

Digital Output Board with Opto-Isolation  
for PCI Express

DO-128L-PE



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

Features

**Optocoupler isolated open-collector outputs (current sink type)**

This product has the 128 channels of Optocoupler 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.

**Optocoupler bus isolation**

As the PC is isolated from the input and output interfaces by Optocoupler, 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 Window/Linux. In addition, a diagnostic program by which the operations of hardware can be checked is provided.

**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 8 channels outputs for over-current protection. Output rating : max 35VDC, 100mA per pin.

**Functions and connectors are compatible with PCI compatible board PO-128L(PCI)H.**

The functions same with PCI compatible board PO-128L(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.

**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.

This product is a PCI Express bus-compliant interface board used to provide a digital signal Output function on a PC. This product can output digital signals at 12 - 24VDC.

This product features 128 Optocoupler isolated open-collector outputs. In addition, output transistor protection circuit (surge voltage protection and overcurrent protection).

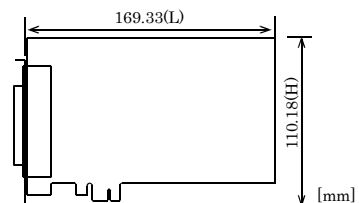
Windows/Linux driver is bundled with this product. Possible to be used as a data recording device for LabVIEW, with dedicated libraries.

Specification

| Item                                   | Specification                                                                                                                 |                              |
|----------------------------------------|-------------------------------------------------------------------------------------------------------------------------------|------------------------------|
| <b>Output</b>                          |                                                                                                                               |                              |
| Output format                          | Optocoupler isolated open-collector output (current sink type)(Negative logic *1)                                             |                              |
| Number of output signal channels       | 128 channels (1 common per 16 channels unit)                                                                                  |                              |
| Output rating                          | Output voltage                                                                                                                | 35VDC (Max.)                 |
|                                        | Output current                                                                                                                | 100mA (par 1 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(NEC) or equivalent to it                                                                                   |                              |
| Response time                          | Within 200µsec                                                                                                                |                              |
| <b>Common</b>                          |                                                                                                                               |                              |
| Allowable distance of signal extension | Approx. 50m (depending on wiring environment)                                                                                 |                              |
| I/O address                            | Any 32-byte boundary                                                                                                          |                              |
| Interruption level                     | Not used                                                                                                                      |                              |
| Max. board count for connection        | 16 boards including the master board                                                                                          |                              |
| Isolated Power                         | 250Vrms                                                                                                                       |                              |
| External circuit power supply          | 12 - 24VDC(±10%)                                                                                                              |                              |
| Power consumption (Max.)               | 3.3VDC 600mA                                                                                                                  |                              |
| Operating condition                    | 0 - 50°C, 10 - 90%RH (No condensation)                                                                                        |                              |
| Bus specification                      | PCI Express Base Specification Rev. 1.0a x1                                                                                   |                              |
| Dimension (mm)                         | 176.41(L) x 106.68(H)                                                                                                         |                              |
| Connector                              | 100 pin 0.8mm pitch connector [F (female) type] x 2 HDRA-E100W1LFD11EC-SL+[HONDA TSUSHIN KOGYO CO., LTD.] or equivalent to it |                              |
| Weight                                 | 215g                                                                                                                          |                              |

\*1 Data "0" corresponds at the High level and data "1" correspond at the Low level.

Board Dimensions



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

## 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 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.

## Cable & Connector

### Cable (Option)

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 (100P→37P D-SUB x 2)

: PCB100WS-1.5 (1.5m)  
: PCB100WS-3 (3m)  
: PCB100WS-5 (5m)

\*1 If using both the CNA and CNB connectors, two cable sets are required.

## 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 (M2.5 x 96P)                   | : DTP-64(PC) *2*4 |
| Connector Conversion Board (96-Pin→37-Pin x 2)          | : CCB-96 *2*4     |
| Signal Monitor / Output Accessory for Digital I/O (64P) | : CM-64(PC)E *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     |
| Screw Terminal (M2.6 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. You will also require sufficient terminal blocks for the number of I/O points you are using.

\*6 "Spring-up" type terminal is used to prevent terminal screws from falling off.

