PCI-compliant Digital Output Board

DO-32T2-PCI

RoHS Compliant

This product is a PCI board designed for extending output function on your PC. It has 32 channels of open-collector inputs with a 200nsec response speed. Both Windows and Linux drivers are included with this board.

CONTEC provides drivers that enable these boards to be used with LabVIEW.

Features

32ch of unisolated open-collector output
This board has 128ch of unisolated open-collector output with a 200µsec response speed. Output rating: Max. 30VDC, 40mA per pin.

Windows and Linux driver libraries are included
The included driver library [API-PAC(W32)] makes it possible to create applications in both Windows and Linux environments. A diagnostic program to check the hardware operation is also provided.

LabVIEW support
LabVIEW is supported by using CONTEC's dedicated library VI-DAQ.

Specifications

Item		Specification
Output		
Output format		Unisolated open collector output (Negative logic *1)
Number of output signal channels		32channels (1 common)
Output rating	Output voltage	30VDC (Max.)
	Output current	40mA (per channel) (Max.)
Response time		Within 200nsec (change by pull-up registor value)
Common		
External supply capable current (Max.)		5VDC 1A
Allowable distance of signal extension		Approx. 1.5m (depending on wiring environment)
I/O address		Any 32-byte boundary
Interrupt Level		None
Max. board count for connection		16 boards including the master board
Power consumption (Max.)		5VDC 200mA
Operating condition		0 - 50°C, 10 - 90%RH (No condensation)
Bus specification		PCI (32bit, 33MHz, Universal key shapes supported *2)
Dimension (mm)		121.69(L) x 105.68(H)
Connector		37 pin D-SUB connector [F (female) type] DCLC-J37SAF-20L9E [mfd. by JAE] equivalent to it
Weight		100g

*1: Data "0" and "1" correspond to the High and Low 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).

Board Dimensions

121.69(L)

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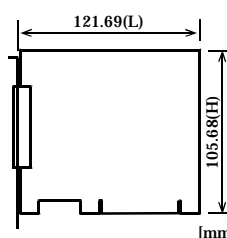
The standard outside dimension (L) is the distance from the end of the board to the outer surface of the slot cover.

[mm]

Support Software

API-DIO(WDM)/API-DIO(98/PC)
Digital I/O driver for Windows

[Found on the included CD-ROM driver library API-PAC(W32)]

For use in Windows environments, API-DIO(98/PC) is driver library software that provides basic Win32 API functions (DLL).

Various sample programs using Visual Basic and Visual C++ and a diagnostic program used to check the hardware operation are also provided.

< Operating Environments >

Operating Systems: Windows Vista, Windows XP, Server 2003, 2000

Programming languages: Visual Basic, Visual C++, Visual C#, Delphi, C++ Builder

Upgraded software versions can be downloaded from CONTEC's document site (http://www.contec.com/apipac/).

For more details on supported OS, programming languages and for updated information, please visit CONTEC's Web site.

API-DIO(LNX)
Digital I/O driver for Linux

[Found on the included CD-ROM driver library API-PAC(W32)]

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

< Operating Environments >

Operating Systems: RedHatLinux, TurboLinux
(For details on supported distributions, refer to Help files that are available after installation.)

Programming language: gcc

Upgraded software versions can be downloaded from CONTEC's document site (http://www.contec.com/apipac/).

For more details on supported OS, programming languages and for updated information, please visit CONTEC's Web site.

VI-DAQ
Data acquisition VI library for LabVIEW

[Available for free download from CONTEC's web site]

CONTEC's VI library is for use with National Instruments' LabVIEW.
VI-DAQ is designed with functions similar to that of LabVIEW's Data Acquisition VI, allowing various devices to be used without complicated settings.
For more details and to download VI-DAQ go to http://www.contec.com/vidaq/.

Optional Cables and Connectors

Flat Cable with 37-Pin D-sub Connectors at either Ends
:PCB37P-1.5 (1.5m)

Shield Cable with 37-Pin D-sub Connector at either Ends (Mold Type)
:PCB37PS-0.5P(0.5m)
:PCB37PS-1.5P (1.5m)

Flat Cable with 37-Pin D-sub Connector at One End
:PCA37P-1.5 (1.5m)

Shield Cable with 37-Pin D-sub Connector at One End (Mold Type)
:PCA37PS-0.5P (1.5m)
:PCA37PS-1.5P (1.5m)

D-SUB37P Male Connector Set (5 Pieces)
:CN5-D37M

Accessories

Screw Terminal Unit (M3 x 37P)   :EPD-37A *1
Screw Terminal Unit (M3.5 x 37P)   :EPD-37 *1
General Purpose Terminal   :DTP-3A *1
Screw Terminal   : DTP-4A *1
Signal Monitor for Digital I/O   :CM-32(PC)E *1

