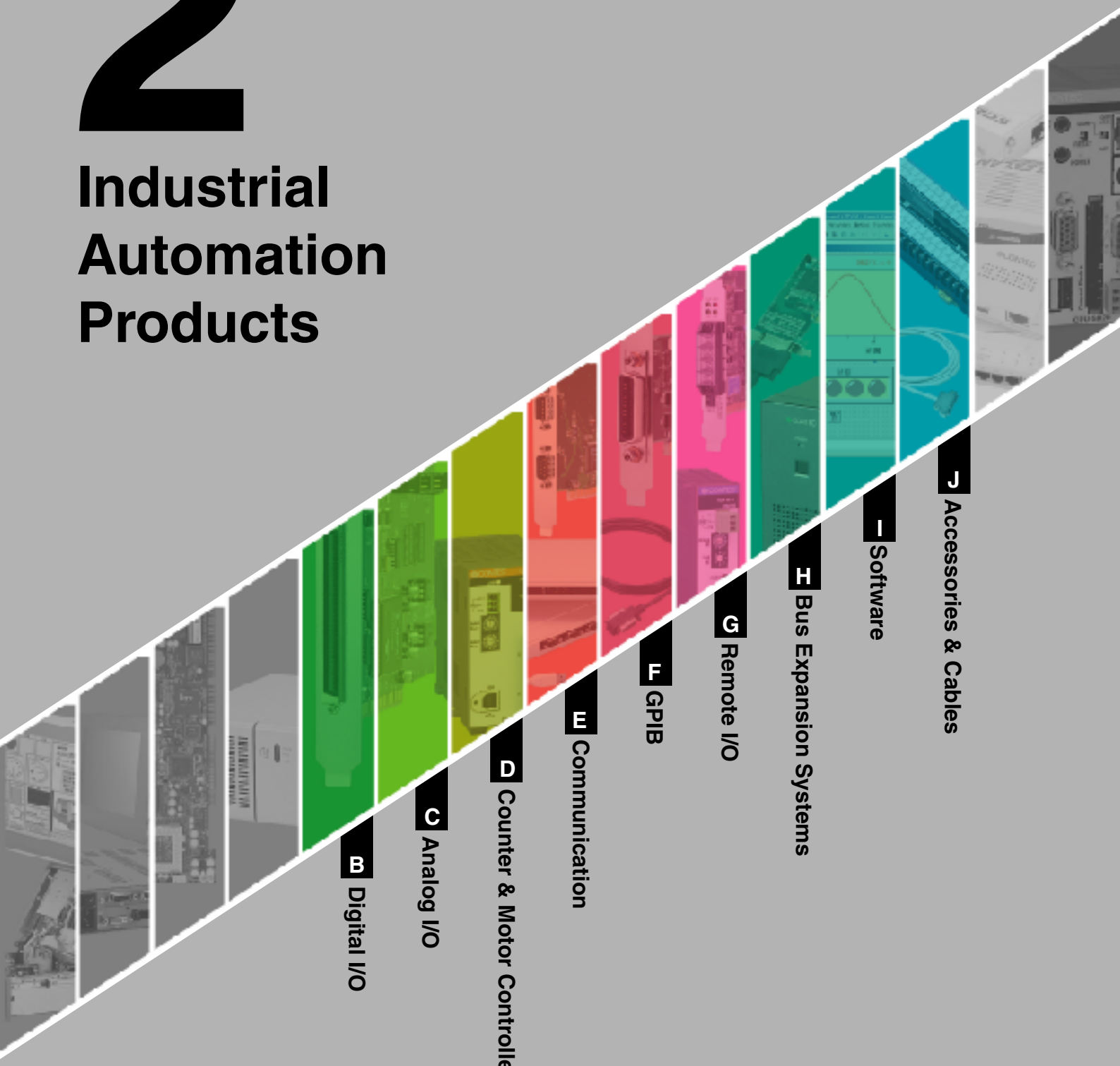
Chapter

2

Industrial Automation Products



B Digital I/O

C Analog I/O

D Counter & Motor Controllers

E Communication

F GPIB

G Remote I/O

H Bus Expansion Systems

I Software

J Accessories & Cables

[Computer Bus Basics]

PCI

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

■Features

[Plug & Play]

Unlike ISA or C (98) interface boards, which require manual set up, PCI allows automatic set up of I/O port addresses and interrupt levels.

[Interrupt (IRQ) Level Sharing]

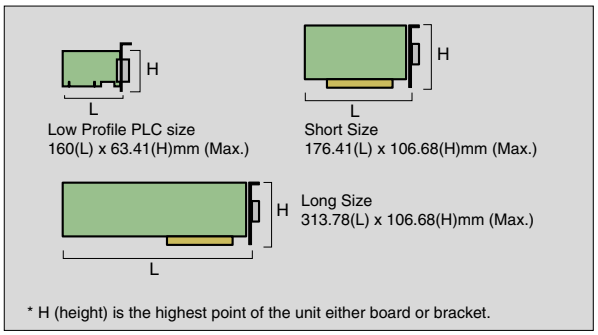
PCI allows multiple boards to share the same IRQ. ISA or C (98) interface boards are affected by any conflicts in interrupt level assignments.