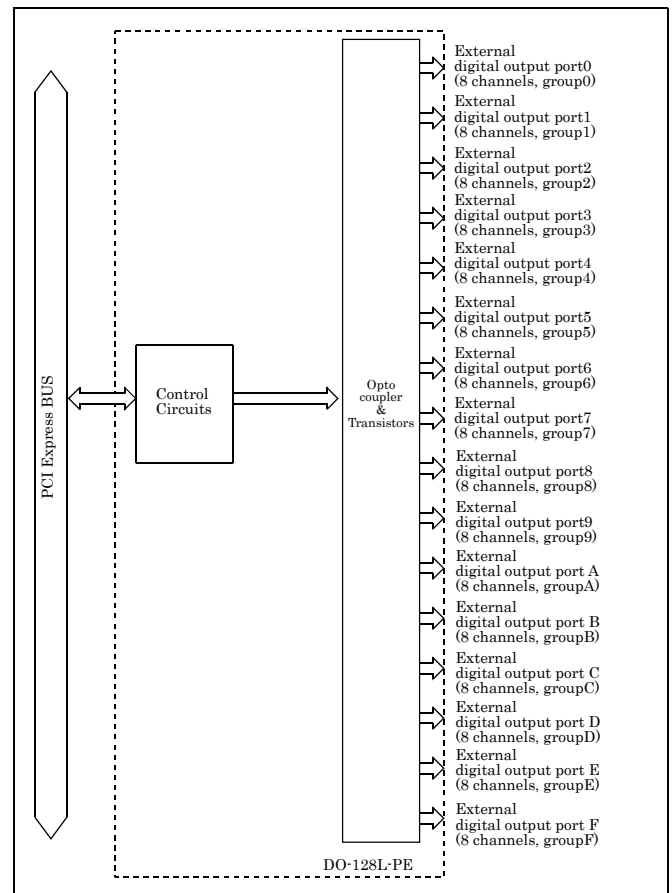
\* Check the CONTEC's Web site for more information on these options.

## Packing List

Board [DO-128L-PE] ... 1  
First step guide ... 1  
CD-ROM \*1 [API-PAC(W32)] ... 1

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

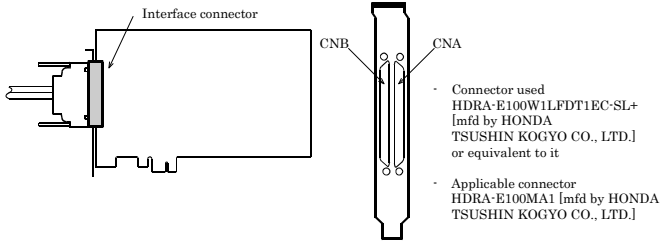
## Block Diagram



## How to connect the connectors

### Connector shape

The on-board interface connector (CNA, CNB) is used when connecting this product and the external devices.



Connector used  
HDRA-E100W1LFD1EC-SL+  
[mfd by HONDA  
TSUSHIN KOGYO CO., LTD.]  
or equivalent to it

Applicable connector  
HDRA-E100MA1 [mfd by HONDA  
TSUSHIN KOGYO CO., LTD.]

\* Please refer to page 2 for more information on the supported cable and accessories.

### Connector Pin Assignment

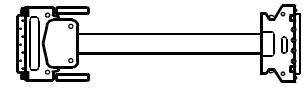
#### Pin Assignments Interface Connector (CNA, CNB)

