# PCI BUS SERIES

B

| **B-02** | **Digital I/O Boards** |
| **B-18** | **Analog I/O Boards** |
| **B-32** | **Communication Boards** |
| **B-40** | **Counter & Motor Controller** |

## ■ PCI Bus

High-speed peripheral equipment has contributed to making the ISA Bus (AT bus) obsolete. Market leader, Intel Corporation, advocated PCI as an international bus standard, and through the efforts of PCISIG they have succeeded. With its 32-bit specification, a maximum data transmission speed of 133MB/second and the future expansion to 64-bit specification, PCI is the bus standard most widely used in both Apple/Macintosh and IBM PC/AT compatible systems.

## ■ Features

### Plug & Play Function

Unlike ISA or C (98) bus interface boards, which need to be manually set up, the PCI bus allows I/O port addressing and interrupt levels to be set up automatically.

### Interrupt (IRQ) Level Sharing

PCI bus allows multiple boards to share the same IRQ. ISA or C (98) interface boards are affected by any conflicts in interrupt level assignments.

## ■ Board size

Contec PCI boards come in two sizes:



H **Short size**
176.4(L) x 107.0(H)mm(Max.)

H **Long size**
313.8(L) x 107.0(H)mm(Max.)

H (height) -- either a board or a bracket -- the higher one is shown.
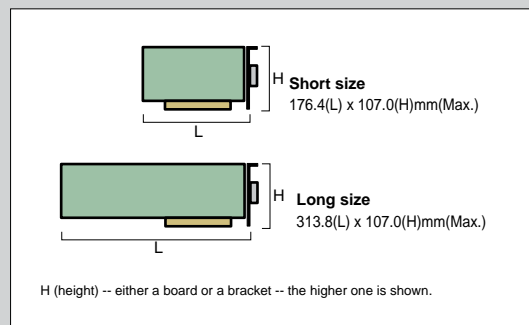
## ■ Use of Two or More Boards

If the number of expansion slots is insufficient or the total power consumption of the add-on boards exceed the capacity of the system's power supply a bus extension unit can be used. Details about these units are in the Chapter "Bus Expansion Systems."

FA-PAC(PCI)H4

B-02

PCI BUS SERIES

Digital I/O
Boards

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# Digital I/O Boards

## SELECTION GUIDE

| Name | Channels | | Signal level | Response time | Isolation | Internal power | Input | | Output | |
|------|----------|--------|--------------|---------------|-----------|----------------|-------|--------|--------|--|
| | Input | Output | | | | | Input circuit | Input resistance | Output type | |
| **Opto-Isolated Input Board** | | | | | | | | | | |
| PI-32L(PCI) | 32 | - | +12 - 24VDC | Max.1msec | ○ | - | Opto-Isolated Input (for high sink current output) (Negative logic) | 3KΩ | - | |
| PI-64L(PCI) | 64 | - | +12 - 24VDC | Max.1msec | ○ | - | Opto-Isolated Input (for high sink current output) (Negative logic) | 3KΩ | - | |
| PI-128L(PCI) | 128 | - | +12 - 24VDC | Max.200μsec | ○ | - | Opto-Isolated Input (for high sink current output) (Negative logic) | 4.7KΩ | - | |
| PO-32L(PCI) | - | 32 | +12 - 24VDC | Max.1msec | ○ | - | - | - | Opto-Isolated Open Collector Output (sinking type) | |
| PO-64L(PCI) | - | 64 | +12 - 24VDC | Max.1msec | ○ | - | - | - | Opto-Isolated Open Collector Output (sinking type) | |
| PO-128L(PCI) | - | 128 | +12 - 24VDC | Max.200μsec | ○ | - | - | - | Opto-Isolated Open Collector Output (sinking type) | |
| PIO-16/16L(PCI) | 16 | 16 | +12 - 24VDC | Max.1msec | ○ | - | Opto-Isolated Input (for high sink current output) (Negative logic) | 3KΩ | Opto-Isolated Open Collector Output (sinking type) | |
| PIO-32/32L(PCI) | 32 | 32 | +12 - 24VDC | Max.1msec | ○ | - | Opto-Isolated Input (for high sink current output) (Negative logic) | 3KΩ | Opto-Isolated Open Collector Output (sinking type) | |
| PIO-64/64L(PCI) | 64 | 64 | +12 - 24VDC | Max.200μsec | ○ | - | Opto-Isolated Input (for high sink current output) (Negative logic) | 4.7KΩ | Opto-Isolated Open Collector Output (sinking type) | |
| **Opto-Isolated High-Speed Digital I/O Board** | | | | | | | | | | |
| PIO-32/32F(PCI) | 32 | 32 | +12 - 24VDC | Max.5μsec | ○ | - | Opto-Isolated Input (for high sink current output) (Negative logic) | 2.2KΩ | Opto-Isolated Open Collector Output (sinking type) | |
| **Opto-Isolated Digital I/O Board with On-board 12V Power Supply** | | | | | | | | | | |
| PI-32B(PCI) | 32 | - | +12 - 24VDC | Max.1msec | ○ | DC12V | Opto-Isolated Input (for high sink current output) (Negative logic) | 3KΩ | - | |
| PO-32B(PCI) | - | 32 | +12 - 24VDC | Max.1msec | ○ | DC12V | - | - | Opto-Isolated Open Collector Output (sinking type) | |
| PIO-16/16B(PCI) | 16 | 16 | +12 - 24VDC | Max.1msec | ○ | DC12V | Opto-Isolated Input (for high sink current output) (Negative logic) | 3KΩ | Opto-Isolated Open Collector Output (sinking type) | |
| PIO-32/32B(PCI)H | 32 | 32 | +12 - 24VDC | Max.1msec | ○ | DC12V | Opto-Isolated Input (for high sink current output) (Negative logic) | 3KΩ | Opto-Isolated Open Collector Output (sinking type) | |
| PIO-16/16TB(PCI) | 16 | 16 | 5VDC-TTL | Max.1μsec | ○ | +5VDC | Opto-Isolated TTL Input | 1.1KΩ | Opto-Isolated TTL Output | |
| **Reed Relay Output Board** | | | | | | | | | | |
| RRY-16C(PCI) | - | 16 | 125VAC/+30VDC | Max.7msec | ○ | - | - | - | Reed Relay Output | |
| RRY-32(PCI) | - | 32 | 100VAC/100VDC | Max.1msec | ○ | - | - | - | Reed Relay Output | |
| **TTL-Level Digital I/O Board** | | | | | | | | | | |
| PIO-16/16T(PCI) | 16 | 16 | 5VDC-TTL | Max.200nsec | - | - | TTL level Input | 10KΩ*1 | Open collector output | |
| PIO-32/32T(PCI) | 32 | 32 | 5VDC-TTL | Max.200nsec | - | - | TTL level Input | 10KΩ*1 | Open collector output | |
| **Bi-Directional Digital I/O Board** | | | | | | | | | | |
| PIO-48D(PCI) | 48 | | 5VDC-TTL | Max.200nsec | - | - | TTL level Input | 10KΩ*1 | TTL level Output | |
| PIO-32DM(PCI) | 32 | | 5VDC-TTL | Max.50nsec | - | - | TTL level Input | 10KΩ*1 | TTL level Output | |

## Tips of Digital I/O Boards

### 1. Digital I/O

Board-level data acquisition provides input and output signals between external machinery and the computer (with ON-OFF signal available via the PC). If a digital I/O board is used, the relay of various control circuits and the state of the operation switches can be supervised. Ongoing monitoring of controller input / output and digitized data can be easily done.

### 2. Digital I/O Board Types / Applications

#### ■Opto-isolated I/O

In these boards the logic and input-and-output circuits are isolated with an optical photo-coupler. A signal (information) is converted and transmitted via light thereby avoiding the electric noise generated in the operation circuit. However, since a photo-coupler requires additional power, an external DC power supply is required. Used with light electrical machinery whose operation circuits are DC 5-24V, such as a digital switch or display machine.

##### ●High-speed Opto-Isolated

Supplies high-speed photo-coupler isolation I/O.
Used when high-speed I/O is required.

##### ●Opto-Isolated I/O w/on-board Power Supply

Supplies an internal logic circuit which carries an isolated DC power supply making it possible to supply the power to operate the photo-coupler from on board DC-DC converter.
Used when an external power supply cannot be supplied.

#### ■Relay Output

Uses a mechanical contact relay for the output circuit. The logic and output circuits on the board are isolated by a mechanical contact relay. AC load can also be connected.
Used when controlling high voltage electrical machinery in which an operation circuit is AC or exceeds DC24V.

#### ■TTL I/O

Supplies high-speed I/O, directly linking the input-output and logic circuits on the board. However, it is best used when the electrical noise is at a minimum and wiring distance is short, since Relay TTL is easily influenced by electrical noise.
Used when a small TTL level (5VDC) relay is needed for connection with the external machinery.

##### ●Bi-directional TTL I/O

Directly links the input-output and logic circuits via an i8255 (or equivalent) chip. It can carry out variable eight-point bi-directional I/O.
Used for TTL level (5VDC) bi-directional I/O connection with external machinery.
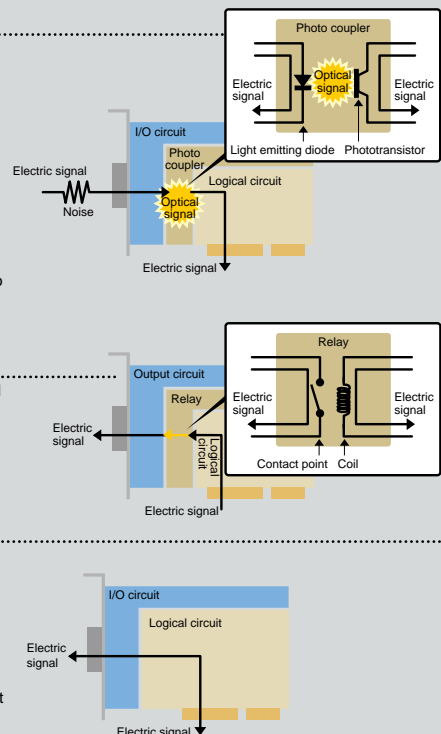
※1:For this type of boards, this data is the resistance of pull-up resistors.
※2:When using external power supply, every 16 channels (signals) are grouped to a single power supply.

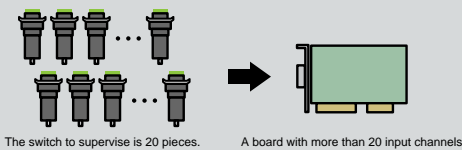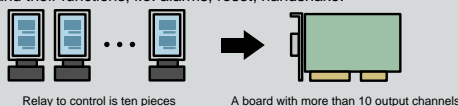| Output rating | Common | Expansion function | Interrupt | Connector | Software ACX-PAC(W32) | API-PAC(W32) | DDE SERVER(W32) | Page | Name |
|---|---|---|---|---|---|---|---|---|---|
| - | 16 | ○ | 4 interrupt signals, 1 interrupt request | 37-pin D-type | ○ | Attached | - | B-05 | PI-32L(PCI) |
| - | 16 | ○ | 4 interrupt signals, 1 interrupt request | 96-pin Half Pitch | ○ | Attached | ○ | B-05 | PI-64L(PCI) |
| | 16 | - | 16 interrupt signals, 1 interrupt request | 100-pin | ○ | Attached | - | B-05 | PI-128L(PCI) |
| +35VDC 100mA | 16 | ○ | - | 37-pin D-type | ○ | Attached | - | B-06 | PO-32L(PCI) |
| +35VDC 100mA | 16 | ○ | - | 96-pin Half Pitch | ○ | Attached | ○ | B-06 | PO-64L(PCI) |
| +35VDC 100mA | 16 | - | - | 100-pin | ○ | Attached | - | B-06 | PO-128L(PCI) |
| +35VDC 100mA | 16 | ○ | 4 interrupt signals, 1 interrupt request | 37-pin D-type | ○ | Attached | ○ | B-07 | PIO-16/16L(PCI) |
| +35VDC 100mA | 16 | ○ | 4 interrupt signals, 1 interrupt request | 96-pin Half Pitch | ○ | Attached | ○ | B-07 | PIO-32/32L(PCI) |
| +35VDC 100mA | 16 | - | 16 interrupt signals, 1 interrupt request | 100-pin | ○ | Attached | - | B-07 | PIO-64/64L(PCI) |
| +35VDC 50mA | 16 | ○ | 4 interrupt signals, 1 interrupt request | 96-pin Half Pitch | ○ | Attached | ○ | B-08 | PIO-32/32F(PCI) |
| - | Common for All the channels*2 | ○ | 4 interrupt signals, 1 interrupt request | 37-pin D-type | ○ | Attached | - | B-05 | PI-32B(PCI) |
| +35VDC 100mA | Common for All the channels*2 | ○ | - | 37-pin D-type | ○ | Attached | - | B-06 | PO-32B(PCI) |
| +35VDC 100mA | Common for All the channels*2 | ○ | 4 interrupt signals, 1 interrupt request | 37-pin D-type | ○ | Attached | - | B-08 | PIO-16/16B(PCI) |
| +35VDC 100mA | Common for All the channels*2 | ○ | 4 interrupt signals, 1 interrupt request | 96-pin Half Pitch | ○ | Attached | ○ | B-08 | PIO-32/32B(PCI)H |
| +5VDC 6.4mA | Common for All the channels*1 | ○ | 4 interrupt signals, 1 interrupt request | 37-pin D-type | ○ | Attached | ○ | B-09 | PIO-16/16TB(PCI) |
| AC125/+30VDC 2A | Independence for All the Channels | | - | 37-pin D-type | ○ | Attached | ○ | B-09 | RRY-16C(PCI) |
| AC/DC100V 0.5A | 8 | | - | 37-pin D-type | ○ | Attached | ○ | B-09 | RRY-32(PCI) |
| +30VDC 40mA | Common for All the channels | ○ | 4 interrupt signals, 1 interrupt request | 37-pin D-type | ○ | Attached | ○ | B-10 | PIO-16/16T(PCI) |
| +30VDC 40mA | Common for All the channels | ○ | 4 interrupt signals, 1 interrupt request | 96-pin Half Pitch | ○ | Attached | ○ | B-10 | PIO-32/32T(PCI) |
| +5VDC 24mA | Common for All the channels | | 48 interrupt signals can be combine to 1 interrupt. | 96-pin Half Pitch | ○ | Attached | ○ | B-10 | PIO-48D(PCI) |
| +5VDC 24mA | Common for All the channels | | Errors and various factors, 1 interrupt request | 96-pin Half Pitch | - | Attached | - | B-11 | PIO-32DM(PCI) |

# 3. Selection of Digital I/O Boards

There are a number of digital I/O boards to choose from, each with varying specifications.
The following will help in selecting the optimal board for your application.
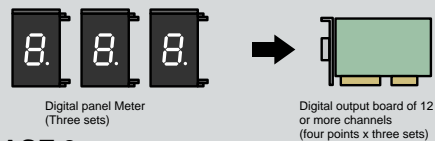
## STEP 1 How many input / output channels are needed?

### CASE 1 [for relay control and/or switch monitoring]

When deciding how many I/O channels are needed consider both the number of relays or switches (on/off) on the equipment to be monitored and their functions; i.e. alarms, reset, handshake.

Relay to control is ten pieces.    A board with more than 10 output channels

The switch to supervise is 20 pieces.    A board with more than 20 input channels

### CASE 2 [7 segment display unit BCD or binary binary code with digital switches]

If the type of decimal number or hexadecimal is used, 4 bits (four points) of output or an input are usually needed for one digit.

Digital panel Meter (Three sets)    Digital output board of 12 or more channels (four points x three sets)

### CASE 3 [rotary encoder/absolute-type with binary output]

Consider the resolution of one rotation. For example, if it is the type that resolves one rotation each 256 minutes, $(256 = 2^8 \rightarrow 8$ bits) eight point input is needed.

Absolute encoder of 256 resolution    Digital input board of eight or more points
* For a rotary encoder/incremental form use a counter board (page B-40)

## STEP 2 Which I/O circuitry is suitable for machinery to be monitored?

### CASE 1
[open collector and input circuit designs / the output circuit of the machinery / voltage of operation circuit in photo-coupler insulation input (DC) does not exceed DC24V]

➔Suitable boards - opto-isolated I/O i.e. PIO-32/32L(PCI)

### CASE 2
[input and output of equipment perform high-speed communication on TTL level-diagram]

➔Suitable boards - non-insulated TTL-level I/O i.e. PIO-32/32T(PCI)
➔If greater insulation is required insulated TTL-level I/O is suitable i.e. PIO-16/16TB(PCI)

## STEP 3 What other factors need to be considered?

● Check for necessary response speed, interrupts and optional functions.

● Decide on support software according to development environment or control need.

**B-04**

PCI BUS SERIES

*Digital I/O Boards*

Analog I/O Boards

Communication Boards

Counter & Motor Controller

## Tips of Digital I/O Boards

# 4. Functional explanation

### ■Extension function

Add the board with this notation to a basic input-and-output function, and it carries the convenient following function

● **Digital filter function**

The digital filter which can set up a frequency band is carried in all input terminals.
Incorrect operation by the electrical noise or the chattering of relay contact is prevented on a hardware level.

● **Echo back function of output data**

The state (ON/OFF) of all output terminals can be read at any time.

● **Handshake function**

Handshake communication by the STB/ACK signal can be performed easily. (Interruption is generated by the STB signal from the outside.)

● **Interruption edge setting function**

Logic reversal of an interruption incoming signal and control of a gate (momentary input prohibition) can be performed.

● **Input-and-output function of a bit unit**

Arbitrary 1-bit the input and output which accept it can be performed on a hardware level. Being unnecessary etc. has the load of software mitigated [operation / logic / troublesome].

### ■Interrupt input function

The board with this notation connects a specific input terminal to IRQ of a personal computer, and carry the function to make a personal computer generate IRQ from the exterior It is the instructions from the outside, and it is convenient when carrying out urgent processing of a high priority etc. This function has the difference in some on a board, and a kind and the notation method are as follows.
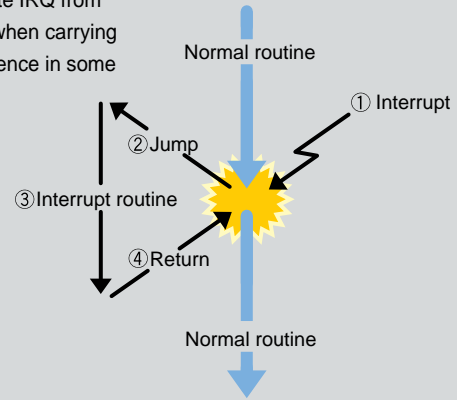
It is the type only whose IRQ of one level it is not concerned with connectable input mark, but uses X inputs for one IRQ. For example, even when connecting four inputs to IRQ of a personal computer, only one IRQ level is used. Moreover, by the signal from which input terminal IRQ occurred reads and checks the status information on a board.

Connection with IRQ is possible respectively in X inputs. It is the type which uses IRQ of one level for every one input. For example, when connecting four inputs to IRQ of a personal computer, the opening of four IRQ levels is required.



Normal routine

① Interrupt
②Jump
③Interrupt routine
④Return

Normal routine

### ■Common constitution

The group division of the what point input-and-output circuit of a common composition digital input-and-output board is electrically carried out in that unit, and the ground between groups has been independent mutually. A kind and the notation method are as follows.

● **X point / [1 common]**

It has been independent into the unit group of X point / what [1 common] point. 16 points / 1 -- when common, operation circuit voltage can be changed into condition of "being 16 points at DC12V system", and "being 16 points at DC24V system" [for example,]
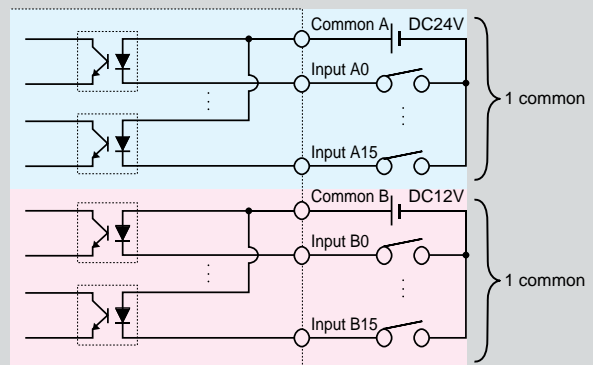
● **Common to all points**

The all points of input and output are common.
The apparatus by which the voltage and the grand level of an operation circuit differ from each other is not connectable with the same board.

● **All points independence**

All points independence every one point each has been independent.
The apparatus by which the voltage and the grand level of an operation circuit differ from each other for every point is connectable.
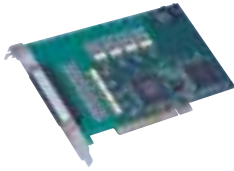


Common A   DC24V
Input A0
Input A15
} 1 common

Common B   DC12V
Input B0
Input B15
} 1 common

## Opto-Isolated Digital Input Board
### PI-32L(PCI)

**FEATURES**
- 32 opto-isolated digital inputs
- External power supply requirement: +12-24VDC
- 1000Vrms voltage isolation

| Input 32 | Isolated |
| --- | --- |

**API function library attachment [API-PAC(W32)]**

### ■SPECIFICATIONS

| | | | |
| --- | --- | --- | --- |
| Inputs channels | 32 | Maximum distance | 50m |
| Output channels | - | I/O address | Any 32-byte boundary |
| I/O Circuit | | Power consumption (Max.) | +5VDC 250mA |
| Signal level | +12 - 24VDC | PCI bus/ | 32bit, 33MHz, 5V/ |
| Internal power | - | Dimension (mm) | 176.4(L)x107.0(H) |
| Input specification | | Connector | 37-pin female D-type |
| Input type | Opto-Isolated Input (for high sink current output) (Negative logic) | | DCL-J37SAF-20L9[JAE] or equivalent |
| Interrupt | Combine four interrupt signal lines to one interrupt request signal as INTA | Option | |
| | | Software | ACX-PAC(W32)BP Ver.2.1 upper, ACX-PAC(W32)AP Ver.2.1 upper |
| Input resistance | 3kΩ | Accessories | DTP-3(PC), DTP-4(PC), EPD-37 *1, CM-32(PC)E *1 |
| Output specification | | | |
| Output type | - | Cables/ | PCA37P, PCB37P, PCA37PS, |
| Output rating | - | Connector | PCB37PS, CN5-D37M |
| Expansion function | Yes | | |
| Response time (Max.) | 1msec | | |

*1:Option cable of PCB37P or PCB37PS is required.