*1: A PCB37P-1.5 or PCB37PS-0.5P, 1.5P optional cable is required separately.
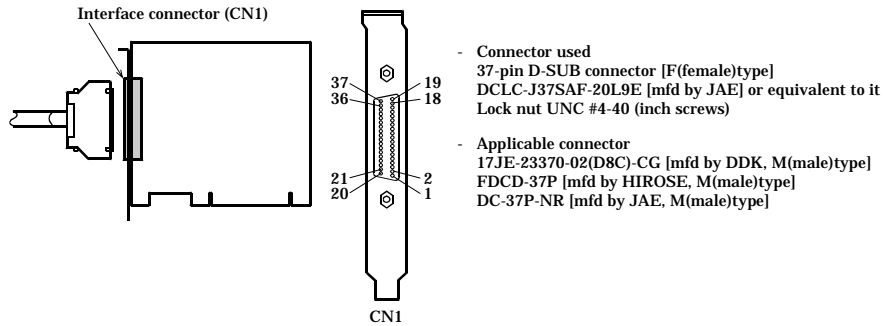
Packing List

- Board [DO-32T2-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.
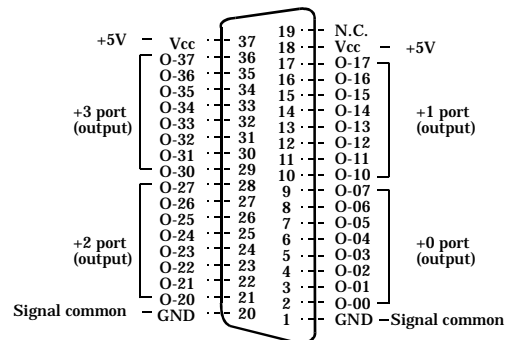
On-board connector wiring

Connector shape

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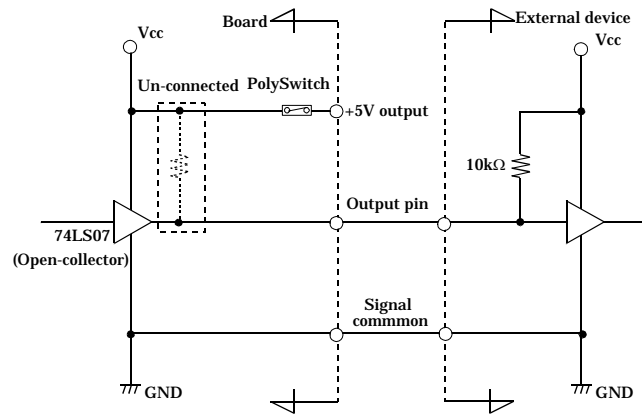
Interface connector (CN1)

37 19
36 18

21 2
20 1

CN1

- **Connector used**
  37-pin D-SUB connector [F(female)type]
  DCLC-J37SAF-20L9E [mfd by JAE] or equivalent to it
  Lock nut UNC #4-40 (inch screws)

- **Applicable connector**
  17JE-23370-02(D8C)-CG [mfd by DDK, M(male)type]
  FDCD-37P [mfd by HIROSE, M(male)type]
  DC-37P-NR [mfd by JAE, M(male)type]

Connector Pin Assignment

Pin Assignments of Interface Connector (CN1)

```
+5V    —  Vcc   37        19  ·  N.C.
          O-37  36        18  ·  Vcc    —  +5V
          O-36  35        17  ·  O-17
          O-35  34        16  ·  O-16
          O-34  33        15  ·  O-15
+3 port   O-33  32        14  ·  O-14    +1 port
(output)  O-32  31        13  ·  O-13    (output)
          O-31  30        12  ·  O-12
          O-30  29        11  ·  O-11
                          10  ·  O-10
          O-27  28         9  ·  O-07
          O-26  27         8  ·  O-06
          O-25  26         7  ·  O-05
+2 port   O-24  25         6  ·  O-04    +0 port
(output)  O-23  24         5  ·  O-03    (output)
          O-22  23         4  ·  O-02
          O-21  22         3  ·  O-01
          O-20  21         2  ·  O-00
Signal common — GND 20     1  ·  GND  — Signal common
```

O-00 - O-37	32 output signal pins. Connect these pins to the input signal pins of the external device.
Vcc	Output +5V. Max. electrical current is 1A.
GND	This pin is connected to GND in the slot.
N.C.	This pin is left unconnected.

## Connection of Output Signals

Output Circuit

* O-xx represents an output pin.
One polyswitch is connected for Vcc(+5V) terminal.

The output circuit of interface is illustrated in Figure 3.6.　Signal outputs are open-collector outputs; individual output signals are sent to the external device as negative logic signals.　Note that each signal output must be pulled up at the external device as it is not pulled up internally.

⚠ **CAUTION**

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

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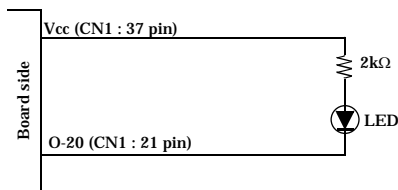
When "1" is output to a relevant bit, the corresponding LED comes on.
When "0" is output to the bit, in contrast, the LED goes out.

Serge Protection

A protection function, which prevents excessive current flow from the +5V outputs, is attached to this board. In case of accidental short of the +5V output and GND, for example, the function works, and the board operation may become impossible temporarily. When such a case, you should turn the PC off and wait for several minutes before you use the board again.

Block Diagrams