|                                         |                                                                                                                                                                                                                                                      |                                                                                                                                                                                                                                                                                                    |                                         |                                                                                                                                                                                                                                                                                            |                                                                                                                                                                                                                                                                                                    |                                                                                                                                                                                                                                                       |                                        |
|-----------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------|
| Common plus pin for +E/+F output ports  | P-E/F 100                                                                                                                                                                                                                                            | 50 P-A/B                                                                                                                                                                                                                                                                                           | Common plus pin for +A/+B output ports  | N-0/1 1                                                                                                                                                                                                                                                                                    | 51 N-4/5                                                                                                                                                                                                                                                                                           | Common minus pin for +4/+5 output ports                                                                                                                                                                                                               |                                        |
| +F port (Output)                        | O-F7 98<br>O-F6 97<br>O-F5 96<br>O-F4 95<br>O-F3 94<br>O-F2 93<br>O-F1 92<br>O-F0 91<br>O-E7 90<br>O-E6 89<br>O-E5 88<br>O-E4 87<br>O-E3 86<br>O-E2 85<br>O-E1 84<br>O-E0 83<br>N-E/F 82<br>N-E/F 81<br>N-E/F 80<br>N-E/F 79<br>N-E/F 78<br>N-E/F 77 | 49 P-A/B<br>48 O-B7<br>47 O-B6<br>46 O-B5<br>45 O-B4<br>44 O-B3<br>43 O-B2<br>42 O-B1<br>41 O-B0<br>40 O-A7<br>39 O-A6<br>38 O-A5<br>37 O-A4<br>36 O-A3<br>35 O-A2<br>34 O-A1<br>33 O-A0<br>32 N-A/B<br>31 N-A/B<br>30 N-A/B<br>29 N-A/B<br>28 N-A/B<br>27 N-A/B<br>26 N.C.<br>25 N.C.<br>24 P-8/9 | +B port (Output)                        | N-0/1 2<br>N-0/1 3<br>N-0/1 4<br>N-0/1 5<br>N-0/1 6<br>O-00 7<br>O-01 8<br>O-02 9<br>O-03 10<br>O-04 11<br>O-05 12<br>O-06 13<br>O-07 14<br>O-10 15<br>O-11 16<br>O-12 17<br>O-13 18<br>O-14 19<br>O-15 20<br>O-16 21<br>O-17 22<br>P-0/1 23<br>P-0/1 24<br>N.C. 25<br>N.C. 26<br>N-2/3 27 | 52 N-4/5<br>53 N-4/5<br>54 N-4/5<br>55 N-4/5<br>56 N-4/5<br>57 O-40<br>58 O-41<br>59 O-42<br>60 O-43<br>61 O-44<br>62 O-45<br>63 O-46<br>64 O-47<br>65 O-50<br>66 O-51<br>67 O-52<br>68 O-53<br>69 O-54<br>70 O-55<br>71 O-56<br>72 O-57<br>73 P-4/5<br>74 P-4/5<br>75 N.C.<br>76 N.C.<br>77 N-6/7 | Common minus pin for +4/+5 output ports                                                                                                                                                                                                               |                                        |
| +E port (Output)                        | O-E5 88<br>O-E4 87<br>O-E3 86<br>O-E2 85<br>O-E1 84<br>O-E0 83<br>N-E/F 82<br>N-E/F 81<br>N-E/F 80<br>N-E/F 79<br>N-E/F 78<br>N-E/F 77                                                                                                               | 23 P-8/9<br>22 O-A7<br>21 O-B6<br>20 O-B5<br>19 O-B4<br>18 O-B3<br>17 O-B2<br>16 O-B1<br>15 O-B0<br>14 O-B7<br>13 O-B6<br>12 O-B5<br>11 O-B4<br>10 O-B3<br>9 O-B2<br>8 O-B1<br>7 O-B0<br>6 N-8/9<br>5 N-8/9<br>4 N-8/9<br>3 N-8/9<br>2 N-8/9<br>1 N-8/9                                            | +A port (Output)                        | N-2/3 28<br>N-2/3 29<br>N-2/3 30<br>N-2/3 31<br>N-2/3 32<br>O-20 33<br>O-21 34<br>O-22 35<br>O-23 36<br>O-24 37<br>O-25 38<br>O-26 39<br>O-27 40<br>O-30 41<br>O-31 42<br>O-32 43<br>O-33 44<br>O-34 45<br>O-35 46<br>O-36 47<br>O-37 48<br>P-2/3 49<br>P-2/3 50                           | 78 N-6/7<br>79 N-6/7<br>80 N-6/7<br>81 N-6/7<br>82 N-6/7<br>83 O-60<br>84 O-61<br>85 O-62<br>86 O-63<br>87 O-64<br>88 O-65<br>89 O-66<br>90 O-67<br>91 O-70<br>92 O-71<br>93 O-72<br>94 O-73<br>95 O-74<br>96 O-75<br>97 O-76<br>98 O-77<br>99 P-6/7<br>100 P-6/7                                  | Common minus pin for +6/+7 output ports                                                                                                                                                                                                               |                                        |
