## 11 CompactPCI Systems

<table>
<thead>
<tr>
<th>Section</th>
<th>Description</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Advantech CompactPCI Introduction</td>
<td></td>
<td>11-2</td>
</tr>
<tr>
<td><strong>3U CPU Cards</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>MIC-3321</td>
<td>3U CompactPCI Pentium M 760 2.0 GHz High-performance Controller</td>
<td>11-4</td>
</tr>
<tr>
<td><strong>3U Backplane Enclosure</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>MIC-3001</td>
<td>4U CompactPCI Enclosure with 8/14-slot 3U Backplane</td>
<td>11-6</td>
</tr>
<tr>
<td>MIC-3002A</td>
<td>4U CompactPCI Enclosure with 6-slot 3U Backplane</td>
<td>11-8</td>
</tr>
<tr>
<td><strong>Data Acquisition and Control Cards</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>MIC-3716</td>
<td>250 kS/s, 16-bit, 16-ch High-resolution Multifunction Cards</td>
<td>11-9</td>
</tr>
<tr>
<td>MIC-3714</td>
<td>30 MS/s, Simultaneous 4-ch Analog Input Card</td>
<td>11-9</td>
</tr>
<tr>
<td>MIC-3723/3723R</td>
<td>16-bit, 8-ch Non-isolated Analog Output Cards</td>
<td>11-9</td>
</tr>
<tr>
<td>MIC-3753/3753R</td>
<td>72-ch Digital I/O Cards</td>
<td>11-10</td>
</tr>
<tr>
<td>MIC-3756</td>
<td>64-ch Isolated Digital I/O Card</td>
<td>11-10</td>
</tr>
<tr>
<td>MIC-3758</td>
<td>128-ch Isolated Digital I/O Card</td>
<td>11-10</td>
</tr>
<tr>
<td>MIC-3761</td>
<td>8-ch Relay Actuator and 8-ch Isolated Digital Input Card</td>
<td>11-11</td>
</tr>
<tr>
<td>MIC-3780/3780R</td>
<td>8-ch Counter/Timer Cards</td>
<td>11-11</td>
</tr>
<tr>
<td><strong>Communication Cards</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>MIC-3611/3611R</td>
<td>4-port RS-422/485 Communication Cards w/Surge &amp; Isolation Protection</td>
<td>11-11</td>
</tr>
<tr>
<td>MIC-3612</td>
<td>4-port RS-232 RS-422/485 Communication Card, w/Surge Protection</td>
<td>11-12</td>
</tr>
<tr>
<td>MIC-3620</td>
<td>8-port RS-232 Communication Card</td>
<td>11-12</td>
</tr>
<tr>
<td>MIC-3680/3680R</td>
<td>2-port Isolated CAN Communication Cards</td>
<td>11-12</td>
</tr>
</tbody>
</table>
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 speeds 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.

Features

- Commercial standard PCI chips provide high performance at a low price
- Up to eight 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

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.
Features
- Built-in Intel® Pentium® M 760 2.0GHz processor with 2MB L2 Cache
- Mobile Intel 915GM express chipset
- Supports up to 1GB DDR2 533/400 SDRAM soldered on board
- Extended operating temp. -25 ~ 70° C (Optional; MIC-3321C/CS only)
- 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 directed soldered CPU and memory provide less weight and a higher shock/vibration resistance than socket devices.

MIC-3321 is a powerful 3U CompactPCI Controller that fulfills your 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

