

CompactPCI Systems

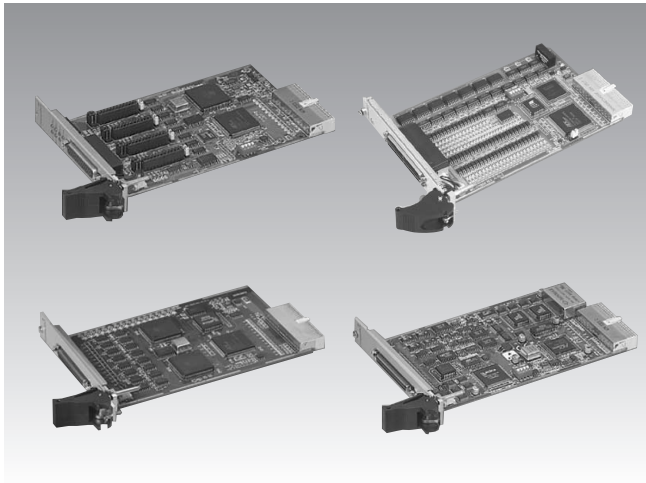
Advantech CompactPCI

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To view all of Advantech's CompactPCI Systems, please visit www.advantech.com/products.



Advantech CompactPCI



- Commercial standard PCI chips provide high performance at a low price
- Up to 8 slots in one bus segment. Expandable using PCI-to-PCI bridge chips
- Eurocard form factor
- Airtight, high density, 2 mm pin-and-socket connectors
- Front loading and removal
- Vertical card orientation for better cooling
- Staged power pins for hot-swap capability
- Excellent shock and vibration characteristics

Introduction

Engineers have been trying to apply high-performance, low-cost PC technologies to critical applications such as telecommunications and industrial automation for quite some time. Unfortunately, the characteristics of desktop PC technologies do not readily lend themselves to critical applications where high serviceability, vibration & shock resistance, and good ventilation are required. CompactPCI may be the answer.

What is CompactPCI?

CompactPCI is a small, rugged, high-performance industrial computer architecture based on the standard PCI bus specification. It was developed by the PCI Industrial Computers Manufacturers Group (PICMG) in late 1994, and is ideal for embedded applications.

Three important technologies form the core of CompactPCI: PCI local bus, Eurocard mechanics, and airtight pin-and-socket connectors.

PCI Local Bus

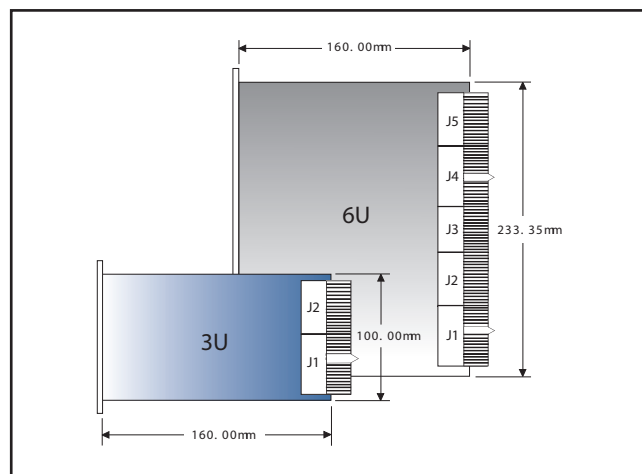
PCI stands for Peripheral Component Interconnect. It was published by Intel® in 1992, and soon became popular in commercial PC designs. It is a high-performance, processor-independent data bus, and most importantly, it is very inexpensive. The PCI local bus specification defines two data widths: 32-bit and 64-bit operating at a speed up to 66 MHz. This provides theoretical throughput up to 264 MB/s at 32-bit or 528 MB/s at 64-bit. Most computer systems and operating systems support the PCI bus. For example, Pentium, Alpha, PowerPC, Windows, Unix, and MacOS. Because PCI components are manufactured in large quantities, they are inexpensive and readily available. With these advantages, the PCI bus is very suitable for high speed computing and high speed data communication applications.

Eurocard Mechanics

Eurocard is an industrial-grade packaging standard popularized by VMEbus. CompactPCI allows the use of 3U and 6U Eurocards. The dimensions of a 3U CompactPCI board are 160 mm deep x 100 mm high, while the dimensions of a 6U CompactPCI board are 160 mm deep x 233.35 mm high. The front panels of CompactPCI boards are IEEE 1101.1 and IEEE 1101.10 compliant, and may include optional EMC gaskets to minimize electromagnetic interference. Typically, the front panel contains I/O connectors, LED indicators, and switches. CompactPCI also supports rear panel I/O, which is compliant with IEEE 1101.11. Rear panel I/O is popular for telecommunication equipment because of its easy-to-maintain characteristics. If all the wiring is done on rear transition boards (passive boards), the front CompactPCI boards (active boards), which may require maintenance, are "clean" without any connected wiring. The front CompactPCI boards can then simply be replaced without the need for rewiring.

Airtight Pin-and-Socket Connectors

CompactPCI uses airtight, high-density pin-and-socket connectors as specified in the IEC-1076 international standard. These 2 mm "hard metric" connectors have low inductance and controlled impedance, which reduce signal reflections caused by the high speed PCI bus. They enable CompactPCI systems to have up to eight slots in one bus segment.



Eurocard Form Factor

The CompactPCI specification defines five connectors, designated as J1 through J5. The 3U CompactPCI board has two connectors labeled J1 and J2, while the 6U CompactPCI board has five connectors labeled J1 through J5. J1 and J2 are defined identically on both 3U and 6U CompactPCI boards, so 3U and 6U CompactPCI boards are electrically interchangeable.



Pin-and-Socket Connector

CompactPCI versus Conventional Industrial PCs

Serviceability

Replacement of a card from a conventional industrial PC system is always time-consuming. Users need to unfasten the chassis cover, disconnect all wiring from the card, replace the card, reconnect the wiring, and refasten the chassis cover. It is a process prone to error because there can be internal cabling between cards and peripheral devices, and it is necessary to remove all cabling before a card can be replaced. The serviceability of conventional industrial PC systems is not as simple and fast as CompactPCI systems.

CompactPCI is designed to be a front loading and removable system. The replacement of a CompactPCI board is very simple, with no need to remove the chassis cover. In addition, if the I/O is cabled through the back of the system, the front CompactPCI boards are "clean" without any connected wiring, and the replacement of a CompactPCI board is quick and easy. The maintenance time can be reduced from a matter of hours (conventional industrial PCs) to a matter of minutes, yielding a lower Mean Time To Repair (MTTR).



4U 8-Slot CompactPCI Enclosure

Vibration and Shock Resistance

Conventional industrial PCs do not provide reliable and secure support for peripheral cards in the system. Cards inside conventional industrial PCs are screwed down at one point only, and the top and bottom card edges are not supported by guide rails. Therefore, the connecting edge of a card is prone to shift under shock and vibration.

CompactPCI boards are firmly mounted in the system. Guide rails support the top and bottom edges of the boards. Front panel retaining mechanisms securely lock the front panel to the surrounding mechanical frame. The connecting edge of the board is held tightly in place by the pin-and-socket connectors. With all four sides of the board firmly held in place, it is much less prone to suffer loss of electrical contact in high vibration and shock environments.

