CompactPCI Systems

Advantech CompactPCI Introduction

3U Backplane Enclosures
- MIC-3001/8 4U 8-slot CompactPCI® Enclosure
- MIC-3002AD/6 (new) 4U 6-slot CompactPCI® Enclosure

3U CPU Boards
- MIC-3316 (new) 3U Compact Ultra Low Voltage Intel® Celeron® 650 MHz Controller
- MIC-3318/3318R 3U CompactPCI® Pentium®-4 M 1.2 G MHz Controller

Data Acquisition and Control Boards
- MIC-3714 (new) 25 MS/s, 4-ch Simultaneous AI Card
- MIC-3716 250 kS/s, 16-bit, 16-ch High-resolution Multifunction Card
- MIC-3723 (new) 16-bit, 8-ch Non-isolated Analog Output Card
- MIC-3753 72-bit Digital I/O Card
- MIC-3756 64-ch Isolated Digital I/O Card
- MIC-3761 8-ch Relay Actuator and 8-ch Isolated Digital Input Card
- MIC-3780 (new) 8-ch Counter/Timer Card

Communication Boards
- MIC-3612 4-port RS-232/422/485 Communication Card, w/Surge Protection
- MIC-3620 8-port RS-232 Communication Card

MIC-3000 Series Dimensions

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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 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.
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-3001/8**  
**MIC-3001R/8**

3U 8-slot CompactPCI® Enclosure  
3U 8-slot CompactPCI® Enclosure with Rear I/O Slots

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### Features
- Eight 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

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### Introduction
The MIC-3001/8 is a 4U-size enclosure with eight 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 an alarm module, a power supply or a CD-ROM drive.

#### Hot-swap Passive Backplane
The 3U-size 8-slot backplane of the MIC-3001/8 supports 32-bit or 64-bit (optional) 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.

#### Hot-swap Fan Tray Module
A 1U-high fan module provides forced cooling air into the system. Two 133-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.

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### Specifications
- **Construction**: Aluminum frame and galvanized sheet steel
- **Slots**: 21-slot space (84 TE), 8 CompactPCI® slots, including one system slot and seven peripheral slots.
- **32-bit CompactPCI bus**: PICMG 2.1 R 1.0 Hot Swap Specification
- **Dimensions (W x H x D)**: 440 x 178 x 240 mm (17.3" x 7" x 10")
  
  Mnt. flanges not inc.
- **Weight**: 7 kg (15 lb)
- **Operating Temperature**: 0 ~ 50° C (32 ~ 122° F)
- **Relative Humidity**: 10 ~ 90% @ 40° C, non-condensing (operating and storage)

#### ATX Power Supply
- **Input**: 90 ~ 135 or 180 ~ 265 VAC @ 47 ~ 63 Hz, switchable
- **Max. Output**: 400W total, 210 W for +3.3 V and 5 V
- **MTBF**: 100 khrs at 75% load for 25° C, Ambient Temperature
- **Safety**: UL/CUL/CE

#### Backplane
- **Slots**: 8 CompactPCI® slots (one system slot and 7 peripheral slots)
- **Bus Width**: 32-bit (64-bit upon request)
- **PCB**: 8-layer PCB, 3.0 mm thick
- **Separation**: Separate power and ground planes

#### Power Connector
One ATX power connector for connecting standard ATX power supply

#### Alarm Connector
20-pin connector for MIC-3920/MIC-3921 alarm board signals

#### Compliance
Complies with PICMG 2.0, Ver. 2.1 CompactPCI® Specification and PICMG 2.1, Ver. 1.0 Hot Swap Specification

#### I/O Voltage
3.3 V or 5 V, jumper selectable

#### Logic Ground and Chassis Ground can be isolated or common

#### Dimensions (W x H)
262.8 x 128.6 mm

#### Operating Temperature
-40 ~ 80° C (-40 ~ 176° F)

### Fan Tray Module
- **Air Flow**: Two fans, providing a total of 266 CFM (or above)
- **Power Consumption**: 0.53 A @ 12 V per fan, 1.06 A total
- **Rated Fan Speed**: 3400 rpm
- **Life Span**: 70,000 hours continuous operation @ 40° C with 15~65% relative humidity

### Ordering Information
- **MIC-3001/8-4B**: 3U CompactPCI® chassis with 8-slot backplane, fan tray module, and AC ATX power supply
- **MIC-3001R/8-4B**: 3U CompactPCI® chassis with 8-slot backplane, for tray module and AC ATX power supply

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

- **I/O Slots**
- **System Slot**
- **Power On/Off Switch**
- **Fan Tray**
- **Device Bay**

**Rear View of MIC-3001R/8**

- **ATX Power Supply**
- **Rear I/O Module**

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All product specifications are subject to change without notice

Last updated: January 2005
Introduction

The MIC-3002AD/6 is a compact 3U CompactPCI® chassis designed specially for portable applications. With a side handle design it can be carried conveniently, and it also has an onboard 6.4” 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 Specification, and you can build easy-to-maintain systems with hot-swappable CompactPCI boards and software.