<table>
<thead>
<tr>
<th>Feature</th>
<th>MIC-3321: Intel Pentium M 760 2.0GHz with 2MB L2 cache</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>MIC-3321C: Intel Celeron M Ultra Low Voltage 373 1.0GHz with 512 KB L2 cache</td>
</tr>
<tr>
<td></td>
<td>MIC3321L: Intel Celeron M 800 MHz (no cache)</td>
</tr>
<tr>
<td>CPU</td>
<td>Award 4 MB Flash</td>
</tr>
<tr>
<td>Chipset</td>
<td>Intel 915 GM (GMCH) + Intel 82801FBM (ICH6-M)</td>
</tr>
<tr>
<td>BIOS</td>
<td>Award 4 MB Flash</td>
</tr>
<tr>
<td>Front Side Bus</td>
<td>533 MHz (Intel Pentium M 760 2.0GHz CPU)</td>
</tr>
<tr>
<td></td>
<td>400 MHz (Intel Celeron M Ultra Low Voltage 373 1.0GHz CPU)</td>
</tr>
<tr>
<td>PCI Bus</td>
<td>PCI-to-PCI Bridge: PERICOM Pi7C8150</td>
</tr>
<tr>
<td></td>
<td>7 x 32bit/33MHz CompactPCI bus Master interface</td>
</tr>
<tr>
<td></td>
<td>3.3 V/5 V VIO adjustable</td>
</tr>
<tr>
<td>Bus</td>
<td>Directed Soldered 512MB DDR2 SDRAM (MIC-3321, MIC-3321C)</td>
</tr>
<tr>
<td></td>
<td>Directed Soldered 256MB DDR2 SDRAM (MIC-3321L)</td>
</tr>
<tr>
<td>Memory</td>
<td>Controller: Intel Graphics Media Accelerator 900 VRAM: DVMT3.0 128MB</td>
</tr>
<tr>
<td></td>
<td>Resolution: Up to 2048 x 1536 with 32-bit color at 75 Hz</td>
</tr>
<tr>
<td>Graphics</td>
<td>Interface: 10/100/1000Base-TX Gigabit Ethernet</td>
</tr>
<tr>
<td></td>
<td>Controller: 2 x Intel 82573GA, PCI Express Gigabit Ethernet Controller</td>
</tr>
<tr>
<td></td>
<td>Connector: 2 x RJ-45</td>
</tr>
<tr>
<td>Ethernet</td>
<td>Supports Pre-boot Execution Environment (PXE)</td>
</tr>
<tr>
<td>Serial</td>
<td>Interface: RS-232</td>
</tr>
<tr>
<td></td>
<td>Controller: 2 x 16C550 Compatible</td>
</tr>
<tr>
<td></td>
<td>Data Bits: 5, 6, 7, 8</td>
</tr>
<tr>
<td></td>
<td>Stop Bits: 1, 1.5, 2</td>
</tr>
<tr>
<td></td>
<td>Parity: None, Even, Odd</td>
</tr>
<tr>
<td></td>
<td>Speed (bps): 50 ~ 115.2K</td>
</tr>
<tr>
<td></td>
<td>Data Signal: TX0, RXD, RTS, CTS, DTR, DSR, DCD, RI, GND</td>
</tr>
<tr>
<td></td>
<td>Connector: 2 x DB9 male</td>
</tr>
<tr>
<td></td>
<td>One as front I/O, one as rear I/O</td>
</tr>
<tr>
<td>P-IDE</td>
<td>One channel P-IDE</td>
</tr>
<tr>
<td></td>
<td>Supports PIO mode 4 (16.67MB/s data transfer rate) and ATA 33/66/100 (33/66/100MB/s data transfer rate)</td>
</tr>
<tr>
<td></td>
<td>1 x CompactFlash Socket Type II</td>
</tr>
<tr>
<td></td>
<td>1 x 44-pin 2.5&quot; HDD connector</td>
</tr>
<tr>
<td>SATA</td>
<td>SATA interface with data transfer rate up to 150MB/s</td>
</tr>
<tr>
<td></td>
<td>1 x External SATA connector</td>
</tr>
<tr>
<td>USB</td>
<td>4 x USB 2.0 channels up to 480Mbps, 2 as front I/O, 2 as rear I/O</td>
</tr>
<tr>
<td>PS/2</td>
<td>PS/2 for keyboard and mouse legacy support</td>
</tr>
<tr>
<td>Watchdog Timer</td>
<td>0 ~ 64s, 0.25s step, generate reset signal</td>
</tr>
<tr>
<td>Hot Swap</td>
<td>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)</td>
</tr>
</tbody>
</table>
### 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
- 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