| Common plus pin for +C/+D output ports  | P-C/D 73                                                                                                                                                                                                                                             | 23 P-8/9                                                                                                                                                                                                                                                                                           | Common plus pin for +8/+9 output ports  | N-2/3 28                                                                                                                                                                                                                                                                                   | 78 N-6/7                                                                                                                                                                                                                                                                                           | Common minus pin for +6/+7 output ports                                                                                                                                                                                                               |                                        |
| +D port (Output)                        | O-D7 72<br>O-D6 71<br>O-D5 70<br>O-D4 69<br>O-D3 68<br>O-D2 67<br>O-D1 66<br>O-D0 65<br>O-C7 64<br>O-C6 63<br>O-C5 62<br>O-C4 61<br>O-C3 60<br>O-C2 59<br>O-C1 58<br>O-C0 57<br>N-C/D 56<br>N-C/D 55<br>N-C/D 54<br>N-C/D 53<br>N-C/D 52<br>N-C/D 51 | 23 P-8/9<br>22 O-A7<br>21 O-B6<br>20 O-B5<br>19 O-B4<br>18 O-B3<br>17 O-B2<br>16 O-B1<br>15 O-B0<br>14 O-B7<br>13 O-B6<br>12 O-B5<br>11 O-B4<br>10 O-B3<br>9 O-B2<br>8 O-B1<br>7 O-B0<br>6 N-8/9<br>5 N-8/9<br>4 N-8/9<br>3 N-8/9<br>2 N-8/9<br>1 N-8/9                                            | +9 port (Output)                        | Common plus pin for +2/+3 output ports                                                                                                                                                                                                                                                     | N-2/3 29<br>N-2/3 30<br>N-2/3 31<br>N-2/3 32<br>O-20 33<br>O-21 34<br>O-22 35<br>O-23 36<br>O-24 37<br>O-25 38<br>O-26 39<br>O-27 40<br>O-30 41<br>O-31 42<br>O-32 43<br>O-33 44<br>O-34 45<br>O-35 46<br>O-36 47<br>O-37 48<br>P-2/3 49<br>P-2/3 50                                               | 79 N-6/7<br>80 N-6/7<br>81 N-6/7<br>82 N-6/7<br>83 O-60<br>84 O-61<br>85 O-62<br>86 O-63<br>87 O-64<br>88 O-65<br>89 O-66<br>90 O-67<br>91 O-70<br>92 O-71<br>93 O-72<br>94 O-73<br>95 O-74<br>96 O-75<br>97 O-76<br>98 O-77<br>99 P-6/7<br>100 P-6/7 | Common plus pin for +4/+5 output ports |
| +C port (Output)                        | O-C7 64<br>O-C6 63<br>O-C5 62<br>O-C4 61<br>O-C3 60<br>O-C2 59<br>O-C1 58<br>O-C0 57<br>N-C/D 56<br>N-C/D 55<br>N-C/D 54<br>N-C/D 53<br>N-C/D 52<br>N-C/D 51                                                                                         | 23 P-8/9<br>22 O-A7<br>21 O-B6<br>20 O-B5<br>19 O-B4<br>18 O-B3<br>17 O-B2<br>16 O-B1<br>15 O-B0<br>14 O-B7<br>13 O-B6<br>12 O-B5<br>11 O-B4<br>10 O-B3<br>9 O-B2<br>8 O-B1<br>7 O-B0<br>6 N-8/9<br>5 N-8/9<br>4 N-8/9<br>3 N-8/9<br>2 N-8/9<br>1 N-8/9                                            | +8 port (Output)                        | Common plus pin for +2/+3 output ports                                                                                                                                                                                                                                                     | N-2/3 29<br>N-2/3 30<br>N-2/3 31<br>N-2/3 32<br>O-20 33<br>O-21 34<br>O-22 35<br>O-23 36<br>O-24 37<br>O-25 38<br>O-26 39<br>O-27 40<br>O-30 41<br>O-31 42<br>O-32 43<br>O-33 44<br>O-34 45<br>O-35 46<br>O-36 47<br>O-37 48<br>P-2/3 49<br>P-2/3 50                                               | 79 N-6/7<br>80 N-6/7<br>81 N-6/7<br>82 N-6/7<br>83 O-60<br>84 O-61<br>85 O-62<br>86 O-63<br>87 O-64<br>88 O-65<br>89 O-66<br>90 O-67<br>91 O-70<br>92 O-71<br>93 O-72<br>94 O-73<br>95 O-74<br>96 O-75<br>97 O-76<br>98 O-77<br>99 P-6/7<br>100 P-6/7 | Common plus pin for +4/+5 output ports |
| Common minus pin for +E/+F output ports | N-E/F 77                                                                                                                                                                                                                                             | 27 N-A/B                                                                                                                                                                                                                                                                                           | Common minus pin for +A/+B output ports | P-0/1 24                                                                                                                                                                                                                                                                                   | 74 P-4/5                                                                                                                                                                                                                                                                                           | Common plus pin for +4/+5 output ports                                                                                                                                                                                                                |                                        |
| Common plus pin for +C/+D output ports  | P-C/D 73                                                                                                                                                                                                                                             | 23 P-8/9                                                                                                                                                                                                                                                                                           | Common plus pin for +8/+9 output ports  | N-2/3 28                                                                                                                                                                                                                                                                                   | 78 N-6/7                                                                                                                                                                                                                                                                                           | Common minus pin for +6/+7 output ports                                                                                                                                                                                                               |                                        |