## Opto-Isolated Digital Input Board
### PI-64L(PCI)

**FEATURES**
- 64 opto-isolated digital inputs
- External power supply requirement: +12-24VDC
- 1000Vrms voltage isolation

| Input 64 | Isolated | C€ |
| --- | --- | --- |

**API function library attachment [API-PAC(W32)]**

### ■SPECIFICATIONS

| | | | |
| --- | --- | --- | --- |
| Inputs channels | 64 | Maximum distance | 50m |
| Output channels | - | I/O address | Any 32-byte boundary |
| I/O Circuit | | Power consumption (Max.) | +5VDC 300mA |
| Signal level | +12 - 24VDC | PCI bus/ | 32bit, 33MHz, 5V/ |
| Internal power | - | Dimension (mm) | 176.4(L)x107.0(H) |
| Input specification | | Connector | PCR-E96LMD[HONDA Tsushin Kogyo] or equivalent |
| Input type | Opto-Isolated Input (for high sink current output) (Negative logic) | Option | |
| Interrupt | Combine four interrupt signal lines to one interrupt request signal as INTA | Software | ACX-PAC(W32)BP, ACX-PAC(W32)AP, DDE SERVER(W32) |
| Input resistance | 3kΩ | Accessories | DTP-3(PC)*1, DTP-4(PC)*1, DTP-64(PC)*2, EPD-96*2, CCB-96*2, CM-32(PC)*1, CM-32(PC)E*1, CM-64(PC)E*2 |
| Output specification | | | |
| Output type | - | Cables/ | PCA96P, PCB96P, PCB96W, PCA96PS, |
| Output rating | - | Connector | PCB96PS, PCB96WS, CN5-H96F |
| Expansion function | Yes | | |
| Response time (Max.) | 1msec | | |

*1:Option cable of PCB96W or PCB96WS is required.
*2:Option cable of PCB96P or PCB96PS is required.

## Opto-Isolated Digital Input Board
### PI-128L(PCI)  NEW
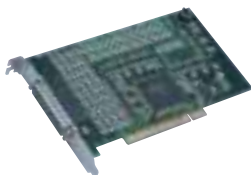
**FEATURES**
- 128 opto-isolated digital inputs
- 128 inputs/outputs on PCI short-size board(occupies 1 slot)
- High-speed response within 200μsec / low power consumption
- 16 interrupt input with Digital filter function

| Input 128 | Isolated |
| --- | --- |

**API function library attachment [API-PAC(W32)]**

### ■SPECIFICATIONS

| | | | |
| --- | --- | --- | --- |
| Inputs channels | 128 | Maximum distance | 50m |
| Output channels | - | I/O address | Any 32-byte boundary |
| I/O Circuit | | Power consumption (Max.) | +5VDC 500mA |
| Signal level | +12 - 24VDC | PCI Bus / | 32bit, 33MHz, |
| Internal power | - | Dimension (mm) | 5V/176.41(L)x106.68(H) |
| Input specification | | Connector | HDRA-E100W1L-FDT1EC-SL[HONDA Tsushin Kogyo] or equivalent |
| Input type | Opto-Isolated Input (for high sink current output) (Negative logic) | | |
| Interrupt | Combine 16 interrupt signal lines to one interrupt request signal as INTA | Option | |
| | | Software | ACX-PAC(W32)BP , ACX-PAC(W32)AP |
| Input resistance | 4.7kΩ | Accessories | EPD-96*1, DTP-64(PC)*1, CM-64(PC)E*1 |
| Output specification | | | |
| Output type | - | Cables/Connector | PCB100/96PS |
| Output rating | - | | |
| Expansion function | - | | |
| Response time (Max.) | 200μsec | | |

*1:Option cable of PCB100/96PS is required.

## Opto-Isolated Digital Input Board with On-Board 12V Power Supply
### PI-32B(PCI)

**FEATURES**
- 32 opto-isolated digital inputs
- Signal level: +12-24VDC
- On board isolated power supply

| Input 32 | Isolated | Power on board |
| --- | --- | --- |

**API function library attachment [API-PAC(W32)]**

### ■SPECIFICATIONS

| | | | |
| --- | --- | --- | --- |
| Inputs channels | 32 | Maximum distance | 50m |
| Output channels | - | I/O address | Any 32-byte boundary |
| I/O Circuit | | Power consumption (Max.) | +5VDC 300mA(External power) +5VDC 1200mA(On board power) |
| Signal level | +12 - 24VDC | PCI bus/ | 32bit, 33MHz, 5V/176.4(L)x107.0(H) |
| Internal power | DC12V 240mA | Dimension (mm) | |
| Input specification | | Connector | 37-pin female D-type |
| Input type | Opto-Isolated Input (for high sink current output) (Negative logic) | | DCL-J37SAF-20L9[JAE] or equivalent |
| Interrupt | Combine four interrupt signal lines to one interrupt request signal as INTA | Option | |
| | | Software | ACX-PAC(W32)BP Ver.2.1 upper, ACX-PAC(W32)AP Ver.2.1 upper |
| Input resistance | 3kΩ | Accessories | DTP-3(PC), DTP-4(PC), EPD-37 *1, CM-32(PC)E *1 |
| Output specification | | | |
| Output type | - | Cables/ | PCA37P, PCB37P, PCA37PS, |
| Output rating | - | Connector | PCB37PS, CN5-D37M |
| Expansion function | Yes | | |
| Response time (Max.) | 1msec | | |

*1:Option cable of PCB37P or PCB37PS is required.

## Opto-Isolated Digital Output Board
### PO-32L(PCI)

- 32 opto-isolated digital outputs
- Signal level: +12-24VDC, 1000Vrms voltage isolation
- High sink current: DC35, 100mA max. per channel, 2A max. per group

**Output 32** **Isolated**

**API function library attachment [API-PAC(W32)]**

### ■SPECIFICATIONS

| Inputs channels | - |
|---|---|
| Output channels | 32 |
| I/O Circuit | |
| Signal level | +12 - 24VDC |
| Internal power | - |
| Input specification | |
| Input type | - |
| Interrupt | - |
| Input resistance | - |
| Output specification | |
| Output type | Opto-Isolated Open Collector Output (current sinking type) (Negative logic) |
| Output rating | +35VDC 100mA |
| Expansion function | Yes |
| Response time (Max.) | 1msec |

| Maximum distance | 50m |
|---|---|
| I/O address | Any 32-byte boundary |
| Power consumption (Max.) | +5VDC 250mA |
| PCI bus/ | 32bit, 33MHz, 5V/ |
| Dimension (mm) | 176.4(L)x107.0(H) |
| Connector | 37-pin female D-type DCL-J37SAF-20L9[JAE] or equivalent |
| Option | |
| Software | ACX-PAC(W32)BP Ver.2.1 upper, ACX-PAC(W32)AP Ver.2.1 upper |
| Accessories | DTP-3(PC), DTP-4(PC), EPD-37*1, CM-32(PC)E*1 |
| Cables/ Connector | PCA37P, PCB37P, PCA37PS, PCB37PS, CN5-D37M |

*1:Option cable of PCB37P or PCB37PS is required.

## Opto-Isolated Digital Output Board
### PO-64L(PCI)

- 64 opto-isolated digital outputs
- Signal level: +12-24VDC, 1000Vrms voltage isolation
- High sink current: DC35, 100mA max. per channel, 2A max. per group

**Output 64** **Isolated** CE

**API function library attachment [API-PAC(W32)]**

### ■SPECIFICATIONS

| Inputs channels | - |
|---|---|
| Output channels | 64 |
| I/O Circuit | |
| Signal level | +12 - 24VDC |
| Internal power | - |
| Input specification | |
| Input type | - |
| Interrupt | - |
| Input resistance | - |
| Output specification | |
| Output type | Opto-Isolated Open Collector Output (current sinking type) (Negative logic) |
| Output rating | +35VDC 100mA |
| Expansion function | Yes |
| Response time (Max.) | 1msec |

| Maximum distance | 50m |
|---|---|
| I/O address | Any 32-byte boundary |
| Power consumption (Max.) | +5VDC 300mA |
| PCI bus/ | 32bit, 33MHz, 5V/ |
| Dimension (mm) | 176.4(L)x107.0(H) |
| Connector | PCR-E96LMD or equivalent [HONDA Tsushin Kogyo] |
| Option | |
| Software | ACX-PAC(W32)BP, ACX-PAC(W32)AP, DDE SERVER(W32) |
| Accessories | DTP-3(PC)*1, DTP-4(PC)*1, DTP-64(PC)*2, EPD-96*2, CCB-96*2, CM-32(PC)*1, CM-64(PC)E*2 |
| Cables/ Connector | PCA96P, PCB96P, PCB96W, PCA96PS, PCB96PS, PCB96WS, CN5-H96F |

*1:Option cable of PCB96W or PCB96WS is required.
*2:Option cable of PCB96P or PCB96PS is required.

## Opto-Isolated Digital Output Board
### PO-128L(PCI) NEW

- 128 outputs on PCI short-size board (occupies 1 slot)
- The protection (the serge voltage, over-current) at output circuit
- High-speed response within 200μsec / low power consumption

**Input 128** **Isolated**

**API function library attachment [API-PAC(W32)]**

### ■SPECIFICATIONS

| Inputs channels | - |
|---|---|
| Output channels | 128 |
| I/O Circuit | |
| Signal level | DC12V-24V |
| Internal power | - |
| Input specification | |
| Input type | - |
| Interrupt | - |
| Input resistance | - |
| Output specification | |
| Output type | Opto-Isolated Open Collector Output (current sinking type) (Negative logic) |
| Output rating | +35VDC 100mA |
| Expansion function | - |
| Response time (Max.) | 200μsec |

| Maximum distance | 50m |
|---|---|
| I/O address | Any 32-byte boundary |
| Power consumption (Max.) | +5VDC 500mA |
| PCI bus/ | 32bit, 33MHz, |
| Dimension (mm) | 5V/176.41(L)x106.68(H) |
| Connector | HDRA-E100W1L-FDT1EC-SL[HONDA Tsushin Kogyo] or equivalent |
| Option | |
| Software | ACX-PAC(W32)BP , ACX-PAC(W32)AP |
| Accessories | EPD-96*1, DTP-64(PC)*1, CM-64(PC)E*1 |
| Cables/Connector | PCB100/96PS |

*1:Option cable of PCB100/96PS is required.

## Opto-Isolated Digital Output Board with On-Board 12V Power Supply
### PO-32B(PCI)

- 32 opto-isolated digital outputs
- Signal level: +12-24VDC
- On board isolated power supply

**Output 32** **Isolated** **Power on board**

**API function library attachment [API-PAC(W32)]**

### ■SPECIFICATIONS

| Inputs channels | - |
|---|---|
| Output channels | 32 |
| I/O Circuit | |
| Signal level | +12 - 24VDC |
| Internal power | DC12V 240mA |
| Input specification | |
| Input type | - |
| Interrupt | - |
| Input resistance | - |
| Output specification | |
| Output type | Opto-Isolated Open Collector Output (current sinking type) (Negative logic) |
| Output rating | +35VDC 100mA |
| Expansion function | Yes |
| Response time (Max.) | 1msec |
| Maximum distance | 50m |

| I/O address | Any 32-byte boundary |
|---|---|
| Power consumption (Max.) | +5VDC 300mA(External power) +5VDC 1200mA(On board power) |
| PCI bus/ | 32bit, 33MHz, 5V/ |
| Dimension (mm) | 176.4(L)x107.0(H) |
| Connector | 37-pin female D-type DCL-J37SAF-20L9[JAE] or equivalent |
| Option | |
| Software | ACX-PAC(W32)BP Ver.2.1 upper ACX-PAC(W32)AP Ver.2.1 upper |
| Accessories | DTP-3(PC), DTP-4(PC), EPD-37 *1, CM-32(PC)E *1 |
| Cables/ Connector | PCA37P, PCB37P, PCA37PS, PCB37PS, CN5-D37M |

*1:Option cable of PCB37P or PCB37PS is required.

Digital I/O Boards

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PCI BUS SERIES

# Opto-Isolated Digital I/O Board

## PIO-16/16L(PCI)

● 32 opto-isolated digital I/Os
● External power supply requirement: +12-24VDC
● 1000Vrms voltage isolation

| Input | Output | | |
|-------|--------|---------|-----|
| 16 | 16 | Isolated | CE |

API function library attachment [API-PAC(W32)]

### ■SPECIFICATIONS

| | | |
|---|---|---|
| Inputs channels | | 16 |
| Output channels | | 16 |
| I/O Circuit | | |
| | Signal level | +12 - 24VDC |
| | Internal power | - |
| Input specification | | |
| | Input type | Opto-Isolated Input (for high sink current output) (Negative logic) |
| | Interrupt | Combine four interrupt signal lines to one interrupt request signal as INTA |
| | Input resistance | 3kΩ |
| Output specification | | |
| | Output type | Opto-Isolated Open Collector Output (current sinking type) (Negative logic) |
| | Output rating | +35VDC 100mA |
| Expansion function | | Yes |
| Response time (Max.) | | 1msec |

| | |
|---|---|
| Maximum distance | 50m |
| I/O address | Any 32-byte boundary |
| Power consumption (Max.) | +5VDC 250mA |
| PCI bus/ | 32bit, 33MHz, 5V/ |
| Dimension (mm) | 176.4(L)x107.0(H) |
| Connector | 37-pin female D-type DCLC-J37SAF-20L9[JAE] or equivalent |
| Option | |
| Software | ACX-PAC(W32)BP, ACX-PAC(W32)AP, DDE SERVER(W32) |
| Accessories | EPD-37*¹, DTP-3(PC), DTP-4(PC), CM-32(PC)E*¹ |
| Cables/ Connector | PCA37P, PCB37P, PCA37PS, PCB37PS, CN5-D37M |

*1:Option cable of PCB37P or PCB37PS is required.

# Opto-Isolated Digital I/O Board

## PIO-32/32L(PCI)

● 64 opto-isolated digital inputs/outputs
● External power supply requirement: +12-24VDC
● 1000Vrms voltage isolation

| Input | Output | | |
|-------|--------|---------|-----|
| 32 | 32 | Isolated | CE |

API function library attachment [API-PAC(W32)]

### ■SPECIFICATIONS

| | | |
|---|---|---|
| Inputs channels | | 32 |
| Output channels | | 32 |
| I/O Circuit | | |
| | Signal level | +12 - 24VDC |
| | Internal power | - |
| Input specification | | |
| | Input type | Opto-Isolated Input (for high sink current output) (Negative logic) |
| | Interrupt | Combine four interrupt signal lines to one interrupt request signal as INTA |
| | Input resistance | 3kΩ |
| Output specification | | |
| | Output type | Opto-Isolated Open Collector Output (current sinking type) (Negative logic) |
| | Output rating | +35VDC 100mA |
| Expansion function | | Yes |
| Response time (Max.) | | 1msec |

| | |
|---|---|
| Maximum distance | 50m |
| I/O address | Any 32-byte boundary |
| Power consumption (Max.) | +5VDC 300mA |
| PCI bus/ | 32bit, 33MHz, 5V/ |
| Dimension (mm) | 176.4(L)x107.0(H) |
| Connector | PCR-E96LMD[HONDA Tsushin Kogyo] or equivalent |
| Option | |
| Software | ACX-PAC(W32)BP, ACX-PAC(W32)AP, DDE SERVER(W32) |
| Accessories | DTP-3(PC)*¹, DTP-4(PC)*¹, DTP-64(PC)*², EPD-96*², CCB-96*², CM-32(PC)*¹, CM-32(PC)E*¹, CM-64(PC)E*² |
| Cables/ Connector | PCA96P, PCB96P, PCB96W, PCA96PS, PCB96PS, PCB96WS, CN5-H96F |

*1:Option cable of PCB96W or PCB96WS is required.
*2:Option cable of PCB96P or PCB96PS is required.

# Opto-Isolated Digital I/O Board

## PIO-64/64L(PCI)  NEW

● 128 inputs/outputs on PCI short-size board (occupies 1 slot)
● High-speed response within 200μsec / low power consumption
● 16 interrupt input with Digital filter function
● The protection (the serge voltage, over-current) at output circuit

| Input | Output | |
|-------|--------|---------|
| 64 | 64 | Isolated |

API function library attachment [API-PAC(W32)]

### ■SPECIFICATIONS

| | | |
|---|---|---|
| Inputs channels | | 64 |
| Output channels | | 64 |
| I/O Circuit | | |
| | Signal level | +12 - 24VDC |
| | Internal power | - |
| Input specification | | |
| | Input type | Opto-Isolated Input (for high sink current output) (Negative logic) |
| | Interrupt | Combine 16 interrupt signal lines to one interrupt request signal as INTA |
| | Input resistance | 4.7kΩ |
| Output type | | Opto-Isolated Open Collector Output (current sinking type) (Negative logic) |
| Output rating | | +35VDC 100mA |
| Expansion function | | - |
| Response time (Max.) | | 200μsec |
| Maximum distance | | 50m |

| | |
|---|---|
| I/O address | Any 32-byte boundary |
| Power consumption (Max.) | +5VDC 500mA |
| PCI bus/ | 32bit, 33MHz, 5V/ |
| Dimension (mm) | 176.41(L)x106.68(H) |
| Connector | HDRA-E100W1L-FDT1EC-SL[HONDA Tsushin Kogyo] or equivalent |
| Option | |
| Software | ACX-PAC(W32)BP , ACX-PAC(W32)AP |
| Accessories | EPD-96*¹, DTP-64(PC)*¹, CM-64(PC)E*¹ |
| Cables/ Connector | PCB100/96PS |

*1:Option cable of PCB100/96PS is required.

# Opto-Isolated High-Speed Digital I/O Board
## PIO-32/32F(PCI)

**FEATURES**
- 64 opto-isolated digital inputs/outputs
- High-speed response
- External power supply requirement: +12-24VDC

| Input 32 | Output 32 | Isolated | CE |

**API function library attachment [API-PAC(W32)]**

### ■SPECIFICATIONS

| | | |
|---|---|---|
| **Inputs channels** | 32 | |
| **Output channels** | 32 | |
| **I/O Circuit** | | |
| | Signal level | +12 - 24VDC |
| | Internal power | - |
| **Input specification** | | |
| | Input type | Opto-Isolated Input (for high sink current output) (Negative logic) |
| | Interrupt | Combine four interrupt signal lines to one interrupt request signal as INTA |
| | Input resistance | 2.2kΩ |
| **Output specification** | | |
| | Output type | Opto-Isolated Open Collector Output (current sinking type) (Negative logic) |
| | Output rating | +35VDC 50mA |
| **Expansion function** | Yes | |
| **Response time (Max.)** | 5μsec | |

| | |
|---|---|
| **Maximum distance** | 50m |
| **I/O address** | Any 32-byte boundary |
| **Power consumption (Max.)** | +5VDC 500mA |
| **PCI bus/** | 32bit, 33MHz, 5V/ |
| **Dimension (mm)** | 176.4(L)x107.0(H) |
| **Connector** | PCR-E96LMD[HONDA Tsushin Kogyo] or equivalent |
| **Option** | |
| Software | ACX-PAC(W32)BP, ACX-PAC(W32)AP, DDE SERVER(W32) |
| Accessories | DTP-3(PC)*1, DTP-4(PC)*1, DTP-64(PC)*2, EPD-96*2, CCB-96*2, CM-32(PC)*1, CM-32(PC)E*1, CM-64(PC)E*2 |
| Cables/ Connector | PCA96P, PCB96P, PCB96W, PCA96PS, PCB96PS, PCB96WS, CN5-H96F |

*1:Option cable of PCB96W or PCB96WS is required.
*2:Option cable of PCB96P or PCB96PS is required.

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# Opto-Isolated Digital I/O Board with On-board 12V Power Supply
## PIO-16/16B(PCI)

**FEATURES**
- 32 opto-isolated digital inputs/outputs
- External power supply requirement: +12-24VDC
- On board isolated power supply

| Input 16 | Output 16 | Isolated | Power on board |

**API function library attachment [API-PAC(W32)]**

### ■SPECIFICATIONS

| | | |
|---|---|---|
| **Inputs channels** | 16 | |
| **Output channels** | 16 | |
| **I/O Circuit** | | |
| | Signal level | +12 - 24VDC |
| | Internal power | DC12V 240mA |
| **Input specification** | | |
| | Input type | Opto-Isolated Input (for high sink current output) (Negative logic) |
| | Interrupt | Combine four interrupt signal lines to one interrupt request signal as INTA |
| | Input resistance | 3kΩ |
| **Output specification** | | |
| | Output type | Opto-Isolated Open Collector Output (current sinking type) (Negative logic) |
| | Output rating | +35VDC 100mA |
| **Expansion function** | Yes | |
| **Response time (Max.)** | 1msec | |

| | |
|---|---|
| **Maximum distance** | 50m |
| **I/O address** | Any 32-byte boundary |
| **Power consumption (Max.)** | +5VDC 300mA(External power) +5VDC 1200mA(On board power) |
| **PCI bus/** | 32bit, 33MHz, 5V/ |
| **Dimension (mm)** | 176.4(L)x107.0(H) |
| **Connector** | 37-pin female D-type DCL-J37SAF-20L9[JAE] or equivalent |
| **Option** | |
| Software | ACX-PAC(W32)BP Ver.2.1 upper, ACX-PAC(W32)AP Ver.2.1 upper |
| Accessories | DTP-3(PC), DTP-4(PC), EPD-37 *1, CM-32(PC)E *1 |
| Cables/ Connector | PCA37P, PCB37P, PCA37PS, PCB37PS, CN5-D37M |

*1:Option cable of PCB37P or PCB37PS is required.

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# Opto-Isolated Digital I/O Board with On-board 12V Power Supply
## PIO-32/32B(PCI)H

**FEATURES**
- 64 opto-isolated digital inputs/outputs
- External power supply requirement: +12-24VDC
- On board isolated power supply

| Input 32 | Output 32 | Power on board | Isolated | CE |

**API function library attachment [API-PAC(W32)]**

### ■SPECIFICATIONS

| | | |
|---|---|---|
| **Inputs channels** | 32 | |
| **Output channels** | 32 | |
| **I/O Circuit** | | |
| | Signal level | +12 - 24VDC |
| | Internal power | DC12V 240mA |
| **Input specification** | | |
| | Input type | Opto-Isolated Input (for high sink current output) (Negative logic) |
| | Interrupt | Combine four interrupt signal lines to one interrupt request signal as INTA |
| | Input resistance | 3kΩ |
| **Output specification** | | |
| | Output type | Opto-Isolated Open Collector Output (current sinking type) (Negative logic) |
| | Output rating | +35VDC 100mA |
| **Expansion function** | Yes | |
| **Response time (Max.)** | 1msec | |

| | |
|---|---|
| **Maximum distance** | 50m |
| **I/O address** | Any 32-byte boundary |
| **Power consumption (Max.)** | +5VDC 300mA(External power), +5VDC 1300mA(Internal power) |
| **PCI bus/** | 32bit, 33MHz, 5V/ |
| **Dimension (mm)** | 176.4(L)x107.0(H) |
| **Connector** | PCR-E96LMD[HONDA Tsushin Kogyo] or equivalent |
| **Option** | |
| Software | ACX-PAC(W32)BP, ACX-PAC(W32)AP, DDE SERVER(W32) |
| Accessories | DTP-3(PC)*1, DTP-4(PC)*1, DTP-64(PC)*2, EPD-96*2, CCB-96*2, CM-32(PC)*1, CM-32(PC)E*1, CM-64(PC)E*2 |
| Cables/ Connector | PCA96P, PCB96P, PCB96W, PCA96PS, PCB96PS, PCB96WS, CN5-H96F |

*1:Option cable of PCB96W or PCB96WS is required.
*2:Option cable of PCB96P or PCB96PS is required.

