This product is a USB 2.0 compliant terminal that extends the digital signal I/O functions of a PC. This product is a 12 - 24VDC opto-coupler isolated type that does not require external power with input 8 channels and open-collector output 8 channels. In addition, output transistor protection circuit (surge voltage protection and overcurrent protection) are provided. Windows 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 (supporting current sink output) and opto-coupler isolated open-collector output (current sink type)

This product has the opto-coupler isolated input 8 channels (supporting current sink output) and opto-coupler isolated open collector output (current sink type) 8 channels whose response speed is 300μsec. Supporting driver voltages of 12 - 24 VDC for I/O. (12 - 24VDC external circuit power supply is required separately.)

Compatible to USB1.1/USB2.0 and not necessary to power this product externally as the bus power is used. Compatible to USB1.1/USB2.0 and capable to achieve high speed transfer at HighSpeed (480 Mbps).

**Opto-coupler bus isolation**

As the USB (PC) is isolated from the input and output interfaces by opto-couplers, this product has excellent noise performance.

Output circuits include zener diodes for surge voltage protection and poly-switches for overcurrent protection.

Zener diodes are connected to the output circuits to protect against surge voltages. Similarly, polyswitches are fitted to each group of 8channels outputs for over-current protection. The output rating is max. 35VDC, 100mA per channel.

**Windows compatible driver libraries are attached.**

Using the attached driver library API-USBP(WDM) makes it possible to create applications of Windows. In addition, a diagnostic program by which the operations of hardware can be checked is provided.

**Easy-to-wire terminal connector adopted**

Adoption of terminal connector (with screws) enables to achieve easy wiring.

**LabVIEW is supported by a plug-in of dedicated library VI-DAQ.**

Using the dedicated library VI-DAQ makes it possible to create each application for LabVIEW.

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**Specification**

<table>
<thead>
<tr>
<th>Item</th>
<th>Specifications</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Input section</strong></td>
<td></td>
</tr>
<tr>
<td>Number of input signal points</td>
<td>8 points (1 common)</td>
</tr>
<tr>
<td>Input format</td>
<td>Opto-isolated input (Compatible with current sink output) (Negative logic*1)</td>
</tr>
<tr>
<td>Input resistance</td>
<td>4.7 kΩ</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>Response time</td>
<td>300μsec within *2</td>
</tr>
<tr>
<td><strong>Output section</strong></td>
<td></td>
</tr>
<tr>
<td>Number of output signal points</td>
<td>8 points (1 common)</td>
</tr>
<tr>
<td>Output format</td>
<td>Opto-isolated open collector output (current sink type) (Negative logic*1)</td>
</tr>
<tr>
<td>Output rating</td>
<td>35VDC (Max.)</td>
</tr>
<tr>
<td>Output current</td>
<td>100mA (per point) (Max.)</td>
</tr>
<tr>
<td>Residual voltage with output on</td>
<td>0.5V or less (Output current:&lt;50mA), 1.0V or less (Output current:&lt;100mA)</td>
</tr>
<tr>
<td>Surge protector</td>
<td>Zener diode RD47FM(NEC) or equivalent</td>
</tr>
<tr>
<td>Response time</td>
<td>300μsec within *2</td>
</tr>
<tr>
<td><strong>USB</strong></td>
<td></td>
</tr>
<tr>
<td>Bus specification</td>
<td>USB Specification 2.0/1.1 standard</td>
</tr>
<tr>
<td>USB transfer rate</td>
<td>12Mbps (Full-speed), 480Mbps (High-speed) *3</td>
</tr>
<tr>
<td>Power supply</td>
<td>Bus power</td>
</tr>
<tr>
<td><strong>Connector</strong></td>
<td>14 pin (screw-terminal) plug header</td>
</tr>
<tr>
<td>Number of terminals used at the same time</td>
<td>127 terminals (Max.) *4</td>
</tr>
<tr>
<td><strong>Dielectric strength</strong></td>
<td>1000Vrms</td>
</tr>
<tr>
<td><strong>External circuit power supply</strong></td>
<td>12 - 24VDC (±10%)</td>
</tr>
<tr>
<td><strong>Current consumption</strong></td>
<td>5VDC 250mA</td>
</tr>
<tr>
<td><strong>Operating conditions</strong></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>Physical dimensions</td>
<td>64(W) x 62(D) x 24(H) (exclusive of protrusions)</td>
</tr>
<tr>
<td>Weight</td>
<td>70g (Not including the USB cable, attachment)</td>
</tr>
<tr>
<td>Attached cable</td>
<td>USB cable 1.8m</td>
</tr>
<tr>
<td><strong>Compatible wires</strong></td>
<td>AWG28 - 16</td>
</tr>
</tbody>
</table>