Specifications

Backplane
- 3U Slots: 3 slots for system module, 5 slots for peripheral cards
- No rear I/O support
- Bus: 32-bit / 33 MHz
- I/O Voltage: 3.3V / 5V (jumper selectable)

Cooling
- Two 46 CFM fans, 12 VDC brush-less, dual ball bearing
- Bottom-access removable filter for easy maintenance
- MTBF: 80,048 hours @ 25° C

6.4” LCD option
- Dimensions: 3U height x 10-slot (40HP) width
- Screen Size: 6.4 inches (diagonal)
- Resolution: 640 x 480 x 18-bit colors (262,144 colors)
- Pixel pitch: 0.203 x 0.203 mm
- Brightness: High Brightness 300 cd/m2
- Lamp Life Time: 15,000 hours @ 25° C (77° F)
- Integrated with back light inverter

Mounting
- Wall/Panel mounting on the front side or rear side
- Side (Upper) handle design for portable applications
- Stand feet on the bottom side for desktop applications

Physical
- Dimensions (W x H x D): 220 x 190 x 245 mm (8.7” x 7.5” x 9.7”)

Power Supply
- Safety Approvals: CE, UL, cUL, TUV
- Input: 100~240 VAC @ 47~63Hz, full range
- Output: 250 (or 300) W ATX power supply
- MTBF: 105,405 hours @ 25° C

Environment
- Operating Temperature: 0 ~ 60° C (32~140° F)
 0 ~ 50° C (32 ~ 122° F) for LCD model
- Storage Temperature: -40 ~ 80° C (-40~122° F)
 0 ~ 70° C (32 ~ 158° F) for LCD model
- Humidity: 95% @ 60° C (140° F), non-condensing
- Storage Vibration: 2.0 Grms
- Shock: 20 G peak-to-peak, 11ms duration
- MTBF: 87,191 hours @ 25° C

Compliance
- PICMG 2.0, R3.0 CompactPCI Specification
- PICMG 2.1, R2.0 Hot-Swap Specification

Ordering Information
- MIC-3002AD/6: 3U CompactPCI® chassis with 6-slot backplane
- MIC-3002A/6: 3U CompactPCI® chassis with 6.4” LCD

NEW

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
**Dimensions**

![Dimensions Diagram]

**Front View**

- CPU Module
- Slots
- Power Supply
- Power On/Off Switch
- Stand Feet

All product specifications are subject to change without notice. Last updated: January 2005.
MIC-3316 3U CompactPCI® Ultra Low Voltage Intel® Celeron® 650 MHz CPU board 2-slot with MIC-3316 basic function

Features
- Build-in Ultra Low Voltage Intel® Celeron® 650 MHz
- Support up to 384 MB SDRAM
- Two on-board CompactFlash® Socket
- Two RS-232/422/485 ports
- Two USB ports
- One 10/100 Mbps Ethernet port
- Watchdog timer
- One DVI-I interface
- One PCI-to-PCI bridge drives up to 7 Masters
- Battery-backup 512K RAM
- Timer IRQ
- Support AC97-audio, Line in, Line out, MIC in
- Rear I/O support (MIC-3316R only)

Introduction
MIC-3316 is a 3U-sized CompactPCI® all-in-one single board computer that is optimized for its Ultra Low Voltage Intel® Celeron® 650 MHz processor. On-chip 256 KB L2 cache provides high performance, while the fanless design increases reliability. The CPU is also designed for a wide operating temperature range.

MIC-3316 has compliance with the PICMG 2.0 R2.1 CompactPCI specifications and provides very powerful functions on a 3U-sized board for demanding applications like real-time machine control and industrial automation.

Compact Mechanical Design
MIC-3316 offers many functions on 2 or 3-slot width. Advantech provides a CPU heat sink specially designed for the Ultra Low Voltage Intel® Celeron® 400/650 MHz and Low Voltage Intel® Pentium® III 800/933 MHz processors, enabling the MIC-3316 to operate without a cooling fan on the heat sink. It only needs external cooling air from the chassis fans for ventilation. This enables the MIC-3316 to use the Ultra Low Voltage Intel® Celeron® 400/650 MHz and Low Voltage Intel® Pentium® III 800/933 MHz processors within a mere 2-slot wide space.