## Opto-Isolated TTL Digital I/O Board with On-Board 5V Power Supply
### PIO-16/16TB(PCI)
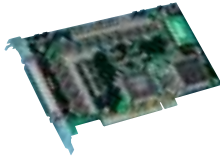
**FEATURES**
● 32 opto-isolated TTL digital inputs and outputs
● On board isolated power supply
● High-speed response

| Input | Output | Isolated | Power on board | CE |
|---|---|---|---|---|
| 16 | 16 | | | |

**API function library attachment [API-PAC(W32)]**

■ **SPECIFICATIONS**

| | | |
|---|---|---|
| Inputs channels | 16 | |
| Output channels | 16 | |
| **I/O Circuit** | | |
| | Signal level | +5VDC |
| | Internal power | +5VDC 400mA |
| **Input specification** | | |
| | Input type | Opto-Isolated TTL Input (Negative logic) |
| | Interrupt | Combine four interrupt signal lines to one interrupt request signal as INTA |
| | Input resistance | 1.1kΩ |
| **Output specification** | | |
| | Output type | Opto-Isolated TTL Output (Negative logic) |
| | Output rating | +5VDC 6.4mA |
| Expansion function | Yes | |
| Response time (Max.) | 1μsec | |

| | |
|---|---|
| Maximum distance | 5m |
| I/O address | Any 32-byte boundary |
| Power consumption (Max.) | +5VDC 500mA (External power), +5VDC 1150mA (On board power) |
| PCI bus/ Dimension (mm) | 32bit, 33MHz, 5V/ 176.4(L)x107.0(H) |
| Connector | 37-pin female D-type DCLC-J37SAF-20L9[JAE] or equivalent |
| **Option** | |
| Software | ACX-PAC(W32)BP, ACX-PAC(W32)AP, DDE SERVER(W32) |
| Accessories | EPD-37*1, DTP-3(PC), DTP-4(PC), CM-32(PC)E*1 |
| Cables/ Connector | PCA37P, PCB37P, PCA37PS, PCB37PS, CN5-D37M |

*1:Option cable of PCB37P or PCB37PS is required.

## Reed Relay Output Board
### RRY-16C(PCI)

**FEATURES**
● The board equips 16 reed relays
● Output rating are designed for a maximum of 125 VAC/30 VDC and 2A per channel

| Output | Isolated | CE |
|---|---|---|
| 16 | | |

**API function library attachment [API-PAC(W32)]**

■ **SPECIFICATIONS**

| | | |
|---|---|---|
| Inputs channels | - | |
| Output channels | 16 | |
| Output type | Reed relay contact (1-make contact) output | |
| **Relay contact specifications** | | |
| | Maximum power | 250VA(AC), 60W(DC) |
| | Maximum voltage | 125V(AC), 30V(DC) |
| | Maximum switching current | 2A(Max.) |
| | Maximum current | 2A(Max.) |
| | Contact resistance | 30mΩ or less |
| | Response time (Max.) | 7msec |
| | Life expectancy | 20 million times (MIN) |

| | |
|---|---|
| I/O address | 4 port occupation |
| Power consumption (Max.) | +5VDC 700mA |
| PCI bus/ Dimension (mm) | 32bit, 33MHz, 5V/ 122.0(L)x107.0(H) |
| Connector | 37-pin female D-type DCLC-J37SAF-20L9[JAE] or equivalent |
| **Option** | |
| Software | ACX-PAC(W32)BP, ACX-PAC(W32)AP, DDE SERVER(W32) |
| Accessories | EPD-37*1, DTP-3(PC), DTP-4(PC) |
| Cables/Connector | PCA37P, PCB37P, CN5-D37M |

*1:Option cable of PCB37P is required.

## Reed Relay Output Board
### RRY-32(PCI)

**FEATURES**
● The board allows output to 32 reed relay contacts organized into four groups each of which consists of 8 points
● Output ratings are designed for a maximum of 100 VAC/VDC and 500mA per point and a maximum of 1A for a total of 8 points (per common)

| Output | Isolated | CE |
|---|---|---|
| 32 | | |

**API function library attachment [API-PAC(W32)]**

■ **SPECIFICATIONS**

| | | |
|---|---|---|
| Inputs channels | - | |
| Output channels | 32 | |
| Output type | Reed relay contact (1-make contact) output | |
| **Relay contact specifications** | | |
| | Maximum power | 10VA(AC), 10W(DC) |
| | Maximum voltage | 100V(AC), 100V(DC) |
| | Maximum switching current | 0.5A |
| | Maximum current | 1A |
| | Contact resistance | 100mΩ or less |
| | Response time (Max.) | 1msec |
| | Life expectancy | 200,000,000 (min) |

| | |
|---|---|
| I/O address | Any 32-byte boundary |
| Power consumption (Max.) | +5VDC 500mA |
| PCI bus/ Dimension (mm) | 32bit, 33MHz, 5V/ 176.4(L)x107.0(H) |
| Connector | 37-pin female D-type DCLC-J37SAF-20L9[JAE] or equivalent |
| **Option** | |
| Software | ACX-PAC(W32)BP, ACX-PAC(W32)AP, DDE SERVER(W32) |
| Accessories | EPD-37*1, DTP-3(PC), DTP-4(PC) |
| Cables/ Connector | PCA37P, PCB37P, PCA37PS, PCB37PS, CN5-D37M |

*1:Option cable of PCB37P or PCB37PS is required.

Digital I/O Boards

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Communication Boards

Counter & Motor Controller

Digital I/O Boards

Analog I/O Boards

Communication Boards

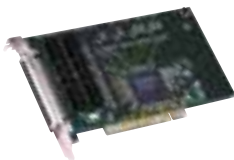Counter & Motor Controller

## TTL-Level Digital I/O Board
### PIO-16/16T(PCI)

**FEATURES**
- 32 TTL compatible digital I/Os
- High sink current digital output
- 4 interrupt signals, 1 interrupt request

Input 16  Output 16  CE

**API function library attachment [API-PAC(W32)]**

### ■SPECIFICATIONS

| | | |
|---|---|---|
| Inputs channels | 16 | |
| Output channels | 16 | |
| I/O Circuit | | |
| | Signal level | +5VDC |
| | Internal power | - |
| Input specification | | |
| | Input type | TTL level (negative logic) |
| | Interrupt | Combine four interrupt signal lines to one interrupt request signal as INTA |
| | Input resistance | 10kΩ |
| Output specification | | |
| | Output type | Open collector outputs (negative logic) |
| | Output rating | +30VDC 40mA |
| Expansion function | Yes | |
| Response time (Max.) | 200nsec | |

| | |
|---|---|
| Maximum distance | 1.5m |
| I/O address | Any 32-byte boundary |
| Power consumption (Max.) | +5VDC 400mA |
| PCI bus/ | 32bit, 33MHz, 5V/ |
| Dimension (mm) | 122.0(L)x107.0(H) |
| Connector | 37-pin female D-type DCLC-J37SAF-20L9[JAE] or equivalent |
| Option | |
| Software | ACX-PAC(W32)BP, ACX-PAC(W32)AP, DDE SERVER(W32) |
| Accessories | EPD-37*[1], DTP-3(PC), DTP-4(PC), CM-32(PC)E* |
| Cables/ Connector | PCA37P, PCB37P, PCA37PS, PCB37PS, CN5-D37M |

*1:Option cable of PCB37P or PCB37PS is required.

## TTL-Level Digital I/O Board
### PIO-32/32T(PCI)

**FEATURES**
- 64 TTL compatible digital I/Os
- High sink current digital output
- 4 interrupt signals, 1 interrupt request

Input 32  Output 32  CE

**API function library attachment [API-PAC(W32)]**

### ■SPECIFICATIONS

| | | |
|---|---|---|
| Inputs channels | 32 | |
| Output channels | 32 | |
| I/O Circuit | | |
| | Signal level | +5VDC |
| | Internal power | - |
| Input specification | | |
| | Input type | TTL level (negative logic) |
| | Interrupt | Combine four interrupt signal lines to one interrupt request signal as INTA |
| | Input resistance | 10kΩ |
| Output specification | | |
| | Output type | Open collector outputs (negative logic) |
| | Output rating | +5VDC 40mA |
| Expansion function | Yes | |
| Response time (Max.) | 200nsec | |

| | |
|---|---|
| Maximum distance | 1.5m |
| I/O address | Any 32-byte boundary |
| Power consumption (Max.) | +5VDC 500mA |
| PCI bus/ | 32bit, 33MHz, 5V/ |
| Dimension (mm) | 122.0(L)x107.0(H) |
| Connector | PCR-E96LMD[HONDA Tsushin Kogyo] or equivalent |
| Option | |
| Software | ACX-PAC(W32)BP, ACX-PAC(W32)AP, DDE SERVER(W32) |
| Accessories | DTP-3(PC)*[1], DTP-4(PC)*[1], DTP-64(PC)*[2], EPD-96*[2], CCB-96*[2], CM-32(PC)*[1], CM-32(PC)E*[1], CM-64(PC)E*[2] |
| Cables/ Connector | PCA96P, PCB96P, PCB96W, PCA96PS, PCB96PS, PCB96WS, CN5-H96F |

*1:Option cable of PCB96W or PCB96WS is required.
*2:Option cable of PCB96P or PCB96PS is required.

## High Current Drive Bi-Directional Digital I/O Board
### PIO-48D(PCI)

**FEATURES**
- 48 TTL current drive bi-directional digital I/Os
- Emulate 8255 PPI mode 0
- All 48 input signals capable of generating interrupt request

Bi-direct 48  CE

**API function library attachment [API-PAC(W32)]**

### ■SPECIFICATIONS

| | | |
|---|---|---|
| No. of channels | 48 | |
| I/O Circuit | | |
| | Signal level | +5VDC |
| | Internal power | - |
| Input specification | | |
| | Input type | TTL level Input(positive logic) |
| | Interrupt | All 48 input signals capable of generating interrupt request |
| | Input resistance | 10kΩ |
| Output specification | | |
| | Output type | TTL level Output(positive logic) |
| | Output rating | +5VDC $I_{OL}$=24mA $I_{OH}$=-15mA |
| Expansion function | - | |
| Response time (Max.) | 200nsec | |

| | |
|---|---|
| Maximum distance | 1.5m |
| I/O address | Any 32-byte boundary |
| Power consumption (Max.) | +5VDC 600mA |
| PCI bus/ | 32bit, 33MHz, 5V/ |
| Dimension (mm) | 176.4(L)x107.0(H) |
| Connector | PCR-E96LMD[HONDA Tsushin Kogyo] or equivalent |
| Option | |
| Software | ACX-PAC(W32) BP, ACX-PAC(W32) AP, DDE SERVER(W32) |
| Accessories | EPD-96*[1] |
| Cables/ Connector | CN1:PCA96PS-1.5, PCB96PS-1.5, PCA96P-1.5, PCB96P-1.5, CN5-H96F CN2,3:PCA50J-1.5, DT/F4 |

*1:Option cable of PCB96P or PCB96PS is required.

# High Speed Bi-Directional Digital I/O Board

## PIO-32DM(PCI)

**FEATURES**

● With bus master, the board transfers data between the PC and board at a speed of 80MB/sec (133 MB/sec. at maximum) without any burden on the CPU
● The board stores digital signals at a sampling rate of 20 MHz and can detect patterns (pattern input)
● The board can be used as a 20 MHz digital pattern generator (pattern output)
● 1K-Word on-board FIFO memory is installed each for input and output

**Bi-direct 32** | **Bus Master**

API function library attachment [API-PAC(W32)]

## ■SPECIFICATIONS

| No. of channels | 32-bit input lines, 16-bit input/output lines, 32-bit output lines (programmable) |
|---|---|
| **I/O Circuit** | |
| Signal level | +5VDC |
| Internal power | - |
| **Input specification** | |
| Input type | TTL level (positive logic) |
| Interrupt | Errors and various factors, One Interrupt request line as INTA |
| Input resistor | 10kΩ |
| **Output specification** | |
| Output type | TTL level (positive logic) |
| Output rating | +5VDC 24mA |
| Expansion function | - |

| Response time (Max.) | 50nsec |
|---|---|
| Maximum distance | 1.5m(dependent on wiring environment) |
| I/O address | Occupies 2 locations, any 32-byte and 64-byte boundary |
| Power consumption (Max.) | +5VDC 700mA |
| PCI bus/ Dimension(mm) | 32bit, 33MHz, 5V/ 176.4(L)x107.0(H) |
| Connector | Synchronization section:PS-10PE-D4L1-B1[JAE] or equivalent x2 Digital section:PCR-96LMD[HONDA Tsushin Kogyo] or equivalent |
| **Option** | |
| Software | - |
| Accessories | EPD-96*1, DTP-64(PC)*1 |
| Cables/ Connector | PCB96PS-1.5, PCB96P-1.5, PCA96PS-1.5, PCA96P-1.5, CN5-H96F |

*1:Option cable of PCB96P or PCB96PS is required.

## ■FEATURES

### Bus master transfer

Since the board supports bus master, it is suited for fast-processing and controlling applications to control external devices with output of any digital pattern or to quickly sample digital input.

With bus master, the board transfers data between the PC and board at a speed of 80MB/sec. (133 MB/sec. at maximum) without any burden on the CPU.

### Synchronization Control Connectors

A maximum of 16 boards can be connected including the master.

The board is equipped with an SC connector to allow easy inter-board synchronization between boards which have support SC connector.

### Utility

The board stores digital signals at a sampling rate of 20 MHz and can detect patterns (pattern input).

The board can be used as a 20 MHz digital pattern generator (pattern output).
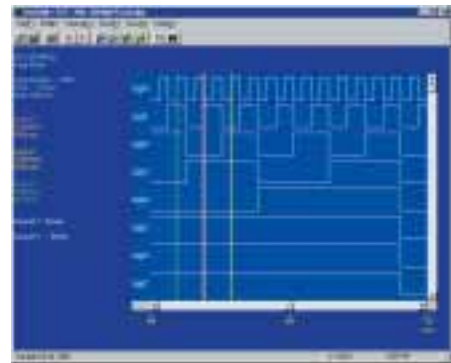
*Digital I/O Boards*

Analog I/O Boards

Communication Boards

Counter & Motor Controller

# 37-pin D-type Connector Board Accessories and Cable (Optional)

## Monitoring and dummy signal generator tool(32ch I/O signal)

### CM-32(PC)E

The CM-32(PC)E is used to monitor the status of the signal line or to generate pseudo signals onto the signal line, making it easier to debug and check the behavior of programs.

* It doesn't accept Bi-directional I/O type.
* Cables is option
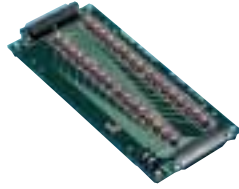
## Terminal Unit (32ch I/O)

### EPD-37

35mm DIN-Rail mountable
Compatible Boards : 32ch I/O Boards
Terminal pitch (10mm)

* Cables is option

### DTP-3(PC)

* Cable (1m) attached

### DTP-4(PC)

* Cable (1m) attached

## Cables/Connector

### ■37-pin D-type → 37-pin D-type Shield Cables

| PCB37PS-0.5P | 0.5m |
| PCB37PS-1.5P | 1.5m |
| PCB37PS-3P | 3.0m |
| PCB37PS-5P | 5.0m |

### ■37-pin D-type → 37-pin D-type Flat Cables

| PCB37P-1.5 | 1.5m |
| PCB37P-3 | 3.0m |
| PCB37P-5 | 5.0m |

### ■37-pin D-type → 37 wires (Pitch 1.27mm) Shield Cables

| PCA37PS-0.5P | 0.5m |
| PCA37PS-1.5P | 1.5m |
| PCA37PS-3P | 3.0m |
| PCA37PS-5P | 5.0m |

### ■37-pin D-type → 37 wires (Pitch 1.27mm) Flat ribbon Cable

| PCA37P-1.5 | 1.5m |
| PCA37P-3 | 3.0m |
| PCA37P-5 | 5.0m |

### ■37-pin D-type (male) Connector (5 pcs)

### CN5-D37M
Easy soldering

## ■CONFIGURATION GUIDE

Digital I/O Boards

Industrial
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Products

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PCI BUS SERIES
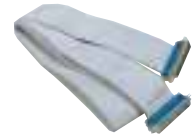
# 96-pin Half Pitch Connectors Board Accessories and Cables

## Monitoring and dummy signal generator tool(64ch I/O signal)

### CM-64(PC)E

The CM-32(PC)E is used to monitor the status of the signal line or to generate pseudo signals onto the signal line, making it easier to debug and check the behavior of programs.

* Cables is option
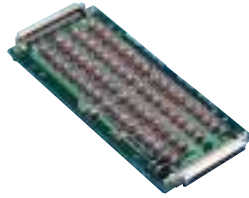
## 96-pin Half Pitch → 37-pin D-type (female) x 2 Connector Converter Board

### CCB-96

The CCB-96 connector converter board converts 96-pin half pitch connectors to a pair of general-purpose, 37-pin female D-type connectors.

* Cables is option

## Terminal Unit (64ch I/O)

### EPD-96

35mm DIN-Rail mountable.
Terminal pitch (8.5mm)

* Cables is option

### DTP-64(PC)

* Cables is option

## Cables/Connector

### ■96-pin Half Pitch → 96-pin Half Pitch Shield Cable

| PCB96PS-1.5 | 1.5m |
| PCB96PS-3 | 3.0m |
| PCB96PS-5 | 5.0m |

### ■96-pin Half Pitch → 96-pin Half Pitch Flat Cable

| PCB96P-1.5 | 1.5m |
| PCB96P-3 | 3.0m |
| PCB96P-5 | 5.0m |

### ■96-pin Half Pitch → 96 wires (Pitch 1.27mm) Shield Cables

| PCA96PS-1.5 | 1.5m |
| PCA96PS-3 | 3.0m |
| PCA96PS-5 | 5.0m |

### ■96-pin Half Pitch → 96 wires (Pitch 1.27mm) Flat Cables

| PCA96P-1.5 | 1.5m |
| PCA96P-3 | 3.0m |
| PCA96P-5 | 5.0m |

### ■96-pin Half Pitch → 37-pin D-type (male) x 2 Connector Converter Shield Cable

| PCB96WS-1.5P | 1.5m |
| PCB96WS-3P | 3.0m |
| PCB96WS-5P | 5.0m |

### ■96-pin Half Pitch → 37-pin D-type (male) x 2 Connector Converter Flat Cable

| PCB96W-1.5 | 1.5m |
| PCB96W-3 | 3.0m |
| PCB96W-5 | 5.0m |

### ■96-pin Half Pitch (female) Connector (5 pcs)

CN5-H96F

### ■100-pin Half Pitch → 96-pin Half Pitch Connector Converter Shield Cable

| PCB100/96PS-1.5 | 1.5m |
| PCB100/96PS-3 | 3.0m |
| PCB100/96PS-5 | 5.0m |

## ■CONFIGURATION GUIDE

# Digital I/O Board Accessories & Cables
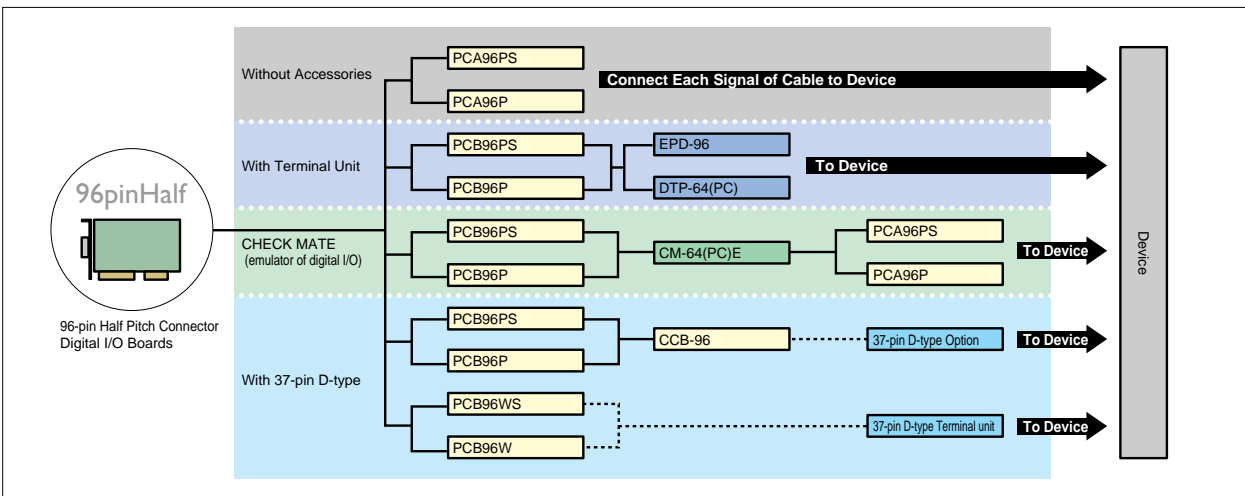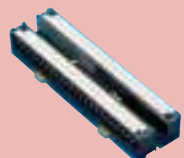
**Industrial Automation Products**

**B-14**

**PCI BUS SERIES**

*Digital I/O Boards*

Analog I/O Boards

Communication Boards

Counter & Motor Controller

| Connector of the Accessories side | Accessories | Cables (both sides connector) | | PI-128L(PCI) | PO-128L(PCI) | PIO-64/64L(PCI) | PI-64L(PCI) | PO-64L(PCI) |
|---|---|---|---|---|---|---|---|---|
| | | | | **100-pin Half Pitch** | | | **96-pin Half Pitch** | |
| **96-pin Half Pitch** | **CHECK MATE (emulator of digital I/O)** CM-64(PC)E 230(W)x35(H)x105(D)mm | **Shield Cable** PCB100/96PS-1.5 (1.5m) PCB100/96PS-3 (3m) PCB100/96PS-5 (5m) | | ● | ● | ● | | |
| | | **Shield Cable** PCB96PS-1.5 (1.5m) PCB96PS-3 (3m) PCB96PS-5 (5m) | | | | | ● | ● |
| | | **Flat Cable** PCB96P-1.5 (1.5m) PCB96P-3 (3m) PCB96P-5 (5m) | | | | | ● | ● |
| | **Terminal Unit** EPD-96 219.5(W)x35.5(H)x64(D)mm | **Shield Cable** PCB100/96PS-1.5 (1.5m) PCB100/96PS-3 (3m) PCB100/96PS-5 (5m) | | ● | ● | ● | | |
| | | **Shield Cable** PCB96PS-1.5 (1.5m) PCB96PS-3 (3m) PCB96PS-5 (5m) | | | | | ● | ● |
| | | **Flat Cable** PCB96P-1.5 (1.5m) PCB96P-3 (3m) PCB96P-5 (5m) | | | | | ● | ● |
| | **Screw-Type Terminal** DTP-64(PC) 170(W)x122(H)mm | **Shield Cable** PCB100/96PS-1.5 (1.5m) PCB100/96PS-3 (3m) PCB100/96PS-5 (5m) | | ● | ● | ● | | |
| | | **Shield Cable** PCB96PS-1.5 (1.5m) PCB96PS-3 (3m) PCB96PS-5 (5m) | | | | | ● | ● |
| | | **Flat Cable** PCB96P-1.5 (1.5m) PCB96P-3 (3m) PCB96P-5 (5m) | | | | | ● | ● |
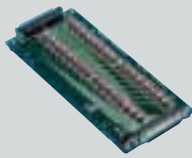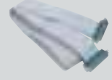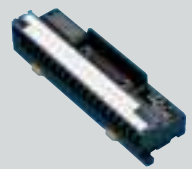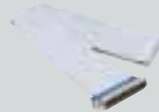
▶Connector of the Board side