Ventilation

Conventional industrial PC systems cannot provide regular airflow paths, resulting in uneven cooling within the chassis. Airflow is blocked by backplanes, card brackets, and disk drives. Cooling air cannot circulate over all the cards, and hot air is not immediately forced out of the chassis. Electronic devices and circuit boards deteriorate because of these cooling related problems: warped circuit boards, bad connections, broken traces, and shortened component lives.

CompactPCI systems provide clear paths for airflow over all active, heat-producing boards in the system. Cooling air easily flows through the spaces between cards, and carries heat out of the spaces. A fan system can be integrated at the bottom of the boards to provide forced air to each slot. CompactPCI systems are therefore much less susceptible to cooling problems because of the even cooling pattern inherent in their mechanical design.

The Complete Offering for Mission-Critical Applications

The MIC-3000 series is an industrial CompactPCI solution which features front-end access, high shock and vibration tolerance characteristics, automatic cooling system, fault resilient and hot swappable capabilities. These features make MIC-3000 the most reliable PC-based computing platform, for mission-critical applications. Advantech leverages 3U CompactPCI as the industrial high-end computing platform, providing Pentium 4-grade CPU modules, 8-slot chassis, high-speed I/O and serial communication modules, to become a total solution provider for industrial CompactPCI solutions. Target applications include military defense, transportation, traffic control, test and measurement (T&M) and critical data acquisition & control markets.

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MIC-3001

4U CompactPCI® Chassis with 8-slot 3U Backplane



Features

- 8-slot 3U CompactPCI®
- Easy installation: rackmount or panelmount
- Hot swap compliant backplane
- Hot swap fan tray module
- Optional fault detection and alarm notification
- Logic Ground and Chassis Ground can be isolated or common

Specifications

Backplane

- Slots 8
- Bus 32-bit/33 MHz
- Vio Voltage 3.3 V/5 V (short-bar selectable)

Device Bay

- HDD or CD-ROM Yes

Cooling

- Fan 2 (2 x 113 CFM)

Power

- Input 90 ~ 132 V_{AC}/180 ~ 264 V_{AC} @ 47 ~ 63 Hz
- Output 400 W
- Loading (A)

Load	+3.3 V	+5 V	-5 V	+12 V	-12 V	+5 Vsb
Max.	20	42	1	14	1	0.75
Min.	0.2	2.5	0	0.5	0	0

Environment

- Operating Temperature 0 ~ 50°C (32 ~ 122°F)
- Storage Temperature -40 ~ 80°C (-40 ~ 176°F)
- Storage Humidity 10 ~ 90% @ 40°C, non-condensing

Physical

- Dimensions (W x H x D) 440 x 178 x 240 mm (MIC-3001/8)
440 x 178 x 283 mm (MIC-3001AR/8)
- Weight 7 Kg (15.4lb) (MIC-3001/8)
10 kg (22 lb) (MIC-3001AR/8)
- Operating Vibration 1.0 Grms w/CF disk
0.5 Grms w/3.5" HDD
- Shock 10 G peak-to peak, 11ms duration

Reliability

- MTBF (hours) 71174 hours

Compliance

- PICMG Compliance PICMG 2.0, R 2.1 CompactPCI Specification
PICMG 2.1, R 1.0 Hot Swap Specification

Ordering Information

- MIC-3001/8 4U CompactPCI chassis with 8-slot backplane, fan tray module, and AC ATX power supply
- MIC-3001AR/8 4U CompactPCI chassis with 8-slot backplane, fan tray module, rear I/O and AC ATX power supply
- 9663300100 3.5" FDD/HDD bracket accessory for MIC-3000 chassis
- 9663300101 3U-4TE Blank Cover accessory for MIC-3000 chassis

MIC-3002A

4U CompactPCI® Chassis with 6-slot 3U Backplane



Features

- 6-slot 3U CompactPCI® backplane
- Compact size, 4U high enclosure for 3U cPCI modules
- Side handle design
- Raised feet on the base for desktop use
- Hot swap compliant backplane
- Logic ground and chassis ground can be isolated or common

Specifications

Backplane

- **Slots** 6 CompactPCI slots
(one system slot and 6 peripheral slots)
- **Bus** 64-bit/33 MHz
- **I/O Voltage** 3.3 V or 5 V, jumper selectable

Cooling System

- **Air Flow** Two 46 CFM fans, 12 V_{DC} brush less, dual ball bearing (with removable filter)
- **Life Span** 80,048 hours @ 25°C

Power Supply

- **Input** 100 ~ 240 V_{AC} @ 47~63 Hz, full range
- **Output** 250 W ATX power supply
- **MTBF** 105,405 hours @ 25°C
- **Loading (A)**

Load	+5 V	-5 V	+12 V	-12 V	+3.3 V	+5 Vsb
Max.	24	0.5	12	0.5	20	1.5
Min.	3	0	2	0	1	0.1

Environment

- **Operating Temperature** 0 ~ 60°C (32~140°F)
- **Storage Temperature** -40 ~ 80°C (-40~112°F)
- **Humidity** 95% @ 60°C (140°F), non-condensing
- **Vibration** 0.5 Grms, 2.0 Grms
- **Shock** 20 G peak-to-peak, 11 ms duration

Physical

- **Dimensions (W x H x D)** 220 x 190 x 245 mm (8.7" x 7.5" x 9.7")
(not inc. mnt flanges)
- **Weight** 5.6 kg (12.32 lb) for MIC-3002A
- **U Height (Slots)** 3 U
- **Mounting Options** Wall, panel on front or rear side, desktop feet included
- **Enclosure Materials** Aluminum frame and galvanized sheet steel

Reliability

- **MTBF** 87,191 hours @ 25°C

Compliance

- PICMG 2.0, Ver. 3.0 CompactPCI
- PICMG 2.1, Ver. 2.0 Hot Swap

Ordering Information

- **MIC-3002A/6** 4U CompactPCI chassis with 6-slot backplane
- **1960002861** 2.5" HDD support kit for anti-vibration for MIC-3002A/6

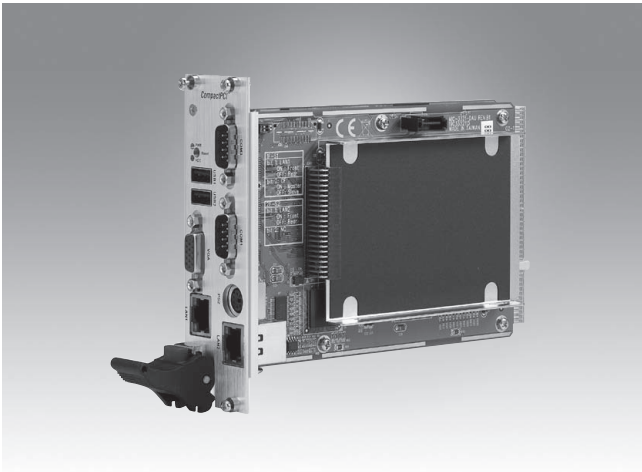
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MIC-3321

3U CompactPCI® Celeron®/ Pentium® M 1 GHz Controller



Features

- Built-in Intel® Pentium® M 760 2.0G processor with 2 MB L2 Cache
- Mobile Intel® 915GM express chipset
- Supports up to 1GB DDR2 533/400 SDRAM soldered on board
- Dual Giga LAN on PCI-Express
- High-performance Intel® Graphics Media Accelerator 900 VGA display
- Onboard CompactFlash® disk socket
- Onboard 2.5" HDD support
- Rear I/O signal support for easy wiring

Introduction

The MIC-3321 3U is a CompactPCI system controller board that combines the performance of Intel's Mobile Pentium M 760 2.0GHz processor with the high integration of the 915GM chipset and the I/O Controller Hub ICH6. The low power of the Intel Mobile Celeron M makes it possible to work with high extended temperature ranges. The directly soldered CPU and memory provides less weight and a higher shock/vibration resistance than socket devices. MIC-3321 is a powerful 3U CompactPCI Controller that fulfills requirements in mission critical applications, such as military defense, transportation, traffic control, test and measurement (T&M) as well as critical data acquisition & control applications.