* Data “0” and “1” correspond to the High and Low levels, respectively.
* The opto-coupler’s response time comes.
* This depends on the host PC environment used (OS and USB host controller).
* As a USB hub is also counted as one device, you cannot just connect 127 USB terminals.
* External circuit power supply is required separately.
Support Software

Driver Library API-USBP(WDM) (Bundled)
It is the library software, and which supplies command of hardware produced by our company in the form of standard Win32 API function(DLL). Using programming languages supporting Win32API functions, such as Visual Basic and Visual C++ etc., you can develop high-speed application software with feature of hardware produced by our company. In addition, you can verify the operation of hardware using Diagnostic programs.
CONTEC provides download services (at http://www.contec.com/apiusbp/) to supply the updated drivers and differential files.
Further details may be found in the help within supplied CD-ROM or the homepage of our company.

< Operating environment >
OS Windows Vista, XP, Server 2003, 2000, Me, 98
Adaptation language Visual Basic, Visual C++, Visual C#, Delphi, C++ Builder

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.

Cable & Connector

Connector (Option)
14pin Screw Terminal Connector Set(6 pieces) : CN6-Y14

Accessories

Accessories (Option)
Bracket for USB I/O Terminal products : BRK-USB-Y
* Check the CONTEC’s Web site for more information on these options.

Packing List
USB terminal [DIO-0808LY-USB]…1
Interface connector plugs…2
First step guide…1
CD-ROM *1 [API-USBP(WDM)]…1
USB Cable(1.8m)…1
USB Cable Attachment…1
Warranty Certificate…1
Serial number label …1

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

Block Diagram

Physical Dimensions

Name of each parts

LED indicator

List of Status LED Functions

How to connect the connectors

Connecting a terminal to a Connector
To connect an external device to this terminal, plug the cable from the device into the interface connector (CN1, CN2) shown below.
**Connector Pin Assignment**

### CN1

1. **14** --- O-PC
2. **13** --- O-PC
3. **12** --- N.C.
4. **11** --- O-00
5. **10** --- O-01
6. **9**  --- O-02
7. **8**  --- O-03
8. **7**  --- O-04
9. **6**  --- O-05
10. **5** --- O-06
11. **4** --- O-07
12. **3** --- N.C.
13. **2** --- O-NC
14. **1** --- O-NC

### CN2

1. **N.C.** --- 1
2. **N.C.** --- 2
3. **N.C.** --- 3
4. **I-07** --- 4
5. **I-06** --- 5
6. **I-05** --- 6
7. **I-04** --- 7
8. **I-03** --- 8
9. **I-02** --- 9
10. **I-01** --- 10
11. **I-00** --- 11
12. **N.C.** --- 12
13. **I-PC** --- 13
14. **I-PC** --- 14

**CAUTION**

Removing the connector plug by grasping the cable can break the wire.

**Cable connection**

When connecting the product to an external device, you can use the supplied connector plug.

For wiring, strip off approximately 9 - 10mm of the covered part of a wire rod and then insert it to the opening. After the insertion, secure the wire rod with screws. Compatible wires are AWG 28 - 16.

### Input Signal Connection

#### Input Circuit

The input circuit of this product is illustrated in the image above. It is connected to devices such as switch and transistor output devices, which can be powered by an electric current. The ON/OFF state of a device that can be powered by an electric current is entered as a digital value. The input channels are to be connected with current sinking output signals. Driving these opto-isolated circuits require an additional power supply isolated from the PC system. When a 12VDC external power is used, each input channel will consume about 2.6mA current; when a 24VDC external power supply is selected, each input channel will consume about 5.1mA current.

#### Connecting a Switch

When the switch is ON, the corresponding bit contains 1. When the switch is OFF, by contrast, the bit contains 0.
The output circuit of this product is illustrated in the image above. The signal output section is an opto-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. A zener diode is connected to the output transistor for protection from surge voltages. A PolySwitch-based over-current protector is provided for every eight output transistors. When the over-current protector works, the output section of the product is temporarily disabled. If this is the case, turn off the power to the PC and the external power supply and wait for a few minutes, then turn them on back.

⚠️ CAUTION
When the PC is turned on, all outputs are reset to OFF.

Example of Connection to LED

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

Connecting the Sink Type Output and Sink Output Support Input

The following example shows a connection between a sink type output (output side) and a sink output support input (input side). Use this sample connection as a reference when connecting more than one of this product together.