Digital Input Board
for PCI Express

# DI-128T-PE


This product is a PCI Express bus-compliant interface board used to provide a digital signal input function on a PC.

The < DI-128T-PE > features 128 unisolated TTL level inputs. You can use 16 input signals as interrupt inputs. In addition, the digital filter function to prevent wrong recognition of input signals is provided.

Windows/Linux driver is bundled with this product.

Possible to be used as a data recording device for LabVIEW, with dedicated libraries.

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

## Features

**Unisolated TTL level input**

The < DI-128T-PE > has the 128ch of unisolated TTL level input whose response speed is 200nsec.

**You can use 16 input signals as interrupt request signals.**

You can use 16 input signals as interrupt request signals and also disable or enable the interrupt in bit units and select the edge of the input signals, at which to generate an interrupt.

**This product has a digital filter to prevent wrong recognition of input signals from carrying noise or a chattering.**

This product has a digital filter to prevent wrong recognition of input signals from carrying noise or a chattering. All input terminals can be added a digital filter, and the setting can be performed by software.

**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.

**Functions and connectors are compatible with PCI compatible board DI-128T2-PCI**

The functions same with PCI compatible board DI-128T2-PCI 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.**

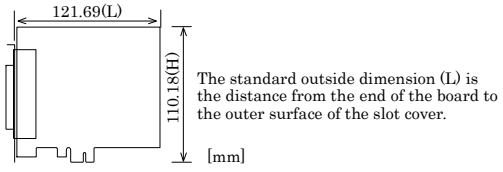
Using the dedicated library VI-DAQ makes it possible to make a LabVIEW application.

## Specification

| Item | | Specification |
|---|---|---|
| Input | | |
| | Input format | Unisolated TTL level input (Negative logic *1) |
| | Number of input signal channels | 128channels (16channels of them are available for interrupts) (1 common) |
| | Input resistance | Pull up 10kΩ (1TTL load) |
| | Interrupt | 16 interrupt input signals are arranged into a single output of interrupt signal INTA.<br>An interrupt is generated at the rising edge (HIGH-to-LOW transition) or falling edge (LOW-to-HIGH transition). |
| | Response time | 200nsec within |
| Common | | |
| | External supply capable current (Max.) | 5VDC 350mA |
| | Allowable distance of signal extension | Approx. 1.5m (depending on wiring environment) |
| | address | Any 32-byte boundary |
| | rrupt Level | 1 level use |
| | Max. board count for connection | 16 boards including the master board |
| | Power consumption (Max.) | 3.3VDC 500mA |
| | Operating condition | 0 - 50°C, 10 - 90%RH (No condensation) |
| | Bus specification | PCI Express Base Specification Rev. 1.0a x1 |
| | Dimension (mm) | 121.69(L) x 110.18(H) |
| | Connector | 100 pin 0.8mm pitch connector [F (female) type] x 2<br>HDRA-E100W1LFDT1EC-SL+[HONDA TSUSHIN KOGYO CO., LTD.] equivalent to it |
| | Weight | 100g |

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

Board Dimensions



## 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<br>(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 (Option)

Shielded Cable With Two 100pin Connector
: PCB100PS-0.5 (0.5m)
: PCB100PS-1.5 (1.5m)

Connection Conversion Shield Cable (100P→96P)
: PCB100/96PS-1.5(1.5m)

Flat Cable with One 100-Pin Connector
: PCA100P-1.5(1.5m)

Connection Conversion Shield Cable (100P→37P D-SUB x 2)
: PCB100WS-1.5(1.5m)

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

## Accessories

| | |
|---|---|
| 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 |
| Connection 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 |
| Signal Monitor / Output Accessory for Digital I/O (32P) | : CM-32(PC)E *3*5 |

*1 PCB100PS-0.5, 1.5 optional cable is required separately.
*2 PCB100/96PS-1.5 optional cable is required separately.
*3 PCB100WS-1.5 optional cable is required separately.
*4 If using both the CNA and CNB connectors, two each of the terminal 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

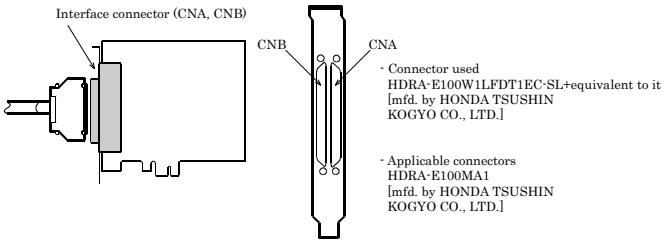
Board [DI-128T-PE] …1
First step guide … 1
CD-ROM *1 [API-PAC(W32)] …1