Specifications

▪ CPU	MIC-3321D: Intel Pentium M 760 2.0 GHz with 2 MB L2 cache MIC-3321C: Intel Celeron M Ultra Low Voltage 373 1.0 GHz with 512 KB L2 cache	▪ Serial	
▪ Chipset	Intel 915 GM (GMCH) + Intel 82801FBM (ICH6-M)	▪ Interface	RS-232
▪ BIOS	Award 4 MB Flash	▪ Controller	2 x 16C550 Compatible
▪ Bus		▪ Data Bits	5, 6, 7, 8
▪ Front Side Bus	533 MHz (Intel Pentium M 760 2.0 GHz CPU) 400 MHz (Intel Celeron M Ultra Low Voltage 373 1.0 GHz CPU) PCI-to-PCI Bridge: PERICOM PI7C8150	▪ Stop Bits	1, 1.5, 2
▪ PCI Bus	7 x 32bit/33MHz CompactPCI bus Master interface	▪ Parity	None, Even, Odd
▪ Memory	3.3 V/5 V VIO adjustable Directed Soldered 1 GB DDR2 SDRAM	▪ Speed (bps)	50 ~ 115.2K
▪ Graphics		▪ Data Signal	TxD, RxD, RTS, CTS, DTR, DSR, DCD, RI, GND
▪ Controller	Intel Graphics Media Accelerator 900	▪ Connector	2 x DB9 male
▪ VRAM	DVMT3.0 128MB	▪ Two as front I/O, one as rear I/O	
▪ Resolution	Up to 2048 x 1536 with 32-bit color at 75 Hz	▪ P-IDE	One channel P-IDE Supports PIO mode 4 (16.67MB/s data transfer rate) and ATA 33/66/100 (33/66/100MB/s data transfer rate) 1 x CompactFlash Socket Type II 1 x 44-pin 2.5" HDD connector
▪ Ethernet		▪ SATA	SATA interface with data transfer rate up to 150MB/s 1 x External SATA connector
▪ Interface	10/100/1000Base-TX Gigabit Ethernet	▪ USB	4 x USB 2.0 channels up to 480Mbps, 2 as front I/O, 2 as rear I/O
▪ Controller	2 x Intel 82573E/L PCI Express Gigabit Ethernet Controller	▪ PS/2	PS/2 for keyboard and mouse legacy support
▪ Connector	2 x RJ-45	▪ Watchdog Timer	0 ~ 64s, 0.25s step, generate reset signal
▪ Supports Pre-boot Execution Environment (PXE)		▪ Hot Swap	Support for all signals to allow peripheral boards to be hot swapped. The individual clocks for each slot and access to the backplane ENUM# signal comply with the PICMG 2.1 Hot Swap specification. (PCI to PCI bridge GPIO3)

Front Panel Functions

- **4HP Board**
 - 1 x VGA-CRT 15-pin D-SUB connector
(For MIC-3321C only, not included on MIC-3321D)
 - Ethernet: 1 x RJ-45 connector with integrated LEDs
 - USB: 2 x 4-pin connectors
 - Reset: Reset button, guarded
 - LED: Power, HDD
- **8HP Board**
(Additional to 4HP)
 - COM1: 1 x DB9 RS-232 connector
 - COM3: 1 x DB9 RS-232 connector
 - PS/2: 1 x PS/2 connector for keyboard and mouse
 - Ethernet: 1 x RJ-45 connector with integrated LEDs
- **Rear I/O via J2**
 - 2 x USB 2.0 channels
 - 2 x Gigabit Ethernet channels with LED (shared with front I/O)
 - 1 x COM port
 - 1 x VGA-CRT channel (shared with front I/O)
 - 1 x PS/2 keyboard/mouse channel (shared with front I/O)
- **Compliance**
 - PICMG 2.0 Rev. 3.0 compatible
 - CompactPCI Hot Swap Specification PICMG 2.1 R2.0

Environment

- **Operating Temperature** 0 ~ 50°C/ 32 ~ 122°F
- **Storage Temperature** -40 ~ 80°C/ -40 ~ 176°F

Physical

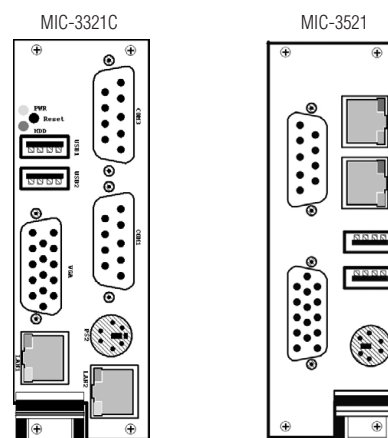
- **Dimensions (L x H)** 160 x 100 mm (3U)
- **Weight** 0.6 Kg

Rear Transition Board

- **P/N** MIC-3521
- **Width** 8HP

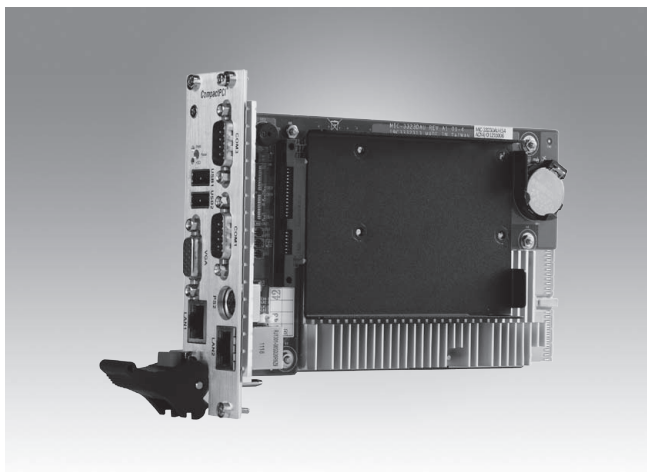
Ordering Information

- **MIC-3321D** Pentium M 2.0 GHz, 2MByte L2 cache, 1 GByte soldered DDR2 SDRAM, 8HP width
- **MIC-3321C** Celeron M 1.0 GHz, 512KByte L2 cache, 1 GByte soldered DDR2 SDRAM, 8HP width
- **MIC-3521** Rear I/O Transition Board for MIC-3321 series

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MIC-3323

3U CompactPCI® Intel® Core™2 Duo/ Atom™ Processor D510 Controller



Features

- Supports two different CPU grade
- Intel® Core™ 2 Duo or Atom™ D510 Processors
- Intel® GME965 GMCH /ICH8M
- Supports up to 4GB DDR2 533/667 MHz SDRAM
- Dual Giga LAN ports
- High-performance Intel® 965GME Graphics Media Accelerator
- Supports SATA 2.5" HDD

Introduction

The MIC-3323 is a 3U CompactPCI system control board, which supports two different CPU grades, one adopts the high performance Intel Core 2 Duo 1.6 GHz processor and highly integrated Intel 965GM Express chipset, and the other one adopts the Intel Atom Processor D510 1.66GHz and ICH8M chipset. In addition to 4MB L2 Cache, it supports 2GMB DDR2 SDRAM up to 4GMB and dual Gigabit Ethernet. MIC-3323 is a powerful 3U CompactPCI controller that fulfills requirements for mission critical applications, such as military defense, transportation, traffic control, test and measurement (T&M) as well as critical data acquisition & control applications.

