## CompactPCI Systems

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

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).

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.
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 VAC/180 ~ 264 VAC @ 47 ~ 63 Hz
- Output: 400 W
- Loading (A)

<table>
<thead>
<tr>
<th>Load</th>
<th>+3.3 V</th>
<th>+5 V</th>
<th>-5 V</th>
<th>+12 V</th>
<th>-12 V</th>
<th>+5 Vsb</th>
</tr>
</thead>
<tbody>
<tr>
<td>Max.</td>
<td>20</td>
<td>42</td>
<td>1</td>
<td>14</td>
<td>1</td>
<td>0.75</td>
</tr>
<tr>
<td>Min.</td>
<td>0.2</td>
<td>2.5</td>
<td>0</td>
<td>0.5</td>
<td>0</td>
<td>0</td>
</tr>
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</table>

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 VDC, brushless, dual ball bearing (with removable filter)
- **Life Span**: 80,048 hours @ 25°C

#### Power Supply
- **Input**: 100 – 240 VAC @ 47~63 Hz, full range
- **Output**: 250 W ATX power supply
- **MTBF**: 105,405 hours @ 25°C

#### Electrical
- **Load**
  - **Max.**: +5 V: 24, 5 V: 5, 12 V: 12, 3.3 V: 20, 5 Vsb: 1.5
  - **Min.**: +5 V: 3, 5 V: 0, 12 V: 2, 3.3 V: 0, 5 Vsb: 1, 12 Vsb: 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 Gms, 2 Gms
- **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")
- **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
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
- **Chipset**
  - Intel 915 GM (GMCH) + Intel 82801FBM (ICH6-M)
- **BIOS**
  - Award 4 MB Flash
- **Bus**
  - 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
- **PCI Bus**
  - 7 x 32bit/33MHz CompactPCI bus Master interface
  - 3.3 V/5 V VIO adjustable
- **Memory**
  - Directed Soldered 1 GB DDR2 SDRAM
- **Graphics**
  - Controller: Intel Graphics Media Accelerator 900
  - VRAM: DVM3.0 128MB
  - Resolution: Up to 2048 x 1536 with 32-bit color at 75 Hz
- **Ethernet**
  - Interface: 10/100/1000Base-TX Gigabit Ethernet
  - Controller: 2 x Intel 82573E/EL PCI Express Gigabit Ethernet Controller
  - Connector: 2 x RJ-45
  - Supports Pre-boot Execution Environment (PXE)
- **Serial**
  - Interface: RS-232
  - Controller: 2 x 16C550 Compatible
  - Data Bits: 5, 6, 7, 8
  - Stop Bits: 1, 1.5, 2
  - Parity: None, Even, Odd
  - Speed (bps): 50 – 115.2K
  - Data Signal: TxD, RxD, RTS, CTS, DTR, DSR, DCD, RI, GND
  - Connector: 2 x 689 male
- **Two as front I/O, one as rear I/O**
- **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
- **SATA**
  - SATA interface with data transfer rate up to 150MB/s
  - 1 x External SATA connector
- **USB**
  - 4 x USB 2.0 channels up to 480Mbps, 2 as front I/O, 2 as rear I/O
- **PS/2**
  - PS/2 for keyboard and mouse legacy support
- **Watchdog Timer**
  - 0 – 64s, 0.25s step, generate reset signal
- **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 GPI03)
Front Panel Functions

- **4HP Board**
  1 x VGA-CRT 15-pin D-SUB connector
  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
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 26G DDR2 SDRAM up to 4GB 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 P1768150
    - 7 x 32 bit/33 MHz Compact PCI bus master interface
    - 3.3V VIO

- **Memory**
  - DDR2 533/667 MHz Support 2G (Note 2)
  - 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 x1 Intel82574E 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,DCE,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
  - **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 x 15 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
### Specifications

#### MIC-3611
- **Features**
  - PCI Specification 2.1 compliant
  - Speeds up to 921.6 kbps
  - 16C954 UARTs with 128-byte standard
  - Standard Industrial 3U(6U sized) CompactPCI Board size
  - I/O address automatically assigned by PCI Plug-and-Play
  - OS supported: Windows 98/2000/XP
  - Surge protection: 2,500 VDC
  - Isolation protection: 2,500 VDC
  - Automatic RS-485 data flow control
  - Tx/Rx LED indicator

