

Digital Output Board with Opto-Isolation for PCI Express (On-board Power Supply) DO-32B-PE



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

Features

Opto-coupler isolated open-collector output (current sink type)

DO-32B-PE has the 32ch of opto-coupler isolated open-collector output (current sink type) whose response time 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 PCI Express bus (PC) is isolated from the output interfaces by opto-couplers, this product has excellent noise performance.

Power for opto-coupler operation (12VDC 240mA) supplied internally

As the power to run the opto-couplers is supplied internally, no external power supply is required. The use of jumpers allows you to decide whether you want to use the internal or external power supply for every 16 points.

Windows/Linux support device driver

Using the device driver API-TOOL 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.

Zener diode for surge voltage protection and the circuit for overcurrent 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.

Functions and connectors are compatible with PCI compatible board PO-32B(PCI)H

DO-32B-PE : The functions same with PCI compatible board PO-32B(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.

This product is a PCI Express bus-compliant interface board for output of digital signals. This product can output digital signals at 12 - 24VDC.

DO-32B-PE features 32 opto-coupler isolated open-collector outputs (current sink type). In addition, this product is equipped with a power supply for driving opto-couplers (12VDC) and output transistor protection circuit (surge voltage protection and overcurrent protection).

Windows/Linux device driver is supported with this product.

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*Visit the CONTEC website to check the latest details in the document.

*The information in the data sheets is as of February 2024.

Hardware Specifications

Function Specifications

Item		Specifications
Output	Type	Opto-Isolated Open Collector Output (current sinking type) (Negative logic *1)
	Number of Channels	32ch (One common power supply per 16 channels)
	Output rated voltage	35VDC (Max)
	Output rated current	100mA/channel (Max)
	Residual voltage with output on	0.5V or less (Output current ≤ 50mA), 1.0V or less (Output current ≤ 100mA)
	Surge protector	Zener diode RD47FM(Renesas) or equivalent
	Response time	200μsec within
Common	Internal power	12VDC 240mA *2
	Connecting distance	50m (Typ.)(depending on wiring environment)
	I/O address	Any 32-byte boundary
	Interruption level	Not used
	Boards in one system	Maximum of 16 boards can be install in a same system.
	Isolated voltage	500Vrms
	External circuit power supply	12 - 24VDC (±10%)
	Power consumption	When using the internal power supply : 3.3VDC 380mA(Max), 12VDC 350mA(Max) When using the external power supply : 3.3VDC 380mA(Max)
	Bus specification	PCI Express Base Specification Rev. 1.0a x1
	Dimension (mm)	169.33(L) x 110.18(H)
	Weight	140g

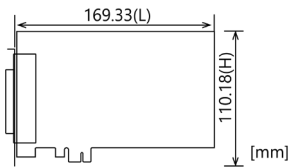
*1 Data "0" and "1" correspond to the High and Low levels, respectively.

*2 When using the internal power supply, the SW section of output channel consumes up to 30mA, so the output current that can be supplied to the external device is 180mA.

Installation Environment Requirements

Item	Specifications
Operating ambient temperature	0 - +50°C
Operating ambient humidity	10 - 90%RH (No condensation)
Floating dust particles	Not to be excessive
Corrosive gases	None
Standard	VCCI Class A, CE Marking (EMC Directive Class A, RoHS Directive), UKCA

Physical Dimensions



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

Packing List

Product ...1

Please read the following ... 1

Support Software

Name	Contents	How to get
Windows Version Digital I/O Driver software API-DIO(WDM)	The Windows device driver is provided as a form of Windows API functions. Various sample programs such as C# and Visual Basic .NET, Visual C++, Python etc. and diagnostic program useful for checking operation is provided.	Download from the CONTEC website *1
Linux Version Digital I/O Driver software API-DIO(LNX)	The Linux device driver is provided as a shared library. The software includes various sample programs such as gcc (C, C++) and Python programs, as well as a configuration tool to configure the device settings.	Download from the CONTEC website *1
Software Development Tool Kits (SDK) and Support Software	In addition to the device drivers, we offer many software programs for using CONTEC devices in an easier manner.	Download from the CONTEC website *2

*1 Download the files from the following URL.

<https://www.contec.com/download/>

*2 For supported software, search the CONTEC website for this product and view the product page.