<table>
<thead>
<tr>
<th>Operating Temperature</th>
<th>Physical Dimensions</th>
</tr>
</thead>
<tbody>
<tr>
<td>0 ~ 50° C (MIC-3321 Pentium M 2.0G)</td>
<td>(W x H) 160 x 100 mm (3U)</td>
</tr>
<tr>
<td>0 ~ 50° C (MIC-3321L Celeron M 800M)</td>
<td>Weight 0.6 Kg</td>
</tr>
<tr>
<td>0 ~ 50° C (MIC-3321C Celeron M 1.0G)</td>
<td></td>
</tr>
<tr>
<td>-25 ~ 70° C (Optional; MIC-3321C/MIC-3321CS only)</td>
<td></td>
</tr>
<tr>
<td>-40 ~ 80° C</td>
<td></td>
</tr>
</tbody>
</table>

### Ordering Information

- **MIC-3321**
  - Pentium M 2.0 GHz, 2Mbyte L2 cache, 512 MByte soldered DDR2 SDRAM, 8 HP width

- **MIC-3321S**
  - Pentium M 2.0 GHz, 2Mbyte L2 cache, 512 MByte soldered DDR2 SDRAM, 4 HP width

- **MIC-3321C**
  - Celeron M 1.0 GHz, 512KByte L2 cache, 512 MByte soldered DDR2 SDRAM, 8 HP width

- **MIC-3321CS**
  - Celeron M 1.0 GHz, 512KByte L2 cache, 512 MByte soldered DDR2 SDRAM, 4 HP width

- **MIC-3321L**
  - Celeron M 800 MHz, 0KByte L2 cache, 256 MByte soldered DDR2 SDRAM, 8 HP width

- **MIC-3321LS**
  - Celeron M 800 MHz, 0KByte L2 cache, 256 MByte soldered DDR2 SDRAM, 4 HP width

- **MIC-3521**
  - Rear I/O Transition Board for MIC-3321 series
Features
- Eight, fourteen 3U CompactPCI® slots
- 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

Introduction
The MIC-3001/8 is a 4U-size enclosure with eight 3U CompactPCI slots for rack or panel mounting. Its flexible modular design allows users to configure for a variety of applications. Reserved space in Device Bay can be used to install peripherals such as 3.5” HDD, or a CD-ROM drive.

The 3U size 8, 14-slot backplane of the MIC-3001 series supports 32-bit operation. The backplane complies with the PICMG 2.1 Hot-Swap Specification, and you can build easy-to-maintain systems with hot-swappable CompactPCI boards and software.

A 1U-high fan module provides forced cooling air into the system. Two 113-CFM high-speed fans are mounted in a hot-swap tray directly underneath the card slots. The fan’s tachometer output enables the alarm module to monitor the speed of the fans, and a protective circuit has been designed into the fan backplane to reduce spikes and noise during hot-swapping. This design allows replacement of fans without turning the system off.

Specifications
Backplane
- Slots: MIC-3001AR/8-A, MIC-3001HR/8-A: 8
  MIC-3001CR/14-A: 14
- Bus: 32-bit/33 MHz
- Vio Voltage: 3.3 V/5 V (short-bar selectable)

Device Bay
- HDD or CD-ROM: Yes

Cooling
- Fan: MIC-3001AR/8-A, MIC-3001HR/8-A: 2 (2 *113 CFM)
  MIC-3001CR/14-A: 3 (3 *113 CFM)

Power
- Input:
  MIC-3001AR/8-A: 90 ~ 132 VAC/180 ~ 264 VAC @ 47 ~ 63 Hz.
  MIC-3001HR/8-A: 100 ~ 240 VAC (With ±10% tolerance)
  MIC-3001CR/14-A: 90 ~ 264 VAC @ 47-63 Hz
- Output:
  MIC-3001AR/8-A: 400 W
  MIC-3001HR/8-A: 300 W
  MIC-3001CR/14-A: 250 W

Loading (A)