Specifications

- **CPU** Intel Core 2 Duo 1.6GHz/Atom D510 1.66 GHz (Note 1)
- **L2 Cache** 4 MB L2 Cache/1MB L2Cache
- **Chipset** Intel 965GM GMCH/ICH8
- **BIOS** AWARD 4 M-bit /AMI 16Mbit Flash BIOS

BUS

- **Front Side Bus** 533MHZ (Intel Core 2 Duo 1.6 GHz CPU)
667MHZ (Intel Atom D510 1.66 GHz CPU)
- **PCI Bus** PCI-PCI bridge PERICOM PI7C8150
7 x 32 bit/33 MHz Compact PCI bus master interface
3.3V VIO

Memory

- **SDRAM** DDR2 533/667 MHz Support 2G (Note 2)
- **Socket** 2 x 200-pin SODIMM sockets

Graphic

- **Chipset** Integrated Intel 965GME Chipset/Intel Atom D510
- **Resolution** Up to 1920 x 1024

Ethernet

- **Interface** 1000/100/10M Base-TX Gigabit Ethernet
- **Controller** PCI-Express×1 Intel®82574E Ethernet Controller
- **Connector** RJ-45*2

Serial

- **Interface** RS-232
- **UART** 3 x 16C550 compatible
- **Data bits** 5,6,7,8
- **Stop Bits** 1,1.5,2
- **Parity** None, Even, Odd
- **Speed** 50~115.2Kbps
- **Data Signal** TXD,RXD,RTS,CTS,DTR,DSR,DCD,RI GND
- **Connector** 2 X DB-9
- **SATA** 1 X SATA interface, data transfer rate up to 300MB/S
- **USB** 2 x USB 2.0 channels up to 480Mbps
- **PS/2** Used for Keyboard and mouse
- **Watchdog Timer** 256 levels timer interval, from 0 to 255 sec or min setup by software, jumper less selection, generates system reset (for MIC-3323D01-D23E)
- **Hot-swap** Supports for all signal to allow peripheral boards to be Hot swapped
- **Compliance** PICMG®2.0 Rev.3.0 Compatible
- Compact PCI Hot-swap PICMG®2.1 Rev.2.0

Environment

- **Humidity** 5~95%(non-condensing)
- **Operating Temp** 0 ~ 50°C (32 ~ 122°F)
- **Storage Temp** -40~80°C (-40~176°F)

Physical

- **Dimensions (L x H)** 160 X 100mm (6.30" x 3.94") (3U)
- **Weight** 0.8Kg

Frontpanel Function (8HP)

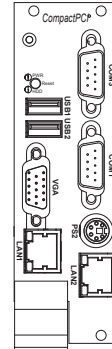
- **COM1/3** 2X DB9, RS-232
- **PS/2** 1 for Keyboard and Mouse
- **Ethernet** 2 x RJ-45 connector with LED
- **VGA** 1 x15 pin D-SUB connector
- **USB** 2 x USB2.0, 4 pin Connector
- **Button** Reset Button
- **LED** Power, HDD

Note 1: Select different CPU grade by order number

Note 2: Supports 2GB to 4GB

Ordering Information

- **MIC-3323D01-D23E** 3U CompactPCI Intel Core 2 Duo 1.6 GHz Controller with SATA HDD/8HP
- **MIC-3323D01-A33E** 3U CompactPCI Intel Atom D510 1.66 G Controller with SATA HDD/8HP

Front View of MIC-3323

MIC-3611

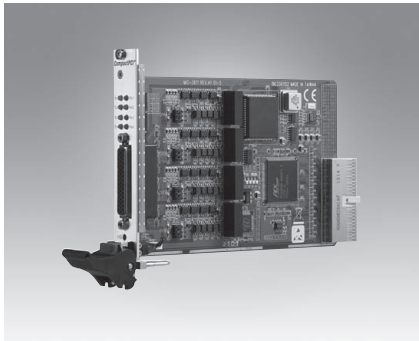
MIC-3612

MIC-3620

4-port RS-422/485 3U CompactPCI® Card with Surge and Isolation Protection

4-port RS-232/422/485 3/6U CompactPCI® Card

8-port RS-232 3U CompactPCI® Card



MIC-3611



Features

- PCI Specification 2.1x compliant
- Speeds up to 921.6Kbps
- 16C954 UARTs with 128-byte standard
- Standard Industrial 3U/6U sized CPCI Board size
- I/O address automatically assigned by PCI Plug-and-Play
- OS supported: Windows 98/2000/XP
- Surge protection: 2,000 V_{DC}
- Isolation protection: 2,500 V_{DC}
- Interrupt status register for increased performance
- Space reserved for termination resistors(for RS-422/485)
- Automatic RS-485 data flow control

Specifications

Communications

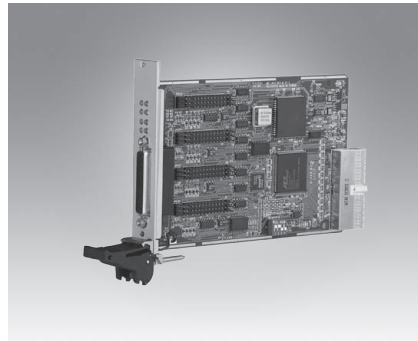
- **Communication** BUS controller: PLX9030 Controller UART: 16C954 UART with 128-byte FIFOs
- **IRQ** All ports use the same IRQ assigned by PCI Plug-and-Play
- **Data Bits** 5, 6, 7, 8
- **Stop Bits** 1, 1.5, 2
- **Parity** none, even, odd
- **Speed** 50bps ~ 921.6 Kbps
- **Data Signals** Tx/D, Rx/D, RTS, CTS (for RS-422/485)
- **Surge Protection** 2,000 V_{DC}
- **Isolation Protection** 2,500 V_{DC}

General

- **Bus Type** CompactPCI bus specification 2.1 compliant
- **I/O Connectors** DB44 and four RS422/485 DB9 male
- **Dimensions (L x H)** 160 x 100 mm (6.3" x 3.9"), 3U bracket
- **Power Consumption** +5 V @ 600 mA
- **Operating Temperature** 0 ~ 60°C (32 ~ 140°F)
- **Storage Temperature** -20 ~ 80°C (-4 ~ 176°F)
- **Operating Humidity** 5 ~ 95% Relative Humidity, non-condensing
- **Certification** CE, FCC

Ordering Information

- **MIC-3611/3** 4-port RS-422/485 3U CompactPCI communication card w/isolation & surge protection
- **MIC-3611R/3** 4-port RS-422/485 3U CompactPCI communication card w/isolation & surge protection, Rear IO support



