

# PIO-16/16L(CB)H



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

#### Features

The signal assignment for the connector is compatible with the PIO-16/16L(PCI)H, PIO-16/16L(PCI), and PIO-16/16L(PM).

The response time has been improved to 200 sec or better.

Individual external power supplies can be used for each common pin as it is shared by 16 signal points.

The PC card slot side (PC) and the I/O interface are isolated from each other by an Optocoupler, offering good noise immunity.

You can use all of the input signals as interrupt inputs. You can also select the interrupt trigger edge of the input signal.

The PC card has a digital filter feature to prevent noise or chatter from causing erroneous inputs.

Up to 35 VDC, 100 mA per signal, max. output.

The output transistor has a zener diode connected to protect the PC card from surge voltages.

Overcurrent protective device provided for every eight channels of output transistors.

#### Packing List

PC Card[PIO-16/16L(CB)H] ...1 Cable with isolation unit [PIO-16/16L(CB)H-BOX and CB-PM68/37] ...1 First step guide ... 1 CD-ROM \*1 [API-PAC(W32)] ...1

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

This product is a PC Card Standard compliant CardBus TYPE II size PC Card for input/output of digital signals.

This product can input and output digital signals at 12 to 24 VDC and can input and output up to 16 channels.

Using the bundled Driver library [API-PAC(W32)], you can create Windows application software for this PC card in your favorite programming language supporting Win32 API functions, such as Visual Basic or Visual C/C++.

If your PC has two TYPE II size PC card slots one on top of the other, you cannot use two cards in both slots at the same time. This is because of the shape of the cable connector. However, you can use this card together with another PC card that does not require an external connector such as a memory PC card.

Specification

Item		Specification				
Input	Input					
Input	format	Optocoupler isolated input (Compatible with current sink output)(Negative logic *1)				
Number of input signal channels		16 channels (all available for interrupts) (1 common pin)				
Input	resistance	4.7kΩ				
Input ON current		2.0 mA or more				
Input	OFF current	0.16 mA or less				
Interr	rupt	16 interrupt input signals are arranged into a single output of interrupt signal INTA.				
		transition) or rising edge (LOW-to-HIGH transition).				
Resp	onse time	200µsec within				
Output						
Outp	ut format	Optocoupler isolated open collector output (current sink type) (Negative logic *1)				
Number of output signal channels		16 channels (1 common)				
Outp	ut Output voltage	35 VDC (Max.)				
rating	Output current	100 mA (par channel) (Max. )				
Resid on	dual voltage with output	0.5V or less (Output current≤50 mA), 1.0V or less (Output current≤100 mA)				
Surge	e protector	Zener diode RD47FM(NEC) or equivalent				
Resp	onse time	200usec within				
Commor	า	-				
I/O a	ddress	8 bit x 32 port boundary				
Interr	uption level	1 level use				
Diele	ctric strength	1000Vrms				
Exter suppl	nal circuit power ly	12 to 24 VDC(±10%)				
Powe	er consumption	3.3 VDC 200 mA (Max.)				
Oper	ating condition	0 to 50°C, 10 to 90%RH (No condensation)				
Allow	vable distance of signal	Approx. 50m (depending on wiring environment)				
Cable	e lenath	1m				
Com	patible PC card slot	PC card Standard compliant CardBus				
Dime	nsion (mm)	85.6(w) x 54.0(D) x 5.0(H) TYPE II *2				
Weig	ht	440g(Total weight of PC card, connection cable, isolation circuit box)				
*1 Data "0" and "1" correspond to the High and Low levels, respectively.						

\*2 On PCs with two TYPE II size PC card slots arranged vertically, two PIO-16/16L(CB)H cards cannot be used in the two slots at the same time. This is due to the shape of the cable connectors.

#### PC card Dimensions



: PCA37PS-1.5P (1.5m)

: PCA37PS-3P (3m)

: PCA37PS-5P (5m)

Ver.1.10

## Support Software

#### Driver Library API-PAC(W32) (Bundled)

API-PAC(W32) is the library software that provides the commands for CONTEC hardware products in the form of Windows standard Win32 API functions (DLL). It makes it easy to create high-speed application software taking advantage of the CONTEC hardware using various programming languages that support Win32 API functions, such as Visual Basic and Visual C/C++.

It can also be used by the installed diagnosis program to check hardware operations.

CONTEC provides download services to supply the updated drivers and differential files. For details, read Help on the bundled CD-ROM or visit the CONTEC's Web site.

< Operating environment >

OS Windows XP, 2000, Me, 98, etc..