Model name of Digital I/O board

| | PIO-32/32L(PCI) | PIO-32/32B(PCI)H | PIO-32/32F(PCI) | PIO-32/32T(PCI) | PIO-48D(PCI) | PIO-32DM(PCI) |
|---|---|---|---|---|---|---|
| | ● | ● | ● | ● | | |
| | ● | ● | ● | ● | | |
| | ● | ● | ● | ● | ● | ● |
| | ● | ● | ● | ● | ● | ● |
| | ● | ● | ● | ● | ● | ● |
| | ● | ● | ● | ● | ● | ● |

## DIN Rail Adapter
**DIN-ADP1**

DIN-rail adapter for
termination panels

●**For use with:
CM-64(PC)E,
CM-32(PC)E,
CCB-96**

**PCI BUS SERIES**

# Digital I/O Board Accessories & Cables

*Digital I/O Boards*

Analog I/O Boards

Communication Boards

Counter & Motor Controller

## First Table

| | Accessories | Cables (both sides connector) | | PI-64L(PCI) | PO-64L(PCI) | PIO-32/32L(PCI) | PIO-32/32B(PCI)H | PIO-32/32F(PCI) |
|---|---|---|---|---|---|---|---|---|
| | | | | | | | 96-pin Half Pitch | |
| 37-pin D-type | **CHECK MATE (emulator of digital I/O)** CM-32(PC)E — 230(W)x35(H)x105(D)mm | **Shield Cable** PCB37PS-0.5P (0.5m) PCB37PS-1.5P (1.5m) PCB37PS-3P (3m) PCB37PS-5P (5m) | | | | | | |
| | | **Flat Cable** PCB37P-1.5 (1.5m) PCB37P-3 (3m) PCB37P-5 (5m) | | | | | | |
| | **Terminal Unit** EPD-37 — 226(W)x40.5(H)x64(D)mm | **Shield Cable** PCB37PS-0.5P (0.5m) PCB37PS-1.5P (1.5m) PCB37PS-3P (3m) PCB37PS-5P (5m) | | | | | | |
| | | **Flat Cable** PCB37P-1.5 (1.5m) PCB37P-3 (3m) PCB37P-5 (5m) | | | | | | |
| | **Screw-Type Terminal** DTP-3(PC) — 190(W)x105(H)mm When board of a 96-pin type is used, two of them are required. | **Attached Cable for DTP-3(PC) (1m)** | | | | | | |
| | | **Shield Cable** PCB96WS-1.5P (1.5m) PCB96WS-3P (3m) PCB96WS-5P (5m) | | ● | ● | ● | ● | ● |
| | | **Flat Cable** PCB96W-1.5 (1.5m) PCB96W-3 (3m) PCB96W-5 (5m) | | ● | ● | ● | ● | ● |
| | **Screw-Type Terminal** DTP-4 (PC) — 160(W)x82(H)mm When board of a 96-pin type is used, two of them are required. | **Attached Cable for DTP-4(PC) (1m)** | | | | | | |
| | | **Shield Cable** PCB96WS-1.5P (1.5m) PCB96WS-3P (3m) PCB96WS-5P (5m) | | ● | ● | ● | ● | ● |
| | | **Flat Cable** PCB96W-1.5 (1.5m) PCB96W-3 (3m) PCB96W-5 (5m) | | ● | ● | ● | ● | ● |

## Second Table

| | Cables (One side connector) | | PI-64L(PCI) | PO-64L(PCI) | PIO-32/32L(PCI) | PIO-32/32B(PCI)H | PIO-32/32F(PCI) | PIO-32/32T(PCI) | PIO-48D(PCI) | PIO-32DM(PCI) |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | 96-pin Half Pitch | | | | |
| 96-pin Half Pitch | **Shield Cable** PCA96PS-1.5 (1.5m) PCA96PS-3 (3m) PCA96PS-5 (5m) | | ● | ● | ● | ● | ● | ● | ● | ● |
| | **Flat Cable** PCA96P-1.5 (1.5m) PCA96P-3 (3m) PCA96P-5 (5m) | | ● | ● | ● | ● | ● | ● | ● | ● |
| 37-pin D-type | **Shield Cable** PCA37PS-0.5P (0.5m) PCA37PS-1.5P (1.5m) PCA37PS-3P (3m) PCA37PS-5P (5m) | | | | | | | | | |
| | **Flat Cable** PCA37P-1.5 (1.5m) PCA37P-3 (3m) PCA37P-5 (5m) | | | | | | | | | |

## 37-pin D-type

| PIO-32/32T(PCI) | PIO-48D(PCI) | PIO-32DM(PCI) | PI-32L(PCI) | PI-32B(PCI) | PO-32L(PCI) | PO-32B(PCI) | PIO-16/16L(PCI) | PIO-16/16B(PCI) | PIO-16/16TB(PCI) | PIO-16/16T(PCI) | RRY-32(PCI) | RRY-16C(PCI) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | ● | ● | ● | ● | ● | ● | ● | ● | | | |
| | | ● | ● | ● | ● | ● | ● | ● | ● | | | |
| | | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | |
| | | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | |
| | | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | |
| | ● | | | | | | | | | | | |
| | ● | | | | | | | | | | | |
| | | | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● |
| | ● | | | | | | | | | | | |
| | ● | | | | | | | | | | | |

**DIN Rail Adapter**
**DIN-ADP1**

DIN-rail adapter for termination panels

● **For use with:
CM-64(PC)E,
CM-32(PC)E,
CCB-96**

*Digital I/O Boards*

Analog I/O Boards

Communication Boards

Counter & Motor Controller

## 37-pin D-type

| PI-32L(PCI) | PI-32B(PCI) | PO-32L(PCI) | PO-32B(PCI) | PIO-16/16L(PCI) | PIO-16/16B(PCI) | PIO-16/16TB(PCI) | PIO-16/16T(PCI) | RRY-32(PCI) | RRY-16C(PCI) |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | |
| | | | | | | | | | |
| ● | ● | ● | ● | ● | ● | ● | ● | ● | ● |
| ● | ● | ● | ● | ● | ● | ● | ● | ● | ● |

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**PCI BUS SERIES**

# Analog I/O Boards

## SELECTION GUIDE

| Name | Resolution (bit) | Channels* SE | Channels* DI | Range | Set up | Conversion Speed | Trigger (Start / Stop) Software | Trigger (Start / Stop) Digital trigger | Level | Clock Timer | Clock Digital trigger |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **Multi-Function A/D Boards (E series)** | | | | | | | | | | | |
| AD12-16(PCI)E | 12 | 16 | 8 | ±10V, 0-10V | Common | 10μsec | ○ | ○ | ○ | ○ | ○ |
| AD12-16U(PCI)E | 12 | 16 | 8 | ±5V, ±2.5V, 0-10V, 0-5V | Common | 1μsec | ○ | ○ | ○ | ○ | |
| AD12-16U(PCI)EH | 12 | 16 | 8 | ±10V, ±5V, ±2.5V, 0-5V, 0-10V | Common | 1μsec | ○ | ○ | ○ | ○ | |
| AD16-16(PCI)E | 16 | 16 | 8 | ±10V, ±5V, 0-10V, 0-5V | Common | 10μsec | ○ | ○ | ○ | ○ | |
| AD16-16U(PCI)EH | 16 | 16 | 8 | ±10V, ±5V, 0-10V, 0-5V | Common | 1μsec | ○ | ○ | ○ | ○ | |
| **Analog To Digital Input Boards** | | | | | | | | | | | |
| AD12-16(PCI) | 12 | 16 | 8 | ±10V, ±5V, ±2.5V, 0-10V, 0-5V, 0-2.5V | Independent | 10μsec | ○ | - | - | ○ | ○ |
| AD12-64(PCI) | 12 | 64 | 32 | ±10V, ±5V, ±2.5V, 0-10V, 0-5V, 0-2.5V | Independent | 10μsec | ○ | - | - | ○ | ○ |
| ADI12-16(PCI) | 12 | 16 | 8 | ±10V, 0-10V, 4-20mA | Common | 20μsec | ○ | ○ | ○ | ○ | ○ |
| ADI16-4C(PCI) | 16 | 4 | - | ±10V, ±5V, 0-10V, 0-5V, 4-20mA | Independent | 20μsec | ○ | - | - | ○ | ○ |
| ADI16-4L(PCI) | 16 | - | 4 | ±1.25V, ±0.125V, 0-2.5V, 0-0.25V | Independent | 10ms | ○ | - | - | ○ | |
| **Digital To Analog Output Boards** | | | | | | | | | | | |
| DA12-4(PCI) | 12 | 4 | | ±5V, ±10V, 0-10V | Independent | 10μsec | ○ | - | - | ○ | ○ |
| DA12-8(PCI) | 12 | 8 | | ±5V, ±10V,0-10V | Independent | 10μsec | ○ | - | - | ○ | ○ |
| DA12-16(PCI) | 12 | 16 | | ±5V, ±10V, 0-10V | Independent | 10μsec | ○ | - | - | ○ | ○ |
| DAI16-4C(PCI) | 16 | 4 | | ±10V, 0-10V, 0-20mA | Independent | 20μsec | ○ | - | - | ○ | ○ |

* SE: single-ended input,  DI: Differential input

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### Tips of Analog I/O Board

## 1. Analog I/O Board

It is an interface board for extending the function which inputs or outputs an analog signal in a personal computer. An external phenomenon can be measured by changing an analog signal into data (digital signal), and downloading to a personal computer, or external apparatus can be controlled by changing and outputting the data of a personal computer to an analog signal.

## 2. Types and applications for Analog I/O Board

### ■Analog Input Board

It is a board with the function of A/D (from Analog to Digital signal) conversion. It is used when connecting a personal computer with a temperature sensor, a pressure sensor, etc. which output the amount of change with voltage and current. An analog input board is divided into the following two kinds by the function to carry.

●**Standard type**

The products which suits a request of a customer's application and has many functions is held from the low price type which carried the basic function and various needs functions such as a multi-channel inputs, isolated input, low-level voltage/current input, on-board timer for series processing.
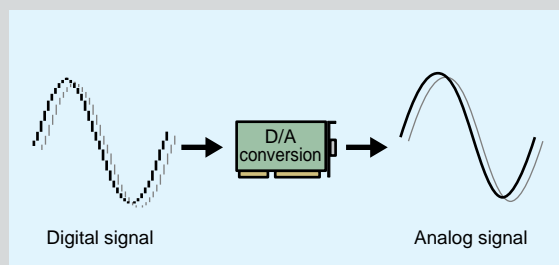
●**Intelligent type (analog E series)**

It is the high spec. type which carried the various sampling control function and the mass memory and which is adapted for suitable applications. If it combines with the convenient exclusive option which adds functions, such as a simultaneous sampling gain amplifier, low path filter and isolated amplifier, it corresponds also to special application flexibly.

Analog signal → A/D conversion → Digital signal
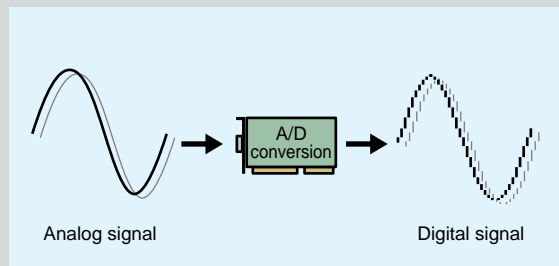
### ■Analog Output Board

It is a board with the function of D/A (from digital to analog signal) conversion. It is used when connecting external actuators and voltage/current control apparatus units with a personal computer directly.

Digital signal → D/A conversion → Analog signal

Digital I/O Boards

*Analog I/O Boards*

Communication Boards

Counter & Motor Controller

**Analog I/O Boards**

Industrial
Automation
Products

**B-19**

**PCI BUS SERIES**

| Memory | Isolation | Digital I/O | Analog Output | Connector | Software | | | Page | Name |
|--------|-----------|-------------|---------------|-----------|----------|--|--|------|------|
| | | | | | ACX-PAC(W32) | API-PAC(W32) | DDE SERVER(W32) | | |
| FIFO/Ring 256Kword | - | 4 TTL inputs, 4 TTL outputs | 1 | 37-pin D-type*1 | ○ | Attached | ○ | B-20 | **AD12-16(PCI)E** |
| FIFO/Ring 256Kword | - | 4 TTL inputs, 4 TTL outputs | 1 | 37-pin D-type*1 | ○ | Attached | ○ | B-20 | **AD12-16U(PCI)E** |
| FIFO/Ring 16Mword | - | 4 TTL inputs, 4 TTL outputs | 1 | 37-pin D-type*1 | ○ | Attached | ○ | B-21 | **AD12-16U(PCI)EH** |
| FIFO/Ring 256Kword | - | 4 TTL inputs, 4 TTL outputs | 1 | 37-pin D-type*1 | ○ | Attached | ○ | B-20 | **AD16-16(PCI)E** |
| FIFO/Ring 16Mword | - | 4 TTL inputs, 4 TTL outputs | 1 | 37-pin D-type*1 | ○ | Attached | ○ | B-21 | **AD16-16U(PCI)EH** |
| - | - | 4 TTL inputs, 4 TTL outputs | - | 96-pin Half Pitch | ○ | Attached | ○ | B-24 | **AD12-16(PCI)** |
| - | - | 4 TTL inputs, 4 TTL outputs | - | 96-pin Half Pitch | ○ | Attached | ○ | B-24 | **AD12-64(PCI)** |
| FIFO/Ring 256Kword | Bus | 4 TTL inputs, 4 TTL outputs | - | 37-pin D-type | ○ | Attached | ○ | B-25 | **ADI12-16(PCI)** |
| - | BUS, Channel | - | - | 37-pin D-type | ○ | Attached | - | B-25 | **ADI16-4C(PCI)** |
| - | BUS, Channel | - | - | 37-pin D-type | ○ | Attached | - | B-25 | **ADI16-4L(PCI)** |
| - | - | - | - | 37-pin D-type | ○ | Attached | ○ | B-26 | **DA12-4(PCI)** |
| - | - | - | - | 37-pin D-type | ○ | Attached | ○ | B-26 | **DA12-8(PCI)** |
| - | - | - | - | 37-pin D-type | ○ | Attached | ○ | B-26 | **DA12-16(PCI)** |
| - | BUS, Channel | - | - | 37-pin D-type | ○ | Attached | - | B-26 | **DAI16-4C(PCI)** |

*1:The digital I/O signals and the control signals are interfaced through the connector CN2.

Digital I/O
Boards

*Analog I/O
Boards*

Communication
Boards

Counter &
Motor
Controller

# 3. Function

## ■Input/Output channels

The sensor or source of a signal which can be outputted and inputted, and the number of actuators
are expressed. Moreover, the following two input methods can be used with an analog input board.
Keep in mind that the number of channels which can be used with an input system changes.

### ●Single end input

It is the system which connects by 2 lines of a signal line and a
ground line, and measures the voltage of the source of a signal.
(Refer to the following figure)

**Merit**
- ●Wiring requires only two lines to the one source of a signal.
- ●The twice [at the time of a differential input] as many number
  of channels as this can be used.

**Demerit**
- ●The potential difference between grounds with the source of - signal is
  contained in a measurement result.
- ●It is easy to be influenced of electrical noise as compared with a differential input.
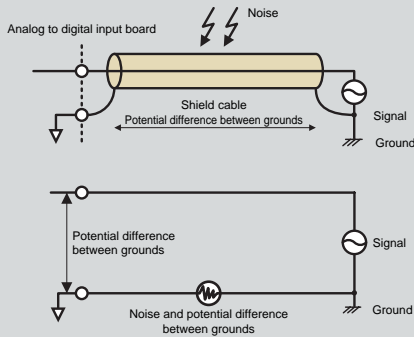
### Differential input

It is the system which connects by a total of three lines of two signal lines and ground lines,
and measures the voltage of the source of a signal. The difference of the potential for a
ground, the potential for points, a ground, and B points is taken, and the potential of the
source of a signal (between A-B) is measured. (Refer to the following figure)

**Merit**
- ●A measurement result is not influenced even if there is potential
  difference between grounds with the source of a signal.
- ●It is hard to be influenced of a noise as compared with a single end input.

**Demerit**
- ●Wiring becomes required three lines to the one source of a signal.
- ●Only half of the numbers of channels at the time of an input
  can be used.
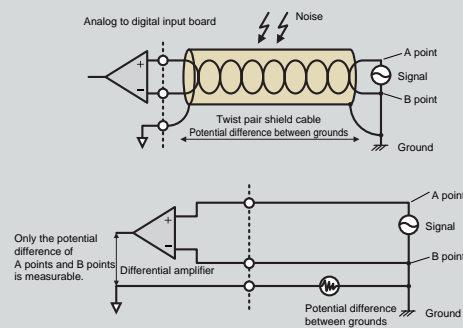


## ■Input/Output range

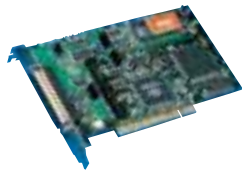Express the range of the voltage or current which can be outputted and inputted.

### ●Range

Express the kind of input-and-output range in which range
selection is possible. Better accuracy is expectable, so that it is
close to a sensor or the range of an actuator.

### ●Setting

Express the difference in the setting method of a setting input-and-output range.
Community: All channels are set as a common input-and-output range.
Independence: A separate input-and-output range can be set up for every channel.

Digital I/O Boards

*Analog I/O Boards*

Communication Boards

Counter & Motor Controller

**Analog I/O Boards**

# Multi-Function A/D Board
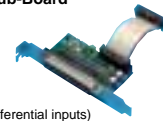## AD12-16(PCI)E

**FEATURES**
- 256K-words on board memory to maximize A/D sampling speeds and enable background processing
- Various A/D sampling control functions
- Four TTL level digital input and four TTL level digital output channels, One i8254 compatible counter

**Non Isolated** **Memory on board** **Gain Amp.** CE

API function library attachment [API-PAC(W32)]

*1:Conversion Accuracy : A value in the table is linearity error at 25 degree.
*2:Option cable of PCB37P or PCB37PS is required.
*3:Option cableDT/E2 and PCB15P is required.
*4:PCB15P is a cable for FTP-15 terminal panel.

### ■SPECIFICATIONS

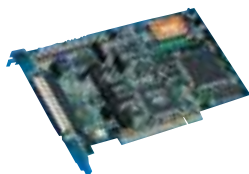| | |
|---|---|
| Inputs channels | 16 single-ended or 8 differential inputs |
| Outputs channels | 1ch |
| Resolution | 12bit |
| **Input specification** | |
| Input Range | ±10V, 0-10V |
| Input gain | x1, x2, x4, x8 |
| Conversion Speed | 10$\mu$sec/ch(Max.) |
| Non-linearity error *1 | ±2LSB(Gain = x 1 and x 2) ±4LSB(Gain = x 4 and x 8) |
| Input Impedance | 1MΩ or more |
| **Output specification** | |
| Output Range | ±5V, ±10V, 0-10V |
| Output rating | ±5mA |
| Conversion Speed | 6$\mu$sec/ch(Max.) |
| Non-linearity error *1 | ±1/2LSB |
| Output impedance | 1Ω or less |
| Trigger | Start Trigger: 3 Mode   Stop Trigger: 4 Mode |
| Isolation | - |
| Timer | 2 - 7x10¹³$\mu$ sec |
| Digital I/O | 4 TTL input and 4 TTL output channels |
| **Interrupt** | |
| Interrupt Request Causes | Up to 15 causes |
| Interrupt Request Level | One interrupt (Selectable enable or disable) |

| | |
|---|---|
| I/O address | Any 16-byte boundary |
| Power consumption (Max.) | +5VDC 1100mA |
| PCI bus/ | 32bit, 33MHz, 5V/ |
| Dimension (mm) | 176.4(L)x107.0(H) |
| Connector | CN1(AIO): 37-pin female D-type CN2(DIO): 16-pin header (male) |
| **Option** | |
| Software | ACX-PAC(W32)BP, ACX-PAC(W32)AP, SUPPORT-PAC(PC)306, DDE SERVER(W32) |
| Accessories | DTP-3(PC), DTP-4(PC), ATP-16*², FTP-15*³, EPD-37*², ATSS-16*², ATII-8A*², ATLF-8*², ATCH-16(PCI) |
| Cables/ Connector | PCA37P, PCB37P, PCA37PS, PCB37PS, PCA15P, PCB15P*⁴, PCC16PS, PCD8PS, DT/E1, DT/E2, CN5-D37M |

**16ch Multiplexer Sub-Board ATCH-16(PCI)**

(16 single-ended or 8 differential inputs)

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# High Speed Multi-Function A/D Board
## AD12-16U(PCI)E

**FEATURES**
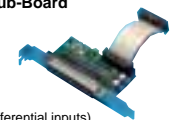- 1$\mu$ sec(1MHz) A/D conversion speed
- 256K-words on board memory to maximize A/D sampling speeds and enable background processing
- Various A/D sampling control functions
- Four TTL level digital input and four TTL level digital output channels, One i8254 compatible counter

**Non Isolated** **Memory on board** **Hi Speed** CE

API function library attachment [API-PAC(W32)]

*1:Conversion Accuracy : A value in the table is linearity error at 25 degree.
*2:Option cable of PCB37P or PCB37PS is required.
*3:Option cableDT/E2 and PCB15P is required.
*4:PCB15P is a cable for FTP-15 terminal panel.

### ■SPECIFICATIONS

| | |
|---|---|
| Inputs channels | 16 single-ended or 8 differential inputs |
| Outputs channels | 1ch |
| Resolution | 12bit |
| **Input specification** | |
| Input Range | ±2.5V, ±5V, 0-5V, 0-10V |
| Input gain | - |
| Conversion Speed | 1$\mu$sec/ch(Max.) |
| Non-linearity error *1 | ±3LSB |
| Input Impedance | 1MΩ or more |
| **Output specification** | |
| Output Range | ±5V, ±10V, 0-10V |
| Output rating | ±5mA |
| Conversion Speed | 6$\mu$sec/ch(Max.) |
| Non-linearity error *1 | ±1/2LSB |
| Output impedance | 1Ω or less |
| Trigger | Start Trigger: 3 Mode   Stop Trigger: 4 Mode |
| Isolation | - |
| Timer | 2 - 7x10¹³$\mu$sec |
| Digital I/O | 4 TTL input and 4 TTL output channels |
| **Interrupt** | |
| Interrupt Request Causes | Up to 15 causes |
| Interrupt Request Level | One interrupt (Selectable enable or disable) |

| | |
|---|---|
| I/O address | Any 16-byte boundary |
| Power consumption (Max.) | +5VDC 1800mA |
| PCI bus/ | 32bit, 33MHz, 5V/ |
| Dimension (mm) | 230.0(L)x107.0(H) |
| Connector | CN1(AIO): 37-pin female D-type CN2(DIO): 16-pin header |
| **Option** | |
| Software | ACX-PAC(W32)BP, ACX-PAC(W32)AP, SUPPORT-PAC(PC)306, DDE SERVER(W32) |
| Accessories | DTP-3(PC), DTP-4(PC), ATP-16*², FTP-15*³, EPD-37*², ATSS-16*², ATII-8A*², ATLF-8*², ATUH-16(PCI) |
| Cables/ Connector | PCA37P, PCB37P, PCA37PS, PCB37PS, PCA15P, PCB15P*⁴, PCC16PS, PCD8PS, DT/E1, DT/E2, CN5-D37M |

**16ch Multiplexer Sub-Board ATUH-16(PCI)**

(16 single-ended or 8 differential inputs)

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# 16-Bit Multi-Function A/D Board
## AD16-16(PCI)E

**FEATURES**
- 256K-words on board memory to maximize A/D sampling speeds and enable background processing
- Various A/D sampling control functions
- Four TTL level digital input and four TTL level digital output channels, One i8254 compatible counter

**Non Isolated** **Memory on board** **Hi Precision** CE

API function library attachment [API-PAC(W32)]

*1:Conversion Accuracy : A value in the table is linearity error at 25 degree.
*2:Option cable of PCB37P or PCB37PS is required.
*3:Option cableDT/E2 and PCB15P is required.
*4:PCB15P is a cable for FTP-15 terminal panel.