MIC-3612



Features

- PCI Specification 2.1 compliant
- Speeds up to 921.6 kbps
- 4-port RS-232/422/485
- Surge protection
- 16C954 UARTs with 128-byte standard
- Standard Industrial CompactPCI® 3U Board size
- I/O address automatically assigned by PCI Plug & Play
- OS supported: Windows® 98/2000/XP, Linux 2.4
- Interrupt status register for increased performance
- Automatic RS-485 data flow control
- Tx/Rx LED indicator

Specifications

Communications

- **Communication** BUS controller: PLX9030 Controller UART: 16C954
- **Data Bits** 5, 6, 7, 8
- **Data Signals** Tx/D, Rx/D, RTS, CTS, DTR, DSR, DCD, RI, GND (for RS-232) Tx/D, Rx/D, RTS, CTS (for RS-422) DATA+, DATA- (for RS-485)
- **IRQ** All ports use the same IRQ assigned by PCI Plug & Play
- **Parity** None, even, odd
- **Speed (bps)** 50 ~ 921.6 k
- **Stop Bits** 1, 1.5, 2

General

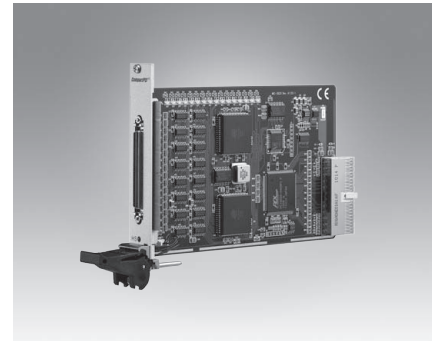
- **PICMG Compliance** CompactPCI V2.0, R 3.0 Hot swap V2.1, R 2.0 CompactPCI V2.1
- **Bus Type** DB 44pin female
- **I/O Connectors** 160 x 100 mm (6.3" x 3.9"), 3U bracket
- **Dimensions (L x H)** 160 x 100 mm (6.3" x 3.9"), 3U bracket
- **Power Consumption**

	Typical	Max.
+5 V	220 mA	285 mA
+3.3 V	100 mA	200 mA
+12 V	60 mA	80 mA

- **Operating Temperature** 0 ~ 70°C (32 ~ 158°F) (IEC68-2-1, 2)
- **Storage Temperature** -20 ~ 80°C (-4 ~ 176°F)
- **Operating Humidity** 5 ~ 95% RH, non-condensing (IEC 68-2-1, 2)

Ordering Information

- **MIC-3612/3** 3U CompactPCI 4-port RS-232/422/485 Card



MIC-3620/3



Features

- PCI Specification 2.1 compliant
- Speeds up to 921.6 kbps
- 16C954 UARTs with 128-byte standard
- 8-port RS-232
- Standard Industrial CompactPCI 3U Board size
- I/O address automatically assigned by PCI Plug & Play
- OS support: Windows 98/2000/XP, Linux 2.4
- Interrupt status register for increased performance

Specifications

Communications

- **Communication** PCI9030 + 16C954 Controller
- **Data Bits** 5, 6, 7, 8
- **Data Signals** Tx/D, Rx/D, RTS, CTS, DTR, DSR, DCD, RI, GND
- **IRQ** All ports use the same IRQ assigned by PCI Plug & Play
- **Parity** None, even, odd
- **Speed (bps)** 50 ~ 921.6 k
- **Stop Bits** 1, 1.5, 2

General

- **PICMG Compliance** CompactPCI V2.0, R 3.0 Hot swap V2.1, R 2.0
- **Bus Type** CompactPCI bus specification 2.1 compliant
- **I/O Connectors** SCSI 68-pin female
- **Dimensions (L x H)** 160 x 100 mm (6.3" x 3.9"), 3U Bracket
- **Power Consumption** +5 V, +3.3 V, +12 V
- **Operating Temperature** 0 ~ 70°C (32 ~ 158°F) (refer to IEC68-2-1, 2)
- **Storage Temperature** -20 ~ 80°C (-4 ~ 176°F)
- **Storage Humidity** 5 ~ 95% Relative Humidity, non-condensing (IEC 68-2-1, 2)

Ordering Information

- **MIC-3620/3** 3U CompactPCI 8-port RS-232 Card

MIC-3621

MIC-3680

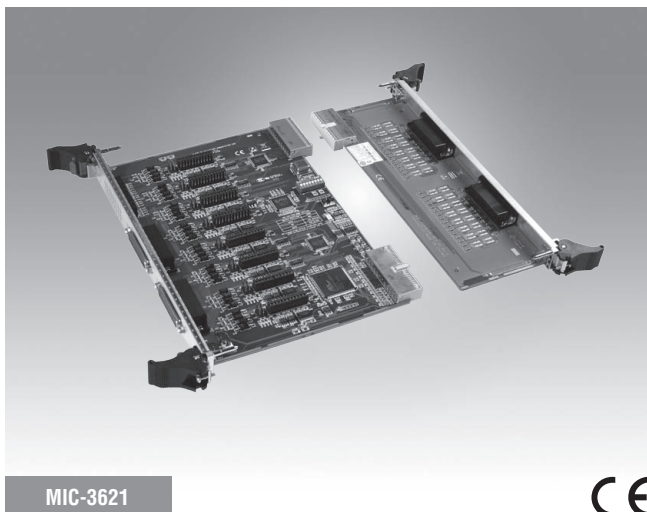
8-port RS-232/422/485 6U CompactPCI® Card with Surge Protection

2-port CAN-bus 3U CompactPCI® Card

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MIC-3621

Features

- CPCI Specification 2.1 compliant
- Speeds up to 921.6 kbps
- 16C954 UARTs with 128-byte standard
- 8-port RS-232/485/422
- Standard Industrial CompactPCI 6U Board size
- I/O address automatically assigned by PCI Plug & Play
- Interrupt status register for increased performance
- Automatic RS-485 data flow control
- OS support: Windows 2000/XP

Specifications

Communications

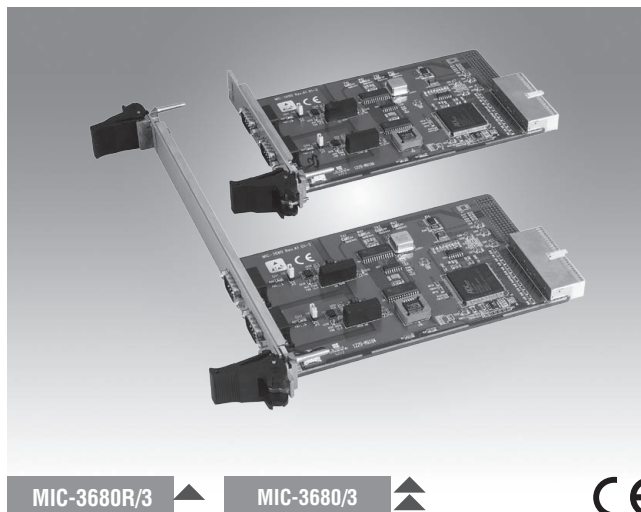
- **Communication Controller** BUS Controller: PC19030 UART:16C954 Controller
- **Data Signals - RS-232** TXD, RXD, RTS, CTS, DTR, DSR, DCD, RI, GND
- **RS-422** TX+, TX-, RX+, RX-, RTS+, RTS-, CTS+, CTS-, GND
- **RS-485** DATA+, DATA-, GND
- **Speed (bps)** 50~921.6k
- **Data Bits** 5, 6, 7, 8
- **Stop Bits** 1, 1.5, 2
- **Parity** None, even, odd
- **IRQ** All ports use the same IRQ assigned by PCI plug & play
- **Surge Protection** 2,500 V_{DC}