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

## How to connect the connectors

### Connector shape

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




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

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

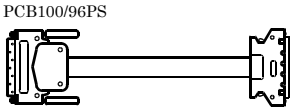
| | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| +5V | Vcc | 100 | CNB | 50 | Vcc | +5V | Signal Common | GND | 1 | CNA | 51 | GND | Signal Common |
| | Vcc | 99 | | 49 | Vcc | | | GND | 2 | | 52 | GND | |
| +F port (Input) | I-F7 | 98 | | 48 | I-B7 | +B port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

* I-00 - I-17 can be used as interrupt signal.

| | |
|---|---|
| I-00 - I-F7 | 128 input signal pins. Connect output signals from the external device to these pins. |
| Vcc | Output +5V. The current that can be supplied is 350mA(Max.). The permitted current per pin of connector is 0.3A. Connect the number of pins required to supply the total current. |
| GND | This pin is connected to GND in the slot. |
| N.C. | This pin is left unconnected. |

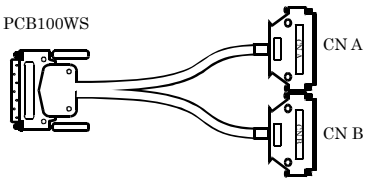
## Pin Assignments of Optional Connector PCB100/96PS or PCB100WS

The figure below shows the correspondence between the option cable pins and signals.




| | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Signal common | GND | B01 | For connecting the board CNB | A01 | GND | Signal common | Signal common | GND | B01 | For connecting the board CNA | A01 | GND | Signal common |
| | GND | B02 | | A02 | GND | | | GND | B02 | | A02 | GND | |
| +C port (Input) | I-C0 | B03 | | A03 | I-80 | +8 port (Input) | +4 port (Input) | I-40 | B03 | | A03 | I-00 | +0 port (Input) |
| | I-C1 | B04 | | A04 | I-81 | | | I-41 | B04 | | A04 | I-01 | |
| | I-C2 | B05 | | A05 | I-82 | | | I-42 | B05 | | A05 | I-02 | |
| | I-C3 | B06 | | A06 | I-83 | | | I-43 | B06 | | A06 | I-03 | |
| | I-C4 | B07 | | A07 | I-84 | | | I-44 | B07 | | A07 | I-04 | |
| | I-C5 | B08 | | A08 | I-85 | | | I-45 | B08 | | A08 | I-05 | |
| | I-C6 | B09 | | A09 | I-86 | | | I-46 | B09 | | A09 | I-06 | |
| | I-C7 | B10 | | A10 | I-87 | | | I-47 | B10 | | A10 | I-07 | |
| +D port (Input) | I-D0 | B11 | | A11 | I-90 | +9 port (Input) | +5 port (Input) | I-50 | B11 | | A11 | I-10 | +1 port (Input) |
| | I-D1 | B12 | | A12 | I-91 | | | I-51 | B12 | | A12 | I-11 | |
| | I-D2 | B13 | | A13 | I-92 | | | I-52 | B13 | | A13 | I-12 | |
| | I-D3 | B14 | | A14 | I-93 | | | I-53 | B14 | | A14 | I-13 | |
| | I-D4 | B15 | | A15 | I-94 | | | I-54 | B15 | | A15 | I-14 | |
| | I-D5 | B16 | | A16 | I-95 | | | I-55 | B16 | | A16 | I-15 | |
| | I-D6 | B17 | | A17 | I-96 | | | I-56 | B17 | | A17 | I-16 | |
| | I-D7 | B18 | | A18 | I-97 | | | I-57 | B18 | | A18 | I-17 | |
| +5V | Vcc | B19 | | A19 | Vcc | +5V | +5V | Vcc | B19 | | A19 | Vcc | +5V |
| | Vcc | B20 | | A20 | Vcc | | | Vcc | B20 | | A20 | Vcc | |
| N.C. | N.C. | B21 | | A21 | N.C. | N.C. | N.C. | N.C. | B21 | | A21 | N.C. | N.C. |
| | N.C. | B22 | | A22 | N.C. | | | N.C. | B22 | | A22 | N.C. | |
| | N.C. | B23 | | A23 | N.C. | | | N.C. | B23 | | A23 | N.C. | |
| | N.C. | B24 | | A24 | N.C. | | | N.C. | B24 | | A24 | N.C. | |
| | N.C. | B25 | | A25 | N.C. | | | N.C. | B25 | | A25 | N.C. | |
| | N.C. | B26 | | A26 | N.C. | | | N.C. | B26 | | A26 | N.C. | |
| | N.C. | B27 | | A27 | N.C. | | | N.C. | B27 | | A27 | N.C. | |
| | N.C. | B28 | | A28 | N.C. | | | N.C. | B28 | | A28 | N.C. | |
| Signal common | GND | B29 | | A29 | GND | Signal common | Signal common | GND | B29 | | A29 | GND | Signal common |
| | GND | B30 | | A30 | GND | | | GND | B30 | | A30 | GND | |
| +E port (Input) | I-E0 | B31 | | A31 | I-A0 | +A port (Input) | +6 port (Input) | I-60 | B31 | | A31 | I-20 | +2 port (Input) |
| | I-E1 | B32 | | A32 | I-A1 | | | I-61 | B32 | | A32 | I-21 | |
| | I-E2 | B33 | | A33 | I-A2 | | | I-62 | B33 | | A33 | I-22 | |
| | I-E3 | B34 | | A34 | I-A3 | | | I-63 | B34 | | A34 | I-23 | |
| | I-E4 | B35 | | A35 | I-A4 | | | I-64 | B35 | | A35 | I-24 | |
| | I-E5 | B36 | | A36 | I-A5 | | | I-65 | B36 | | A36 | I-25 | |
| | I-E6 | B37 | | A37 | I-A6 | | | I-66 | B37 | | A37 | I-26 | |
| | I-E7 | B38 | | A38 | I-A7 | | | I-67 | B38 | | A38 | I-27 | |
| +F port (Input) | I-F0 | B39 | | A39 | I-B0 | +B port (Input) | +7 port (Input) | I-70 | B39 | | A39 | I-30 | +3 port (Input) |
| | I-F1 | B40 | | A40 | I-B1 | | | I-71 | B40 | | A40 | I-31 | |
| | I-F2 | B41 | | A41 | I-B2 | | | I-72 | B41 | | A41 | I-32 | |
| | I-F3 | B42 | | A42 | I-B3 | | | I-73 | B42 | | A42 | I-33 | |
| | I-F4 | B43 | | A43 | I-B4 | | | I-74 | B43 | | A43 | I-34 | |
| | I-F5 | B44 | | A44 | I-B5 | | | I-75 | B44 | | A44 | I-35 | |
| | I-F6 | B45 | | A45 | I-B6 | | | I-76 | B45 | | A45 | I-36 | |
| | I-F7 | B46 | | A46 | I-B7 | | | I-77 | B46 | | A46 | I-37 | |
| +5V | Vcc | B47 | | A47 | Vcc | +5V | +5V | Vcc | B47 | | A47 | Vcc | +5V |
| | Vcc | B48 | | A48 | Vcc | | | Vcc | B48 | | A48 | Vcc | |