Specifications

Standard SBC functions

- **CPU**
  - MIC-3316 supports Ultra Low Voltage Intel® Celeron® 650 MHz
  - Options: Celeron® 400 MHz ULV or Pentium® 800/933 MHz LV

- **BIOS**
  - Award 4Mb flash memory

- **Chipset**
  - Intel® 82815E Graphics and Memory Controller Hub (GMCH)
  - Intel® 82801BA I/O Controller Hub (ICH2)

- **Front Side Bus**
  - 100 MHz (Ultra Low Voltage Intel® Celeron® 400/650 MHz)
  - 133 MHz (Low Voltage Intel® Pentium® III Processor 800/933)

- **2nd level cache**
  - Built-in 256 KB on Ultra Low Voltage Intel® Celeron®
  - Built-in 512KB on Low Voltage Intel® Pentium® III Processor 800/933

- **RAM**
  - Up to 384 MB in one 144-pin DIMM socket and soldered SDRAM
  - 128MB (On-board) soldered SDRAM (no ECC)
  - And one 144-pin SODIMM Socket supports up to 256 MB (Optional)
  - Supports PC100/ PC133-compliant SDRAMs
  - ECC (parity) DRAM not supports

- **Enhanced IDE interface**
  - In second slot, One IDE channel have two connectors
  - (One IDE connector and space reserved for embedded 2.5” HDD and one external 44-pin (2 mm) connector for external IDE Device).
  - Supports PIO mode 4 (16.67 MB/s data transfer rate) and Ultra ATA 100/66/33 (100/66/33 MB/s data transfer rate).
  - BIOS enabled/disabled

- **CompactFlash Socket**
  - Two sockets, One IDE CompactFlash® socket on board. 3-slot model has one USB Hot-swapable CompactFlash® Reader

- **Enhanced Parallel Port**
  - In 3-slot Configurable to LPT1, LPT2, LPT3, or disabled. Standard DB-25 female connector provided.
  - Supports EPP/SPP/ECP

- **Serial Ports**
  - Four RS-232/422/485 (jumper selectable) ports with 16C550 UARTs (or compatible) with 16-byte FIFO buffer.
  - Two port are autoflow support in 2-slot,and Two port in rear I/O are not autoflow support in Rear I/O.
  - Supports speeds up to 115.2 Kbps. Ports can be individually configured to COM1, COM2, COM3,COM4 or disabled

- **Keyboard and PS/2 Mouse Connector**
  - One 6-pin mini-DIN connector is located on the mounting bracket for easy connection to a keyboard or PS/2 mouse.
  - An on-board keyboard pin header connector is also available
MIC-3316

- **USB Ports**: Four USB ports with fuse protection comply with USB specification 1.1. One for 3-slot CompactFlash® reader, and one for rear I/O USB connector, two for front panel.

- **PCI-to-PCI Bridge**: One PERICOM PI7C8150 controller chip, drives up to seven bus master peripherals.

- **Watchdog Timer**: Provides system reset and software control. Time interval is programmable from 1 to 255 seconds/minutes.

- **Ethernet LAN**: 10/100Base-TX Ethernet Interface

- **Controller Chips**: One Intel® 82551QM Ethernet controller chip provides one port, one front RJ-45 LAN port 10 Mbps, 100 Mbps auto-switching. One RTC8100 Ethernet on Rear I/O, supports 10/100 Mbps.

- **VGA Interface**: Intel 815E chipset integrated

- **Display Memory**: Shared from system memory up to 11 MB SDRAM. 2D Graphics- Up to 1600 X 1200 in 8-bit color at 85 Hz refresh. 3D Graphics- Up to 1024 X 768 in 16-bit color at 85 Hz refresh. VGA-RGB CRT, One CRT on Rear I/O. Digital Video Output-DVI. SiI 164 Scaleable Bandwidth: 25 - 165 MHz. Flexible Graphics Controller Interface: 12-bit.

- **Audio**: AC'97 Compliant Audio IN 3-slot, Line IN, Line OUT, MIC IN

- **Battery-backup RAM**: 512 KB

- **Timer IRQ**:  PCI 2.2 compliant, 32 bit/33 MHz Interface

- **Input/Output Bus Requirements**: PICMG 2.1 CompactPCI Hot Swap Specification R1.0 Compliant

- **Board Size**: 160 x 100 mm (3U size), 2 or 3-slot (8TE) wide.

- **Max. Power**: CPU ULV C650 MHz

  - +5 V (4.75 – 5.25 V) @ 2.3 A
  - +3.3 V (4.75 – 5.25 V) @ 1.9 A
  - +12 V (4.75 – 5.25 V) @ 44 mA
  - CPU LV P3 933 MHz
  - +5 V (4.75 – 5.25 V) @ 2.5 A
  - +3.3 V (3.1 – 3.5 V) @ 2.7 A
  - +12 V (11.0 – 13.0 V) @ 44mA

- **Operating Temperature**: 0 – 60° C (32 – 140° F)

- **Storage Temperature**: -20 – 80° C (-4 – 176° F)

- **Humidity**: 5 – 95% (non-condensing)

- **Operating System**: Windows® 2000/XP


## Ordering Information

- **MIC-3316**: 3U CompactPCI® Ultra Low Voltage Intel® Celeron® 650 MHz CPU board 2-slot with MIC-3316 basic function and 128 MB on-board SDRAM.