General

- **PICMG Compliance** CompactPCI V2.0, R 2.1 Hot swap V2.1, R 2.0
- **Bus Type** CompactPCI bus specification 2.1 compliant
- **Hotswap Support** Yes
- **I/O Connectors** 2 x DB44 (female)
- **Dimensions (LxH)** 233.35 x 160 mm (9.19" x 6.3"), 6U Bracket
- **Power Consumption** +5V, +3.3V, +12V
- **Operating Temperature** 0~70°C (32~158°F) (refer to IEC68-2-1, 2)
- **Storage Temperature** -20~80°C (-4~176°F)
- **Storage Humidity** 5~95%, Relative Humidity, non-condensing (refer to IEC 68-1,-2,-3)

Ordering Information

- **MIC-3621RE** 6U CompactPCI 8-port RS-232/485/422 Front I/O Card and Rear I/O Support
- **MIC-3621RIOE** 6U CompactPCI Rear I/O Module for MIC-3621RE



MIC-3680R/3

MIC-3680/3

Features

- CompactPCI specification PICMG 2.0 R3.0 compatible
- Hot swap support
- Two individual CAN ports
- Supports CAN2.0 A/B
- High speed transmission up to 1 Mbps
- 16 MHz CAN controller frequency
- Optical isolation up to 2,500 V_{DC}
- Microsoft Windows DLL library and examples included
- Supports Windows 98/2000/XP drivers and utility
- Support Rear IO

Specifications

Communications

- **CAN Controller Frequency** 16 MHz
- **CAN Transceiver** 82C250
- **Communication Controller** SJA-1000
- **Ports** 2
- **Protocol** CAN 2.0 A/B
- **Signal Support** CAN_H, CAN_L, GND
- **Speed (bps)** Up to 1 Mbps programmable transfer rate
- **Isolation Protection** 2,500 V_{DC}

General

- **PICMG Compliance** CompactPCI V2.0, R 3.0 Hot swap V2.1, R 2.0
- **Bus Type** CompactPCI
- **I/O Connectors** 2 x DB9-M
- **Dimensions (L x H)** 160 x 100 mm (6.3" x 3.9")
- **Power Consumption** 5 V @ 400 mA (Typical)
- **Operating Temperature** 0 ~ 65°C (32 ~ 149°F)
- **Storage Temperature** -25 ~ 85°C (-13 ~ 185°F)
- **Storage Humidity** 5 ~ 95% RH, non-condensing

Ordering Information

- **MIC-3680/3** 3U CompactPCI 2-port Isolated CAN Communication Card
- **MIC-3680R/3** 3U CompactPCI 2-port Isolated CAN Communication Card with Rear I/O Support

MIC-3716

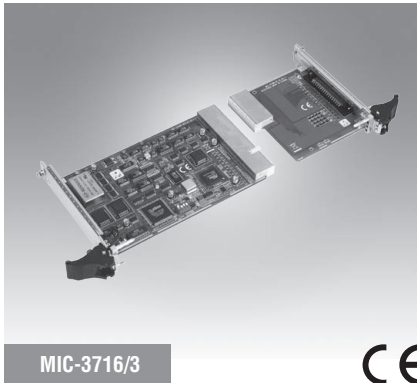
MIC-3714

MIC-3723

250 kS/s, 16-bit, 16-ch Multifunction 3U CompactPCI® Card

30 MS/s, 12-bit, Simultaneous 4-ch Analog Input 3U CompactPCI® Card

16-bit, 8-ch Analog Output 3U CompactPCI® Card



MIC-3716/3



Specifications

Analog Input

- Channels 16 single-ended, 8 differential, or combination
- Resolution 16 bits
- Max. Sampling Rate 250 kS/s
- FIFO Size 1024 samples/ch
- Overvoltage Protection 30 Vp-p
- Input Impedance 100 M Ω /10 pF (Off); 100 M Ω /100 pF (On)
- Sampling Modes Software, pacer, or external
- Input Range

Bipolar	± 10	± 5	± 2.5	± 1.25	± 0.625
Unipolar	-	0 ~ 10	0 ~ 5	0 ~ 2.5	0 ~ 1.25
Accuracy (% of FSR ± 1 LSB)	0.15	0.03	0.03	0.05	0.1

Analog Output

- Channels 2
- Resolution 16 bits
- Output Rate Static update
- Output Range

Internal Reference	Bipolar	$\pm 5, \pm 10$
Unipolar	0 ~ 5, 0 ~ 10	
External Reference	0 ~ +x V @ +x V (-10 \leq x \leq 10) -x ~ +x V @ +x V (-10 \leq x \leq 10)	

- Slew Rate 20 V/ μ s
- Driving Capability ± 20 mA
- Output Impedance 0.1 Ω max.
- Operation Mode Single output
- Accuracy Relative: ± 1 LSB

Digital Input/Output

- Channels 16, 5V/TTL
- Input Voltage Logic 0: 0.4 V max.
Logic 1: 2.4 V min.
Logic 0: 0.4 V max.
Logic 1: 2.7 V min.
Sink: 0.4 V max. @ +8 mA
Source: 2.4 V min. @ -0.4 mA
- Output Voltage
- Output Capability

Counter/Timer

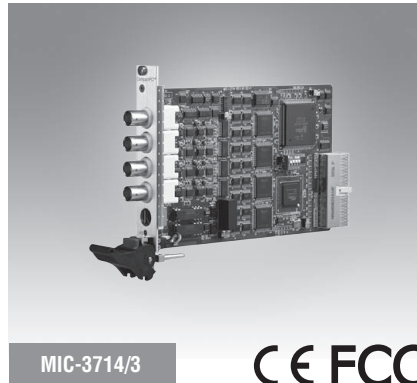
- Channels 3
- Compatibility 5 V/TTL
- Resolution 16 bits
- Max. Input Frequency 1 MHz
- Reference Clock Internal 10 MHz
External Clock Frequency 10 MHz
External Voltage Range TTL (Low: 0.8, High: 2 V)

General

- PICMG Compliance CompactPCI V2.0, R 2.1 Hot-Swap V2.1, R 2.0
- Bus Type CompactPCI
- I/O Connector Type 68-pin SCSI-II female
- Dimensions (L x H) 160 x 100 mm (6.9" x 3.9") with 3U Bracket
Typical: +5 V @ 850 mA, +12 V @ 600 mA
Max.: +5 V @ 1 A, +12 V @ 700 mA
- Power Consumption
- Certification CE

Ordering Information

- MIC-3716/3 3U, 250 kS/s, 16-bit, 16-ch High-Resolution Multifunction Card Industrial Wiring Terminal Board with CJC circuit for DIN-rail Mounting, (cable not included)
- PCLD-8710
- PCL-10168 68-pin SCSI-II cable with male connectors on both ends and special shielding for noise reduction, 1 and 2 m
- ADAM-3968 68-pin SCSI-II Wiring Terminal Board for DIN-rail Mounting



MIC-3714/3



Specifications

Analog Input

- Channels 4 single-ended channels
- Resolution 12 bits
- Max. Sampling Rate 30 MS/s (Only in FIFO 32k)
- FIFO Size 32,768 samples/ch
- Overvoltage Protection 30 Vp-p
- Input Impedance 50 Ω /1 M Ω /jumper selectable, 100 pF
- Sampling Modes Software, pacer, post-trigger, pre-trigger, delay-trigger, about-trigger
- Input Range (V) $\pm 5, \pm 2.5, \pm 1, \pm 0.5$