### ■SPECIFICATIONS

| | |
|---|---|
| Inputs channels | 16 single-ended or 8 differential inputs |
| Outputs channels | 1ch |
| Resolution | 16bit |
| **Input specification** | |
| Input Range | ±5V, ±10V, 0-5V, 0-10V |
| Input gain | - |
| Conversion Speed | 10Ωsec/ch(Max.) |
| Non-linearity error *1 | ±5LSB |
| Input Impedance | 1MΩ or more |
| **Output specification** | |
| Output Range | ±10V, 0-10V |
| Output rating | ±5mA |
| Conversion Speed | 13$\mu$sec/ch(Max.) |
| Non-linearity error *1 | ±2LSB |
| Output impedance | - |
| Trigger | Start Trigger: 3 Mode   Stop Trigger: 4 Mode |
| Isolation | - |
| Timer | 2 - 7x10¹³$\mu$sec |
| Digital I/O | 4 TTL input and 4 TTL output channels |
| **Interrupt** | |
| Interrupt Request Causes | Up to 15 causes |
| Interrupt Request Level | One interrupt (Selectable enable or disable) |

| | |
|---|---|
| I/O address | Any 16-byte boundary |
| Power consumption (Max.) | +5VDC 1300mA |
| PCI bus/ | 32bit, 33MHz, 5V/ |
| Dimension (mm) | 176.4(L)x107.0(H) |
| Connector | CN1(AIO): 37-pin female D-type CN2(DIO): 16-pin header |
| **Option** | |
| Software | ACX-PAC(W32)BP, ACX-PAC(W32)AP, SUPPORT-PAC(PC)306, DDE SERVER(W32) |
| Accessories | DTP-3(PC), DTP-4(PC), ATP-16*², FTP-15*³, EPD-37*², ATSS-16*², ATII-8A*², ATLF-8*², ATCH-16(PCI) |
| Cables/ Connector | PCA37P, PCB37P, PCA37PS, PCB37PS, PCA15P, PCB15P*⁴, PCC16PS, PCD8PS, DT/E1, DT/E2, CN5-D37M |

**16ch Multiplexer Sub-Board ATCH-16(PCI)**

(16 single-ended or 8 differential inputs)

## High Speed Multi-Function A/D Board

### AD12-16U(PCI)EH

**NEW**

**FEATURES**
- 1μsec(1MHz) A/D conversion speed
- 16M-words on board memory to maximize A/D sampling speeds and enable background processing
- Various A/D sampling control functions
- Four TTL level digital input and four TTL level digital output channels, One i8254 compatible counter

**Non Isolated** | **Memory on board** | **Hi Speed**

**API function library attachment [API-PAC(W32)]**

*1:When the environment temperature is near 0℃ or 50℃, the non-linearity error may become larger. A maximum ±0.1% FSR non-linearity error is possible.
*2:If an external device requires this AD12-16U(PCI)EH board to supply +5VDC from the CN1 or CN2 connectors, the power consumption of this board will be bigger than what this specification has defined.
*3:PCB15P is a cable for FTP-15 terminal panel.
*4:Option cable of PCB37PS-0.5 is required.
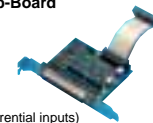*5:Option cable DT/E2 and PCB15P is required.

### ■SPECIFICATIONS

| Inputs channels | 16 single-ended or 8 differential inputs |
|---|---|
| Outputs channels | 1ch |
| Resolution | 12bit |
| Input specification | |
|   Input Range | ±10V, ±5V, ±2.5V, 0 - +5V, 0 - +10V |
|   Input gain | - |
|   Conversion Speed | 1μsec/ch (Max.) |
|   Non-linearity error*1 | ±3LSB |
|   Input Impedance | 1MΩ or more |
| Output specification | |
|   Output Range | ±10V, ±5V, 0 - +10V |
|   Output rating | ±5mA |
|   Conversion Speed | 6μsec/ch (Max.) |
|   Non-linearity error*1 | ±1/2LSB |
|   Output impedance | 1Ω or less |
| Isolation | |
| Digital I/O | 4 TTL input and 4 TTL output channels |
| Interrupt | One interrupt request signal as INTA |
| I/O address | Any 32-byte boundary |
| Power consumption (Max.)*2 | +5VDC 1200mA |
| PCI bus/ | 32bit, 33MHz, 5V/ |
| Dimension (mm) | 176.41(L)x106.68(H) |

| Connector | CN1(AIO): 37-pin female D-type CN2(DIO): 16-pin header |
|---|---|
| Option | |
|   Software | ACX-PAC(W32)BP, ACX-PAC(W32)AP, SUPPORT-PAC(PC)306 |
|   Accessories | DTP-3(PC), DTP-4(PC), ATP-16*4, FTP-15*5, EPD-37*4, ATSS-16*4, ATII-8A*4, ATLF-8*4, ATUH-16(PCI) |
|   Cables/ Connector | PCA37P-1.5, PCA37PS-0.5P,1.5P, PCB37PS-0.5P,1.5P, PCA15P-1.5, PCB15P-1.5*3, PCC16PS, PCD8PS, DT/E1, DT/E2, CN5-D37M |

**16ch Multiplexer Sub-Board ATUH-16(PCI)**
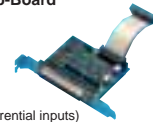
(16 single-ended or 8 differential inputs)

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## 16-Bit High Speed Multi-Function A/D Board

### AD16-16U(PCI)EH

**NEW**

**FEATURES**
- 1μsec(1MHz) A/D conversion speed
- 16M-words on board memory to maximize A/D sampling speeds and enable background processing
- Various A/D sampling control functions
- Four TTL level digital input and four TTL level digital output channels, One i8254 compatible counter

**Non Isolated** | **Memory on board** | **Hi Speed** | **Hi Precision**

**API function library attachment [API-PAC(W32)]**

*1:When the environment temperature is near 0℃ or 50℃, the non-linearity error may become larger. A maximum ±0.1% FSR non-linearity error is possible.
*2:If an external device requires this AD16-16U(PCI)EH board to supply +5VDC from the CN1 or CN2 connectors, the power consumption of this board will be bigger than what this specification has defined.
*3:PCB15P is a cable for FTP-15 terminal panel.
*4:Option cable of PCB37PS-0.5 is required.
*5:Option cable DT/E2 and PCB15P is required.

### ■SPECIFICATIONS

| Inputs channels | 16 single-ended or 8 differential inputs |
|---|---|
| Outputs channels | 1ch |
| Resolution | 16bit |
| Input specification | |
|   Input Range | ±10V, ±5V, 0 - +10V, 0 - +5V |
|   Input gain | - |
|   Conversion Speed | 1μsec/ch (Max.) |
|   Non-linearity error*1 | ±5LSB |
|   Input Impedance | 1MΩ or more |
| Output specification | |
|   Output Range | ±10V, 0-+10V |
|   Output rating | ±5mA |
|   Conversion Speed | 10μsec/ch (Max.) |
|   Non-linearity error*1 | ±3LSB |
|   Output impedance | 1Ω or less |
| Isolation | - |
| Digital I/O | 4 TTL input and 4 TTL output channels |
| Interrupt | One interrupt request signal as INTA |
| I/O address | Any 32-byte boundary |
| Power consumption (Max.)*2 | +5VDC 1400mA |
| PCI bus/ | 32bit, 33MHz, 5V/ |
| Dimension (mm) | 176.41(L)x106.68(H) |

| Connector | CN1(AIO): 37-pin female D-type CN2(DIO): 16-pin header |
|---|---|
| Option | |
|   Software | ACX-PAC(W32)BP, ACX-PAC(W32)AP, SUPPORT-PAC(PC)306 |
|   Accessories | DTP-3(PC), DTP-4(PC), ATP-16*4, FTP-15*5, EPD-37*4, ATSS-16*4, ATII-8A*4, ATLF-8*4, ATUH-16(PCI) |
|   Cables/ Connector | PCA37P-1.5, PCA37PS-0.5P,1.5P, PCB37PS-0.5P,1.5P, PCA15P-1.5, PCB15P-1.5*2, PCC16PS, PCD8PS, DT/E1, DT/E2, CN5-D37M |

**16ch Multiplexer Sub-Board ATUH-16(PCI)**

(16 single-ended or 8 differential inputs)
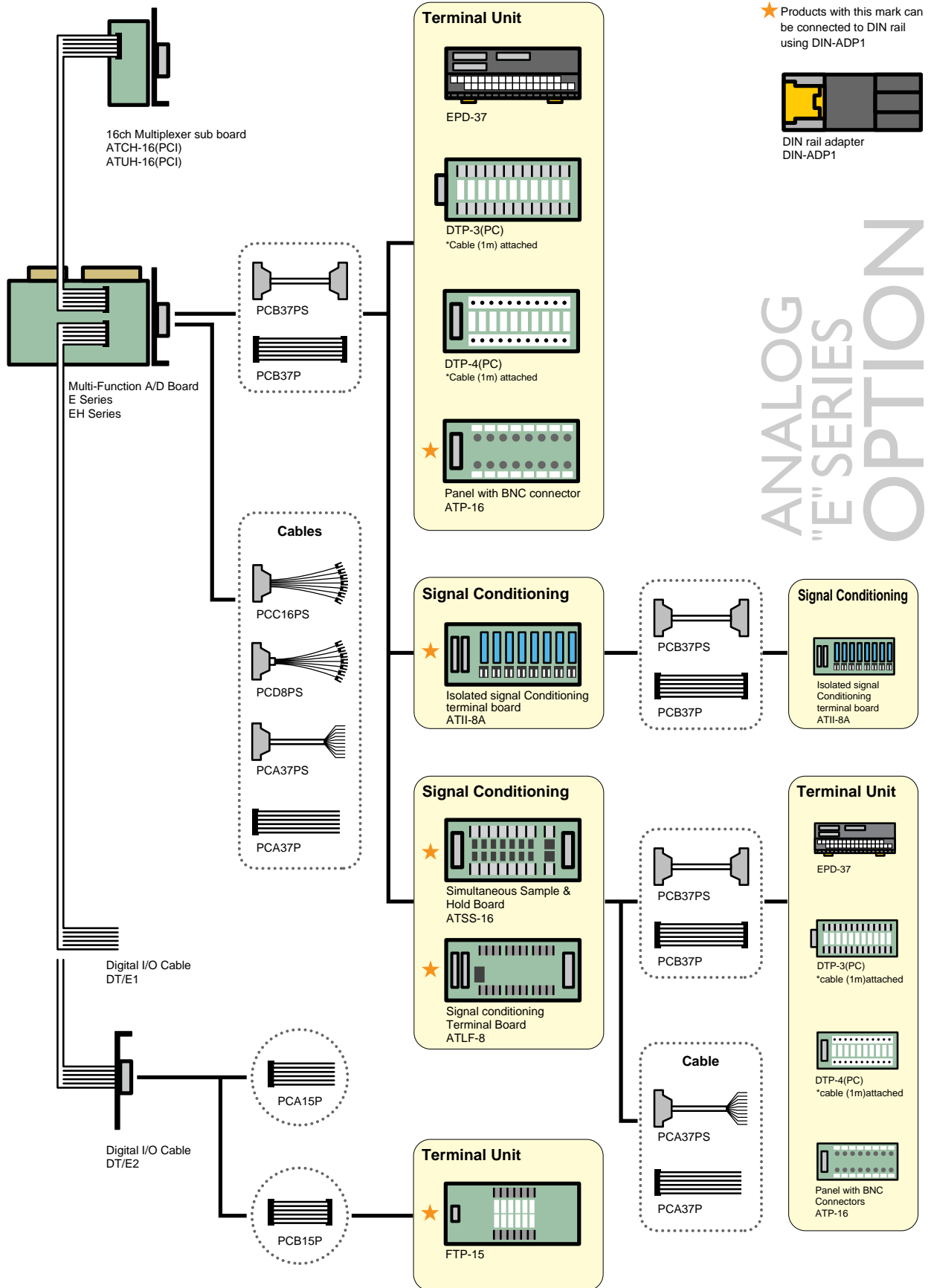
**B**-22

**PCI BUS SERIES**

Digital I/O
Boards

*Analog I/O
Boards*

Communication
Boards

Counter &
Motor
Controller

# Multi-Function A/D Board Accessories & Cables

★ Products with this mark can
be connected to DIN rail
using DIN-ADP1

DIN rail adapter
DIN-ADP1

16ch Multiplexer sub board
ATCH-16(PCI)
ATUH-16(PCI)

Multi-Function A/D Board
E Series
EH Series

PCB37PS

PCB37P

**Terminal Unit**

EPD-37

DTP-3(PC)
*Cable (1m) attached

DTP-4(PC)
*Cable (1m) attached

★ Panel with BNC connector
ATP-16

ANALOG
"E" SERIES OPTION

**Cables**

PCC16PS

PCD8PS

PCA37PS

PCA37P

**Signal Conditioning**

★ Isolated signal Conditioning
terminal board
ATII-8A

PCB37PS

PCB37P

**Signal Conditioning**

Isolated signal
Conditioning
terminal board
ATII-8A

**Signal Conditioning**

★ Simultaneous Sample &
Hold Board
ATSS-16

★ Signal conditioning
Terminal Board
ATLF-8

PCB37PS

PCB37P

**Terminal Unit**

EPD-37

DTP-3(PC)
*cable (1m)attached

DTP-4(PC)
*cable (1m)attached

Panel with BNC
Connectors
ATP-16

**Cable**

PCA37PS

PCA37P

Digital I/O Cable
DT/E1

Digital I/O Cable
DT/E2

PCA15P

PCB15P

**Terminal Unit**

★ FTP-15

# Multi-Function A/D Board Accessories & Cables

## 16ch Multiplexer Sub-Board

16 single-ended or 8 differential input

* ATCH-16(PCI) or ATUH-16(PCI) occupies one slot.

**ATCH-16(PCI)**

For use with:
AD12-16(PCI)E
AD16-16(PCI)E
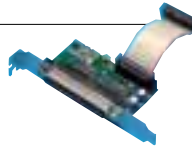
**ATUH-16(PCI)**

For use with:
AD12-16U(PCI)E

## 16 Channel Simultaneous Sample & Hold Board
### ATSS-16

ATSS-16 is a accessory board that provides simultaneous sampling function for the Analog E series boards.

* ATSS-16 is available at single ended input mode.

For use with:    * Cables is option
AD12-16(PCI)E
AD16-16(PCI)E
AD12-16U(PCI)E

## 8 Channel Isolated Signal Conditioning Terminal Board
### ATII-8A

ATII-8A contains 8 isolation amplifier channels. The board provides isolation between the input and output signals and also between channels. The input gain can be set independently for each channel to either 1 or 200. ATII-8A has a cold junction compensation (CJC) circuit used for all eight channels.

* ATII-8A is available at single ended input mode. When using 16 channels, two pieces of ATII-8A is required.
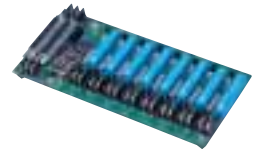
For use with:    * Cables is option
AD12-16(PCI)E
AD16-16(PCI)E
AD12-16U(PCI)E
ADI12-16(PCI)

## 8 Channel Signal Conditioning Terminal Board
### ATLF-8

8 differential gain amplifiers with bandwidth of 0-100KHz, with up to 500 times signal gain. Each input channel has an on-board 4th order lowpass Butterworth filter (values jumper selectable). A semiconductor temperature sensor is used to compensate for thermocouple signal deviations.

*ATLF-8 is available at single ended input mode. When using 16 channels, two pieces of ATLF-8 is required.
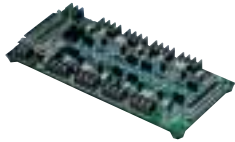
For use with:    * Cables is option
AD12-16(PCI)E
AD16-16(PCI)E
AD12-16U(PCI)E
ADI12-16(PCI)

## DIN Rail Adapter
### DIN-ADP1

DIN-rail adapter for termination panels

For use with:
ATSS-16      ATP-16
ATII-8A      FTP-15
ATLF-8

## Accessories for Analog I/O

■**Panel With BNC Connectors** * Cables is option
**ATP-16**
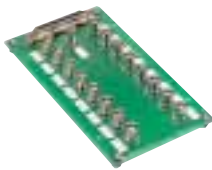
■**Shield Cable for Differential Inputs**
**PCD8PS-1.5**    1.5m

**PCD8PS-3**      3.0m

■**Coaxial Cable for Single-Ended inputs**
**PCC16PS-1.5**    1.5m

**PCC16PS-3**      3.0m

## Digital I/O Accessories

■**Termination Panel**
**FTP-15**
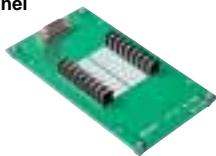
■**16-pin Header → 15-pin D-type Connector Cable**
**DT/E2**

■**16-pin D-type → 16(End Open) Flat Cable (1.5m)**
**DT/E1**
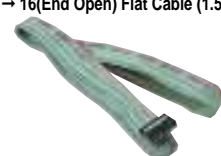
■**15-pin D-type → 15-pin
D-type Flat Cable**

**PCB15P-1.5**    1.5m
**PCB15P-3**      3.0m
**PCB15P-5**      5.0m

■**15-pin D-type → 15
(End Open) Flat Cable**

**PCA15P-1.5**    1.5m
**PCA15P-3**      3.0m
**PCA15P-5**      5.0m

Digital I/O
Boards

*Analog I/O
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Boards

Counter &
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Controller

**B-24**

**PCI BUS SERIES**

Digital I/O
Boards

*Analog I/O
Boards*

Communication
Boards

Counter &
Motor
Controller

## Analog To Digital Inputs Board
### AD12-16(PCI)

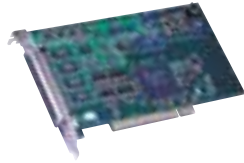**FEATURES**
● **16 single-ended analog inputs or 8 differential analog inputs**
● **4 TTL-level digital inputs and four 4 TTL-level digital outputs**
● **External trigger input capability**

**Non Isolated** CE

**API function library attachment [API-PAC(W32)]**

### ■SPECIFICATIONS

| Inputs channels | 16 single-ended or 8 differential inputs |
|---|---|
| Resolution | 12bit |
| Input specification | |
| Input Range | ±10V, ±5V, ±2.5V, ±1.25V, 0-10V, 0-5V, 0-2.5V, 0-1.25V(Settable for each channel by software) |
| Input gain | - |
| Conversion Speed | 10μsec/ch(Max.) |
| Non-linearity error | ±10V, ±5V, 0-10V, 0-5V:±2LSB±2.5V, ±1.25V, 0-2.5V:±4LSB0-1.25V:±8LSB |
| Input Impedance | 1MΩ or more |
| Trigger | 1 TTL input |
| Isolation | - |
| Timer | 0.5μsec-17min (specifiable in steps of 250nsec) |
| Digital I/O | 4 TTL input and 4 TTL output channels |

| Interrupt | |
|---|---|
| Interrupt Request Causes | 8 Modes |
| Interrupt Request Level | One interrupt request signal as INTA |
| I/O address | Any 32-byte boundary |
| Power consumption (Max.) | +5VDC 700mA |
| PCI bus/ | 32bit, 33MHz, 5V/ |
| Dimension (mm) | 176.4(L)x107.0(H) |
| Connector | PCR-E96LMD[HONDA Tsushin Kogyo] or equivalent |
| Option | |
| Software | ACX-PAC(W32)BP, ACX-PAC(W32)AP, DDE SERVER(W32) |
| Accessories | EPD-96[1] |
| Cables/ Connector | PCA96P, PCB96P, PCA96PS, PCB96PS, CN5-H96F |

[1]:Option cable of PCB96P or PCB96PS is required.

## Analog To Digital Input Board
### AD12-64(PCI)

**FEATURES**
● **64 single-ended analog inputs or 32 differential analog inputs**
● **4 TTL-level digital inputs and four 4 TTL-level digital outputs**
● **External trigger input capability**

**Non Isolated** CE

**API function library attachment [API-PAC(W32)]**

### ■SPECIFICATIONS

| Inputs channels | 64 single-ended or 32 differential inputs |
|---|---|
| Resolution | 12bit |
| Input specification | |
| Input Range | ±10V, ±5V, ±2.5V, ±1.25V, 0-10V, 0-5V, 0-2.5V, 0-1.25V(Settable for each channel by software) |
| Input gain | - |
| Conversion Speed | 10μsec/ch(Max.) |
| Non-linearity error | ±10V, ±5V, 0-10V, 0-5V:±2LSB±2.5V, ±1.25V, 0-2.5V:±4LSB, 0-1.25V:±8LSB |
| Input Impedance | 1MΩ or more |
| Trigger | 1 TTL input |
| Isolation | - |
| Timer | 0.5μsec-17min (specifiable in steps of 250nsec) |
| Digital I/O | 4 TTL input and 4 TTL output channels |

| Interrupt | |
|---|---|
| Interrupt Request Causes | 8 Modes |
| Interrupt Request Level | One interrupt request signal as INTA |
| I/O address | Any 32-byte boundary |
| Power consumption (Max.) | +5VDC 700mA |
| PCI bus/ | 32bit, 33MHz, 5V/ |
| Dimension (mm) | 176.4(L)x107.0(H) |
| Connector | PCR-E96LMD[HONDA Tsushin Kogyo] or equivalent |
| Option | |
| Software | ACX-PAC(W32)BP, ACX-PAC(W32)AP, DDE SERVER(W32) |
| Accessories | EPD-96[1] |
| Cables/ Connector | PCA96P, PCB96P, PCA96PS, PCB96PS, CN5-H96F |

[1]:Option cable of PCB96P or PCB96PS is required.