- **General**
  - Bus Type: CompactPCI bus specification 2.1 compliant
  - I/O Connectors: DB44 and four RS232/485 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)
  - Certification: CE, FCC

- **Ordering Information**
  - MIC-3611
  - MIC-3611R

#### 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

- **General**
  - Bus Type: PCI Specification 2.1 compliant
  - Data Bits: 5, 6, 7, 8
  - Data Signals: TxD, RxD, RTS, CTS, DTR, DSR, DCD, RI, NRD
  - 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
  - Power Supply: 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

- **Ordering Information**
  - MIC-3612

#### MIC-3620
- **Features**
  - PCI Specification 2.1 compliant
  - Speeds up to 921.6 kbps
  - 8-port RS-232/422/485
  - Standard Industrial CompactPCI® 3U Card 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

- **General**
  - PICMG Compliance: CompactPCI V2.0, R 3.0
  - 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)
  - Storage Temperature: 5 ~ 95% Relative Humidity, non-condensing
  - Power Supply: 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

- **Ordering Information**
  - MIC-3620/3

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### Ordering Information

- **MIC-3611**
  - 4-port RS-422/485 3U CompactPCI® Card with Surge and Isolation Protection

- **MIC-3612**
  - 4-port RS-232/422/485 3/6U CompactPCI® Card

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

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**21-10**

**CompactPCI Systems**

**SHOP ONLINE at [www.airlinehyd.com](http://www.airlinehyd.com)**

**800-999-7378**
MIC-3621
MIC-3680

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

2-port CAN-bus 3U CompactPCI® Card

Features
- PICMG Compliance
- Bus Type
- Hotswap Support
- I/O Connectors
- Dimensions (L x H)
- Power Consumption
- Operating Temperature
- Storage Temperature
- Storage Humidity

Ordering Information
- MIC-3621R/3
- MIC-3680/3

Specifications
Communications
- CAN Controller Frequency
- CAN Transceiver
- Communication Controller
- Data Signals
- Speed (bps)
- Data Bits
- Stop Bits
- Parity
- IRQ

General
- PICMG Compliance
- Bus Type
- Hotswap Support
- I/O Connectors
- Dimensions (L x H)
- Power Consumption
- Operating Temperature
- Storage Temperature
- Storage Humidity

Ordering Information
- MIC-3621R/3
- MIC-3680/3

Features
- PICMG Compliance
- Bus Type
- Hotswap Support
- I/O Connectors
- Dimensions (L x H)
- Power Consumption
- Operating Temperature
- Storage Temperature
- Storage Humidity

Ordering Information
- MIC-3621R/3
- MIC-3680/3

Specifications
Communications
- CAN Controller Frequency
- CAN Transceiver
- Communication Controller
- Data Signals
- Speed (bps)
- Data Bits
- Stop Bits
- Parity
- IRQ

General
- PICMG Compliance
- Bus Type
- Hotswap Support
- I/O Connectors
- Dimensions (L x H)
- Power Consumption
- Operating Temperature
- Storage Temperature
- Storage Humidity

Ordering Information
- MIC-3621R/3
- MIC-3680/3
### MIC-3716
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

### 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 Vpp
- **Input Impedance:** 100 Ω (100 MΩ/100 Ω (100 MΩ/100 Ω/10 kHz)
- **Sampling Modes:** Software, paced, or external
- **Input Range:**
  - Unipolar: 0 ~ 10 V
  - Bipolar: ±10 V
- **Accuracy (% of FSR ±1LSB):** ±0.15% ±0.03% ±0.03% ±0.05% ±0.1%

#### Analog Output
- **Channels:** 2
- **Resolution:** 16 bits
- **Output Rate:** Static update
- **Output Capability:**
  - Logic 0: 0.4 V max.
  - Logic 1: 2.4 V min.
- **Accuracy:**
  - Relative: ±1LSB