General

- Bus Type CompactPCI
- I/O Connectors 4 x BNC connector (for AI)
1 x PS/2 connector (for ext. colock and trigger)
- Dimensions (L x H) 160 x 100 mm (6.3" x 3.9") with 3U bracket
- Power Consumption Typical: +3.3 V @ 550 mA, +5 V @ 150 mA, +12 V @ 600 mA
Max.: +3.3 V @ 850 mA, +5 V @ 200 mA, +12 V @ 700 mA
- Operating Temperature 0 ~ 70°C (32~158°F)
- Storage Temperature -20 ~ 85°C (-4 ~ 185°F)
- Storage Humidity 5 ~ 95% RH, non-condensing (refer to IEC 68-2-3)
- Certification CE, FCC

Ordering Information

- MIC-3714/3 3U, 30 MS/s Simultaneous 4-ch Analog Input Card
- ADAM-3909 DB-9 Wiring Terminal for DIN-rail Mounting
- PCL-10901-1 PS2 to DB-9 wiring cable, 1 m
- PCL-10901-3 PS2 to DB-9 wiring cable, 3 m
- PCL-1010B-1 BNC to BNC wiring cable, 1 m



MIC-3723/3



Specifications

Analog Output

- Channels 8
- Resolution 16 bits
- Output Rate Static update
- Output Range (V, software programmable)

Internal Reference	Unipolar	± 10 V
Current Loop	0 ~ 20 mA, 4 ~ 20 mA	

- Slew Rate 20 V/ μ s
- Driving Capability 5mA
- Output Impedance 0.1 Ω max.
- Operation Modes Single output, synchronized output

Digital Input/Output

- Channels 16, 5V/TTL
- Input Voltage Logic 0: 0.8 V max.
Logic 1: 2.0 V min.
- Output Voltage Logic 0: 0.5 V max. @ 24 mA
Logic 1: 2.4 V min. @ -15 mA
- Output Capability Sink: 0.5 V max. @ 24 mA
Source: 2.4 V min. @ -15 mA

General

- PICMG Compliance CompactPCI V2.0, R 2.1 Hot-Swap V2.1, R 2.0
- Bus Type CompactPCI
- I/O Connector Type 68-pin SCSI-II female
- Dimensions (L x H) 160 x 100 mm (6.9" x 3.9") with 3U Bracket
Typical: 5 V @ 850, 12 V @ 600 mA
- Power Consumption
- Certification CE

Ordering Information

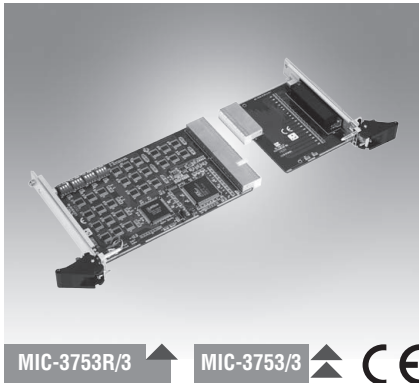
- MIC-3723/3 3U CompactPCI 16-bit, 8-ch non-isolated analog output card
- MIC-3723R/3 3U CompactPCI 16-bit, 8-ch non-isolated analog output card with Rear I/O support
- PCL-10168-1 68-pin SCSI-II cable with male connectors on both ends and special shielding for noise reduction, 1 and 2 m
- PCL-10168-2 68-pin SCSI-II Wiring Terminal Board for DIN-rail mounting
- ADAM-3968

MIC-3753 MIC-3756 MIC-3758

72-ch Digital I/O 3U CompactPCI® Card

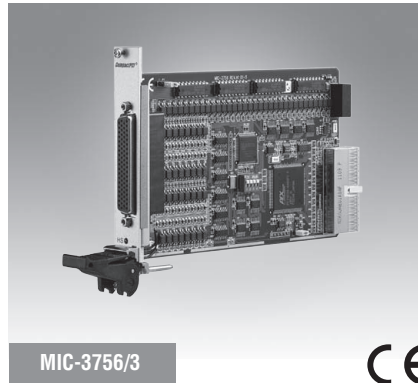
64-ch Isolated Digital I/O 3U CompactPCI® Card

128-ch Isolated Digital I/O 3U CompactPCI® Card



MIC-3753R/3

MIC-3753/3



MIC-3756/3



MIC-3758/3

Specifications

Digital Input

- Channels: 72 (shared with output)
- Compatibility: 5 V/TTL
- Input Voltage: Logic 0: 0.8 V max.
Logic 1: 2.0 V min.
- Interrupt Capable Ch.: 6 (2 for each C port)

Digital Output

- Channels: 72 (shared with input)
- Compatibility: 5 V/TTL
- Output Voltage: Logic 0: 0.44 V max. @ 24 mA
Logic 1: 3.76 V min. @ 24 mA
Sink: 0.44 V max. @ 24 mA
Source: 3.76 V min. @ 24 mA
- Output Capability

General

- PICMG Compliance: CompactPCI V2.0, R 2.1
Hot-Swap V2.1, R 2.0
- Bus Type: CompactPCI
- I/O Connectors: 1 x 78-pin D-type female connector
- Dimensions (L x H): 160 x 100 mm (6.9" x 3.9") with 3U Bracket
- Power Consumption: Typical: +5 V @ 400 mA
Max.: +5 V @ 0.7 A
- Operating Temperature: 0 ~ 60°C (32 ~ 140°F) (refer to IEC 68-2-1, 2)
- Operating Humidity: 5 ~ 95% RH, non-condensing (refer to IEC 68-2-3)
- Storage Temperature: -20 ~ 70°C (-4 ~ 158°F)
- Certification: CE

Ordering Information

- MIC-3753/3: 3U CompactPCI 72-ch Digital I/O card
- MIC-3753R/3: 3U CompactPCI 72-ch Digital I/O card with Rear I/O support
- PCL-10178-1: DB-78 cable assembly, 1 m
- ADAM-3978: DB-78 wiring terminal for DIN-rail mounting

Specifications

Isolated Digital Input

- Channels: 32
- Input Voltage: Logic 0: 2 V max.
Logic 1: 10 V min. (50 V max.)
- Interrupt Capable Ch.: 2 (DI00, DI16)
- Isolation Protection: 2,500 V_{DC}
- Input Resistance: 5.7 kΩ

Isolated Digital Output

- Channels: 32
- Output Type: Sink (NPN)
- Isolation Protection: 2,500 V_{DC}
- Output Voltage: 5 ~ 40 V_{DC}
- Sink Current: 100 mA max./channel
- Opto-Isolator Response: OFF delay (±20%) 5 μs
ON delay (±20%) 120 μs

Photocoupler Response Time

Input Voltage	*OFF delay (±20%)	*ON delay (±20%)
12 V	120 μs	10 μs
24 V	140 μs	5 μs
30 V	150 μs	4 μs
50 V	200 μs	4 μs