- **MIC-3316P**: 3U CompactPCI® Ultra Low Voltage Intel® Celeron® 650 MHz CPU board 3-slot with a parallelport and 128 MB on-board SDRAM.

- **MIC-3316F**: 3U CompactPCI® Ultra Low Voltage Intel® Celeron® 650 MHz CPU board 2-slot with MIC-3316 basic function and 128 MB on-board SDRAM and Rear I/O support.

- **MIC-3316PR**: 3U CompactPCI® Ultra Low Voltage Intel® Celeron® 650 MHz CPU board 3-slot with a parallelport and 128 MB on-board SDRAM and Rear I/O support.

- **MIC-3316FR**: 3U CompactPCI® Ultra Low Voltage Intel® Celeron® 650 MHz CPU board 3-slot with AC97 Audio and CF Card Reader and 128 MB on-board SDRAM and Rear I/O support.

- **MIC-3516**: Rear I/O Module for MIC-3316R.
**MIC-3318**  
3U CompactPCI® Pentium® 4-M Controller

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### Features
- Built-in Intel® Pentium® 4-M CPU processor up to 1.7 GHz
- Supports up to 512 MB DDR-266 memory on board
- On-board high-performance VGA display
- Dual Gigabit Ethernet with RJ-45 connector on board
- Supports 2 Ultra ATA 33/66/100 high-speed IDE devices
- Onboard CompactFlash® disk socket
- One PCI-to-PCI bridge drives up to 7 bus master peripherals
- Advantech Hot-swap Manager to support Advantech I/O and Communication Hot-swap function
- Rear I/O signal support for easy wiring (MIC-3318R only)
- Supports on-board 2.5" HDD

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### Introduction
The MIC-3318 is a 3U CompactPCI® controller that has been optimized for its on-board Intel® Pentium® 4 Processor-M, and Intel® 845GV Chipset. Designed to be a high performance CompactPCI® platform, MIC-3318 delivers compelling system bus speed performance at 400 MHz with its Intel NetBurst™ microarchitecture. Innovative wide data paths and flexible memory refresh technology optimize the DDR SDRAM’s performance in the MIC-3318. 512 KB of On-die L2 Cache, and dual Gigabit Ethernet ports are also provided.

MIC-3318 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.

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### Specifications

#### Processor System
- **CPU**: Intel® Pentium® 4 Processor–M (fanless)
- **Speed**: 1.2 or 1.7 GHz (400MHz FSB), BIOS selection
- **L2 Cache**: 512 KB on die
- **Chipset**: Intel® 845GV
- **BIOS**: Award 4 MB Flash

#### Bus
- **Front Side Bus**: 400 MHz
- **PCI-to-PCI Bridge Controller Pericom**: P07C8150
- **PCI**: 32-bit/33 MHz

#### Memory
- **Technology**: PC-2100 DDR266 SO-DIMM, 200-pin socket x 1
- **Capacity**: 512 MB

#### Graphics
- **Controller**: Integrated in Intel® 845GV chipset
- **VRAM**: DVMT 64 MB
- **Resolution**:
  - 2048 x 1536 High Color @ 75 Hz for Flat panel
  - 1920 x 1080 True Color @ 85 Hz for CRT

#### Ethernet
- **Interface**: 10/100/1000Base-TX Gigabit Ethernet
- **Controller**: Intel® 82540 x 2
- **Connector**: RJ-45 x 2
- **LAN1 supports both front and rear I/O access on MIC-3318R (jumper selectable)**

#### Serial
- **Interface**: RS-232/422/485, jumper selectable
- **Controller**: Winbond™ 83627HF Super I/O chip
- **Data Bits**: 5, 6, 7, 8
- **Stop Bits**: 1, 1.5, 2
- **Parity**: None, even, odd
- **Speed (bps)**:
  - RS-232: TxD, RxD, RTS, CTS, DTR, DSR, DCD, GND, RI
  - RS-422/485: TxD, RxD, RTS
- **Connectors**: DB-9 x 2
- **COM1 supports both front and rear I/O access on MIC-3318R**

#### EIDE
- **Mode**: ATA 33/66/100 mode
- **Channels**: 2 (One 44-pin 2.5" HDD connector and ext-connector; another for CF socket)
- **Storage Site**: One IDE connector and space reserved for embedded 2.5" HDD

#### Front I/O Interface
- **LAN**: 2 x Gigabit Ethernet, RJ-45 connector
- **Serial**: 2 x RS-232/422/485, DB-9 connector

#### Rear I/O Signal Interface (MIC-3318R series)
- **VGA, KB/MS, USB3, USB4, LAN1, COM1**

#### Operating Systems
- **Compatibility**: Windows® 2000/XP

#### Hardware Monitor
- **Controller**: Winbond™ 83627HF Super I/O chip
- **Monitor**: CPU temperature, 3.3 V/5 V/12 V
Watchdog Timer
- Output: System reset
- Interval: Programmable, 0 – 255 sec.