■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."

■Board Sizes

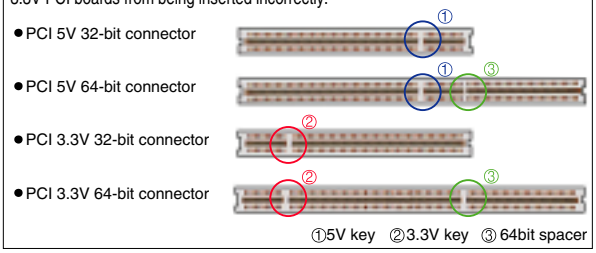
CONTEC PCI boards come in three sizes.



* H (height) is the highest point of the unit either board or bracket.

■Universal key and 5V key are both supported

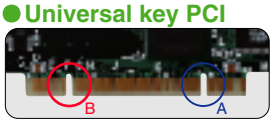
PCI bus slots in computers are equipped with keys which prevent 5V PCI boards and 3.3V PCI boards from being inserted incorrectly.



CONTEC provides 5V key-compliant boards supporting 5V PCI slots as well as universal key-complaint boards supporting both **5V and 3.3V PCI slots.**

●32 bit 5V PCI

●Universal key PCI



A: 5V PCI compliant notch (①above).
B: 3.3V PCI compliant notch (②above).

Bus slots and corresponding boards

	5V 32 bit PCI card	Universal key PCI card
PCI 5V 32-bit connector	OK	OK
PCI 5V 64-bit connector	OK	OK
PCI 3.3V 32-bit connector	NOT OK	OK
PCI 3.3V 64-bit connector	NOT OK	OK

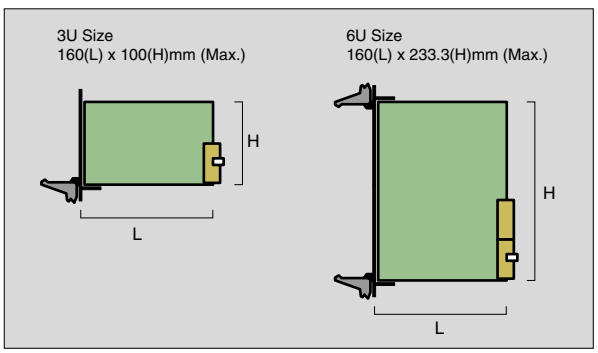
* +5V power must be supplied from PCI bus slot.

Compact PCI

Established by PICMG (PCI Industrial Computers Manufacturers Group), Compact PCI (CPCI) products require the use of a pin type connector and Euro-style card while still retaining the characteristics of PCI such as high speed and Plug & Play capabilities.

■Support Slots and Board Sizes

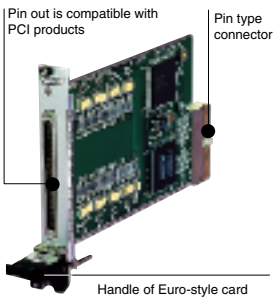
Boards can be used with units and expansion slots marked PICMG2.0 Revision2.1 or higher.
Compact PCI is available in the following 2 sizes.



■Setup

[Enhanced reliability of pin-type connector]

CPCI's pin type connector is highly resistant to contact failures that can be induced by dust or vibration. Compared to the metal edge board contact often used in PCI and ISA, it exhibits a superior environmental resistance as well as greater durability.



[Higher compatibility with PCI bus and improved development efficiency]

Due to the specification similarities, CPCI is highly compatible with PCI. CONTEC CPCI products share driver software, connectors and connector pin allocation with CONTEC PCI interface boards. As a result, a Compact PCI based system can be efficiently developed in the PCI-based environment.

[Improved maintainability of Euro-card style]

Compact PCI systems employs Euro card style chassis. Even when placed into a rack, the chassis is easy to maintain since boards can be inserted or removed from the front of the chassis. A handle is provided to ensure easy and secure handling of the boards.

PC Card

PC Card standards were established by PCMCIA (Personal Computer Memory Card International Association) and JEIDA (Japan Electronics Industries Development Association). PC Card slots are primarily used for expansion of a notebook PC or in a space saving personal computer. There are two generations of PC Cards. The first is 16 bits with a maximum transmission speed of 16MB/second. The second, corresponding to "ZV Port" (CardBus-compliant), is 32 bits with a maximum transmission speed of 132 MB/second.

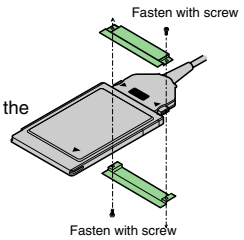
■Features

[Plug & Play]

Unlike ISA or C (98) interface boards, which require manual set up, PC Card slots allow automatic I/O port addressing and interrupt level set up.