<table>
<thead>
<tr>
<th>Model</th>
<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>MIC-3001AR/8-A</td>
<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></td>
<td>Min.</td>
<td>0.2</td>
<td>2.5</td>
<td>0.5</td>
<td>0</td>
<td>0</td>
<td>0.05</td>
</tr>
<tr>
<td>MIC-3001HR/8-A</td>
<td>Max.</td>
<td>18</td>
<td>25</td>
<td>0.5</td>
<td>16</td>
<td>0.5</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>Min.</td>
<td>1</td>
<td>3</td>
<td>0</td>
<td>2</td>
<td>0</td>
<td>0.1</td>
</tr>
<tr>
<td>MIC-3001CR/14-A</td>
<td>Max.</td>
<td>18</td>
<td>25</td>
<td>N/A</td>
<td>5</td>
<td>0.5</td>
<td>N/A</td>
</tr>
<tr>
<td></td>
<td>Min.</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

Environment
- Operating Temperature: 0~50° C (32~122° F)

Storing Temperature: -40 ~ 80° C (-40 ~ 176° F)
Storing Humidity: 10 ~ 90% @ 40° C, non-condensing

Physical
- Dimensions (W x H x D): MIC-3001/8 440 x 178 x 240mm
  MIC-3001R series 440 x 178 x 283mm
- Weight: 7 Kg (15.4lb)

Operating Vibration: 1.0 Grms w/CF disk
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
- MIC-3001HR/8: 4U CompactPCI chassis with 8-slot backplane, fan tray module, rear I/O and AC ATX redundant power supply
- MIC-3001CR/14: 4U CompactPCI chassis with 14-slot backplane, fan tray module, rear I/O and cPCI standard redundant power supply
- 9663300100: 3.5" FDD/HDD bracket accessory for MIC-3000 chassis
- 9663300101: 3U-4TE Blank Cover accessory for MIC-3000 chassis
**MIC-3001 Series**

**Dimensions**

Front View of MIC-3001/8 and MIC-3001R/8

- I/O Slot
- System Slot
- Power On/Off Switch

Fan Tray
Device Bay

Front View of MIC-3001HR/8

- I/O Slot
- Power Switch
- LED Indicator
- Redundant Power
- Power Inlet
- Reset Button

Fan Tray
System Slot
Device Bay

Rear View of MIC-3001R/8

- ATX Power Supply
- Rear I/O Module

Rear I/O Module
ATX Power Supply

Rear View of MIC-3001CR/14

- I/O Slots
- System Slots
- Redundant Power

Fan Tray
Power Switch

**Courtesy of Steven Engineering, Inc. 230 Ryan Way, South San Francisco, CA 94080-6370  Main Office: (650) 588-9200  Outside Local Area: (800) 258-9200  www.stevenengineering.com**
MIC-3002A

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

Features
- 6-slot 3U CompactPCI® backplane
- Compact size, 4U high enclosure for 3U cPCI modules
- Side handle design and optional 6" LCD display for portable applications
- Stand feet on the bottom side for desktop applications
- Hot-swap compliant backplane
- Logic ground and chassis ground can be isolated or common

Introduction
The MIC-3002AD/6 is a compact 4U CompactPCI chassis designed specifically for portable applications. With a side handle design, it can be carried conveniently, and it also has an onboard 6" LCD display on the rear panel. The MIC-3002AD/6 is therefore suitable as a rugged all-in-one mobile controller for applications in battle fields, production lines, transportation systems, and traffic control systems.

Hot Swap Passive Backplane
The 3U-size, 6-slot backplane of MIC-3002AD/6 supports 32-bit operation. The backplane complies with the PICMG 2.1 Hot Swap specifications, and you can build easy-to-maintain systems with hot-swappable CompactPCI boards and software.