* The numbers in square brackets [ ] are pin numbers designated by HONDA TSUSHIN KOGYO CO., LTD.




| | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | N.C. | 19 | CNA of PCB100WS connecting to the board CNB | 37 | Vcc | +5V | | N.C. | 19 | CNA of PCB100WS connecting to the board CNA | 37 | Vcc | +5V |
| +5V | Vcc | 18 | | 36 | I-B7 | | +5V | Vcc | 18 | | 36 | I-37 | |
| +9 port (Input) | I-97 | 17 | | 35 | I-B6 | | +1 port (Input) | I-17 | 17 | | 35 | I-36 | |
| | I-96 | 16 | | 34 | I-B5 | | | I-16 | 16 | | 34 | I-35 | |
| | I-95 | 15 | | 33 | I-B4 | +B port (Input) | | I-15 | 15 | | 33 | I-34 | +3 port (Input) |
| | I-94 | 14 | | 32 | I-B3 | | | I-14 | 14 | | 32 | I-33 | |
| | I-93 | 13 | | 31 | I-B2 | | | I-13 | 13 | | 31 | I-32 | |
| | I-92 | 12 | | 30 | I-B1 | | | I-12 | 12 | | 30 | I-31 | |
| | I-91 | 11 | | 29 | I-B0 | | | I-11 | 11 | | 29 | I-30 | |
| | I-90 | 10 | | 28 | I-A7 | | | I-10 | 10 | | 28 | I-27 | |
| +8 port (Input) | I-87 | 9 | | 27 | I-A6 | | +0 port (Input) | I-07 | 9 | | 27 | I-26 | |
| | I-86 | 8 | | 26 | I-A5 | | | I-06 | 8 | | 26 | I-25 | |
| | I-85 | 7 | | 25 | I-A4 | +A port (Input) | | I-05 | 7 | | 25 | I-24 | +2 port (Input) |
| | I-84 | 6 | | 24 | I-A3 | | | I-04 | 6 | | 24 | I-23 | |
| | I-83 | 5 | | 23 | I-A2 | | | I-03 | 5 | | 23 | I-22 | |
| | I-82 | 4 | | 22 | I-A1 | | | I-02 | 4 | | 22 | I-21 | |
| | I-81 | 3 | | 21 | I-A0 | | | I-01 | 3 | | 21 | I-20 | |
| | I-80 | 2 | | 20 | GND | Signal common | | I-00 | 2 | | 20 | GND | Signal common |
| Signal common | GND | 1 | | | | | Signal common | GND | 1 | | | | |