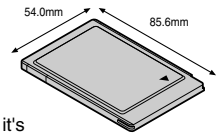
[PC Card attachment]

CONTEC includes a PC Card attachment with all of its PC Card products.
This attachment is fastened after installing the cable and helps to protect the card from accidental power application and prevent breaks at the connection.



■Usable slot / Card size

CONTEC cards can be used in PCMCIA, Rel.2.1/JEIDA Ver.4.1 (and up) and in personal computer TYPE II and TYPE III slots. PC Card types refer to the thickness (depth and width are the same on all three) of the cards.
CONTEC has standardized on TYPE II for it's PC Card products.



TYPE I	3.3mm Thickness. Primarily used for memory cards. These can be used in slots labeled "TYPE I~III."
TYPE II	5.5mm Thickness Primarily used for I/O extension (i.e. modem or SCSI) These can be used in slots labeled "TYPE II~III."
TYPE III	10.5mm Thickness. Primarily used for card-style hard disks. These can be only be used in slots labeled "TYPE III."

USB

Seven companies (including Intel, Microsoft, and NEC) agreed upon USB (Universal Serial Bus) as the standard for an additional serial interface for personal computers. Through the use of a hub, a maximum of 127 peripherals can be connected to a host computer. This interface allows peripheral expansion that is not restricted to the number of available slots. With USB 1.1 data can be transmitted at full speed mode (12Mbps) and low speed mode (1.5Mbps). USB 2.0 data can be transmitted in high speed (480Mbps).

■Features

USB is Plug & Play and can be used immediately after it is connected. It is also hot swappable allowing it to be connected or disconnected while the computer is running. Most USB products by CONTEC use a standard driver that allows them to be used immediately.

■Exclusive driver software

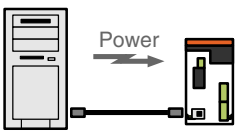
CONTEC's driver "API-USBP(WDM)" is used with USB digital or analog I/O, and counter products. It comes with a number of sample programs, help files and diagnostic programs.

■Supported Power Sources

USB products can be powered in 2 different ways - bus or self power. Bus power comes directly from the personal computer, while self power is supplied from an external power source. CONTEC's USB products support either power source.

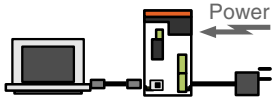
[Bus power]

Used when connecting a bus power USB cable.



[Self power]

Used when needing to limit the power consumption of the host computer (i.e. when using a laptop)

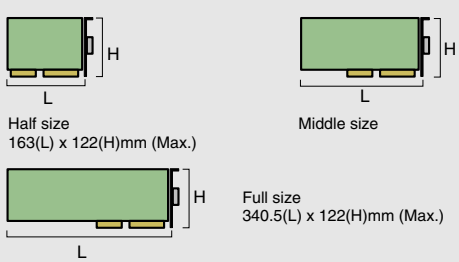


ISA Bus

ISA (Industry Standard Architecture) bus, is the designation that the IEEE (Institute of Electrical and Electronics Engineers) gave to IBM's "AT bus". ISA includes the "XT bus" (8-bit) and "AT bus" (16-bit). Either XT or AT boards can be used in computers that have ISA bus expansion capabilities.

■Usable slot / Card size

ISA boards can be used in computers and expansion units with ISA, AT, or EISA expansion slot specifications . CONTEC's ISA boards come in three sizes - half, middle and full.



* H (height) is the highest point of the unit either board or bracket.

■Setup

Most components of a personal computer, communicate with computers using an I/O Port or interrupt (IRQ) level. ISA boards must be set up to use different address levels so that there are no conflicts.

[Windows 2000/98/95]

A device information (INF) file is attached to board or its support software.When used during set up, it allows for smooth integration with no conflicts with other system components.

[MS-DOS and other operating systems]

Set up for I/O port address

The address needs to be manually set to one that other devices are not used.

● CONTEC Recommended I/O Addresses

*300~*31FH, *700~*71FH, *B00~*B1FH, *F00~*F1FH

(* designates arbitrary numerical values of 0-FH)

Interrupt (IRQ) level set up

Unlike PCI, ISA interface boards can not share an interrupt (IRQ) level. Once the interrupt (IRQ) level is set up it can not compete with other devices.
The table to the right shows the interrupt (IRQ) level assignment for common computer components.

Controller1	Controller2	Device
IRQ0		Timer
IRQ1		Keyboard
IRQ2	IRQ8	Slave side
	IRQ9	Real-time clock
	IRQ10	Software interrupt
	IRQ11	Video
	IRQ12	Mouse
IRQ3		Math coprocessor
IRQ4		Hard disk drive
IRQ5	IRQ13	Serial port 2
IRQ6	IRQ14	Serial port 1
IRQ7	IRQ15	Floppy disk drive
		Parallel port 1

chapter

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