| +D port (Output)                        | O-D7 72<br>O-D6 71<br>O-D5 70<br>O-D4 69<br>O-D3 68<br>O-D2 67<br>O-D1 66<br>O-D0 65<br>O-C7 64<br>O-C6 63<br>O-C5 62<br>O-C4 61<br>O-C3 60<br>O-C2 59<br>O-C1 58<br>O-C0 57<br>N-C/D 56<br>N-C/D 55<br>N-C/D 54<br>N-C/D 53<br>N-C/D 52<br>N-C/D 51 | 23 P-8/9<br>22 O-A7<br>21 O-B6<br>20 O-B5<br>19 O-B4<br>18 O-B3<br>17 O-B2<br>16 O-B1<br>15 O-B0<br>14 O-B7<br>13 O-B6<br>12 O-B5<br>11 O-B4<br>10 O-B3<br>9 O-B2<br>8 O-B1<br>7 O-B0<br>6 N-8/9<br>5 N-8/9<br>4 N-8/9<br>3 N-8/9<br>2 N-8/9<br>1 N-8/9                                            | +9 port (Output)                        | Common plus pin for +2/+3 output ports                                                                                                                                                                                                                                                     | N-2/3 29<br>N-2/3 30<br>N-2/3 31<br>N-2/3 32<br>O-20 33<br>O-21 34<br>O-22 35<br>O-23 36<br>O-24 37<br>O-25 38<br>O-26 39<br>O-27 40<br>O-30 41<br>O-31 42<br>O-32 43<br>O-33 44<br>O-34 45<br>O-35 46<br>O-36 47<br>O-37 48<br>P-2/3 49<br>P-2/3 50                                               | 79 N-6/7<br>80 N-6/7<br>81 N-6/7<br>82 N-6/7<br>83 O-60<br>84 O-61<br>85 O-62<br>86 O-63<br>87 O-64<br>88 O-65<br>89 O-66<br>90 O-67<br>91 O-70<br>92 O-71<br>93 O-72<br>94 O-73<br>95 O-74<br>96 O-75<br>97 O-76<br>98 O-77<br>99 P-6/7<br>100 P-6/7 | Common plus pin for +4/+5 output ports |
| +C port (Output)                        | O-C7 64<br>O-C6 63<br>O-C5 62<br>O-C4 61<br>O-C3 60<br>O-C2 59<br>O-C1 58<br>O-C0 57<br>N-C/D 56<br>N-C/D 55<br>N-C/D 54<br>N-C/D 53<br>N-C/D 52<br>N-C/D 51                                                                                         | 23 P-8/9<br>22 O-A7<br>21 O-B6<br>20 O-B5<br>19 O-B4<br>18 O-B3<br>17 O-B2<br>16 O-B1<br>15 O-B0<br>14 O-B7<br>13 O-B6<br>12 O-B5<br>11 O-B4<br>10 O-B3<br>9 O-B2<br>8 O-B1<br>7 O-B0<br>6 N-8/9<br>5 N-8/9<br>4 N-8/9<br>3 N-8/9<br>2 N-8/9<br>1 N-8/9                                            | +8 port (Output)                        | Common plus pin for +2/+3 output ports                                                                                                                                                                                                                                                     | N-2/3 29<br>N-2/3 30<br>N-2/3 31<br>N-2/3 32<br>O-20 33<br>O-21 34<br>O-22 35<br>O-23 36<br>O-24 37<br>O-25 38<br>O-26 39<br>O-27 40<br>O-30 41<br>O-31 42<br>O-32 43<br>O-33 44<br>O-34 45<br>O-35 46<br>O-36 47<br>O-37 48<br>P-2/3 49<br>P-2/3 50                                               | 79 N-6/7<br>80 N-6/7<br>81 N-6/7<br>82 N-6/7<br>83 O-60<br>84 O-61<br>85 O-62<br>86 O-63<br>87 O-64<br>88 O-65<br>89 O-66<br>90 O-67<br>91 O-70<br>92 O-71<br>93 O-72<br>94 O-73<br>95 O-74<br>96 O-75<br>97 O-76<br>98 O-77<br>99 P-6/7<br>100 P-6/7 | Common plus pin for +4/+5 output ports |
| Common minus pin for +E/+F output ports | N-E/F 77                                                                                                                                                                                                                                             | 27 N-A/B                                                                                                                                                                                                                                                                                           | Common minus pin for +A/+B output ports | P-0/1 24                                                                                                                                                                                                                                                                                   | 74 P-4/5                                                                                                                                                                                                                                                                                           | Common plus pin for +4/+5 output ports                                                                                                                                                                                                                |                                        |
| Common plus pin for +C/+D output ports  | P-C/D 73                                                                                                                                                                                                                                             | 23 P-8/9                                                                                                                                                                                                                                                                                           | Common plus pin for +8/+9 output ports  | N-2/3 28                                                                                                                                                                                                                                                                                   | 78 N-6/7                                                                                                                                                                                                                                                                                           | Common minus pin for +6/+7 output ports                                                                                                                                                                                                               |                                        |