Miscellaneous
- Solid State Disk: One on-board CompactFlash socket
- 2.5” HDD: One 2.5” HDD bay for easy installation
- LEDs: Power, IDE
- USB (v2.0): 2 channels
- Real Time Clock: Built into the South Bridge

Power Requirements

<table>
<thead>
<tr>
<th>With P4-M 1.2 GHz</th>
<th>+3.3 V</th>
<th>+5 V</th>
<th>+12 V</th>
<th>-12 V</th>
</tr>
</thead>
<tbody>
<tr>
<td>Typical</td>
<td>1.7 A</td>
<td>3.4 A</td>
<td>16 mA</td>
<td>16 mA</td>
</tr>
<tr>
<td>Max</td>
<td>1.7 A</td>
<td>4.7 A</td>
<td>16 mA</td>
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</tbody>
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<table>
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<th>With P4-M 1.7 GHz</th>
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<td>16 mA</td>
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</tr>
<tr>
<td>Max</td>
<td>1.7 A</td>
<td>5.7 A</td>
<td>16 mA</td>
<td>16 mA</td>
</tr>
</tbody>
</table>

Environment
- Operating Temperature: -10 – 60° C @1.2 GHz CPU
- Storage Temperature: -40 – 80° C (-40~140° F)
- Humidity: 95% @ 60° C, non-condensing

Physical
- Dimensions: 100 x 160 mm (3U), 2-slot (8 TE) width
- Weight: 0.6 kg

Compliance
- Standard: PICMG 2.0, R3.0 CompactPCI® Specification
  PICMG 2.1, R2.0 Hot-Swap Specification

Rear Transition Board for MIC-3318R series
- P/N: MIC-3518
- KB/MS: Yes
- COM: COM1
- LAN: LAN1
- VGA: Yes
- USB: USB3, USB4

Ordering Information
- MIC-3318-AC00: MIC-3318 w/ on-board P4-M 1.7 GHz CPU, 256 MB RAM without Rear I/O support
- MIC-3318-AD00: MIC-3318 w/ on-board P4-M 1.7 GHz CPU, 512 MB RAM without Rear I/O support
- MIC-3318R-AC00: MIC-3318 w/ on-board P4-M 1.7 GHz CPU, 256 MB RAM and Rear I/O support
- MIC-3318R-AD00: MIC-3318 w/ on-board P4-M 1.7 GHz CPU, 512 MB RAM and Rear I/O support
- MIC-3518: Rear I/O module for MIC-3318R

Front View of MIC-3318
MIC-3714

30 MS/s Simultaneous 4-ch Analog Input Card

Introduction

The MIC-3714 is an advanced performance data acquisition card based on 32-bit PCI bus architecture. The maximum sampling rate of the MIC-3714 is 30 M samples per second, with an emphasis on continuous, non-stop, high-speed, streaming data of A/D samples to host memory.

Specifications

Analog Input

- **Channels**: 4 single-ended analog input channels
- **Resolution**: 12-bit
- **FIFO Size**: 32K Samples/ch
- **Max. Sampling Rate**: Up to 30 MS/s
- **Common Mode Voltage**: ±11 V max. (operational)

Gain and Gain List

<table>
<thead>
<tr>
<th>Gain</th>
<th>1</th>
<th>±5 V</th>
<th>±2.5 V</th>
<th>±1 V</th>
<th>±0.5 V</th>
</tr>
</thead>
<tbody>
<tr>
<td>Range</td>
<td>2</td>
<td>±5 V</td>
<td>±2.5 V</td>
<td>±1 V</td>
<td>±0.5 V</td>
</tr>
</tbody>
</table>

Drift

<table>
<thead>
<tr>
<th>Gain</th>
<th>1</th>
<th>±30</th>
<th>±30</th>
<th>±30</th>
<th>±30</th>
<th>±30</th>
<th>±30</th>
</tr>
</thead>
<tbody>
<tr>
<td>Range</td>
<td>2</td>
<td>±30</td>
<td>±30</td>
<td>±30</td>
<td>±30</td>
<td>±30</td>
<td>±30</td>
</tr>
</tbody>
</table>