Analog I/O Boards

Industrial
Automation
Products

B-25

PCI BUS SERIES

# 12-bit Isolated A/D Board

## ADI12-16(PCI)

- PC bus signal isolated from external analog and digital signals
- Buffer memory: 256K word FIFO or 256K word Ring (programmable)
- Various A/D sampling control function
- 16 single-ended analog inputs or 8 differential analog inputs

Isolated | Memory on board | Gain Amp. | CE

**API function library attachment [API-PAC(W32)]**

### ■SPECIFICATIONS

| | |
|---|---|
| Inputs channels | 16 single-ended or 8 differential inputs |
| Resolution | 12bit |
| Input specification | |
| Input Range | ±10V, 0 - +10V, 4-20mA*5 |
| Input gain | x1, x2, x4, x8(specifiable by software for each channel) |
| Conversion Speed | 20μsec/ch.(Max.) |
| Non-linearity error | ±2LSB (Gain = x1 and x2) at voltage input<br>±4LSB (Gain = x4 and x8) at voltage input<br>±3LSB (Gain = x1) at current Input |
| Input Impedance | Voltage input: Input impedance 1M Ω min. Current loop input: 250 Ω typ. |
| Digital trigger | 1 opto-isolated input (shares one of Digital input) |
| Conversion start Trigger | Software command, Analog level trigger, External digital input trigger |
| Conversion stop Trigger | Software command, Analog level trigger, External Digital input trigger |
| Isolation | PCI bus signal isolated from external analog and digital signals |
| Timer | - |
| Digital I/O | 4 channel opto-isolated input and 4 channel opto-isolated output |

| | |
|---|---|
| Interrupt | |
| Interrupt Request Causes | 13 modes |
| Interrupt Request Level | One interrupt request signal as INTA |
| I/O address | Any 16-byte boundary |
| Power consumption (Max.) | +5VDC 1200mA |
| PCI bus/ | 32bit, 33MHz, 5V/ |
| Dimension (mm) | 176.4(L)x107.0(H) |
| Connector | CN1(AIO): 37-pin female D-type, CN2(DIO): 16-pin header |
| Option | |
| Software | ACX-PAC(W32)BP, ACX-PAC(W32)AP, DDE SERVER(W32), SUPPORT-PAC(PC)306 Ver.2.20 upper |
| Accessories | ATLF-8*1*2, ATII-8*1*2, ATP-16*2, DTP-3(PC), DTP-4(PC), EPD-37, FTP-15*3 |
| Cables/ Connector | PCA37P, PCB37P, PCA37PS, PCB37PS, PCA15P, PCB15P*4, DT/E1, DT/E2, PCC16PS, PCD8PS, CN5-D37M |

*1:External power supply is necessary.
*2:Option cable of PCB37P or PCB37PS is required.
*3:Option cable DT/E2 and PCB15P is required.
*4:PCB15P is a cable for FTP-15 terminal panel.
*5:At 4-20mA current loop mode, an input gain can be used x 1

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# 16-bit Isolated A/D Board

## ADI16-4C(PCI)
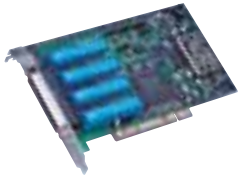
- Channels are electrically isolated from one another and the PC is isolated from the output
- Installed with an independent programmable timer
- Installed with an independent external trigger input function

Isolated | Hi Precision

**API function library attachment [API-PAC(W32)]**

### ■SPECIFICATIONS

| | |
|---|---|
| Inputs channels | 4 single-ended |
| Outputs channels | - |
| Resolution | 16bit |
| Input specification | |
| Input Range | ±10V, ±5V, 0-+5V, 0-+10V, 4-20mA |
| Input gain | - |
| Conversion Speed | 20μsec/ch.(Max.) |
| Non-linearity error | ±10V:±32LSB ±5V, 0-+10V:±64LSB<br>0-+5V:128LSB 4-20mA:±160LSB |
| Input Impedance | Voltage input: Input impedance 1M Ω min. Current loop input: 250 Ω typ. |
| Output specification | |
| Output Range | - |
| Output rating | - |
| Conversion Speed | - |
| Non-linearity error | - |
| Output impedance | - |
| Trigger | 1 opto-isolated input |

| | |
|---|---|
| Isolation | Individual Isolation |
| Timer | 500nsec - 17min (specifiable in steps of 250nsec) |
| Digital I/O | - |
| Interrupt | |
| Interrupt Request Causes | 9 modes |
| Interrupt Request Level | One interrupt request signal as INTA |
| I/O address | Any 32-byte boundary |
| Power consumption (Max.) | DC+5V 1100mA |
| PCI bus/ | 32bit, 33MHz, 5V/ |
| Dimension (mm) | 176.4(L)x107.0(H) |
| Connector | 37-pin female D-type |
| Option | |
| Software | ACX-PAC(W32)BP Ver.2.1 upper, ACX-PAC(W32)AP Ver.2.1 upper |
| Accessories | DTP-3(PC), DTP-4(PC), EPD-37*1 |
| Cables/ Connector | PCA37P, PCB37P, PCA37PS, PCB37PS, CN5-D37M |

*1:Option cable of PCB37P or PCB37PS is required.

---

# 16-bit Isolated A/D Board (Sensor Input Type)

## ADI16-4L(PCI)

- Individual-Isolated analog Input board for low voltage like sensor signal
- Low-cost model with isolation and high-resolution for low-speed application
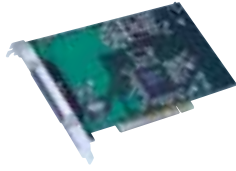- Temperature sensor on board can be used for cold-junction reference of thermocouple

Isolated | Hi Precision

**API function library attachment [API-PAC(W32)]**

### ■SPECIFICATIONS

| | |
|---|---|
| Inputs channels | 4 differential |
| Outputs channels | - |
| Resolution | 16bit |
| Input specification | |
| Input Range | ±0.125V, ±1.25V, 0-2.5V, 0-0.25V |
| Input gain | - |
| Conversion Speed | 10msec/ch.(Max.) |
| Non-linearity error | ±15LSB |
| Input Impedance | 1MΩ or more |
| Output specification | |
| Output Range | - |
| Output rating | - |
| Conversion Speed | - |
| Non-linearity error | - |
| Output impedance | - |
| Trigger | 1 opto-isolated input |
| Isolation | Individual Isolation |

| | |
|---|---|
| Timer | 500nsec - 17min (specifiable in steps of 250nsec) |
| Digital I/O | - |
| Interrupt | |
| Interrupt Request Causes | 8 modes |
| Interrupt Request Level | One interrupt request signal as INTA |
| I/O address | Any 32-byte boundary |
| Power consumption (Max.) | DC+5V 1200mA |
| PCI bus/ | 32bit, 33MHz, 5V/ |
| Dimension (mm) | 176.4(L)x107.0(H) |
| Connector | 37-pin female D-type |
| Option | |
| Software | ACX-PAC(W32)BP Ver.2.1 upper, ACX-PAC(W32)AP Ver.2.1 upper |
| Accessories | DTP-3(PC), DTP-4(PC), EPD-37*1 |
| Cables/ Connector | PCA37P, PCB37P, PCA37PS, PCB37PS, CN5-D37M |

*1:Option cable of PCB37P or PCB37PS is required.

## Digital to Analog Output Board
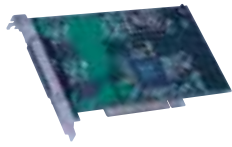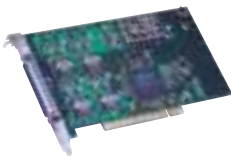### DA12-4(PCI)

**FEATURES**
- ● 4 channels for the analog output function for converting 12bit digital signals to analog voltages
- ● Capable of updating the output voltage using a sampling clock
- ● Independent, TTL-level external trigger input function

CE

**API function library attachment [API-PAC(W32)]**

### ■SPECIFICATIONS

| | |
|---|---|
| Outputs channels | 4ch |
| Resolution | 12bit |
| **Output specification** | |
| Output Range | ±10V, ±5V, 0-10V(Settable for each channel by software) |
| Output rating | ±5mA |
| Conversion Speed | 10μsec/ch(Max.) |
| Non-linearity error | ±3LSB |
| Output impedance | 10Ω or less |
| Trigger | 1 TTL input |
| Isolation | - |
| Timer | 500-1,073,741,824,000nsec (specifiable in steps of 250nsec) |
| **Interrupt** | |
| Interrupt Request Causes | 8 Modes |
| Interrupt Request Level | One interrupt request signal as INTA |

| | |
|---|---|
| I/O address | Any 32-byte boundary |
| Power consumption (Max.) | +5VDC 600mA |
| PCI bus/ | 32bit, 33MHz, 5V/ |
| Dimension (mm) | 176.4(L)x107.0(H) |
| Connector | 37-pin female D-type |
| **Option** | |
| Software | ACX-PAC(W32)BP, ACX-PAC(W32) AP, DDE SERVER(W32) |
| Accessories | DTP-3(PC), DTP-4(PC), EPD-37[1], ATP-16[1] |
| Cables/ Connector | PCA37P, PCB37P, PCA37PS, PCB37PS, PCC16PS, CN5-D37M |

[1]:Option cable of PCB37P or PCB37PS is required.

## Digital to Analog Output Board
### DA12-8(PCI)

**FEATURES**
- ● 8 channels for the analog output function for converting 12bit digital signals to analog voltages
- ● Capable of updating the output voltage using a sampling clock
- ● Independent, TTL-level external trigger input function

**API function library attachment [API-PAC(W32)]**

### ■SPECIFICATIONS

| | |
|---|---|
| Outputs channels | 8ch |
| Resolution | 12bit |
| **Output specification** | |
| Output Range | ±10V, ±5V, 0-10V(Settable for each channel by software) |
| Output rating | ±5mA |
| Conversion Speed | 10μsec/ch(Max.) |
| Non-linearity error | ±3LSB |
| Output impedance | 10Ω or less |
| Trigger | 1 TTL input |
| Isolation | - |
| Timer | 500-1,073,741,824,000nsec (specifiable in steps of 250nsec) |
| **Interrupt** | |
| Interrupt Request Causes | 8 Modes |
| Interrupt Request Level | One interrupt request signal as INTA |

| | |
|---|---|
| I/O address | Any 32-byte boundary |
| Power consumption (Max.) | +5VDC 800mA |
| PCI bus/ | 32bit, 33MHz, 5V/ |
| Dimension (mm) | 176.4(L)x107.0(H) |
| Connector | 37-pin female D-type |
| **Option** | |
| Software | ACX-PAC(W32)BP, ACX-PAC(W32) AP, DDE SERVER(W32) |
| Accessories | DTP-3(PC), DTP-4(PC), EPD-37[1], ATP-16[1] |
| Cables/ Connector | PCA37P, PCB37P, PCA37PS, PCB37PS, PCC16PS, CN5-D37M |

[1]:Option cable of PCB37P or PCB37PS is required.

## Digital to Analog Output Board
### DA12-16(PCI)

**FEATURES**
- ● 16 channels for the analog output function for converting 12bit digital signals to analog voltages
- ● Capable of updating the output voltage using a sampling clock
- ● Independent, TTL-level external trigger input function

CE

**API function library attachment [API-PAC(W32)]**

### ■SPECIFICATIONS

| | |
|---|---|
| Outputs channels | 16ch |
| Resolution | 12bit |
| **Output specification** | |
| Output Range | ±10V, ±5V, 0-10V(Settable for each channel by software) |
| Output rating | ±5mA |
| Conversion Speed | 10μsec/ch(Max.) |
| Non-linearity error | ±3LSB |
| Output impedance | 10Ω or less |
| Trigger | 1 TTL input |
| Isolation | - |
| Timer | 500-1,073,741,824,000nsec (specifiable in steps of 250nsec) |
| **Interrupt** | |
| Interrupt Request Causes | 8 Modes |
| Interrupt Request Level | One interrupt request signal as INTA |

| | |
|---|---|
| I/O address | Any 32-byte boundary |
| Power consumption (Max.) | +5VDC 1400mA |
| PCI bus/ | 32bit, 33MHz, 5V/ |
| Dimension (mm) | 176.4(L)x107.0(H) |
| Connector | 37-pin female D-type |
| **Option** | |
| Software | ACX-PAC(W32)BP, ACX-PAC(W32)AP, DDE SERVER(W32) |
| Accessories | DTP-3(PC), DTP-4(PC), EPD-37[1], ATP-16[1] |
| Cables/ Connector | PCA37P, PCB37P, PCA37PS, PCB37PS, PCC16PS, CN5-D37M |

[1]:Option cable of PCB37P or PCB37PS is required.

## 16-bit Isolated Digital to Analog Output Board
### DAI16-4C(PCI)

**FEATURES**
- ● Compatible with voltage and current output
- ● Highly accurate isolated analog output board
- ● The channels are electrically isolated from each other , and the PC and the output are insulated as well
- ● Allows analog output to be updated using sampling clocks

Isolated  Hi Precision

**API function library attachment [API-PAC(W32)]**

### ■SPECIFICATIONS

| | |
|---|---|
| Inputs channels | - |
| Outputs channels | 4ch |
| Resolution | 16bit |
| **Input specification** | |
| Input Range | - |
| Input gain | - |
| Conversion Speed | - |
| Non-linearity error | - |
| Input Impedance | - |
| **Output specification** | |
| Output Range | 0-+10V, ±10V, 0-20mA |
| Output rating | Voltage (Output current:Max.±5mA), Current 0-20mA (Load resistance:Max.500Ω) |
| Conversion Speed | 20μsec/ch(Max.) |
| Non-linearity error | 0-10V, ±10V : ±5LSB, 0-20mA : ±15LSB |
| Output impedance | 10Ω or less (voltage output) |
| Trigger | 1 opto-isolated input |
| Isolation | Individual Isolation |

| | |
|---|---|
| Timer | 500nsec - 17min (specifiable in steps of 250nsec) |
| Digital I/O | - |
| **Interrupt** | |
| Interrupt Request Causes | 9 |
| Interrupt Request Level | one interrupt request signal as INTA |
| I/O address | Any 32-byte boundary |
| Power consumption (Max.) | DC+5V 2200mA |
| PCI bus/ | 32bit, 33MHz, 5V/ |
| Dimension (mm) | 176.4(L)x107.0(H) |
| Connector | 37-pin male D-type |
| **Option** | |
| Software | ACX-PAC(W32)BP Ver.2.1 upper, ACX-PAC(W32)AP Ver.2.1 upper |
| Accessories | DTP-3(PC), DTP-4(PC), EPD-37[1] |
| Cables/ Connector | PCA37P, PCB37P, PCA37PS, PCB37PS, CN5-D37M |

[1]:Option cable of PCB37P or PCB37PS is required.

# General option for Analog I/O Board

## Terminal Unit
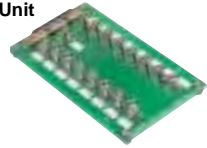
**■Screw-Type Terminal
DTP-3(PC)**

* Cable (1m) attached

**■Screw-Type Terminal
DTP-4(PC)**
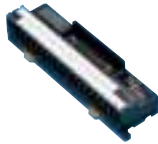
* Cable (1m) attached

**■BNC Terminal Unit
ATP-16**

* Cables is option

**■Terminal Unit
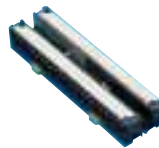EPD-37**

35mm DIN-Rail
mountable
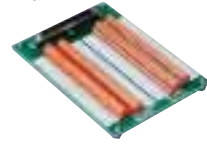Terminal pitch (10mm)

* Cables is option

**■Terminal Unit
EPD-96**

35mm DIN-Rail
mountable
Terminal pitch (8.5mm)

* Cables is option

**■Screw-Type Terminal
DTP-64(PC)**

* Cables is option

## Cables/Connector

**■37-pin D-type → 37-pin D-type Shield Cables**

| | |
|---|---|
| PCB37PS-0.5P | 0.5m |
| PCB37PS-1.5P | 1.5m |
| PCB37PS-3P | 3.0m |
| PCB37PS-5P | 5.0m |

**■37-pin D-type → 37-pin D-type Flat Cables**

| | |
|---|---|
| PCB37P-1.5 | 1.5m |
| PCB37P-3 | 3.0m |
| PCB37P-5 | 5.0m |

**■37-pin D-type → 37 wires (Pitch 1.27mm) Shield Cables**

| | |
|---|---|
| PCA37PS-0.5P | 0.5m |
| PCA37PS-1.5P | 1.5m |
| PCA37PS-3P | 3.0m |
| PCA37PS-5P | 5.0m |

**■37-pin D-type → 37 wires (Pitch 1.27mm) Flat ribbon Cable**

| | |
|---|---|
| PCA37P-1.5 | 1.5m |
| PCA37P-3 | 3.0m |
| PCA37P-5 | 5.0m |

**■96-pin Half Pitch → 96-pin Half Pitch Shield Cable**

| | |
|---|---|
| PCB96PS-1.5 | 1.5m |
| PCB96PS-3 | 3.0m |
| PCB96PS-5 | 5.0m |

**■96-pin Half Pitch → 96-pin Half Pitch Flat Cable**

| | |
|---|---|
| PCB96P-1.5 | 1.5m |
| PCB96P-3 | 3.0m |
| PCB96P-5 | 5.0m |

**■96-pin Half Pitch → 96 wires (Pitch 1.27mm) Shield Cables**

| | |
|---|---|
| PCA96PS-1.5 | 1.5m |
| PCA96PS-3 | 3.0m |
| PCA96PS-5 | 5.0m |

**■96-pin Half Pitch → 96 wires (Pitch 1.27mm) Flat Cables**

| | |
|---|---|
| PCA96P-1.5 | 1.5m |
| PCA96P-3 | 3.0m |
| PCA96P-5 | 5.0m |

**■37-pin D-type (male) Connector (5 pcs)**

**CN5-D37M**

Easy soldering

**■96-pin Half Pitch (female) Connector (5 pcs)**

**CN5-H96F**

PCI BUS SERIES

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**B**-28

**PCI BUS SERIES**

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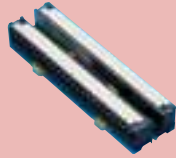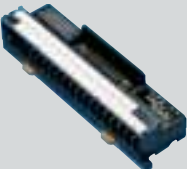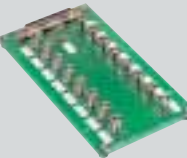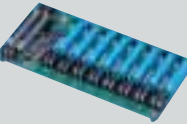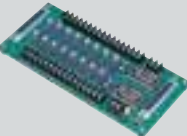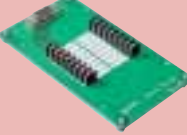
# Analog I/O Board Accessories & Cables

| ▶ Connector of the Board side | | | Model name of Analog I/O board | 96-pin Half Pitch | | |
|---|---|---|---|---|---|---|
| ▼ Connector of the Accessories side | **Accessories** | **Cables (both sides connector)** | | AD12-16(PCI) | AD12-64(PCI) | |
| **96-pin Half Pitch** | **Terminal Unit** EPD-96 — 219.5(W)x35.5(H)x64(D)mm | **Shield Cable** PCB96PS-1.5 (1.5m) PCB96PS-3 (3m) PCB96PS-5 (5m) | | ● | ● | |
| | | **Flat Cable** PCB96P-1.5 (1.5m) PCB96P-3 (3m) PCB96P-5 (5m) | | ● | ● | |
| **37-pin D-type** | **Terminal Unit** EPD-37 — 226(W)x40.5(H)x64(D)mm | **Shield Cable** PCB37PS-0.5P (0.5m) PCB37PS-1.5P (1.5m) PCB37PS-3P (3m) PCB37PS-5P (5m) | | | | |
| | | **Flat Cable** PCB37P-1.5 (1.5m) PCB37P-3 (3m) PCB37P-5 (5m) | | | | |
| | **Screw-Type Terminal** DTP-3(PC) — 190(W)x105(H)mm | **Attached Cable for DTP-3(PC) (1m)** | | | | |
| | **Screw-Type Terminal** DTP-4(PC) — 160(W)x82(H)mm | **Attached Cable for DTP-4(PC) (1m)** | | | | |
| | **BNC Terminal Unit** ATP-16 — 190(W)x105(H)mm | **Shield Cable** PCB37PS-0.5P (0.5m) PCB37PS-1.5P (1.5m) PCB37PS-3P (3m) PCB37PS-5P (5m) | | | | |
| | | **Flat Cable** PCB37P-1.5 (1.5m) PCB37P-3 (3m) PCB37P-5 (5m) | | | | |
| | **Signal Conditioning Terminal** ATLF-8 — 105(W)x230(H)x22.5(D)mm | **Shield Cable** PCB37PS-0.5P (0.5m) PCB37PS-1.5P (1.5m) PCB37PS-3P (3m) PCB37PS-5P (5m) | | | | |
| | | **Flat Cable** PCB37P-1.5 (1.5m) PCB37P-3 (3m) PCB37P-5 (5m) | | | | |
| | **Isolated Signal Conditioning Terminal** ATII-8A — 105(W)x230(H)x22.5(D)mm | **Shield Cable** PCB37PS-0.5P (0.5m) PCB37PS-1.5P (1.5m) PCB37PS-3P (3m) PCB37PS-5P (5m) | | | | |
| | | **Flat Cable** PCB37P-1.5 (1.5m) PCB37P-3 (3m) PCB37P-5 (5m) | | | | |
| | **Simultaneous Sample & Hold** ATSS-16 — 105(W)x230(H)x22.5(D)mm | **Shield Cable** PCB37PS-0.5P (0.5m) PCB37PS-1.5P (1.5m) PCB37PS-3P (3m) PCB37PS-5P (5m) | | | | |
| | | **Flat Cable** PCB37P-1.5 (1.5m) PCB37P-3 (3m) PCB37P-5 (5m) | | | | |
| **15-pin D-type** | **Screw-Type Terminal** FTP-15 — 190(W)x105(H)mm * DIO Accessories | **Flat Cable** PCB15P-1.5 (1.5m) PCB15P-3 (3m) PCB15P-5 (5m) | **Flat Cable** DT/E2 | | | |

## 37-pin D-type

| | AD12-16(PCI)E | AD12-16U(PCI)E | AD16-16(PCI)E | ADI12-16(PCI) | ADI16-4C(PCI) | ADI16-4L(PCI) | DA12-4(PCI) | DA12-8(PCI) | DA12-16(PCI) | DAI16-4C(PCI) |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | |
| | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● |
| | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● |
| | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● |
| | ● | ● | ● | ● | | ● | ● | ● | ● | ● |
| | ● | ● | ● | ● | | | ● | ● | ● | |
| | ● | ● | ● | ● | | | ● | ● | ● | |
| | ● | ● | ● | ● | | | | | | |
| | ● | ● | ● | ● | | | | | | |
| | ● | ● | ● | ● | | | | | | |
| | ● | ● | ● | ● | | | | | | |
| | ● | ● | ● | | | | | | | |
| | ● | ● | ● | | | | | | | |
| | ● | ● | ● | ● | | | | | | |

