]

The API-DIO(LNX) is the Linux version driver software which provides device drivers (modules) by shared library and kernel version. Various sample programs of gcc are provided.

< Operating environment >
OS
RedHatLinux, TurboLinux
(For details on supported distributions, refer to Help available after installation.)

Adaptation language
- gcc

You can download the updated version from the CONTEC's Web site (http://www.contec.com/apipac/). For more details on the supported OS, applicable language and new information, please visit the CONTEC's Web site.

**Data acquisition VI library for LabVIEW VI-DAQ (Available for downloading (free of charge) from 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.

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**Cable & Connector**

**Shielded Cable With Two 100pin Connector**
- PCB100PS-0.5 (0.5m)
- PCB100PS-1.5 (1.5m)
- PCB100PS-3 (3m)
- PCB100PS-5 (5m)

**Connection Conversion Shield Cable (100P→96P)**
- PCB100/96PS-1.5 (1.5m)
- PCB100/96PS-3 (3m)
- PCB100/96PS-5 (5m)

**Flat Cable with One 100-Pin Connector**
- PCA100P-1.5 (1.5m)
- PCA100P-3 (3m)
- PCA100P-5 (5m)

**Connection Conversion Shield Cable (100pin→37pin D-SUB x 2)**
- PCB100WS-1.5 (1.5m)
- PCB100WS-3 (3m)
- PCB100WS-5 (5m)

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**Accessories**

**Accessories (Option)**

- Screw Terminal Unit (M3 x 100P)
  - EPD-100A *1*4*6
- Screw Terminal Unit (M3 x 96P)
  - EPD-96A *2*4*6
- Screw Terminal Unit (M3.5 x 96P)
  - EPD-96 *2*4
- Terminal Unit for Cables (M3 x 96P)
  - DTP-64A *2*4
- Connector Conversion Board (96-Pin→37-Pin x 2)
  - CCB-96 *2*4
- Screw Terminal Unit (M3 x 37P)
  - EPD-37A *3*5*6
- Screw Terminal Unit (M3.5 x 37P)
  - EPD-37 *3*5
- General Purpose Terminal (M3 x 37P)
  - DTP-3A *3*5
- General Purpose Terminal (M3 x 37P)
  - DTP-4A *3*5

*1 PCB100PS optional cable is required separately.
*2 PCB100/96PS optional cable is required separately.
*3 PCB100WS optional cable is required separately.
*4 If using both the CNA and CNB connectors, two each of the terminal block and cable sets are required.
*5 If using both the CNA and CNB connectors, two cable sets are required.
*6 “Spring-up” type terminal is used to prevent terminal screws from falling off.
* Please check the CONTEC's Web site for more information on these options.

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**Packing List**

- Board [DI-128RL-PCI] …1
- First step guide …1
- CD-ROM *1 [API-PAC(W32)] …1

*1 The CD-ROM contains the driver software and User's Guide (this guide)
The standard outside dimension (L) is the distance from the end of the board to the outer surface of the slot cover.

176.41 (L)
106.68 (H)

Connecting a Device to a Connector
To connect an external device to this board, plug the cable from the device into the interface connector (CAN, CNB) shown below.

- Connector used: HDRA-E100W1LFDT1EC-SL (mfd. by HONDA)
- Applicable connector: HDRA-E100MA1 (mfd. by HONDA)

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 (CAN, CNB) shown below.
Pin assignments for connecting to the PCB100/96PS or PCB100WS
The figure below shows the correspondence between the option cable pins and signals.

Pin Assignments of PCB100/96PS

<table>
<thead>
<tr>
<th>CN A</th>
<th>CN B</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Pin Assignments of PCB100WS</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
</tr>
</tbody>
</table>

*[] shows pin numbers specified by HONDA TNUSHIN KOGYO CO., LTD.

1/00 - 1/F    128 input pins. Connect output signals from the external device to these pins.
N/C - N/F    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.

Relationships between API-PAC(W32) Logical Ports/Bits and Connector Signal Pins

The following table lists the relationships between the connector signal pins and the logical port/bit numbers used for I/O functions when applications are written with API-PAC(W32).

<table>
<thead>
<tr>
<th>Relationships between Logical Ports/Bits and Connector Signal Pins</th>
</tr>
</thead>
<tbody>
<tr>
<td>D7</td>
</tr>
<tr>
<td>----</td>
</tr>
<tr>
<td>1/0</td>
</tr>
<tr>
<td>1/17</td>
</tr>
<tr>
<td>1/23</td>
</tr>
<tr>
<td>1/31</td>
</tr>
<tr>
<td>1/39</td>
</tr>
<tr>
<td>1/47</td>
</tr>
<tr>
<td>1/56</td>
</tr>
<tr>
<td>1/65</td>
</tr>
<tr>
<td>1/74</td>
</tr>
<tr>
<td>1/83</td>
</tr>
<tr>
<td>1/96</td>
</tr>
<tr>
<td>1/108</td>
</tr>
<tr>
<td>1/117</td>
</tr>
<tr>
<td>1/126</td>
</tr>
</tbody>
</table>

xx represents a CNA or a CNB input signal. [xx] represents a logical bit.
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 represents the input pin.

The input circuit of this board is illustrated in the above figure. The signal inputs are isolated by opto-couplers (corresponding to the current source output). 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.