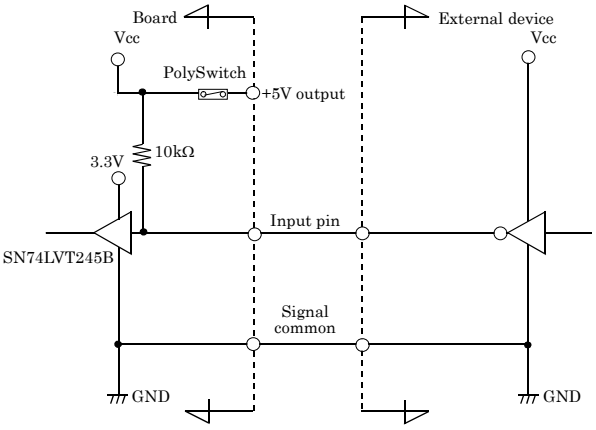
| | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | N.C. | 19 | CNB of PCB100WS connecting to the board CNB | 37 | Vcc | +5V | | N.C. | 19 | CNB of PCB100WS connecting to the board CNA | 37 | Vcc | +5V |
| +5V | Vcc | 18 | | 36 | I-F7 | | +5V | Vcc | 18 | | 36 | I-77 | |
| +D port (Input) | I-D7 | 17 | | 35 | I-F6 | | +5 port (Input) | I-57 | 17 | | 35 | I-76 | |
| | I-D6 | 16 | | 34 | I-F5 | | | I-56 | 16 | | 34 | I-75 | |
| | I-D5 | 15 | | 33 | I-F4 | +F port (Input) | | I-55 | 15 | | 33 | I-74 | +7 port (Input) |
| | I-D4 | 14 | | 32 | I-F3 | | | I-54 | 14 | | 32 | I-73 | |
| | I-D3 | 13 | | 31 | I-F2 | | | I-53 | 13 | | 31 | I-72 | |
| | I-D2 | 12 | | 30 | I-F1 | | | I-52 | 12 | | 30 | I-71 | |
| | I-D1 | 11 | | 29 | I-F0 | | | I-51 | 11 | | 29 | I-70 | |
| | I-D0 | 10 | | 28 | I-E7 | | | I-50 | 10 | | 28 | I-67 | |
| +C port (Input) | I-C7 | 9 | | 27 | I-E6 | | +4 port (Input) | I-47 | 9 | | 27 | I-66 | |
| | I-C6 | 8 | | 26 | I-E5 | | | I-46 | 8 | | 26 | I-65 | |
| | I-C5 | 7 | | 25 | I-E4 | +E port (Input) | | I-45 | 7 | | 25 | I-64 | +6 port (Input) |
| | I-C4 | 6 | | 24 | I-E3 | | | I-44 | 6 | | 24 | I-63 | |
| | I-C3 | 5 | | 23 | I-E2 | | | I-43 | 5 | | 23 | I-62 | |
| | I-C2 | 4 | | 22 | I-E1 | | | I-42 | 4 | | 22 | I-61 | |
| | I-C1 | 3 | | 21 | I-E0 | | | I-41 | 3 | | 21 | I-60 | |
| | I-C0 | 2 | | 20 | GND | Signal common | | I-40 | 2 | | 20 | GND | Signal common |
| Signal common | GND | 1 | | | | | Signal common | GND | 1 | | | | |

## Connecting Input Signals

The input circuits of interface blocks is illustrated in Figure 3.11.

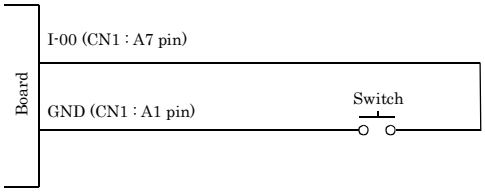
External digital signals given to signal inputs are TTL levels. The individual input signals are passed to the personal computer as negative logic signals. As each of the signal inputs is pulled up internally, the output of a relay contact or semiconductor switch can be connected directly between the signal input and the signal common pin.

### Input Circuit




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

### Connecting a Switch




When the switch is ON, the corresponding bit contains 1.
When the switch is OFF, by contrast, the bit contains 0.

## Block Diagram