|               |                                                                                                                                                                                                                                                                                                                                                                                          |
|---------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| O-00 - O-F7   | 128 channels output signal. Connect input signals from the external device to these pins.                                                                                                                                                                                                                                                                                                |
| P-0/1 - P-E/F | Connect the positive side of the external power supply. These pins are common to 16 channels output signal.                                                                                                                                                                                                                                                                              |
| N-0/1 - N-E/F | Connect the negative side of the external power supply. These pins are common to 16 channels output signal. One pin permissible current of the connector is 0.3A. Please connect necessary number of pins for the corresponding total current of the output 16 channels. When 16 channels are used by the output full ratings (100mA per 1 channel), it is necessary to connect six all. |
| N.C.          | This pin is left unconnected.                                                                                                                                                                                                                                                                                                                                                            |

### Pin assignments for connecting to the PCB100/96PS or PCB100WS

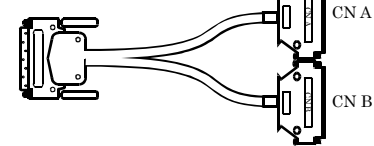
PCB100/96PS



|                                         |                                                                                                                                                                                                                        |                                                                                                                                                                                                                        |                                         |                                         |                                        |                                                                                                                                                                                                                                     |                                                                                                                                                                                                                        |                                         |
|-----------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------|-----------------------------------------|----------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------|
| Common minus pin for +C/+D output ports | N-C/D B01<br>N-C/D B02                                                                                                                                                                                                 | A01 N-8/9<br>A02 N-8/9                                                                                                                                                                                                 | Common minus pin for +8/+9 output ports | Common minus pin for +4/+5 output ports | N-4/5 B01<br>N-4/5 B02                 | A01 N-0/1<br>A02 N-0/1                                                                                                                                                                                                              | Common minus pin for +8/+1 output ports                                                                                                                                                                                |                                         |
| +C port (Output)                        | O-C0 B03<br>O-C1 B04<br>O-C2 B05<br>O-C3 B06<br>O-C4 B07<br>O-C5 B08<br>O-C6 B09<br>O-C7 B10<br>O-D0 B11<br>O-D1 B12<br>O-D2 B13<br>O-D3 B14<br>O-D4 B15<br>O-D5 B16<br>O-D6 B17<br>O-D7 B18<br>P-C/D B19<br>P-C/D B20 | A03 O-80<br>A04 O-81<br>A05 O-82<br>A06 O-83<br>A07 O-84<br>A08 O-85<br>A09 O-86<br>A10 O-87<br>A11 O-90<br>A12 O-91<br>A13 O-92<br>A14 O-93<br>A15 O-94<br>A16 O-95<br>A17 O-96<br>A18 O-97<br>A19 P-8/9<br>A20 P-8/9 | +8 port (Output)                        | Common plus pin for +8/+9 output ports  | Common plus pin for +4/+5 output ports | N-4/5 B20<br>P-4/5 B20                                                                                                                                                                                                              | A20 P-0/1                                                                                                                                                                                                              | Common plus pin for +8/+1 output ports  |
| +D port (Output)                        | O-D1 B12<br>O-D2 B13<br>O-D3 B14<br>O-D4 B15<br>O-D5 B16<br>O-D6 B17<br>O-D7 B18<br>P-C/D B19<br>P-C/D B20                                                                                                             | A21 N.C.<br>A22 N.C.<br>A23 N.C.<br>A24 N.C.<br>A25 N.C.<br>A26 N.C.<br>A27 N.C.<br>A28 N.C.<br>A29 N-A/B<br>A30 N-A/B                                                                                                 | Unconnected                             | Unconnected                             | Unconnected                            | N.C. B21<br>N.C. B22<br>N.C. B23<br>N.C. B24<br>N.C. B25<br>N.C. B26<br>N.C. B27<br>N.C. B28<br>N-6/7 B29<br>N-6/7 B30                                                                                                              | A21 N.C.<br>A22 N.C.<br>A23 N.C.<br>A24 N.C.<br>A25 N.C.<br>A26 N.C.<br>A27 N.C.<br>A28 N.C.<br>A29 N-2/3<br>A30 N-2/3                                                                                                 | Unconnected                             |
| Common plus pin for +C/+D output ports  | P-C/D B20                                                                                                                                                                                                              | A31 O-A0<br>A32 O-A1<br>A33 O-A2<br>A34 O-A3<br>A35 O-A4<br>A36 O-A5<br>A37 O-A6<br>A38 O-A7<br>A39 O-B0<br>A40 O-B1<br>A41 O-B2<br>A42 O-B3<br>A43 O-B4<br>A44 O-B5<br>A45 O-B6<br>A46 O-B7<br>P-E/F B47<br>P-E/F B48 | Common plus pin for +A/+B output ports  | Common plus pin for +6/+7 output ports  | Common plus pin for +4/+5 output ports | N-6/7 B30<br>O-60 B31<br>O-61 B32<br>O-62 B33<br>O-63 B34<br>O-64 B35<br>O-65 B36<br>O-66 B37<br>O-67 B38<br>O-70 B39<br>O-71 B40<br>O-72 B41<br>O-73 B42<br>O-74 B43<br>O-75 B44<br>O-76 B45<br>O-77 B46<br>P-6/7 B47<br>P-6/7 B48 | A31 O-20<br>A32 O-21<br>A33 O-22<br>A34 O-23<br>A35 O-24<br>A36 O-25<br>A37 O-26<br>A38 O-27<br>A39 O-30<br>A40 O-31<br>A41 O-32<br>A42 O-33<br>A43 O-34<br>A44 O-35<br>A45 O-36<br>A46 O-37<br>A47 P-2/3<br>A48 P-2/3 | Common minus pin for +2/+3 output ports |
| Common minus pin for +E/+F output ports | N-E/F B30                                                                                                                                                                                                              | A47 P-A/B<br>A48 P-A/B                                                                                                                                                                                                 | Common minus pin for +A/+B output ports | Common plus pin for +6/+7 output ports  | Common plus pin for +4/+5 output ports | N-6/7 B30<br>O-60 B31<br>O-61 B32<br>O-62 B33<br>O-63 B34<br>O-64 B35<br>O-65 B36<br>O-66 B37<br>O-67 B38<br>O-70 B39<br>O-71 B40<br>O-72 B41<br>O-73 B42<br>O-74 B43<br>O-75 B44<br>O-76 B45<br>O-77 B46<br>P-6/7 B47<br>P-6/7 B48 | A47 P-2/3<br>A48 P-2/3                                                                                                                                                                                                 | Common plus pin for +2/+3 output ports  |