Small Signal Bandwidth for PGA

<table>
<thead>
<tr>
<th>Gain</th>
<th>1</th>
<th>2</th>
<th>5</th>
<th>10</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bandwidth</td>
<td>7 MHz</td>
<td>7 MHz</td>
<td>7 MHz</td>
<td>7 MHz</td>
</tr>
</tbody>
</table>

- **Max. Input Voltage**: ±15 V
- **Input Surge Protection**: ±30
- **Input Impedance**: 50 Ω / 1 M Ω / jumper selectable 100 pF
- **Trigger Impedance**: Software, pacet, post-trigger, pre-trigger, delay-trigger, about-trigger

Accuracy

<table>
<thead>
<tr>
<th>DC</th>
<th>Offset error</th>
<th>Adjustable to ±1LSB</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Gain error</td>
<td>Adjustable to ±1LSB</td>
</tr>
</tbody>
</table>

AC

<table>
<thead>
<tr>
<th>SINAD: S/(N+D): 68 dB</th>
<th>ENOB: 11bitsTHD: -75 dB</th>
</tr>
</thead>
</table>

External TTL Trigger Input

<table>
<thead>
<tr>
<th>Logic level</th>
<th>Low: 0.8 V max.</th>
<th>High: 2.0V min.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Input impedance</td>
<td>50 Ω</td>
<td></td>
</tr>
<tr>
<td>Input coupled</td>
<td>DC</td>
<td></td>
</tr>
</tbody>
</table>

Features

- 12-bit A/D converter up to 30 MS/s
- 4 single-ended analog input channels
- Programmable gain for each input channel
- 32 K samples on board FIFO memory per channel
- 4 A/D converters simultaneously sampling
- Multiple A/D triggering modes
- Programmable pacet/counter

General

- **I/O Connector Types**: 4 BNC connector (for AI)
  1 PS2 connector (for ext. colock and trigger)
- **Dimensions**: 160 x 100 mm (6.3” x 3.9”) with 3U/6U 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)
- **Relative Humidity**: 5~95%RH non-condensing (refer to IEC 68-2-3)
- **Certifications**: CE and FCC certified

Ordering Information

- **MIC-3714/3**: 3U, 30 MS/s Simultaneous 4-ch Analog Input Card, user’s manual and driver CD-ROM (PCL-10901-1 cable included)
- **MIC-3714/6**: 6U, 30 MS/s Simultaneous 4-ch Analog Input Card, user’s manual and driver CD-ROM (PCL-10901-1 cable included)
- **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
Feature Details

Simultaneous Sampling
The MIC-3714 is capable of simultaneous sampling as it uses 4 identical circuitries and ADC for each analog input channel. Where the time relationship between inputs is important, this feature lets you sample simultaneously.

Supports S/W, Internal and External Pacer Triggering
The MIC-3714 supports three kinds of trigger modes for A/D conversion: software triggering, internal pacer triggering and external pacer triggering. The software trigger allows users to acquire a sample when it is needed. The internal pacer triggers continuous high-speed data acquisition. The MIC-3714 also accepts external trigger sources, allowing synchronous sampling with external devices.

PCI-bus Mastering Data Transfer
The MIC-3714 supports PCI-bus mastering DMA data transfer for high speed and gap-free data acquisition. By setting aside a block of memory in the PC, the MIC-3714 performs bus-mastering data transfers without CPU intervention, allowing the CPU to perform other tasks such as data analysis and graphics.

On-board FIFO Memory
There is 32K sample FIFO memory on the MIC-3714. This is an important feature for faster data transfer and more predictable performance under Windows®.

Auto Calibration
The MIC-3714 features convenient software auto calibration with no variable resistor trimming required.

Function Block Diagram

[Diagram of MIC-3714 block diagram showing various components and connections, including Input Attenuator, ADC, Gain and Offset Auto Calibration, Local Bus, CPCI Bus Controller, and External Trigger and Clock.]
**MIC-3716**

**250 kS/s, 16-bit, 16-ch High-resolution Multifunction Card**

### Features
- 16-bit high resolution
- 250 kS/s sampling rate
- Auto calibration function
- PCI-bus mastering for data transfer
- 16 analog input channels with 1K FIFO
- 16 S.E. or 8 Diff. AI, or a combination
- Unipolar/Bipolar input range
- 2 analog output channels
- 16 digital input channels
- 16 digital output channels
- One 10 MHz 16-bit resolution counter
- BoardID™ switch