#### Dimensions (L x H)

<table>
<thead>
<tr>
<th>Metric</th>
<th>Measurement</th>
</tr>
</thead>
<tbody>
<tr>
<td>General</td>
<td>16, 5V/TL</td>
</tr>
<tr>
<td>Input Voltage</td>
<td>Logic 0: 0.4 V max.</td>
</tr>
<tr>
<td>Output Voltage</td>
<td>Logic 1: 2.4 V max.</td>
</tr>
<tr>
<td>Input Capability</td>
<td>Sink: 0.4 V max. @ ±8 mA</td>
</tr>
<tr>
<td>Reference Clock</td>
<td>Source: 2.4 V max. @ ±0.4 mA</td>
</tr>
</tbody>
</table>

#### General
- **Bus Type:** CompactPCI
- **I/O Connectors Type:** 4 x BNC connector (for AI) 1 x PS/2 connector (for AO)
- **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
- **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-3716/3**
  3U, 250 kS/s, 16-bit, 16-ch
  High-Resolution Multifunction Card Industrial Wiring Terminal Board with DIN-rail Mounting (cable not included)
- **PCLD-8710**
  68-pin SCSI-II cable with male connectors on both ends and special shielding for noise reduction, 16, 5V/TL
- **PCL-10158**
  68-pin SCSI-III Wiring Terminal Board for DIN-rail Mounting

### MIC-3714

### MIC-3723

### 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:** 50 Ω/1 MΩ jumper selectable, 100 Ω
- **Input Impedance:** Software, paced, post-trigger, pre-trigger, delay-trigger, about-trigger
- **Sampling Modes:** i+, i-, x, i+2, x, i+5
- **Input Range (V):**
  - Unipolar: 0 ~ +x V @ +x V
  - Bipolar: ±10 V, ±5 V, ±2.5 V, ±1.25 V, ±0.625 V
- **Accuracy (% of FSR ±1LSB):** ±0.15% ±0.03% ±0.03% ±0.05% ±0.1%

#### Analog Output
- **Channels:** B
- **Resolution:** 8
- **Output Rate:** Static update
- **Output Range:** (V, software programmable)
  - Internal Reference
  - Unipolar
  - ±20 V
  - ±20 mA, ±20 mA

#### Dimensions (L x H)

<table>
<thead>
<tr>
<th>Metric</th>
<th>Measurement</th>
</tr>
</thead>
<tbody>
<tr>
<td>General</td>
<td>16, 5V/TL</td>
</tr>
<tr>
<td>Input Voltage</td>
<td>Logic 0: 0.8 V max.</td>
</tr>
<tr>
<td>Output Voltage</td>
<td>Logic 1: 2.0 V min.</td>
</tr>
<tr>
<td>Input Capability</td>
<td>Sink: 2.4 V min. @ -15 mA</td>
</tr>
<tr>
<td>Reference Clock</td>
<td>Source: 2.4 V min. @ -15 mA</td>
</tr>
</tbody>
</table>

#### General
- **PICMG Compliance:** CompactPCI V2.0, R 2.1
- **Bus Type:** CompactPCI
- **I/O Connector Type:** 1 x PS/2 connector (for AI)
- **Dimensions (L x H):** 160 x 100 mm (6.3" x 3.9") with 3U bracket
- **Power Consumption:** Typical: 5 V @ 850, 12 V @ 600 mA
- **Certification:** CE

#### Ordering Information
- **MIC-3714**
  3U, 30 MS/s, Simultaneous 4-ch Analog Input Card
- **PCL-10901**
  DB-9 Wiring Terminal Board for DIN-rail Mounting
- **PCL-10903**
  16, 5V/TL
- **PCL-10108**
  16, 5V/TL
- **PCL-10168-2**
  PS2 to DB-9 wiring cable, 1 m
- **PCL-10168-1**
  PS2 to DB-9 wiring cable, 2 m
- **ADAM-3968**
  68-pin SCSI-II Wiring Terminal Board for DIN-rail Mounting