Specifications

<table>
<thead>
<tr>
<th>System</th>
<th>Backplane</th>
<th>Cooling System</th>
<th>Power Supply</th>
<th>Environment</th>
<th>Reliability</th>
<th>Compliance</th>
<th>LCD Option</th>
</tr>
</thead>
<tbody>
<tr>
<td>Slots</td>
<td>6 CompactPCI slots (one system slot and 66 peripheral slots)</td>
<td>Air Flow: Two 45 CFM fans, 12 VDC brush less, dual ball bearing (with removable filter)</td>
<td>Input: 100 – 240 VAC, @ 47–63 Hz, full range</td>
<td>Temperature: 0 – 60°C (32–140°F) or 0 – 50°C (32–122°F) for LCD model</td>
<td>MTBF: 105,405 hours @ 25°C</td>
<td>PICMG 2.0, Ver. 3.0 CompactPCI</td>
<td>Screen Size: 6&quot;</td>
</tr>
<tr>
<td>Bus</td>
<td>32-bit/33 MHz</td>
<td>Life Span: 80,048 hours @ 25°C</td>
<td>Output: 250 W ATX power supply</td>
<td>Humidity: 95% @ 60°C (140°F), non-condensing</td>
<td></td>
<td>PICMG 2.1, Ver. 2.0 Hot Swap</td>
<td>Dimensions: 3U height x 10-slot (40 HP) width</td>
</tr>
<tr>
<td>I/O Voltage</td>
<td>3.3 V or 5 V, jumper selectable</td>
<td>Power</td>
<td></td>
<td>Vibration: 0.5 Gms</td>
<td></td>
<td></td>
<td>Resolution: 640 x 480 x 18-bit colors (262,144 colors)</td>
</tr>
<tr>
<td>Cooling System</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Pixel Pitch: 0.1905 x 0.1905 mm</td>
</tr>
<tr>
<td>Power Supply</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Brightness: 400 cd/m2</td>
</tr>
<tr>
<td>Environment</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Operating Temperature: 0 – 60°C (32–140°F) for LCD model</td>
</tr>
<tr>
<td>Reliability</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Storing Temperature: -40 – 80°C (-40–112°F) for LCD model</td>
</tr>
<tr>
<td>Compliance</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>LCD Option:</td>
</tr>
<tr>
<td>LCD Option</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Screen Size: 6&quot;</td>
</tr>
</tbody>
</table>

Ordering Information
- MIC-3002A/6: 4U CompactPCI chassis with 6-slot backplane
- MIC-3002AD/6: 4U CompactPCI chassis with 6-slot backplane and 6" LCD
- MIC-3002AR/6: 4U CompactPCI chassis with 6-slot backplane and Rear I/O support
- 1960002861: 2.5" HDD support kit for anti-vibration for MIC-3002A/6 and MIC-3002AD/6

Courtesy of Steven Engineering, Inc.-230 Ryan Way, South San Francisco, CA 94080-6370-Main Office: (650) 588-9200-Outside Local Area: (800) 258-9200-www.stevenengineering.com
## MIC-3716/3714/3723/3723R

**High-resolution Multifunction Cards**

### 30 MS/s Simultaneous 4-ch Analog Input Card

16-bit, 8-ch Non-isolated Analog Output Cards

### 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 kΩ/10 pF (Off), 100 MΩ/100 pF (On)
- **Sampling Modes**: Software, pacer, or external
- **Input Range**: ±10 ±5 ±2.5 ±1.25 ±0.625

#### Analog Output
- **Channels**: 2
- **Resolution**: 16 bits
- **Output Range**: Static update
- **Output Capability**: ±20 mA
- **Output Voltage**: ±5 V @ 1 A, ±12 V @ 700 mA

#### Counter/Timer
- **Channels**: 3
- **Applications**: 16-bit, 16-ch
- **Max. Input Frequency**: 1 MHz
- **Reference Clock**: Internal 10 MHz, External Clock: 10 MHz

#### Dimensions
- **CompactPCI**: 3U, 160 x 100 mm (6.3" x 3.9")
- **68-pin SCSI-II female**: 30 Vp-p
- **AI**: ±20 mA
- **Logic 0**: 0.5 V max. @ 24 mA
- **Logic 1**: 2.4 V min. @ -15 mA
- **Sink**: 0.4 V max. @ -8 mA
- **Source**: 2.4 V min. @ -4 mA