<https://www.contec.com/>

Optional Products

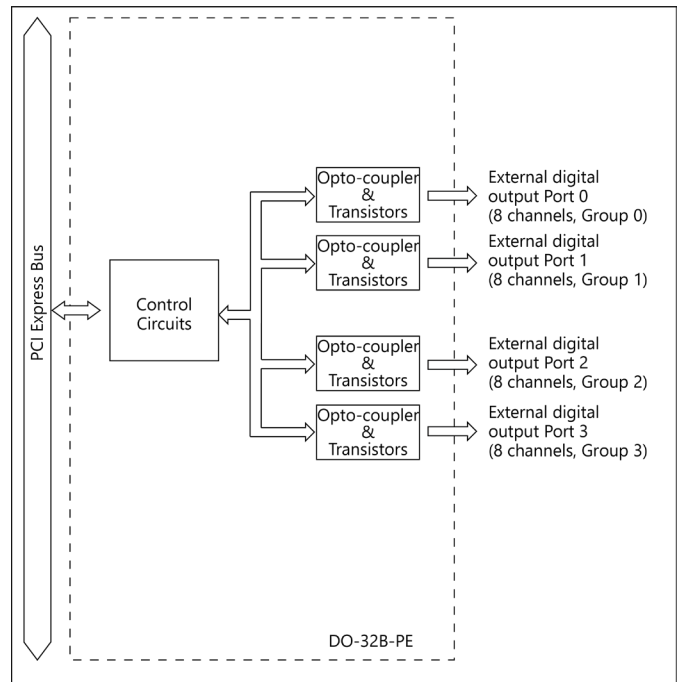
Product Name	Model type	Description
Shield Cable with two 37-pin D-type connectors	PCB37PS-0.5P	0.5m
	PCB37PS-1.5P	1.5m
	PCB37PS-3P	3m
	PCB37PS-5P	5m
Flat Cable with 37-Pin D-type Connectors on 2Ends	PCB37P-1.5	1.5m
Shield Cable with One 37pin D-type Connector	PCA37PS-0.5P	0.5m
	PCA37PS-1.5P	1.5m
	PCA37PS-3P	3m
	PCA37PS-5P	5m
Flat Cable with a 37Pin D-type Connectors	PCA37P-1.5	1.5m
	PCA37P-3	3m
Screw Terminal (M3 * 37P)	EPD-37A	*1 *2
Screw Terminal (M3.5 * 37)	EPD-37	*2
General Purpose Terminal	DTP-3C	*2
Screw Terminal	DTP-4C	*2
Signal monitor Accessory for Digital I/O (32bits)	CM-32L	*2

*1 "Spring-up" type terminal is used to prevent terminal screws from falling off.

*2 A PCB37P or PCB37PS optional cable is required separately.

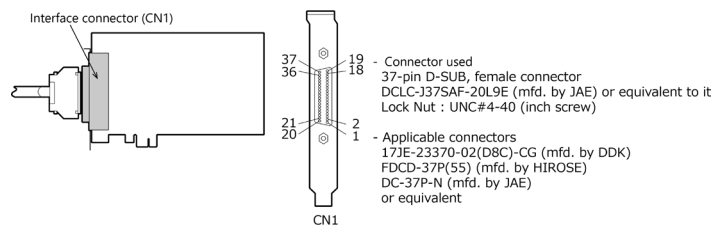
Visit the CONTEC website for the latest optional products.

Block Diagram



Connecting an Interface Connector

To connect an external device to this product, plug the cable from the device into the interface connector (CN1) shown below.



Layout on the Interface Connector(CN1)

Common plus pin for +2/+3 output ports			Common minus pin for +2/+3 output ports		
P1	37		N1	20	
O-37	36				
O-36	35				
O-35	34				
O-34	33				
O-33	32				
O-32	31				
O-31	30				
O-30	29				
O-27	28				
O-26	27				
O-25	26				
O-24	25				
O-23	24				
O-22	23				
O-21	22				
O-20	21				
Common plus pin for +0/+1 output ports			Common minus pin for +0/+1 output ports		
P0			N0		
O-17					
O-16					
O-15					
O-14					
O-13					
O-12					
O-11					
O-10					
O-07					
O-06					
O-05					
O-04					
O-03					
O-02					
O-01					
O-00					

Signal name	Description
O-00 - O-37	32 output signal pins. Connect these pins to the input signal pins of the external device.
P0	When the external power supply is selected, its positive side is connected to this pin. When the internal power supply is used, this pin output power at +12 V. This pin is common to 16 output signal pins.
P1	When the external power supply is selected, its positive side is connected to this pin. When the internal power supply is used, this pin output power at +12 V. This pin is common to 16 output signal pins.
N0	When the external power supply is selected, its negative side is connected to this pin. When the internal power supply is used, this pin serves as the ground. This pin is common to 16 output signal pins.
N1	When the external power supply is selected, its negative side is connected to this pin. When the internal power supply is used, this pin serves as the ground. This pin is common to 16 output signal pins.
N.C.	This pin is left unconnected.