### Ordering Information
- **MIC-3723**
  3U CompactPCI 16-bit, 8-ch non-isolated analog output card
- **MIC-3723R**
  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, 16, 5V/TL
- **PCL-10168-2**
  68-pin SCSI-II cable with male connectors on both ends and special shielding for noise reduction, 16, 5V/TL
- **ADAM-3968**
  68-pin SCSI-II Wiring Terminal Board for DIN-rail Mounting

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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
- **Sink Current**: 0.44 V max. @ 24 mA
- **Source**: 3.76 V min. @ 24 mA

**General**
- **PICMG Compliance**: CompactPCI V2.0, R 2.1
- **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 (refer to IEC 68-2-1, 2)
- **Operating Temperature**: 0 – 60°C (32 – 140°F)
- **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-3756/3** 3U CompactPCI 72-ch Digital I/O card with Rear I/O support
- **PCL-10176-1** DB-78 cable assembly, 1 m
- **ADAM-3978** DB-78 wiring terminal for DIN-rail mounting

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**Specifications**

**Isolated Digital Input**
- **Channels**: 32
- **Input Voltage**: Logic 0: 2.2 V max. Logic 1: 1.0 V min. (50 V max.)
- **Interrupt Capable Ch.**: 2 (DI00, DI16)
- **Isolation Protection**: 2,500 VDC
- **Input Resistance**: 5 kΩ

**Isolated Digital Output**
- **Channels**: 32
- **Output Type**: Sink (NPN)
- **Output Voltage**: 2,500 VDC
- **Sink Current**: 100 mA max./channel
- **Opto-Isolator Response**: OFF delay (±20%) 5 µs ON delay (±20%) 120 µs

**Photocouple Response Time**

<table>
<thead>
<tr>
<th>Input Voltage</th>
<th>OFF delay (±20%)</th>
<th>ON delay (±20%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>12 V</td>
<td>120 µs</td>
<td>10 µs</td>
</tr>
<tr>
<td>24 V</td>
<td>140 µs</td>
<td>5 µs</td>
</tr>
<tr>
<td>30 V</td>
<td>150 µs</td>
<td>4 µs</td>
</tr>
<tr>
<td>50 V</td>
<td>200 µs</td>
<td>4 µs</td>
</tr>
</tbody>
</table>

**General**
- **PICMG Compliance**: CompactPCI V2.0, R 3.0
- **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 @ 800 mA, Max: -5 V @ 1 A, +3.3 V @ 1 A (referee to IEC 68-2-1, 2)
- **Operating Temperature**: 0 – 60°C (32 – 140°F) (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-3758/3** 3U CompactPCI 128-ch Isolated Digital I/O Card
- **PCL-101100S-1** 100-pin SCSI wiring cable, 1 m
- **ADAM-393100** 100-pin SCSI wiring terminal, DIN-rail mounting

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**21-13**

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## 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: 1.6 mA (typical)
  - 12 V: 1.9 mA (typical)
  - 24 V: 4.1 mA (typical)
  - 48 V: 8.5 mA (typical)
  - 50 V: 8.9 mA (typical)
- **Interrupt Capable Ch.**: ID0 ~ ID7
- **Isolation Protection**: 3,750 V
- **Overvoltage Protection**: 70 VDC
- **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 VDC, or 3 A @ 24 VAC
- **Relay on Time**: 15 ms max.
- **Relay off Time**: 5 ms max.
- **Life Span**
  - Mechanical: 2 x 10⁷ ops. min.
  - Electrical: 2 x 10⁶ ops. min. (contact rating)
- **Resistance**: 1 GΩ min. (at 500 VDC)

### General

- **PICMG Compliance**: CompactPCI V2.0, R 3.0, Hot-Swap V2.1, R 2.0
- **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
  - +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-3761/3**: 3U 8-ch Relay Actuator and 8-ch Isolated DI 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

## 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
- **Output Capability**
  - Sink: 0.5 V max. @ 24 mA
  - Source: 2.4 V min. @ -15 mA

### 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
- **Bus Type**: CompactPCI V2.1
- **I/O Connectors**: 68-pin SCSI-II female connector
- **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 CompactPCI 8-ch, 16-bit counter/timer card
- **MIC-3780R/3**: 3U CompactPCI 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

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**MIC-3761/3**

**MIC-3780/3**

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