### Specifications

#### Analog Input

<table>
<thead>
<tr>
<th>Channels</th>
<th>16 single-ended or 8 differential or combination</th>
</tr>
</thead>
<tbody>
<tr>
<td>Resolution</td>
<td>250 kS/s max.</td>
</tr>
<tr>
<td>FIFO Size</td>
<td>1 K Samples/ch</td>
</tr>
<tr>
<td>Sampling Rate*</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Gain 0.5 1 2 4 8</td>
</tr>
<tr>
<td></td>
<td>Input range and Gain List</td>
</tr>
<tr>
<td></td>
<td>Unipolar N/A 0<del>10 0</del>5 0<del>0.25 0</del>1.25</td>
</tr>
<tr>
<td></td>
<td>Bipolar ±10 ±5 ±2.5 ±1 ±0.25 ±0.625</td>
</tr>
<tr>
<td>Small Signal Bandwidth for PGA</td>
<td>Gain 0.5 1 2 4 8</td>
</tr>
<tr>
<td></td>
<td>Bandwidth 4.0 4.0 2.0 1.5 MHz 0.55 MHz</td>
</tr>
<tr>
<td>Common Mode Voltage</td>
<td>±1 V max. (operational)</td>
</tr>
<tr>
<td>Max. Input Voltage</td>
<td>±20 V</td>
</tr>
<tr>
<td>Input Impedance</td>
<td>100 MHz/16(FSR); 100 MHz/16(FSR)</td>
</tr>
<tr>
<td>Trigger Mode</td>
<td>Software, on-board programmable paper or external</td>
</tr>
<tr>
<td>Accuracy</td>
<td>DC</td>
</tr>
<tr>
<td></td>
<td>DNLE ±1 LSB</td>
</tr>
<tr>
<td></td>
<td>INLE ±1 LSB</td>
</tr>
<tr>
<td></td>
<td>Gain (Full-scale) error: Adjustable to ±1 LSB</td>
</tr>
<tr>
<td></td>
<td>±0.5 1 2 4 8</td>
</tr>
<tr>
<td></td>
<td>Gain error (% FSR)</td>
</tr>
<tr>
<td></td>
<td>0.15 0.03 0.03 0.05 0.1</td>
</tr>
<tr>
<td>Clocking and Trigger Inputs</td>
<td>Trigger Mode Software, onboard programmable paper or external</td>
</tr>
<tr>
<td></td>
<td>A/D pacer clock 250 kS/s (max.)</td>
</tr>
<tr>
<td></td>
<td>External A/D trigger clock Max. frequency: 250 kHz</td>
</tr>
</tbody>
</table>

#### Analog Output

<table>
<thead>
<tr>
<th>Channels</th>
<th>2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Resolution</td>
<td>16-bit</td>
</tr>
<tr>
<td>Operation mode</td>
<td>Single output</td>
</tr>
<tr>
<td>Throughput*</td>
<td>200 kS/s max. per channel (FSR)</td>
</tr>
<tr>
<td>Output Range</td>
<td>Using Internal Reference: 0... +5 V, 0... -10 V, 0... +5 V, 0... -10 V</td>
</tr>
<tr>
<td></td>
<td>Using External Reference: -x... +x V, -x... +x V, -x... +x V (x ≤ 10)</td>
</tr>
<tr>
<td>Accuracy</td>
<td>DC</td>
</tr>
<tr>
<td></td>
<td>DNLE ±1 LSB (monotonic)</td>
</tr>
<tr>
<td></td>
<td>INLE ±1 LSB</td>
</tr>
<tr>
<td></td>
<td>Gain (Full-scale) error: Adjustable to ±1 LSB</td>
</tr>
<tr>
<td>Dynamic Performance</td>
<td></td>
</tr>
<tr>
<td>Setting Time</td>
<td>5 µs (to ±1 LSB of FSR)</td>
</tr>
<tr>
<td>Slew Rate</td>
<td>20 V/µs</td>
</tr>
<tr>
<td>Drift</td>
<td>10 ppm/°C</td>
</tr>
<tr>
<td>Driving Capability</td>
<td>±20 mA</td>
</tr>
<tr>
<td>Output Impedance</td>
<td>0.1 Ω max.</td>
</tr>
</tbody>
</table>

#### Digital Input /Output

<table>
<thead>
<tr>
<th>Input Channels</th>
<th>16</th>
</tr>
</thead>
<tbody>
<tr>
<td>Input Voltage</td>
<td>Low 0.4 V max.</td>
</tr>
<tr>
<td></td>
<td>High 2.4 V min.</td>
</tr>
<tr>
<td>Input Load</td>
<td>Low 0.4 V max. @ -0.2 mA</td>
</tr>
<tr>
<td></td>
<td>High 2.7 V min. @ 20 µA</td>
</tr>
<tr>
<td>Output Channels</td>
<td>16</td>
</tr>
<tr>
<td>Output Voltage</td>
<td>Low 0.4 V max. @ +8.0 mA (sink)</td>
</tr>
<tr>
<td></td>
<td>High 2.4 V min. @ -0.4 mA (source)</td>
</tr>
</tbody>
</table>

### Ordering Information

- **MIC-3716/3**
  3U, 250 kS/s, 16-bit, 16-ch High-Resolution Multifunction Card, user’s manual and driver CD-ROM. (cable not included)