#### Power Consumption
- **Typical**: +5 V @ 850 mA, +12 V @ 600 mA
- **Max. Sampling Rate**: +5 V @ 150 mA, +12 V @ 600 mA
- **Max. Overvoltage Protection**: +3.3 V @ 850 mA, ±5 V @ 200 mA
- **Output Voltage**: ±12 V @ 700 mA

#### Overvoltage Protection
- **Logic 1**: 2.0 V min.
- **Logic 0**: 0.4 V max. @ 24 mA
- **Sink**: 0.4 V max. @ 24 mA
- **Source**: 2.4 V min. @ -4 mA

#### 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 MΩ/jumper selectable, 100 pF Software, pacer, post-trigger, pre-trigger, delay-trigger, about trigger
- **Sampling Modes**: (V, software programmable)
- **Input Range**: ±10 V

#### General
- **Bus Type**: CompactPCI
- **I/O Connectors**: 4 x BNC connector (for AI)
- **Dimensions (L x H)**: 160 x 100 mm (6.3" x 3.9")
- **Power Consumption**: Typical 5 V @ 850, 12 V @ 600 mA
- **Certifications**: CE and FCC certified

### Ordering Information
- **MIC-3714/3**: 3U CompactPCI 16-bit, 16-ch Analog Input Card
- **MIC-3723R/3**: 3U CompactPCI 16-bit, 8-ch Non-isolated Analog Output Card
- **PCL-10901**: 68-pin SCSI-II cable with male connectors on both ends and special shielding for noise reduction, 1 and 2 m
- **PCL-10901**: 68-pin SCSI-II wiring terminal board for DIN rail mounting
- **ADAM-3908**: 68-pin SCSI-II wiring terminal board for DIN rail mounting

### Ordering Information
- **MIC-3714**: 3U CompactPCI 16-bit, 16-ch Analog Input Card
- **MIC-3723**: 3U CompactPCI 16-bit, 8-ch Non-isolated Analog Output Card
- **PCL-10901**: 68-pin SCSI-II cable with male connectors on both ends and special shielding for noise reduction, 1 and 2 m
- **PCL-10901**: 68-pin SCSI-II wiring terminal board for DIN rail mounting

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**Ordering Information**

1. Mic-3716/3714/3723/3723R
2. PCL-10168-1
3. PCLD-8710
4. MIC-3716/3714/3723/3723R
5. PCL-10168-3
6. ADAM-3908
7. ADAM-3908
8. ADAM-3908
9. ADAM-3908
10. ADAM-3908
11. ADAM-3908
12. ADAM-3908
13. ADAM-3908
14. ADAM-3908
15. ADAM-3908
16. ADAM-3908
17. ADAM-3908

**Certifications**

- CE and FCC certified

**Ordering Information**

- MIC-3714/3
- PCL-10901
- PCL-10901
- PCL-10901
- ADAM-3908
- ADAM-3908
MIC-3753/3753R
MIC-3756
MIC-3758

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.
- **Input Current**: 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 Current**: 0.44 V max. @ 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**: 160 x 100 mm (6.9” x 3.9”) with 3U/6U Bracket
- **Power Consumption**: Typical: +5 V @ 400 mA
- **Operating Temperature**: 0 ~ 60° C (32 ~ 140° F)
- **Operating Humidity**: 5 ~ 95% RH, non-condensing
- **Storing Temperature**: -20 ~ 70°C (-4 ~ 158°F)
- **Certifications**: CE

**Ordering Information**
- **MIC-3753/3**: 3U CompactPCI 37-ch Digital I/O card
- **MIC-3753R/3**: 3U CompactPCI 72-ch Digital I/O card with Rear I/O support
- **PCL-10178-1**: MIC-3753/3 3U CompactPCI 37-ch Digital I/O Card with DB-78 cable assembly, 1 m DB-78 wiring terminal for DIN-rail mounting
- **ADAM-3978**: 3U 64-channel isolated digital I/O Card