Adaptation language Visual C/C++, Visual Basic, Delphi, Builder, etc..

Others Each piece of library software requires 50 megabytes of free hard disk space.

# Linux version of digital I/O driver API-DIO(LNX) (Supplied: Stored on the API-PAC(W32) CD-ROM)

This driver is used to control CONTEC digital I/O boards (PC cards) from within Linux.

You can control CONTEC I/O boards easily using the shared library used by gcc and Kylix, the device driver (module) for each kernel version, and the board (PC card) configuration program (config).

CONTEC provides download services to supply the updated drivers and differential files.

For details, read Help on the bundled CD-ROM or visit the CONTEC's Web site.

< Operating environment >

os	RedHatLinux, TurboLinux, etc (For details on supported distributions, refer to Help available after installation.)
Adaptation language	gcc, Kylix, etc
Others	Requires 3 megabytes of free hard disk space.

# Data acquisition VI library for LabVIEW VI-DAQ (Free download)

This is a VI library to use in National Instruments LabVIEW. VI-DAQ is created with a function form similar to that of LabVIEW's Data Acquisition VI, allowing you to use various devices without complicated settings.

See http://www.contec.co.jp/vidaq/ for details and download of VI-DAQ.

## Cable & Connector

#### Cable (Option)

Flat Cable with a 37-Pin D-SUB (	Connectors at 2 Ends : PCB37P-1.5 (1.5m) : PCB37P-3 (3m) : PCB37P-5 (5m)
Shielded Cable with a 37-Pin D-S	UB Connectors at 2 Ends : PCB37PS-0.5P (0.5m) : PCB37PS-1.5P (1.5m) : PCB37PS-3P (3m) : PCB37PS-5P (5m)
Flat Cable with a 37-Pin D-SUB (	Connector : PCA37P-1.5 (1.5m) : PCA37P-3 (3m) : PCA37P-5 (5m)
Shielded Cable with a 37-Pin D-S	UB Connector

#### Connector (Option)

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

Accessories

#### Accessories (Option)

· · · ·	
Relay Terminal Unit for Crimping	: EPD-37 *1
Relay Terminal Unit for Crimping	: EPD-37A *1
Termination Panel (M3)	: DTP-3(PC)
Terminal Unit for Cables	: DTP-4(PC)
Signal Monitor for Digital I/O	: CM-32(PC)E *1

\*1 PCB37P or PCB37PS optional cable is required separately.

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

#### **Block Diagram**



# Using the On-board Connectors

# Connecting a Device to a Connector

To connect an external device to this PC card, plug the cable from the device into the interface connector [37pin D-SUB(female)]shown below.



#### Pin Assignments of Interface Connector



# **Connecting Input Signals**

Connect the input signals to a device which can be current-driven, such as a switch or transistor output device. The connection requires an external power supply to feed currents.

The PC card inputs the ON/OFF state of the current-driven device as a digital value.

#### Input Circuit



The input circuits of interface blocks of this product is illustrated in the image above.

The signal inputs are isolated by the Optocoupler (ready to accept current sinking output signals). The PC card therefore requires an external power supply to drive the inputs. The power requirement for each input pin is about 5.1 mA at 24 VDC (about 2.6 mA at 12 VDC).

# **Connecting a Switch**



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

# **Connecting Output Signals**

The connection requires an external power supply to feed currents.

The PC card controls turning on/off the current-driven controlled device using a digital value.

#### **Output Circuit**



The output circuits of interface blocks of this product is illustrated in the image above. The signal output section is an the Optocoupler isolated, open-collector output (current sink type). Driving the output section requires an external power supply.

The rated output current per channel is 100 mA at maximum.

The output section can also be connected to a TTL level input as it uses a low-saturated transistor for output. The residual voltage (low-level voltage) between the collector and emitter with the output on is 0.5V or less at an output current within 50 mA or at most 1.0V at an output current within 100 mA.

A zener diode is connected to the output transistor for protection from surge voltages. A PolySwitch-based overcurrent protector is provided for every eight output transistors. When the overcurrent protector works, the output section of the PC card is temporarily disabled. If this is the case, turn of the power to the PC and the external power supply and wait for a few minutes, then turn them on back.

A CAUTION

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

#### **Connection to the LED**



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

# Example of Connection to TTL Level Input



# Connecting the Sink Type Output and Sink Output Support Input

The following example shows a connection between a sink type output (output PC card) and a sink output support input (input PC card). Refer to this connection example when you connect such PC cards to each other.