**DIN Rail Adapter**
**DIN-ADP1**

DIN-rail adapter for termination panels

● **For use with:**
**ATSS-16**
**ATII-8A**
**ATLF-8**
**ATP-16**
**FTP-15**

Digital I/O Boards

*Analog I/O Boards*

Communication Boards

Counter & Motor Controller

# Analog I/O Board Cables

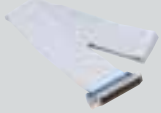| Connector of the Accessories side / Cables (One side connector) | | 96-pin Half Pitch | | | 37-pin D-type | | | |
|---|---|---|---|---|---|---|---|---|
| | | AD12-16(PCI) | AD12-64(PCI) | | AD12-16(PCI)E | AD12-16U(PCI)E | AD16-16(PCI)E | ADI12-16(PCI) |
| **96-pin Half Pitch** | **Shield Cable** PCA96PS-1.5 (1.5m) PCA96PS-3 (3m) PCA96PS-5 (5m) | ● | ● | | | | | |
| | **Flat Cable** PCA96P-1.5 (1.5m) PCA96P-3 (3m) PCA96P-5 (5m) | ● | ● | | | | | |
| **37-pin D-type** | **Shield Cable** PCA37PS-0.5P (0.5m) PCA37PS-1.5P (1.5m) PCA37PS-3P (3m) PCA37PS-5P (5m) | | | | ● | ● | ● | ● |
| | **Flat Cable** PCA37P-1.5 (1.5m) PCA37P-3 (3m) PCA37P-5 (5m) | | | | ● | ● | ● | ● |
| | **Coaxial Cable** PCC16PS-1.5 (1.5m) PCC16PS-3 (3m) | | | | ● | ● | ● | ● |
| | **Shield Cable for Differential Inputs** PCD8PS-1.5 (1.5m) PCD8PS-3 (3m) | | | | ● | ● | ● | ● |
| **15-pin D-type** | **Flat Cable** PCA15P-1.5 (1.5m) PCA15P-3 (3m) PCA15P-5 (5m) *DIO Accessories / Flat Cable DT/E2 | | | | ● | ● | ● | ● |
| **16-pin Header** | **Flat Cable** DT/E1 (1.5m) *DIO Accessories | | | | ● | ● | ● | ● |

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Motor
Controller

| | ADI16-4C(PCI) | ADI16-4L(PCI) | DA12-4(PCI) | DA12-8(PCI) | DA12-16(PCI) | DAI16-4C(PCI) |
|---|---|---|---|---|---|---|
| | | | | | | |
| | | | | | | |
| | ● | ● | ● | ● | ● | ● |
| | ● | ● | ● | ● | ● | ● |
| | | | ● | ● | ● | |
| | | | | | | |
| | | | | | | |
| | | | | | | |

# Communication Boards

## SELECTION GUIDE

| Name | Channels | Interface Type | | | | | Speed [bps] | Isolation | Connector | Software | | Page |
|------|----------|---------|---------|--------|--------|-------|-------------|-----------|-----------|------------------|------------|------|
| | | RS-232C | RS-422A | RS-485 | Async. | Sync. | | | | COM-DRV(W32) | API-PAC(W32) | |
| **RS-232C** | | | | | | | | | | | | |
| COM-2(PCI)H | 2 | ○ | ✕ | ✕ | ○ | ✕ | 50 - 921,600 | ✕ | 9-pin D-type | Attached | ○ | B-33 |
| COM-4(PCI)H | 4 | ○ | ✕ | ✕ | ○ | ✕ | 50 - 921,600 | ✕ | 37-pin D-type | Attached | ○ | B-33 |
| COM-8(PCI)H | 8 | ○ | ✕ | ✕ | ○ | ✕ | 50 - 921,600 | ✕ | 78-pin D-type | Attached | ○ | B-33 |
| **Isolated type (RS-422A/RS-485)** | | | | | | | | | | | | |
| COM-2PD(PCI)H | 2 | ✕ | ○ | ○ | ○ | ✕ | 50-921,600 | ○ | 9-pin D-type | Attached | ○ | B-34 |
| COM-4PD(PCI)H | 4 | ✕ | ○ | ○ | ○ | ✕ | 50-921,600 | ○ | 37-pin D-type | Attached | ○ | B-34 |
| **Intelligent type of RS-232C/RS-485** | | | | | | | | | | | | |
| COM-4FS(PCI) | 4 | ○ | ○ | ○ | ○ | ○ | Async.: 10 - 115,200 BOP : 72 - 384,000 COP : 100 - 9,600 | ✕ | 25-pin D-type | ✕ | Attached | B-34 |

### Tips of Communication Boards

## 1. Serial communication standard

It is carried in the standard personal computer of serial communication as standard, and there are "RS-232C" currently used widely, "RS-422A" used for communication of the apparatus for industries, "RS-485", etc. These standards are the International Standards of the serial communication upon which EIA (Electronic Industries Association: United States electronic industrial society) decided.

### ■RS-232C

It is the telecommunications standard currently used most widely, such as being carried in a RS-232C personal computer as standard. It is referred to as "EIA-232." The connection connector besides the purpose of each signal line or timing is also specified (25 pin D-type or 9 pin D-type). A standard is revised by the addition of a signal line etc. and a formal name is "ANSI/EIA-232-E" now. However, generally it is also called "RS-232C" now.

RS-232C connection image
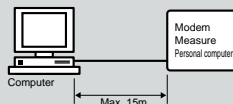


### ■RS-422A

RS-232C, transmission distance is the standard to which short access speed improved a fault, such as being late, and it was made as for it. It is referred to as "EIA-422A." Although the purpose and timing of each signal line are specified, there is no regulation of a connection connector. With the product of our company, 25 pin D-type or 9 pin D-type is adopted.

RS-422A, RS-485 connection image
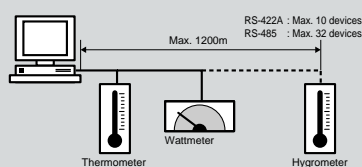


### ■RS-485

RS-422A, it is the standard to which the number of connection improved the point of being few, and it was made as for it. It is referred to as "EIA-485." RS-485 are a standard compatible with a higher rank to RS-422A. Although the purpose and timing of each signal line are specified, there is no regulation of a connection connector. With the product of our company, 25 pin D-type or 9 pin D-type is adopted.

RS-422A can perform connection of two or more set machine with which "1:N" RS-485 is called the multi-drops of "N:N" or party line. Although RS-232C needs the channel for the number of connection for a host office since only connection of "1:1" can be performed, in RS-422A or RS-485, two or more apparatus is connectable with one channel. Construction of the telemetry system made broadly dotted with a sensor as shown in the left figure is easy.

| Parameter | RS-232C | RS-422A | RS-485 |
|-----------|---------|---------|--------|
| Transmission mode | Simplex | Multi-point Simplex | Multi-point Multiplex |
| Connectable number of device | 1 driver 1 receiver | 1 driver 10 receivers | 32 drivers 32 receivers |
| Max.Speed | 20Kbps | 10Mbps | 10Mbps |
| Maximum distance | 15m | 1200m | 1200m |
| Mode | Single-ended (Non-equilibrium type) | Differential (Equilibrium type) | Differential (Equilibrium type) |
| Connection image |  |  |  |
| Merit | Short distance Full-duplex 1:1 | Long distance Full-duplex, half-duplex Multi-drops of 1:N | Long distance Full-duplex, half-duplex Party line of N:N |

## 2. Correspondence support software

### ■Standard COM driver- COM-DRV(W32) appended

PCI bus and ISA Bus type (enhanced mode setup) Windows version driver software only for serial communication boards. By including this software in OS, the extended serial communication board is recognized by the serial port (COM port) and the same rank of the main part of a personal computer, and can be used from the commercial application which uses a serial port (COM port).

Moreover It is controllable using the standard function for serial ports for a programming language.

You can download the newest version for free from homepage of our company.



B-32

PCI BUS SERIES

Digital I/O Boards

Analog I/O Boards

Communication Boards

Counter & Motor Controller
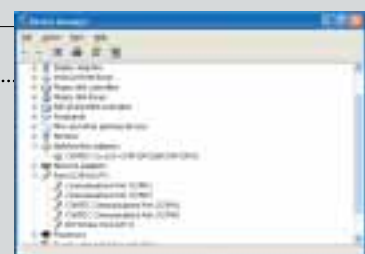
## 2 Port RS-232C Serial communication board
### COM-2(PCI)H   NEW

FEATURES
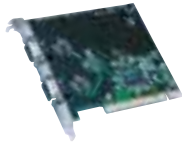- ●2 channels serial communication
- ●Programmable baud rate from 50 to 921,600bps
- ●Up to 16 boards can be used in a system

RS-232C

Standard COM Driver for Windows XP/2000/NT/Me/98/95 included
MS-DOS sample software included

### ■SPECIFICATIONS

| Interface Type | RS-232C(Async.) |
|---|---|
| Channels | 2ch |
| Speed | 50-921,600bps |
| Data type | 5-8 bits / 1,1.5,2 stop bit |
| Parity Check | even, odd, non-parity |
| Controller | 162850 compatible (I/O buffer:128Byte) |
| Interrupt | One interrupt request signal as INTA |
| Maximum distance | 15m |
| I/O address | Any 32-byte boundary |
| Power consumption (Max.) | +5VDC 250mA |

| Connector | 9-pin male D-type, DELC-J9PAF-20L9[JAE]or equivalent |
|---|---|
| PCI bus/ Dimension (mm) | 32bit, 33MHz, 5V/ 122.0(L)x107.0(H) |
| Option | |
| Software | ACX-PAC(W32)BP, ACX-PAC(W32)AP, API-PAC(W32) |
| Accessories | - |
| Cables/ Connector | RSS-9M/F, RSC-9F, RSS-25M/9F, RSC-25F/9F, CN5-D9F |

## 4 Port RS-232C Serial communication board
### COM-4(PCI)H   NEW

FEATURES
- ●4 channels serial communication
- ●Programmable baud rate from 50 to 921,600bps
- ●Up to 16 boards can be used in a system

RS-232C
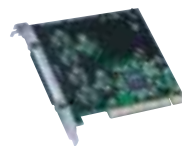
Standard COM Driver for Windows XP/2000/NT/Me/98/95 included
MS-DOS sample software included

### ■SPECIFICATIONS

| Interface Type | RS-232C(Async.) |
|---|---|
| Channels | 4ch |
| Speed | 50-921,600bps |
| Data type | 5-8 bits / 1,1.5,2 stop bit |
| Parity Check | even, odd, non-parity |
| Controller | 162850 compatible (I/O buffer:128Byte) |
| Interrupt | One interrupt request signal as INTA |
| Maximum distance | 15m |
| I/O address | Any 32-byte boundary |
| Power consumption (Max.) | +5VDC 500mA |

| Connector | 37-pin female D-type, DCLC-J37SAF-20L9[JAE] or equivalent |
|---|---|
| PCI bus/ Dimension (mm) | 32bit, 33MHz, 5V/ 122.0(L)x107.0(H) |
| Option | |
| Software | ACX-PAC(W32)BP, ACX-PAC(W32)AP, API-PAC(W32) |
| Accessories | CCU-78F/25M*[1], RSS-78M/37M |
| Cables/ Connector | PCE37/9PS, PCE37/25PS, COM-4M CABLE(PC)1, CN5-D37M |

*1:RSS-78M/37M is necessary

## 8 Port RS-232C Serial communication board
### COM-8(PCI)H   NEW

FEATURES
- ●8 channels serial communication
- ●Programmable baud rate from 50 to 921,600bps
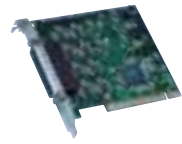- ●Up to 16 boards can be used in a system

RS-232C

Standard COM Driver for Windows XP/2000/NT/Me/98/95 included
MS-DOS sample software included

### ■SPECIFICATIONS

| Interface Type | RS-232C(Async.) |
|---|---|
| Channels | 8ch |
| Speed | 50-921,600bps |
| Data type | 5-8 bits / 1,1.5,2 stop bit |
| Parity Check | even, odd, non-parity |
| Controller | 162850 compatible (I/O buffer:128Byte) |
| Interrupt | One interrupt request signal as INTA |
| Maximum distance | 15m |
| I/O address | 64 port occupation |
| Power consumption (Max.) | +5VDC 600mA |

| Connector | 78-pin female D-type |
|---|---|
| PCI bus/ Dimension (mm) | 32bit, 33MHz, 5V/ 122.0(L)x107.0(H) |
| Option | |
| Software | ACX-PAC(W32)BP, ACX-PAC(W32)AP, API-PAC(W32) |
| Accessories | CCU-78F/25M*[1], RSS-78M |
| Cables/ Connector | PCE78/9PS, PCE78/25PS, CN5-D78M |

*1:RSS-78M is necessary
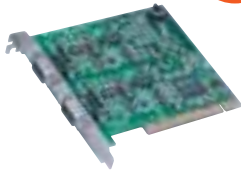
Digital I/O
Boards

Analog I/O
Boards

*Communication
Boards*

Counter &
Motor
Controller

## High Speed 2 Port Isolated RS-422/RS-485 serial communication board
## COM-2PD(PCI)H

NEW

**FEATURES**
- ●2 channels isolated RS-422A/RS-485
- ●Programmable baud rate from 50 to 921,600bps
- ●Full-duplex or half-duplex communication mode

RS-485  RS-422  Isolated

Standard COM Driver for Windows XP/2000/NT/Me/98/95 included

MS-DOS sample software included

### ■SPECIFICATIONS

| | |
|---|---|
| Interface Type | RS-422A/RS-485(Opto-isolated) Full-duplex or half-duplex communication mode |
| Channels | 2ch |
| Speed | 50-921,600bps |
| Data type | 5-8 bits / 1,1.5,2 stop bit |
| Parity Check | even, odd, non-parity |
| Controller | 162850 compatible (I/O buffer:128Byte) |
| Interrupt | One interrupt request signal as INTA |
| Maximum distance | 1200m |
| I/O address | Any 32-byte boundary |

| | |
|---|---|
| Power consumption (Max.) | +5VDC 550mA |
| Connector | 9-pin male D-type, DELC-J9PAF-20L9[JAE] or equivalent |
| PCI bus/ | 32bit, 33MHz, 5V/ |
| Dimension (mm) | 122.0(L)x107.0(H) |
| Option | |
|   Software | ACX-PAC(W32)BP, ACX-PAC(W32)AP, API-PAC(W32) |
|   Accessories | - |
|   Cables/Connector | CN5-D9F |

## High Speed 4 Port Isolated RS-422/RS-485 serial communication board
## COM-4PD(PCI)H

NEW

**FEATURES**
- ●4 channels isolated RS-422A/RS-485
- ●Programmable baud rate from 50 to 921,600bps
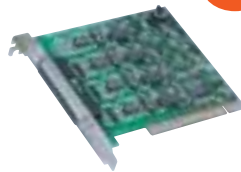- ●Full-duplex or half-duplex communication mode

RS-485  RS-422  Isolated

Standard COM Driver for Windows XP/2000/NT/Me/98/95 included

MS-DOS sample software included

### ■SPECIFICATIONS

| | |
|---|---|
| Interface Type | RS-422A/RS-485(Opto-isolated) Full-duplex or half-duplex communication mode |
| Channels | 4ch |
| Speed | 50-921,600bps |
| Data type | 5-8 bits / 1,1.5,2 stop bit |
| Parity Check | even, odd, non-parity |
| Controller | 162850 compatible (I/O buffer:128Byte) |
| Interrupt | One interrupt request signal as INTA |
| Maximum distance | 1200m |
| I/O address | Any 32-byte boundary |

| | |
|---|---|
| Power consumption (Max.) | +5VDC 950mA |
| Connector | 37-pin female D-type Connector, DCLC-J37SAF-20L9[JAE] or equivalent |
| PCI bus/ | |
| Dimension (mm) | 32bit, 33MHz, 5V/122.0(L)x107.0(H) |
| Option | |
|   Software | ACX-PAC(W32)BP, ACX-PAC(W32)AP, API-PAC(W32) |
|   Accessories | - |
|   Cables/Connector | PCE37/9PS, CN5-D37M |

## High Performance Intelligent RS-232C Multiport System
## COM-4FS(PCI)

**FEATURES**
- ●4-channel serial communication, RS-232C/RS-485 protocol
- ●A pair of on-board CPUs reduces the CPU on the motherboard in your PC and allows more than one communications protocols to be used at the same time

RS-232C  RS-485  C€

API function library attachment [API-PAC(W32)]

MS-DOS driver included

### ■SPECIFICATIONS

| | |
|---|---|
| Interface Type | RS-232C, RS-485(Async./Sync., Full-duplex/half-duplex) |
| Channels | 4ch |
| Speed | Async.:10-115,200bps, BOP:72-384,000bps, COP:100-9,600bps |
| Data type | Async.: 5-8 bits / 1,1.5,2 stop bit BOP: 5,7 bits, COP: 8 bits |
| Parity Check | Async.: even, odd, non-parity (software programmable) COP: non-parity |
| Controller | Async. :16552 or equivalent BOP, COP : uPD72001 or equivalent |

| | |
|---|---|
| Interrupt | One interrupt request signal as INTA |
| Maximum distance | RS-232C:15m, RS-485:1200m |
| I/O address | 128byte, 32byte |
| Power consumption (Max.) | +5VDC 2.5A |
| Connector | 25-pin D-type, 17JE-13250-02(D1)[DDK] |
| PCI bus/ | 32bit, 33MHz, 5V/ |
| Dimension (mm) | 313.8(L)x107.0(H) |
| Option | |
|   Software | - |
|   Accessories | - |
|   Cables/Connector | CN5-D25M |

# Communication Board  Connectors

## Connectors

**■9-pin D-type (male) Connector (5 pcs)**
**CN5-D9M**

**■9-pin D-type (female) Connector (5pcs)**
**CN5-D9F**

**■25-pin D-type (male) Connector (5 pcs)**
**CN5-D25M**

**■25-pin D-type (female) Connector (5 pcs)**
**CN5-D25F**

**■37-pin D-type (male) Connector (5 pcs)**
**CN5-D37M**

**■78-pin D-type (male) Connector (5 pcs)**
**CN5-D78M**

**Communication Boards**

Industrial
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Products

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PCI BUS SERIES

# Communication Board Accessories & Cables

## Cable for COM-8(PCI)H

■**78-pin D-type → 9-pin D-type (male) x 8 Shield Cable (1m)**
**PCE78/9PS** `Double Shield` `UL`

Shielded cable converts a 78-pin
D-type connector into eight 9-pin
D-type connectors (Male) for COM-
8(PCI)H.

■**78-pin D-type → 25-pin D-type (male) x 8 Shield Cable (1m)**
**PCE78/25PS** `Double Shield` `UL`

Shielded cable converts a 78-pin
D-type connector into eight 25-pin
D-type connectors (Male) for COM-
8(PCI)H.

## Cable for COM-4(PCI)H

■**37-pin D-type → 9-pin D-type (male) x 4 Shield Cable (0.25m)**
**PCE37/9PS** `Double Shield` `UL`

Shielded cable converts a 37-pin
D-type connector into four 9-pin
D-type connectors (Male) for
COM-4(PCI)H.

■**37-pin D-type → 25-pin D-type (male) x 4 Shield Cable (0.25m)**
**PCE37/25PS** `Double Shield` `UL`

Shielded cable converts a 37-pin
D-type connector into four 25-pin
D-type connectors (Male) for
COM-4(PCI)H.

## Distribution unit for the COM-8(PCI)H / COM-4(PCI)H

■**78-pin D-type → 25-pin D-type (male) 8ch Distribution Unit**
**CCU-78F/25M**

Distribution unit for the COM-
8(PCI)H / COM-4(PCI)H has 25-pin
D-type connectors of 8 channels.
The cable for connecting to the
interface board is not included with
CCU-78F/25M.
2 monitoring LEDs for
communication state of each
channel.
Can be attached to a DIN rail.

**Option Cable**

RSS-78M, RSS-78M/37M,
RSC-25F, RSS-25F/9M,
RSS-25M/F, RSC-25F/9F

■**78-pin D-type (male) → 78-pin D-type (male) connecting Cable (2m)**
**RSS-78M** `Double Shield` `UL`

COM-8(PCI)H connection cable for
CCU-78F/25M

■**78-pin D-type (male) → 37-pin D-type (male) connecting shielded Cable (2m)**
**RSS-78M/37M** `Double Shield` `UL`

COM-4(PCI)H connection cable for
CCU-78F/25M

# Communication Board Cables

## RS-232C Straight Cables

■**9-pin D-type (male) → 9-pin D-type (female) Shield Cable (1.8m)**
**RSS-9M/F** `Double Shield` `UL`

■**25-pin D-type (male) → 25-pin D-type (female) Shield Cable (1.8m)**
**RSS-25M/F** `Double Shield` `UL`

■**25-pin D-type (male) → 9-pin D-type (female) Shield Cable (1.8m)**
**RSS-25M/9F** `Double Shield` `UL`

■**25-pin D-type (female) → 9-pin D-type (male) Shield Cable (1.8m)**
**RSS-25F/9M** `Double Shield` `UL`

## RS-232C Cross Cables

■**9-pin D-type (female) → 9-pin D-type (female) Shield Cable (1.8m)**
**RSC-9F** `Double Shield` `UL`

■**25-pin D-type (female) → 25-pin D-type (female) Shield Cable (1.8m)**
**RSC-25F** `Double Shield` `UL`

■**25-pin D-type (female) → 9-pin D-type (female) Shield Cable (1.8m)**
**RSC-25F/9F** `Double Shield` `UL`
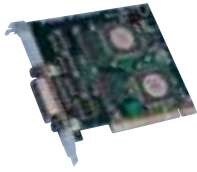
`Double Shield` :Double shield cable

`UL` :UL Mark

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PCI BUS SERIES

Digital I/O
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Analog I/O
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*Communication
Boards*

Counter &
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Controller

# IEEE-488.2/GPIB Interface Board
## GP-IB(PCI)

**FEATURES**
- Data can be transmitted at a maximum transmission rate of 1.2 Mbyte/sec
- 1Mbyte of FIFO is built in for data transmission and reception, so the maximum capacity data communication can be conducted
- Contains a GPIB bus analyzer function

GPIB | Memory on board | C€

API function library attachment [API-PAC(W32)]

### ■SPECIFICATIONS

| | |
|---|---|
| Interface Type | IEEE488.1, IEEE488.2 |
| Channels | 1ch |
| Speed | 1.2Mbyte/sec(Max.) |
| Data Format | 8 parallel limes, 3 handshake lines |
| Signal logic | Negative logic Low level : 0.8V or less, High level : 2.0V or more |
| Interrupt | One interrupt request signal as INTA |
| I/O address | Any 16-byte boundary |
| Cable length between device | 4m or less |
| Total cable length | 20m or less |
| Connectable number of device | Max. 15 devices |
| Power consumption (Max.) | +5VDC 970mA |

| | |
|---|---|
| Connector | 555139-1[AMP] or equivalent |
| PCI bus/ | 32bit, 33MHz, 5V/ |
| Dimension (mm) | 122.0(L)x107.0(H) |
| Option | |
| Software | ACX-PAC(W32)BP, ACX-PAC(W32)AP, SUPPORT-PAC(PC)202 Ver.2.30 upper, |
| Accessories | CN-GP |
| Cables/Connector | PCN-02, PCN-04 |

# IEEE-488.2/GPIB Interface Board
## GP-IB(PCI)L

**FEATURES**
- Conforming to the IEEE-488.2 standard, the GP-IB(PCI)L can exchange signals with a variety of external devices compliant with the standard
- The board can use the CONTEC FPGA (uPD7210C compatible) as a GPIB controller for long-term stable supply

GPIB

API function library attachment [API-PAC(W32)]

### ■SPECIFICATIONS

| | |
|---|---|
| Interface Type | IEEE488.1, IEEE488.2 |
| Channels | 1ch |
| Speed | 120Kbyte/sec(Max.) |
| Data Format | 8 parallel limes, 3 handshake lines |
| Signal logic | Negative logic  L-Level: 0.8V or less H-Level: 2.0V or more |
| Controller chip | CONTEC original FPGA (uPD7210C compatible) |
| Interrupt | One interrupt request signal as INTA |
| I/O address | Any 32-byte boundary |
| Cable length between device | 4m or less |
| Total cable length | 20m or less |
| Connectable number of device | Max. 15 devices |

| | |
|---|---|
| Power consumption (Max.) | +5VDC 300mA |
| Connector | 555139-1[AMP] or equivalent |
| PCI Bus/ | 32bit, 33MHz, 5V/ |
| Dimension (mm) | 120.0(L)x107.0(H) |
| Option | |
| Software | ACX-PAC(W32)BP Ver.2.1 upper, ACX-PAC(W32)AP Ver.2.1 upper, SUPPORT-PAC(PC)202 Ver.2.40 upper, |
| Accessories | CN-GP |
| Cables/Connector | PCN-02, PCN-04 |

# Cable & Accessories

## GPIB Cable

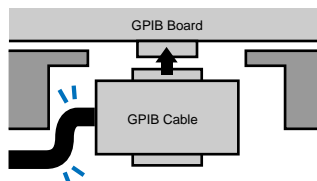| PCN-02 | 2m |
|---|---|
| **PCN-04** | **4m** |

High noise eliminate and high reliable GPIB cable
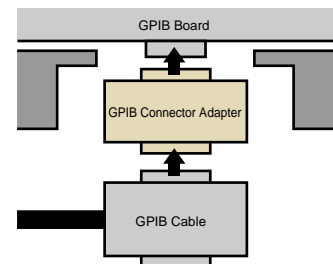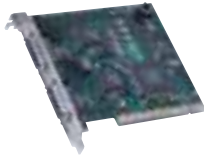
## GPIB Connector Adapter
### CN-GP

The connector adapter is useful when slot is tough to insert board.

