Digital Output Board with Opto-Isolation for PCI
PO-64L(PCI)H

This product is a PCI bus-compliant interface board used to provide a
digital signal output function on a PC.
This product can input and output digital signals at 12 - 24VDC.
PO-64L(PCI)H features 64 opto-coupler isolated open-collector outputs.
In addition, output transistor protection circuit (surge voltage protection
and overcurrent protection).

Windows/Linux driver is bundled with this product.
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 May, 2018.

**Features**

Opto-coupler isolated open-collector output (current sink type)
PO-64L(PCI)H has the 64ch of opto-coupler isolated open-collector
output (current sink type) whose response speed 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 PC is isolated from the input and output interfaces by opto-
couplers, this product has excellent noise performance.

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.

The output circuit, has a built-in Zener diode and the overcurrent
protection circuit of the surge voltage protection.
Zener diodes are connected to the output circuits to protect against
surge voltages. In addition, the output circuit, it attaches the overcurrent
protection circuit at the output 8-channel unit. The output rating is max.
35VDC, 100mA per channel.

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

**Hardware specifications**

<table>
<thead>
<tr>
<th>Item</th>
<th>Specifications</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Output</strong></td>
<td></td>
</tr>
<tr>
<td>Output format</td>
<td>Opto-coupler isolated open-collector output (current sink type)(Negative logic *1)</td>
</tr>
<tr>
<td>Number of output signal channels</td>
<td>64 channels(One common power supply per 16 channels)</td>
</tr>
<tr>
<td>Output rating</td>
<td>35VDC (Max.)</td>
</tr>
<tr>
<td>Output current</td>
<td>100mA (per channel) (Max.)</td>
</tr>
<tr>
<td>Residual voltage with output on</td>
<td>0.5V or less (Output current:50mA), 1.0V or less (Output currents:100mA)</td>
</tr>
<tr>
<td>Surge protector</td>
<td>Zener diode(RD47FM(NEC) or equivalent)</td>
</tr>
<tr>
<td>Response time</td>
<td>200µsec within</td>
</tr>
<tr>
<td><strong>Common</strong></td>
<td></td>
</tr>
<tr>
<td>Address</td>
<td>Any 32-byte boundary</td>
</tr>
<tr>
<td>Interrupt level</td>
<td>Not used</td>
</tr>
<tr>
<td>Max board count for connection</td>
<td>16 boards including the master board</td>
</tr>
<tr>
<td>Dielectric strength</td>
<td>5000mF</td>
</tr>
<tr>
<td>Internal circuit power supply</td>
<td>12 - 24VDC (+10%)</td>
</tr>
<tr>
<td>Power consumption</td>
<td>500W, 250mA (Max.)</td>
</tr>
<tr>
<td>Operating condition</td>
<td>0 - 50ºC, 10% 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>176x111x 105x18</td>
</tr>
<tr>
<td>Weight</td>
<td>250g</td>
</tr>
</tbody>
</table>

*1 Data “0” and “1” correspond to the High and Low levels, respectively.
*2 This board 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).

**Board Dimensions**

The standard outside dimension (LI) is the distance from the end of the board to
the outer surface of the slot cover.

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

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**Packing List**

Product [PO-64L(PCI)H] ...1
First step guide ... 1
Disk *1 [API-PAC(W32)] ...1
Warranty Certificate ...1
Serial number Label ...1

*1 The bundled disk contains the driver software and User's Guide
Support Software

Windows version of digital I/O driver API-DIO(WDM)/API-DIO(98/PC) [Storied on the bundled disk driver API-PAC(W32)]
The API-DIO(WDM) is the Windows version driver 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. 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) [Storied on the bundled disk driver API-PAC(W32)]
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LabVIEW-support data acquisition library DAQfast for LabVIEW (Available for downloading (free of charge) from the CONTEC web site.)
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. For more details on the library and download of DAQfast for LabVIEW, please visit the CONTEC’s Web site.

How to connect the connectors

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

Accessories (Option)

Cable & Connector (Option)
96-Pin Shield Cable with a Half-Pitch Connector
: PCB96PS-0.5P (0.5m), PCB96PS-1.5P (1.5m), PCB96PS-5P (5m)
Flat Cable with 96-Pin Half-Pitch Connectors at Both Ends
: PCB96P-1.5 (1.5m), PCB96P-3 (3m)
96-Pin Shield Cable with 2sided Half-Pitch Connector
: PCA96PS-0.5P (0.5m), PCA96PS-1.5P (1.5m), PCA96PS-3P (3m), PCA96PS-5P (5m)
Flat Cable with One 96-Pin Half-Pitch Connector
: PCA96P-1.5 (1.5m), PCA96P-3 (3m)
Connection Conversion Shield Cable(96P → 37P x 2)
: PCB96WS-1.5P (1.5m), PCB96WS-3P (3m), PCB96WS-5P (5m)

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**Output Circuit**

Connect the output signals to a current-driven controlled device such as a relay or LED. The connection requires an external power supply to feed currents. The board controls turning on/off the current-driven controlled device using a digital value.

The output circuits of interface blocks of the PO-64L(PCI)H is illustrated in Figure. The signal output section is an opto-coupler isolated, open-collector output (current sink type). Driving the output section requires an external power supply. The rated output current per channel is 100 mA at maximum. The output section can also be connected to a TTL level input as it uses a low-saturated transistor for output. The residual voltage (low-level voltage) between the collector and emitter with the output on is 0.5 V or less at an output current within 50 mA or at most 1.0 V at an output current within 100 mA. To protect against surge voltage, a Zener diode is connected to the output transistor. Also, an overcurrent protection circuit is attached to a unit of eight output channels.

### CAUTION

When the PC is turned on, all output are reset to OFF.

**Connection to the LED**

<table>
<thead>
<tr>
<th>Board side</th>
<th>Output plus common (CN1 : B19pin)</th>
<th>5.1kΩ</th>
<th>LED</th>
</tr>
</thead>
<tbody>
<tr>
<td>O-40 (CN1 : B03pin)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>O-40 (CN1 : B01pin)</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

When “1” is output to a relevant bit, the corresponding LED comes on. When “0” is output to the bit, in contrast, the LED goes out.

**Example of Connection to TTL Level Input**

[Diagram showing connection setup]

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

1. Protective elements provided for outputs
   - PO-64L(PCI)H: Surge protector: Zener diode
   - PO-64L(PCI): Nothing

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