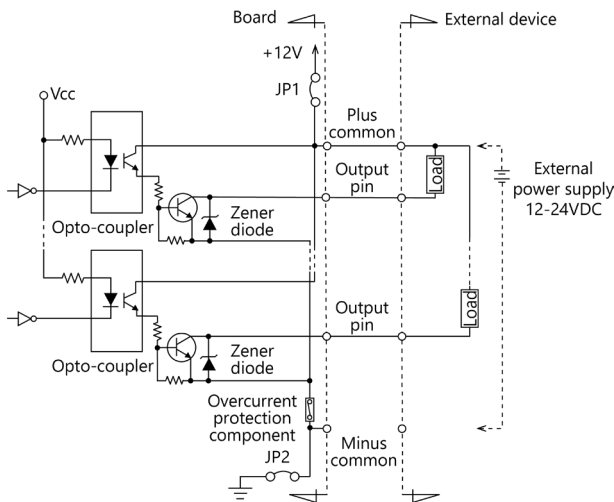
CAUTION

To perform output using this product with the CONTEC device driver, specify logical ports and logical bits when calling each function. For details, refer to the "Relationships between API-TOOL Logical Ports/Bits and Connector Signal Pins" of Reference Manual.

Connecting Output Signal

Output Circuit

Connect the output signals to a current-driven controlled device such as a relay or LED. The product controls turning on/off the current-driven controlled device using a digital value.



* Output pin represents O-xx.

The signal output section is an opto-coupler isolated, open-collector output (current sink type).

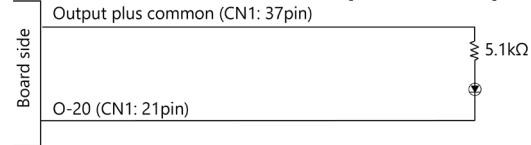
This product therefore requires the on-board internal power supply or the external power supply to drive the output section of this product. The rated output current per channel is 100mA at maximum. The output section can also be connected to a TTL level input as it uses a low-saturated transistor for output. The residual voltage (low-level voltage) between the collector and emitter with the output on is 0.5V or less at an output current within 50mA or at most 1.0V at an output current within 100mA.

A zener diode is connected to the output transistor for protection from surge voltages. A overcurrent protection components is provided for every 8 output transistors.

CAUTION

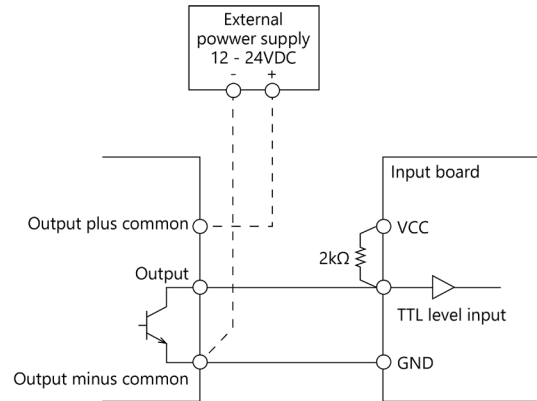
- When the PC is turned on, all output are reset to OFF.
- Please refer to "Selecting Power Supply" of Reference Manual and then connect the jumper in accordance with the power supply to be used.

Connection to the LED (An Example to use Output O-20)



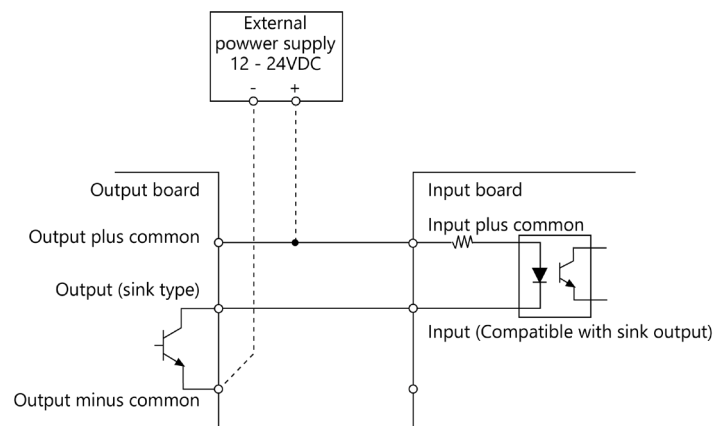
When "1" is output to a relevant bit, the corresponding LED comes on. When "0" is output to the bit, in contrast, the LED goes out.

Example of Connection to TTL Level Input (Connection Example of Output and TTL level Input Signal)

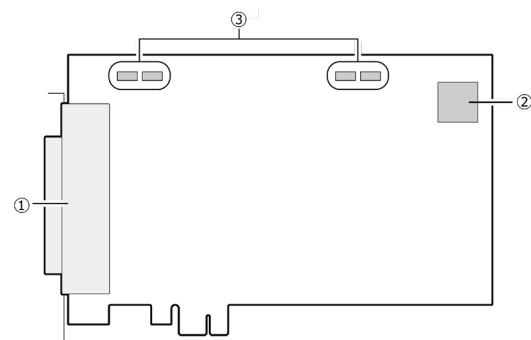


Connecting the Sink Type Output and Sink Output Support Input

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.



Nomenclature of Product Components



No.	Name	No.	Name
1	Interface Connector	3	Supply power setting jumper
2	Board ID Setting Switch		