General

- PICMG Compliance: CompactPCI V2.0, R 3.0
Hot-Swap V2.1, R 2.0
- Bus Type: CompactPCI
- I/O Connectors: 1 x 78-pin D-type female connector
- Dimensions (L x H): 160 x 100 mm (6.9" x 3.9") with 3U Bracket
- Power Consumption: Typical: 5 V @ 220 mA
Max: 3.3 V @ 260 mA
- Operating Temperature: 0 ~ 60°C (32 ~ 140°F) (refer to IEC 68-2-1, 2)
- Operating Humidity: 5 ~ 95% RH, non-condensing (refer to IEC 68-2-3)
- Storage Temperature: -20 ~ 70°C (-4 ~ 158°F)
- Certification: CE

Ordering Information

- MIC-3756/3: 3U 64-channel isolated digital I/O Card
- PCL-10178-1: DB-78 cable assembly, 1 m
- ADAM-3978: DB-78 wiring terminal for DIN-rail mounting

Specifications

Isolated Digital Input

- Channels: 64
- Input Voltage: Logic 0: 2.5 V max.
Logic 1: 5 V min. (25 V max)
- Interrupt Capable Ch.: 64
- Isolation Protection: 2,500 V_{DC}
- Opto-Isolator Response: 50 μs
- Input Resistance: 3 kΩ

Isolated Digital output

- Channels: 64
- Output Type: Sink (NPN)
- Isolation Protection: 2500 V_{DC}
- Output Voltage: 5 ~ 40 V_{DC}
- Sink Current: 90 mA max./Channel
- Opto-isolator Response: 50 μs

General

- Bus Type: CPCI bus spec. 2.1 compliant
- I/O Connectors: 1 x MINI-SCSII HDRA-E100 Female
- Dimensions (L x H): 160 x 100 mm (6.9" x 3.9") with 3U Bracket
- Power Consumption: Typical : +5 V @ 800 mA, +3.3 V @ 600 mA
Max : +5 V @ 1 A, +3.3 V @ 1 A
- Operating Temperature: 0 ~ 60°C (32 ~ 140°F) (IEC 68-2-1,2)
- Storage Temperature: -20° ~ 70°C (-4° ~ 158°F)
- Storage Humidity: 5 ~ 95% (IEC 68-2-3) non-condensing

Ordering Information

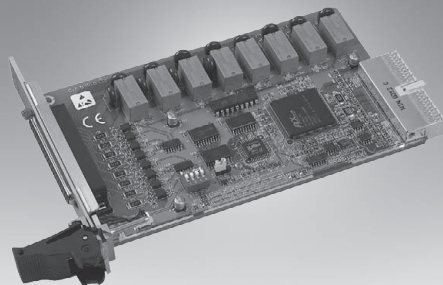
- MIC-3758/3: 3U CompactPCI 128-ch isolated Digital I/O card
- PCL-101100S-1: 100-pin SCSI Cable, 1 m
- ADAM-39100: 100-pin SCSI wiring terminal, DIN-rail mounting

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MIC-3761 MIC-3780

8-ch Relay & 8-ch Isolated Digital Input 3U
CompactPCI® Card

8-ch, 16-bit Counter/Timer 3U CompactPCI® Card



MIC-3761/3

Specifications

Isolated Digital Input

- Channels 8
- Input Voltage Logic 0: 3 V max.
Logic 1: 10 V min.
(50 V max.)
- Input Current* 10 V_{DC} 1.6 mA (typical)
12 V_{DC} 1.9 mA (typical)
24 V_{DC} 4.1 mA (typical)
48 V_{DC} 8.5 mA (typical)
50 V_{DC} 8.9 mA (typical)
- Interrupt Capable Ch. ID0 ~ ID7
- Isolation Protection 3,750 V_{DC}
- Overvoltage Protection 70 V_{DC}
- Opto-Isolator Response 25 µs
- Input Resistance 560 Ω

Relay Output

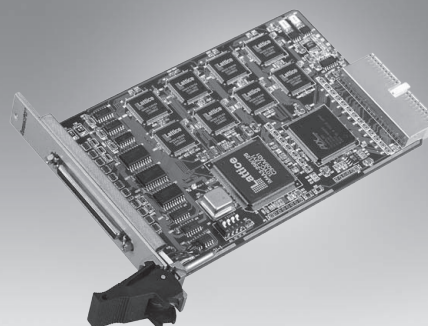
- Channels 8
- Relay Type SPDT
(4 Form A, and 4 Form C)
- Contact Rating 3 A @ 250 V_{AC} or 3 A @ 24 V_{DC}
- Relay on Time 15 ms max.
- Relay off Time 5 ms max.
- Life Span Mechanical
2 x 10⁷ ops. min.
Electrical
2 x 10⁵ ops. min. (contact rating)
- Resistance 1 GΩ min. (at 500 V_{DC})

General

- PICMG Compliance CompactPCI V2.0, R 3.0
Hot-Swap V2.1, R 2.0, R 2.1
- Bus Type CompactPCI
- I/O Connectors 1 x 37-pin D-type female connector
- Dimensions (L x H) 160 x 100 mm (6.3" x 3.9") with 3U Bracket
- Power Consumption Typical: +5 V @ 220 mA
Max.: +5 V @ 750 mA
- Certifications CE

Ordering Information

- MIC-3761/3 3U 8-ch Relay Actuator and 8-ch Isolated D/I Card
- PCL-10137-1/2/3 DB-37 cable assembly, 1, 2 and 3 m
- ADAM-3937 DB-37 Wiring Terminal for DIN-rail Mounting
- PCLD-780 Universal Screw Terminal Board



MIC-3780/3

Specifications

Digital Input

- Channels 8
- Compatibility 5 V/TTL
- Input Voltage Logic 0: 0.8 V max.
Logic 1: 2.4 V min.
- Interrupt Capable Ch. 1 (channel 0)

Digital Output

- Channels 8
- Compatibility 5 V/TTL
- Output Voltage Logic 0: 0.5 V max. @ 24 mA
Logic 1: 2.4 V min. @ -15 mA
Sink: 0.5 V max. @ 24 mA
Source: 2.4 V min. @ -15 mA
- Output Capability

Counter/Timer

- Channels 8 (independent)
- Resolution 16 bits
- Compatibility 5 V/TTL
- Max. Input Frequency 20 MHz
- Reference Clock Internal: 20 MHz
- Counter Modes 12 (programmable)
- Interrupt Capable Ch. 8

General

- PICMG Compliance CompactPCI V2.0, R 3.0
Hot-Swap V2.1, R 2.0
- Bus Type CompactPCI V2.1
- I/O Connectors 68-pin SCSI-II female
- Dimensions (L x H) 160 x 100 mm (6.3" x 3.9") with 3U Bracket
- Power Consumption Typical: +5 V @ 900 mA
Max: +3.3 V @ 1.2 A
- Operating Temperature 0 ~ 60°C (32 ~ 140°F) (refer to IEC 68-2-1, 2)
- Storage Temperature -20 ~ 70°C (-4 ~ 158°F)
- Relative Humidity 5 ~ 95 % RH non-condensing (refer to IEC 68-2-3)
- Certifications CE, FCC Class A

Ordering Information

- MIC-3780/3 3U Compact PCI 8-ch, 16 bit counter/timer card
- MIC-3780R/3 3U Compact PCI 8-ch, 16 bit counter/timer card with Rear I/O support
- PCL-10168 68-pin SCSI-II cable with male connectors on both ends and special shielding for noise reduction, 1 and 2 m
- ADAM-3968 68-pin SCSI-II Wiring Terminal Board for DIN-rail mounting