### Isolated Digital Input

<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.2.1
- **Bus Type**: CompactPCI
- **I/O Connectors**: 1 x 78-pin D-type female connector
- **Dimensions**: 160 x 100 mm (6.9” x 3.9”) with 3U/6U Bracket
- **Power Consumption**: Typical: 5 V @ 220 mA
- **Operating Temperature**: 0 ~ 60° C (32 ~ 140° F)
- **Operating Humidity**: 5 ~ 95% RH, non-condensing
- **Storing Temperature**: -20 ~ 70°C (-4 ~ 158°F)
- **Certifications**: CE

### Micro-3756/3753R

- **Channels**: 64
- **Input Voltage**: Logic 0: 2.5 V max.
- **Input Current**: Logic 1: 1.0 V min. (50 V max.)
- **Interrupt Capable Ch.**: 2 (DO0, DO16)
- **Isolation Protection**: 2,500 VDC
- **Opto-Isolator Response**: Sink (NPN)
- **Input Resistance**: 3 Ω

### MICRO-3758/3

- **Channels**: 64
- **Input Voltage**: Logic 0: 5.0 V max.
- **Input Current**: Logic 1: 1.0 V min. (50 V max.)
- **Interrupt Capable Ch.**: 2 (DI00, DI16)
- **Isolation Protection**: 2,500 VDC
- **Opto-Isolator Response**: Sink (NPN)
- **Input Resistance**: 3 Ω

### Ordering Information
- **MIC-3756/3**: 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

**Courtesy of Steven Engineering, Inc.-230 Ryan Way, South San Francisco, CA 94080-6370-Main Office: (650) 588-9200-Outside Local Area: (800) 258-9200-www.stevenengineering.com**
## MIC-3611/3611R

### Specifications

#### Isolated Digital Input
- **Channels**: 8
- **Input Voltage**: Logic 0: 0 V max.
  - Logic 1: 10 V min.
  - (50 V max.)
- **Input Current**
  - 10 VR: 1.6 mA (typical)
  - 12 VR: 1.9 mA (typical)
  - 24 VR: 4.1 mA (typical)
  - 48 VR: 8.5 mA (typical)
  - 50 VR: 8.9 mA (typical)
- **Interrupt Capable Ch.**: 8
- **Isolation Protection**: 1000 VDC
- **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 VAC
  - 3 A @ 24 VDC
- **Relay on time**: 5 ms max.
- **Relay off time**: 15 ms max.
- **Life Span**: 1 x 10⁷ ops. min.
- **Mechanical**: 2 x 10⁶ ops. min.
- **Design**: 1 x 10⁶ ops. min.
- **Contact Rating**:
- **Resistance**:
  - Mechanical: 2 x 10⁶ Ω (contact rating)
  - Electrical: 2 x 10⁶ Ω (contact rating)
- **General**:
  - PICMG Compliance: CompactPCI V2.0, R 3.0
  - Bus Type: CompactPCI
  - I/O Connectors: 1 x 37-pin D-type female connector
  - Dimensions: 160 x 100 mm (6.3 x 3.9") with 3U/6U Bracket
  - Power Consumption: Typical: +5 V @ 220 mA
  - Max.: +5 V @ 750 mA
  - Input Voltage: Logic 0: 0.8 V max.
  - Logic 1: 2.4 V min.
  - (channel 9)
- **Certifications**: CE, FCC

### Ordering Information
- **MIC-3780/3780R**
- **MIC-3611/3611R**

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## MIC-3761/3761R

### Specifications

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

#### Digital Input
- **Channels**: 8
- **Compatibility**: 5 V/TTL
- **Input Voltage**: Logic 0: 0.8 V max.
  - Logic 1: 2.4 V min.
  - (channel 9)

#### 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**: 0.5 V min.
  - @ 24 mA
  - (at 500 V DC)

#### General
- **PICMG Compliance**: CompactPCI V2.0, R 3.0
- **Bus Type**: CompactPCI
- **I/O Connectors**: 68-pin SCSI-II female
- **Dimensions (L x H)**: 160 x 100 mm (6.3 x 3.9") with 3U/6U Bracket
- **Power Consumption**: Typical: +5 V @ 900 mA
  - Max.: +3.3 V @ 1.2 A
- **Operating Temperature**: -20 ~ 70°C
- **Storage Temperature**: -20 ~ 80°C
- **Relative Humidity**: 5 ~ 95% Relative Humidity, non-condensing
- **Certifications**: CE, FCC