GPIB Board

GPIB Cable

When a GPIB cable conflicts with a case, please use a CN-GP.

GPIB Board

GPIB Connector Adapter

GPIB Cable

# Parallel Port Extension Board
## PRN-2(PCI)

● Providing two channels of the IEEE 1284 compatible Centronics interface
● Supporting the five IEEE 1284 modes (Compatibility, Nibble, Byte, EPP, ECP) selectable depending on the OS and machine type

**CE**

Attached LPT Driver for Windows XP/NT/Me/98/95

### ■SPECIFICATIONS

| | |
|---|---|
| Channels | 2ch |
| Communication standard | Conforming to IEEE 1284 |
| Communication mode | Compatibility, Nibble, Byte, EPP, ECP |
| Hardware specification | TTL level (+5VDC) |
| Controller | ST78C36CJ44(EXAR) or equivalent |
| Reference clock | 24MHz(Reference clock of on-chip LSI) |
| Maximum distance | 5m (depending on wiring environment) |
| Interrupt | 1 level |
| I/O address | 16 ports (control ports) + (8 ports + 4 ports) x 2 |
| Supply voltage | +5VDC(±5%) |
| Power consumption (Max.) | +5VDC 150mA |
| Outside Dimensions (mm) | 122.0(L)x107.0(H) |

| | |
|---|---|
| Connector | DHA-RP36-R13AN[DDK] or equivalent |
| Option | |
| Software | - |
| Accessories | - |
| Cables/Connector | PRN-CB105 |

PRN-CB105(5m)

# Driver Software for PRN-2(PCI)
## PRN-DRV(W32)

Windows driver software for PRN-2(PCI)

This driver software is attached to PRN-2(PCI).
The PRN-2(PCI) package contains utility software for Windows.
The utility software displays the LPT numbers assigned to the individual channels on the PRN-2(PCI) board.
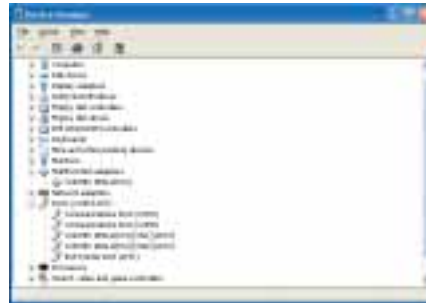
| Machine type | O S | IEEE 1284 Modes | | | | |
|---|---|---|---|---|---|---|
| | | Compatibility | Nibble | Byte | EPP | ECP |
| PC/AT compatible | Windows XP/Me/98/95 | ○ | ○ | ○ | ○ | ○ |
| | Windows NT 4.0 | ○ | ○ | × | × | × |

# Cable (Optional)

# IEEE 1284 Printer cable
## PRN-CB105

36-pin half-pitch ➝ 36-pin Centronics
Conversion connector

# Communication Board for DeviceNet

## DeviceNet PCI Bus Board
## FDN(PCI)

- This board can be used for communicating with the master/slave machines in conformity with DeviceNet Release 2.0
- I/O Communication (Polling,Bit Strobe, Change of State/Cyclic, Peer), Explicit Communication, and System Messaging are all supported
- With the device definition tool, the communication parameter (communication type, sending cycle, sending data size and so on) of the connecting device can be easily set
- This board features a 32-Bit RISC processor and supports high-speed I/O update cycle in 1024-Point per 10msec (when works at 250k/500kbps)

**DeviceNet**
CONFORMANCE TESTED

**This product has passed ODVA CONFORMANCE TESTED**

| Driver software [FLB-DRV(DNX)] for Windows 2000/NT 4.0 included |
| --- |

## ■Hardware Specification

| | Item | Specification |
| --- | --- | --- |
| **Network** | Number of DeviceNet Connection Channels | 1ch |
| | Network Speed | Selectable data rates of 125kbps, 250kbps and 500kbps |
| | MAC ID | Selectable MAC ID of 0 - 63 |
| | Max. number of connectable nodes | 64(Include itself) |
| | Network Power Supply | 11 - 25V (FDN(PCI) Received Voltage) |
| | Power consumption-current | 60mA(Max.) (+24VDC) |
| | Connector for Connection | Open Plug Connector |
| | Hot Plug-In and Plug-Out | No (Neither network-power nor self-power) |
| **Common** | External dimensions (mm) | PCI Bus Short-size 176.4(L) x 107.0(H) |
| | consumption-current | DC+5V 1.1A |
| | Operating Requirements | 0 - 50℃, 20 - 90% (No condensation) |
| | Weight | 110g |
| | Number of boards that are used simultaneously | 4(max.) |

## ■List of Supported Functions

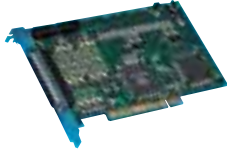| Classification | | | Function | | Remarks |
| --- | --- | --- | --- | --- | --- |
| **I/O Communication Function** | **Base Part** | **Peer** | Non-Fragment | | |
| | | | Fragment | | 128byte Max. |
| | | **Master** | Poll | | |
| | | | Bit Strobe | | |
| | | | Change of State/Cyclic | | |
| | | | ACK Handler | | |
| | | | PROXY | | |
| | | | Fragment | | 128byte Max. |
| | | **Slave** | Poll | | |
| | | | Bit Strobe | | |
| | | | Change of State/Cyclic | | |
| | | | Fragment | | 128byte Max. |
| | **Expansion Part** | **User Interface** | **Memory** | Cycle | |
| | | | | Event | |
| | | **Data Exclusive Process** | Exclusive | | 128byte Max. |
| | | | Not Exclusive | | 4byte Max. |
| **Explicit Communication Function** | | | Client Function | | 70byte Max. |
| | | | Client Function(User Release) | | 70byte Max. |
| | | | Server Function(In Protocol) | | 70byte Max. |
| | | | Connection Establishment/Opening(UCMM)Request | | |
| | | | Connection Establishment/Opening(UCMM)Request(User Release) | | |
| | | | Connection Establishment/Opening(UCMM)Response | | |
| **System Management Function** | | | HeartBeat Sending | | |
| | | | HeartBeat Receiving | | |
| | | | Shutdown Sending | | |
| | | | Shutdown Receiving | | |
| | | | Dup Mac ID Detection | | |

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**PCI BUS SERIES**

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Analog I/O
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*Communication
Boards*

Counter &
Motor
Controller

Digital I/O
Boards

Analog I/O
Boards

Communication
Boards

Counter &
Motor
Controller

**Counter & Motor Controller**

## 4 Channels 24-Bit Up/Down Counter Board
### CNT24-4(PCI)

**FEATURES**
- 24-bit up/down counter for four channels
- Counts two phase signals from devices like rotary encoders or linear gauges
- Opto-isolated input or TTL level input for each channel

Isolated  C E

API function library attachment [API-PAC(W32)]

### ■SPECIFICATIONS

| | |
|---|---|
| Channels | 4ch |
| Counting system | 24-bit up/down counter |
| Input type | single-phase or two-phase pulse input |
| Response frequency | TTL-level : 1MHz (duty 50%), Opto-isolated input : 500KHz (duty: 50%) |
| Timer | 1msec-200sec |
| Max. count | 24 bits (binary data) |
| Input specification | TTL-level input, Opto-isolated input : 5 - 12VDC , (Input resistor : 220 Ω) |
| Interrupt | Generates by each channel count coincidence or timer runs out of preset time |
| I/O address | 4 port occupation |
| Other function | Filter, Counter coincidence signal output |
| Power consumption (Max.) | +5VDC 400mA |

| | |
|---|---|
| Connector | Opto-isolated : DCLC-J37SAF-20L9 [JAE] or equivalent TTL-level input : PS-30PE-D4TIPNI [JAE] or equivalent |
| PCI bus/ Dimension (mm) | 32bit, 33MHz, 5V/ 176.4(L)x107.0(H) |
| Option | |
| Software | ACX-PAC(W32)BP , ACX-PAC(W32)AP, DDE SERVER(W32) |
| Accessories | DTP-3(PC), DTP-4(PC), EPD-37*1 |
| Cables/ Connector | PCA37P, PCB37P, PCA37PS, PCB37PS, DT/O, DT/B2, CN5-D37M |

*1:Option cable of PCB37P or PCB37PS is required.

## 4 Channels 24-Bit Differential Up/Down Counter Board
### CNT24-4D(PCI)

**FEATURES**
- 24-bit up/down counter for four channels
- The board is equipped with a programmable timer to allow interrupts to be generated periodically according to a specified timer value
- Differential input or TTL level input for each channel

API function library attachment [API-PAC(W32)]

### ■SPECIFICATIONS

| | |
|---|---|
| Channels | 4ch |
| Counting system | 24-bit up/down counter |
| Input type | single-phase or two-phase pulse input |
| Response frequency | Line-receiver : Max 1MHz (duty 50%), TTL-level input : Max 1MHz (duty 50%) |
| Timer | 1msec-200sec |
| Max. count | 24 bits (binary data) |
| Input specification | TTL-level input, Line-receiver : Input voltage range ±7V |
| Interrupt | One. Generated when each channel count matches or the timer runs out of time. |
| I/O address | Any 32-byte boundary |
| Other function | Filter, Counter coincidence signal output |
| Power consumption (Max.) | +5VDC 500mA |

| | |
|---|---|
| Connector | PCR-E96LMD [HONDA Tsushin Kogyo] or equivalent |
| PCI bus/ Dimension (mm) | 32bit, 33MHz, 5V/ 176.4(L)x107.0(H) |
| Option | |
| Software | ACX-PAC(W32)BP, ACX-PAC(W32)AP |
| Accessories | DTP-3(PC)*1, DTP-4(PC)*1, EPD-37*1, EPD-96*2 |
| Cables/ Connector | PCA96P, PCB96P, PCA96PS, PCB96PS, PCB96WS, CN5-H96F |

*1:Option cable of PCB96WS is required
*2:Option cable of PCB96P or PCB96PS is required.

## PCI Bus Master High Speed
## 8 Channels 32-Bit Up/Down Counter Board
### CNT32-8M(PCI) NEW

**FEATURES**
- At bus master transfer, the board can achieve transfers speed of 80MB/sec without CPU Loads
- The SC connector allows synchronous operation with other boards

Bus Master

API function library attachment [API-PAC(W32)]

### ■SPECIFICATIONS

| | |
|---|---|
| Channels | 8ch |
| Counting system | 32-bit up/down counter (Two-phase/Single-phase/Single-phase with Gate control) |
| Input type | Phase A / UP at each channel Phase B/DOWN One x 8 channels Phase Z/CLR at each channel |
| Response frequency | Line-receiver : 10MHz (duty 50%) TTL-level : 10MHz (duty 50%) |
| Timer | 1-6553msec (specifiable in steps of 1msec) |
| Max. count | 32 bits (binary data) |
| Input specification | TTL-level input, Line-receiver : Input voltage range ±7V |
| Interrupt | 1 interrupt (Factor of interrupt: count matches, counter error, SCC error, carry/borrow, timer, etc.) |

| | |
|---|---|
| I/O address | 32 port, 64 port |
| Other function | Low-pass filter, Count coincidence pulse output, a test pulse output, disconnection alarm detection |
| Power consumption (Max.) | +5VDC, 1A |
| Connector | PCR-E96LMD [HONDA Tsushin Kogyo] or equivalent PS-10PE-D4L1-B1[JAE] or equivalent x 2 |
| PCI bus/ Dimension (mm) | 32bit, 33MHz, 5V/ 176.4(L)x107.0(H) |
| Option | |
| Software | - |
| Accessories | EPD-96*1, DTP-64(PC)*1 |
| Cables/ Connector | PCB96PS-1.5, PCB96P-1.5, PCA96PS-1.5, PCA96P-1.5, CN5-H96F |

*1:Option cable of PCB96 or PCB96PS is required.

Counter & Motor Controller

Industrial
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PCI BUS SERIES

# High-Speed 2 Axis Motor Control Board
## SMC-2P(PCI)

●The board supports a stepping motor or servo motor (pulse train input type)
●The board can store up to 1000 frames each of which carries the information required for a single positioning sequence, such as the speed, acceleration/deceleration rates, and target location
●The board can control multiple axes (up to 32 axes) in synchronization

CE

**API function library attachment [API-PAC(W32)]**

### ■SPECIFICATIONS

| | |
|---|---|
| Channels | 2 axis |
| Pulse output type | Open collector output( Software selectable logic, positive or negative) |
| Signal format | CW/CCW or pulse/direction |
| Pulse rate | 0.1-1,000,000PPS |
| **Encoder Input** | |
| Input signal type | single-phase Input (UP/DOWN/Z), Phase input (A/B/Z) |
| Signal type | High-speed opto-Isolated input |
| Response frequency | 1MHz |
| Input resistance | A.B:220Ω/Z:510Ω |
| **Limit signal** | |
| Signal channels | 3 signals/ch (ORG, +LIM, -LIM) |
| Signal type | Opto-Isolated input (12-24VDC) |
| Input resistance | 3kΩ |
| **General Purpose Input** | |
| Signal channels | 7 signals/ch |
| Signal type | Opto-Isolated input (12-24VDC) |
| Input resistance | IN1, IN3-IN7: 3KΩ,  IN2:1.8KΩ |

| **General Purpose Output** | |
|---|---|
| Signal channels | 3 signals/ch |
| Signal type | Open collector output |
| Output rating | +35VDC 100mA |
| Controller chip | PCL5014 [NPM] |
| Interrupt | - |
| I/O address | Any 16-byte boundary |
| Power consumption (Max.) | +5VDC 800mA |
| Connector | PCR-E96LMD [HONDA Tsushin Kogyo] or equivalent |
| PCI bus/ | 32bit, 33MHz, 5V/ |
| Dimension (mm) | 176.4(L)x107.0(H) |
| **Option** | |
| Software | - |
| Accessories | CCB-SMC1*¹ |
| Cables/ Connector | PCA96P, PCB96P, PCA96PS, PCB96PS, CN5-H96F |

*1:Option cable of PCB96P or PCB96PS is required.

# High-Speed 4 Axis Motor Control Board
## SMC-4P(PCI)

●The board supports a stepping motor or servo motor (pulse train input type)
●The board can store up to 1000 frames each of which carries the information required for a single positioning sequence, such as the speed, acceleration/deceleration rates, and target location
●The board can control multiple axes (up to 64 axes) in synchronization

CE

**API function library attachment [API-PAC(W32)]**

### ■SPECIFICATIONS

| | |
|---|---|
| Channels | 4 axis |
| Pulse output type | Open collector output( Software selectable logic, positive or negative) |
| Signal format | CW/CCW or pulse/direction |
| Pulse rate | 0.1-1,000,000PPS |
| **Encoder Input** | |
| Input signal type | single-phase Input (UP/DOWN/Z), Phase input (A/B/Z) |
| Signal type | High-speed opto-Isolated input |
| Response frequency | 1MHz |
| Input resistance | A.B:220Ω/Z:510Ω |
| **Limit signal** | |
| Signal channels | 3 signals/ch (ORG, +LIM, -LIM) |
| Signal type | Opto-Isolated input (12-24VDC) |
| Input resistance | 3kΩ |
| **General Purpose Input** | |
| Signal channels | 7 signals/ch |
| Signal type | Opto-Isolated input (12-24VDC) |
| Input resistance | IN1, IN3-IN7: 3KΩ,  IN2:1.8KΩ |

| **General Purpose Output** | |
|---|---|
| Signal channels | 3 signals/ch |
| Signal type | Open collector output |
| Output rating | +35VDC 100mA |
| Controller chip | PCL5014 [NPM] |
| Interrupt | - |
| I/O address | Any 16-byte boundary |
| Power consumption (Max.) | +5VDC 900mA |
| Connector | PCR-E96LMD [HONDA Tsushin Kogyo] or equivalent |
| PCI bus/ | 32bit, 33MHz, 5V/ |
| Dimension (mm) | 176.4(L)x107.0(H) |
| **Option** | |
| Software | - |
| Accessories | CCB-SMC1*¹ |
| Cables/ Connector | PCA96PS, PCB96PS, PCA96P, PCB96P, CN5-H96F |

*1:Option cable of PCB96P or PCB96PS is required.

Digital I/O Boards

Analog I/O Boards

Communication Boards

*Counter & Motor Controller*

# CNT24-4(PCI) Cables (Optional)

## 30-pin Header Connector Flat Cables

■**30-pin Header to 37-pin D-type (F) Cable (0.5m) with Bracket**
**DT/B2**

A cable for the TTL-level input

■**Flat cable (1.5m)**
**DT/O**

A cable for the TTL-level input

## 37-pin D-type Connector Board Accessories and Cables (Optional)

### Terminal Unit

**EPD-37**

35mm DIN-Rail mountable
Compatible Boards : 32ch
I/O Boards
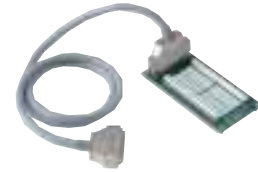Terminal pace 10mm

* Cables is option

**DTP-3(PC)**

* Cable (1m) attached

**DTP-4(PC)**

* Cable (1m) attached

### Cables/Connector

■**37-pin D-type → 37-pin D-type Shield Cables**

| | |
|---|---|
| **PCB37PS-0.5P** | 0.5m |
| **PCB37PS-1.5P** | 1.5m |
| **PCB37PS-3P** | 3.0m |
| **PCB37PS-5P** | 5.0m |

■**37-pin D-type → 37-pin D-type Flat Cables**

| | |
|---|---|
| **PCB37P-1.5** | 1.5m |
| **PCB37P-3** | 3.0m |
| **PCB37P-5** | 5.0m |

■**37-pin D-type → 37 wires (Pitch 1.27mm) Shield Cables**

| | |
|---|---|
| **PCA37PS-0.5P** | 0.5m |
| **PCA37PS-1.5P** | 1.5m |
| **PCA37PS-3P** | 3.0m |
| **PCA37PS-5P** | 5.0m |

■**37-pin D-type → 37 wires (Pitch 1.27mm) Flat Cable**

| | |
|---|---|
| **PCA37P-1.5** | 1.5m |
| **PCA37P-3** | 3.0m |
| **PCA37P-5** | 5.0m |

■**37-pin D-type (male) Connector (5 pcs)**
**CN5-D37M**
●**Easy soldering**

### ■CONFIGURATION GUIDE

37pinD-SUB

PCB37PS — EPD-37
PCB37P

Attached cable — DTP-3(PC) — **To device**
Attached cable — DTP-4(PC)

PCB37PS — **Connect each signal of cable to device**
With DT/B2
PCB37P

With DT/O — **Connect each signal of cable to device**

Device

# Motor Control Board Accessories (Optional)

## Terminal Unit

### ■SMC-2P(PCI), SMC-4P(PCI) Terminal Unit
### CCB-SMC1

The CCB-96 connector converter board converts 96-pin half pitch connectors to a pair of general-purpose 37-pin female D-type connectors. Encoder input type supports a line driver and an open collector both(jumperselectable)
Connection of various limit sensors is easy with a screw type terminal.
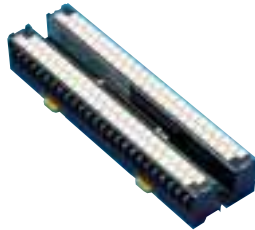DIN-ADP1(option) enables CCB-SMC1 to attach on 35mm DIN rail.
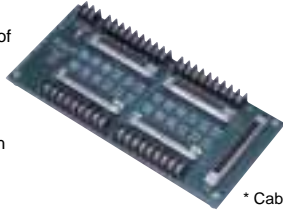
* Cables is option

## 96-pin Half Pitch Connectors  Board Accessories and cables

### Terminal Unit

**EPD-96**

**35mm DIN-Rail mountable**
**Terminal pace 8.5mm**

* Cables is option

**DTP-64(PC)**

* Cables is option

### Cables/Connector

**■96-pin Half Pitch → 96-pin Half Pitch Shield Cable**

| | |
|---|---|
| PCB96PS-1.5 | 1.5m |
| PCB96PS-3 | 3.0m |
| PCB96PS-5 | 5.0m |

**■96-pin Half Pitch → 96-pin Half Pitch Flat Cable**

| | |
|---|---|
| PCB96P-1.5 | 1.5m |
| PCB96P-3 | 3.0m |
| PCB96P-5 | 5.0m |

**■96-pin Half Pitch → 96 wires (Pitch 1.27mm) Shield Cables**

| | |
|---|---|
| PCA96PS-1.5 | 1.5m |
| PCA96PS-3 | 3.0m |
| PCA96PS-5 | 5.0m |

**■96-pin Half Pitch → 96 wires (Pitch 1.27mm) Flat Cables**

| | |
|---|---|
| PCA96P-1.5 | 1.5m |
| PCA96P-3 | 3.0m |
| PCA96P-5 | 5.0m |

**■96-pin Half Pitch → 37-pin D-type (male) x 2 Connector Converter Shield Cable**

| | |
|---|---|
| PCB96WS-1.5 | 1.5m |
| PCB96WS-3 | 3.0m |
| PCB96WS-5 | 5.0m |

**■96-pin Half Pitch → 37-pin D-type (male) x 2 Connector Converter Flat Cable**

| | |
|---|---|
| PCB96W-1.5 | 1.5m |
| PCB96W-3 | 3.0m |
| PCB96W-5 | 5.0m |

**■96-pin Half Pitch (female) Connector (5 pcs)**
**CN5-H96F**

Diagram:

96pinHalf

With CCB-SMC1
PCB96PS / PCB96P → CCB-SMC1 → To device

With Terminal unit
PCB96PS → EPD-96 → To device
PCB96P → DTP-64(PC)

Without Accessory
PCA96PS / PCA96P → Connect each signal of cable to device

Device