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

Features

Input Interface

- Capable of receiving digital signals at 12 to 24 VDC or at 24 to 48 VDC through 16 input channels.
- Supports both of current sink and current source outputs.
- Capable of selecting a voltage range of 12 to 24 VDC or 24 to 48 VDC for each channel.
- Directly accepts the output device of a leakage current (OFF current) of up to 1 mA.
- Provided with a digital filter feature to prevent noise or chatter from causing erroneous input.
- You can use all of the input signals as interrupt inputs. You can also select the interrupt trigger edge of the input signal.

Output Interface

- The board can output digital signals of up to 120 VAC/VDC through 16 channels.
- A load of up to 100 mA can be driven per channel.
- The PCI bus (personal computer) and the I/O interface are isolated from each other by an Optocoupler or semiconductor relay, offering good noise immunity.

Included Items

Product [PIO-16/16RY(PCI)] ...1 Please read the following ... 1 This board is a PCI-compliant interface board for input/output of digital signals.

The board provides 16 Optocoupler isolated input channels and 16 semiconductor-relay output channels.

Windows/Linux driver is supported with this product.

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

*The contents in this document are subject to change without notice. *Visit the CONTEC website to check the latest details in the document. *The information in the data sheets is as of October, 2022.

Hardware specifications

ltem	Specification		
Input			
Input format	Optocoupler isolated input (Both of current sink and source outputs supported)		
Number of input signal points	16 points (all available for interrupts) (1 common pin)		
Input resistance	3 k Ω (with 12 to 24 V selected) or 6 k Ω (with 24 to 48 V selected)		
Input ON current	3.1mA or more		
Input OFF current	1.0mA or less		
External circuit power supply	12 - 24 VDC (±10%) or 24 - 48 VDC (±10%) (selected by jumper switch)		
Interrupt	16 interrupt input signals are arranged into a single output of interrupt signal INTA. An interrupt occurs at the OFF-to-ON or ON-to-OFF edge (software-selected)		
Response time	200µsec within		
Output			
Output format	Semiconductor relay output		
Number of output signal points	16 points (1 common)		
Output Output voltage	120VAC/DC(Max)		
rating Output current	100mA (par channel) (Max.)		
Device used	PS7221A-2A (NEC) *2		
ON resistance	10.0Ω or less *2		
OFF leakage current	1.0µA or less		
Response time	1.0msec within		
Common			
I/O address	Any 32-byte boundary		
Interruption level	1 level use		
Max. board count for connection	16 boards including the master board		
Dielectric strength	1000Vrms		
Power consumption	5VDC 400mA(Max)		
Operating condition	0 - 50°C, 10 - 90%RH (No condensation)		
Allowable distance of signal extension	Approx. 50m (depending on wiring environment)		
PCI bus specification	33bit, 33MHz, Universal key shapes supported *1		
Dimension (mm)	176.41(L) × 105.68(H)		
Weight	130g		
Certification	VCCI Class A, CE Marking (EMC Directive Class A, RoHS Directive), UKCA		

*1 This board requires power supply at +5V from an expansion slot (it does not work on a machine with a +3.3V power supply alone).

*2 If the board No is 7228, "Device used" is "PS7221-2A (NEC)" and "ON resistance" is 8.00 or less.

Physical Dimensions



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

Support Software

You can use CONTEC support software according to your purpose and development environment. For more details on the supported OS, applicable languages, or to download the latest version of software, visit the CONTEC Web site.

Name	Contents	How to get
Windows Version Digital I/O Driver software API-DIO(WDM)	The API-DIO(WDM) is the Windows version driver software that provides products in the form of Win32 API functions (DLL). Various sample programs such as Visual Basic and Visual C++, etc and diagnostic program useful for checking operation is provided.	Download from the CONTEC website
Linux Version Digital I/O Driver software API-DIO(LNX)	The API-DIO(LNX) is the Linux version driver software which provides device drivers (modules) by shared library and kernel version. Various sample programs of gcc are provided.	Download from the CONTEC website
LabVIEW-support data acquisition library DAQfast for LabVIEW	This is a data collection library to use in the LabVIEW by National Instruments. With Polymorphic VI, our design enables a LabVIEW user to operate seamlessly. Our aim is that the customers to perform easily, promptly what they wish to do.	Download from the CONTEC website

Option

Product Name	Model type	Description
Flat Cable with Two 37-pin D- SUB Connectors	PCB37P-1.5	1.5m
Shielded Cable with Two 37-pin D- SUB Connectors	PCB37PS-0.5P	0.5m
	PCB37PS-1.5P	1.5m
	PCB37PS-3P	3m
	PCB37PS-5P	5m
Flat Cable with One 37-pin D- SUB Connector	PCA37P-1.5	1.5m
	PCA37P-3	3m
Shielded Cable with One 37-pin D- SUB Connector	PCA37PS-0.5P	0.5m
	PCA37PS-1.5P	1.5m
	PCA37PS-3P	3m
	PCA37PS-5P	5m
Screw Terminal (M3 x 37P)	EPD-37A	*1*2
Screw Terminal (M3.5 x 37P)	EPD-37	*2
General Purpose Terminal (M3 x 37P)	DTP-3C	*2
Screw Terminal (M2.5 x 37P)	DTP-4C	*2
Signal Monitor for Digital I/O (32Bits)	CM-32L	*2

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

*2 A PCB37P or PCB37PS optional cable is required separately.

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

How to connect the connectors

Connector shape

To connect an external device to this board, plug the cable from the device into the interface connector shown below.



Connector Pin Assignment

Pin Assignments of Interface Connector



I-00 - I-17	32 input signal pins. Connect output signals from the external device to these pins.
020 - 037	32 output signal pins. Connect these pins to the input signal pins of the external device.
ICOM 0/1	Common pin for input signals. These pins are common to 16 input signal pins.
OCOM 2/3	Connect the positive side of the external power supply. These pins are common to 16 output signal pins.
N.C.	This pin is left unconnected.

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

Input Circuit



The input circuits of interface blocks of the board are illustrated in the image above. For each input channel, use the corresponding jumper to select a voltage range of 12 - 24 or 24 - 48 VDC depending on the voltage of the input signal.

The signal inputs are isolated by the Optocoupler (Both of current sink and source outputs supported). The board therefore requires an external power supply to drive the inputs. The power capacity required for driving each input channel is about 8 mA when the signal voltage is 48 VDC (with the 24 - 48 VDC setting) or about 4 mA when the signal voltage is 12 VDC (with the 12 - 24 VDC setting).

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Connecting a Switch



When the switch is ON, the corresponding bit contains 1.

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

Examples of Connecting the Board to an External Device Connecting the input to the sink type output



Connecting the input to the source type output



Connecting Output Signals

Connect the output signals to a current-driven controlled device such as a relay or LED.

The connection requires an external power supply to feed currents. The board controls turning on/off the current-driven controlled device using a digital value.

Output Circuit



* Output Pin: O-xx

The output circuits of interface blocks of the board are illustrated in the image above.

The signal outputs are semiconductor relay outputs using a rated output current of up to 100 mA per channel.

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.

Examples of Connecting the Board to an External Device Example of Connection to TTL Level Input



Connecting the Output to the Source Output Acceptable Input



Block Diagram