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

PCB100WS



|                                         |                                                                                                                                                                      |                                                                                                                                                                              |                                         |                                        |                                        |                                                                                                                                                                                 |                                                                                                                                                                                          |                                         |
|-----------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------|----------------------------------------|----------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------|
| Common plus pin for +C/+D output ports  | P-C/D 18                                                                                                                                                             | 37 P-A/B                                                                                                                                                                     | Common plus pin for +8/+9 output ports  | Common plus pin for +4/+5 output ports | N.C. 19                                | 37 P-2/3                                                                                                                                                                        | Common plus pin for +2/+3 output ports                                                                                                                                                   |                                         |
| +D port (Output)                        | O-D7 17<br>O-D6 16<br>O-D5 15<br>O-D4 14<br>O-D3 13<br>O-D2 12<br>O-D1 11<br>O-D0 10<br>O-C7 9<br>O-C6 8<br>O-C5 7<br>O-C4 6<br>O-C3 5<br>O-C2 4<br>O-C1 3<br>O-C0 2 | 36 O-B7<br>35 O-B6<br>34 O-B5<br>33 O-B4<br>32 O-B3<br>31 O-B2<br>30 O-B1<br>29 O-B0<br>28 O-A7<br>27 O-A6<br>26 O-A5<br>25 O-A4<br>24 O-A3<br>23 O-A2<br>22 O-A1<br>21 O-A0 | +8 port (Output)                        | Common plus pin for +A/+B output ports | Common plus pin for +6/+7 output ports | N.C. 19<br>O-17 16<br>O-18 17<br>O-15 15<br>O-14 14<br>O-13 13<br>O-12 12<br>O-11 11<br>O-10 10<br>O-07 9<br>O-06 8<br>O-05 7<br>O-04 6<br>O-03 5<br>O-02 4<br>O-01 3<br>O-00 2 | 37 P-2/3<br>36 O-37<br>35 O-36<br>34 O-35<br>33 O-34<br>32 O-33<br>31 O-32<br>30 O-30<br>29 O-27<br>28 O-27<br>27 O-26<br>26 O-25<br>25 O-24<br>24 O-23<br>23 O-22<br>22 O-21<br>21 O-20 | Common minus pin for +A/+B output ports |
| Common minus pin for +E/+F output ports | N-E/F 1                                                                                                                                                              | 20 N-A/B                                                                                                                                                                     | Common minus pin for +A/+B output ports | Common plus pin for +6/+7 output ports | Common plus pin for +4/+5 output ports | N-0/1 1                                                                                                                                                                         | Common minus pin for +2/+3 output ports                                                                                                                                                  |                                         |
| Common plus pin for +C/+D output ports  | P-C/D 18                                                                                                                                                             | 37 P-E/F                                                                                                                                                                     | Common plus pin for +8/+9 output ports  | Common plus pin for +4/+5 output ports | N.C. 19                                | 37 P-6/7                                                                                                                                                                        | Common plus pin for +6/+7 output ports                                                                                                                                                   |                                         |
| +D port (Output)                        | O-D7 17<br>O-D6 16<br>O-D5 15<br>O-D4 14<br>O-D3 13<br>O-D2 12<br>O-D1 11<br>O-D0 10<br>O-C7 9<br>O-C6 8<br>O-C5 7<br>O-C4 6<br>O-C3 5<br>O-C2 4<br>O-C1 3<br>O-C0 2 | 36 O-F7<br>35 O-F6<br>34 O-F5<br>33 O-F4<br>32 O-F3<br>31 O-F2<br>30 O-F1<br>29 O-F0<br>28 O-E7<br>27 O-E6<br>26 O-E5<br>25 O-E4<br>24 O-E3<br>23 O-E2<br>22 O-E1<br>21 O-E0 | +9 port (Output)                        | Common plus pin for +A/+B output ports | Common plus pin for +6/+7 output ports | N.C. 19<br>O-57 17<br>O-58 16<br>O-55 15<br>O-54 14<br>O-53 13<br>O-52 12<br>O-51 11<br>O-50 10<br>O-47 9<br>O-46 8<br>O-45 7<br>O-44 6<br>O-43 5<br>O-42 4<br>O-41 3<br>O-40 2 | 36 O-77<br>35 O-76<br>34 O-75<br>33 O-74<br>32 O-73<br>31 O-72<br>30 O-70<br>29 O-70<br>28 O-67<br>27 O-66<br>26 O-65<br>25 O-64<br>24 O-63<br>23 O-62<br>22 O-61<br>21 O-60             | Common minus pin for +A/+B output ports |
| Common minus pin for +E/+F output ports | N-E/F 1                                                                                                                                                              | 20 N-E/F                                                                                                                                                                     | Common minus pin for +E/+F output ports | Common plus pin for +4/+5 output ports | Common plus pin for +4/+5 output ports | N-4/5 1                                                                                                                                                                         | Common minus pin for +E/+F output ports                                                                                                                                                  |                                         |