### Ordering Information
- **MIC-3761/3761R**

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## MIC-3780/3780R

### Specifications

#### Isolated Digital Input
- **Channels**: 8
- **Input Voltage**: Logic 0: 0 V max.
  - Logic 1: 10 V min.
  - (50 V max.)
- **Input Current**
  - 10 VR: 1.6 mA (typical)
  - 12 VR: 1.9 mA (typical)
  - 24 VR: 4.1 mA (typical)
  - 48 VR: 8.5 mA (typical)
  - 50 VR: 8.9 mA (typical)
- **Interrupt Capable Ch.**: 8
- **Isolation Protection**: 1000 VDC
- **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 VAC
  - 3 A @ 24 VDC
- **Relay on time**: 5 ms max.
- **Relay off time**: 15 ms max.
- **Life Span**: 1 x 10⁷ ops. min.
- **Mechanical**: 2 x 10⁶ ops. min.
- **Design**: 2 x 10⁶ ops. min.
- **Contact Rating**:
- **Resistance**:
  - Mechanical: 2 x 10⁶ Ω (contact rating)
  - Electrical: 2 x 10⁶ Ω (contact rating)
- **General**:
  - PICMG Compliance: CompactPCI V2.0, R 3.0
  - Bus Type: CompactPCI
  - I/O Connectors: 68-pin SCSI-II female
  - Dimensions (L x H): 160 x 100 mm (6.3 x 3.9") with 3U/6U Bracket
  - Power Consumption: Typical: +5 V @ 900 mA
  - Max.: +3.3 V @ 1.2 A
  - (refer to IEC 68-2-1, 2)
- **Operating Temperature**: -20 ~ 70°C
- **Storage Temperature**: -20 ~ 80°C
- **Relative Humidity**: 5 ~ 95% Relative Humidity, non-condensing
- **Certifications**: CE, FCC

### Ordering Information
- **MIC-3780/3780R**

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## MIC-3611/3611R

### Specifications

#### 8-ch Relay Actuator and 8-ch Isolated Digital Input Card

#### 8-ch Counter/Timer Cards

#### 4-port RS-422/485 Communication Cards, w/Surge and Isolation Protection
**Features**

- PIC9030 + 16C954 Controller
- Supports Windows 98/ME/2000/XP drivers and utility
- Microsoft® Windows DLL library and examples included
- Optical isolation up to 2,500 VDC
- 16 MHz CAN controller frequency
- High speed transmission up to 1 Mbps
- Supports CAN2.0 A/B
- Hot swap support
- CompactPCI specification PICMG 2.0 R3.0 compatible
- CompactPCI V2.1 compatible
- Supports Windows 98/2000/XP/Linux
- Internal status register for increased performance
- 2-port isolated CAN Communication Cards
- Hot swap V2.1, R 2.0
- CAN 2.0 A/B
- CAN_H, CAN_L, GND
- Speed (bps) 5 - 95% Relative Humidity, non-condensing
- (IEC 68-2-1, 2)
- Protection Isolation Protection 2,500 Vdc

**Specifications**

- Communication PIC9030 + 16C954
- Data Bits 5, 6, 7, 8
- Data Signals TxD, RxD, RTS, CTS, DTR
- Signal Support CAN_H, CAN_L, GND
- Power Consumption 5 V @ 400 mA (Typical)
- Operating Temperature 0 ~ 65° C
- Storing Temperature -25 ~ 85° C
- Storing Humidity 5 ~ 95% RH, non-condensing

**Ordering Information**

- MIC-3612/3 3U CompactPCI 8-port RS-232 Card
- MIC-3620/3 2-port isolated CAN Communication Card
- MIC-3680R/3 2-port isolated CAN Communication Card with Rear I/O Support