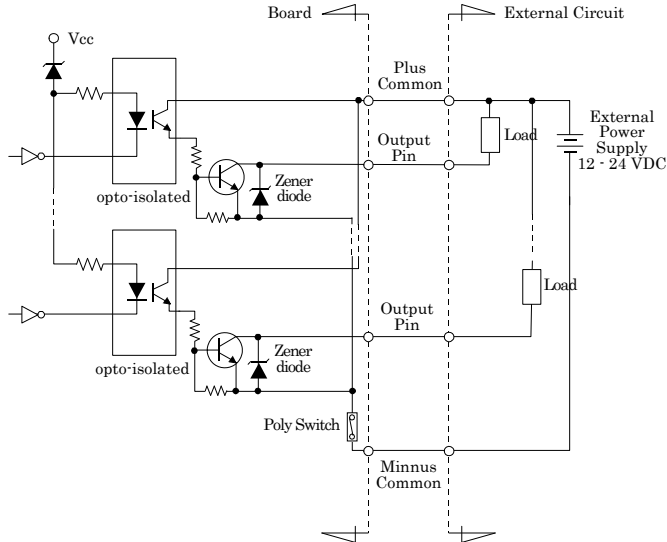
## Connecting Output Signals

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.

### Output Circuit



\* O-xx shows output pins.

This product output circuit of interface is illustrated in the image above.

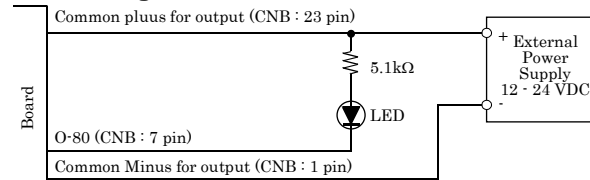
The signal output section is an Optocoupler isolated, open-collector output (current sink type). Driving the output section requires an external power supply.

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 PolySwitch-based overcurrent protector is provided for every eight output transistors. When the overcurrent protector works, the output section of the board is temporarily disabled. If this is the case, turn of the power to the PC and the external power supply and wait for a few minutes, then turn them on back.

### CAUTION

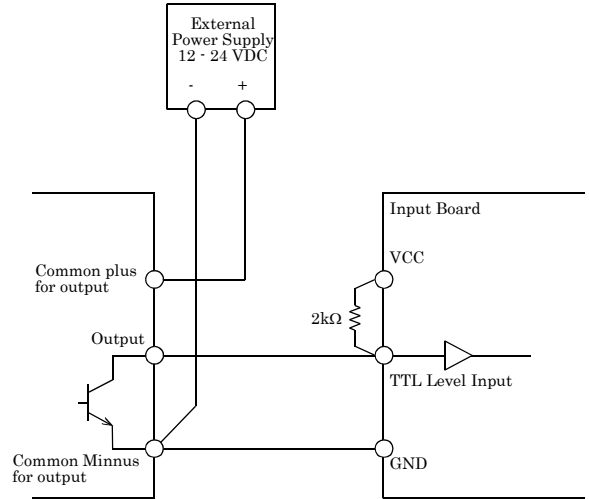
When the PC is turned on, all output are reset to OFF.

### Connecting 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.

### 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 board) and a sink output support input (input board). Refer to this connection example when you connect such boards to each other.