- **MIC-3716/6**
  6U, 250 kS/s, 16-bit, 16-ch High-Resolution Multifunction Card, user’s manual and driver CD-ROM. (cable not included)

- **PCLD-8710**
  Industrial Wiring Terminal Board with CJC circuit for DIN-rail Mounting. (cable not included)

- **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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**Introduction**

The MIC-3716 is a powerful high-resolution multifunction card for the PCI bus. It features a 250 kS/s 16-bit A/D converter, and an on-board 1K sample FIFO buffer for A/D. The MIC-3716 provides a total of 16 single-ended or eight differential A/D input channels or a mixed combination of these. There are also two 16-bit D/A output channels, 16 digital input/output channels, and one 10 MHz 16-bit counter channel. MIC-3716 provides specific functions for different user requirements.
### Feature Details

#### PCI-Bus Mastering Data Transfer
The MIC-3716 supports PCI-Bus mastering DMA for high-speed data transfer and gap-free analog input as well as analog output. By setting aside a block of memory in the PC, the MIC-3716 performs bus-mastering data transfers without CPU intervention, setting the CPU free to perform more urgent tasks such as data analysis and graphic manipulation. This function allows users to run all I/O functions simultaneously at full speed without losing data.

#### Auto-Calibration Function
The MIC-3716 provides an auto-calibration function by using a calibration utility. The built-in calibration circuitry of the MIC-3716 corrects gain and offset errors in analog input and analog output channels, thereby eliminating the need for external equipment and user adjustments.

#### BoardID™ Switch
The MIC-3716 has a built-in DIP switch that helps define each card’s ID when multiple MIC-3716 cards have been installed on the same PC chassis. The BoardID™ switch is very useful when users build their system with multiple MIC-3716 cards. With the correct BoardID™ switch, the user can easily identify and access each card during hardware configuration and software programming.

#### Plug & Play Function
The MIC-3716 is a Plug & Play device that fully complies with the PCI Specification Rev 2.2. During card installation, there is no need to set jumpers or DIP switches. Instead, all bus-related configurations such as base I/O address and interrupt are automatically done by the Plug & Play function.

### Pin Assignments

#### Automatic Channel/Gain/SD/BU* Scanning
The MIC-3716 features an automatic channel/gain/SD/BU scanning circuit. This circuit controls the multiplexer switching during sampling in a way that is more efficient than what can be achieved by software implementation. On-board SRAM stores different gain, SD and BU values for each channel. This combination lets users perform multi-channel high-speed sampling with different gain, SD and BU values for each channel.

#### On-Board FIFO Memory
The MIC-3716 provides a 1K samples onboard FIFO (First In First Out) memory buffer for AD. This is an important feature for faster data transfer and more predictable performance under the Windows® system.

#### On-Board Programmable Timer/Counter
The MIC-3716 provides a programmable timer/counter for generating a pacer trigger for the A/D conversion. The timer/counter chip is 82C54, which includes three 16-bit 10 MHz clocks. One counter is used as an event counter for counting events coming from the input channel. The other two are cascaded together to make a 32-bit timer for pacer trigger time base.

### Counter/Timer

<table>
<thead>
<tr>
<th>Channels</th>
<th>3 channels, 2 channels are permanently configured as programmable pacers. 1 channel is free for user application</th>
</tr>
</thead>
<tbody>
<tr>
<td>Resolution</td>
<td>16-bit</td>
</tr>
<tr>
<td>Compatibility</td>
<td>TTL level</td>
</tr>
<tr>
<td>Base Clock</td>
<td>Channel 2: Takes input from output of channel 1</td>
</tr>
<tr>
<td></td>
<td>Channel 1: 10 MHz</td>
</tr>
<tr>
<td></td>
<td>Channel 0: Internal 1 MHz or external clock (10 MHz) max</td>
</tr>
<tr>
<td></td>
<td>Selected by software</td>
</tr>
<tr>
<td>Max. Input Frequency</td>
<td>1 MHz</td>
</tr>
<tr>
<td>Clock Input</td>
<td>Low: 0.8 V max.</td>
</tr>
<tr>
<td></td>
<td>High: 2.0 V min.</td>
</tr>
<tr>
<td>Gate Input</td>
<td>Low: 0.8 V max.</td>
</tr>
<tr>
<td></td>
<td>High: 2.0 V min.</td>
</tr>
<tr>
<td>Counter Output</td>
<td>Low: 0.5 V max. @ +24 mA</td>
</tr>
<tr>
<td></td>
<td>High: 2.4 V min. @ -15 mA</td>
</tr>
</tbody>
</table>

### General

<table>
<thead>
<tr>
<th>I/O Connector Type</th>
<th>68-pin SCSI-H female</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dimensions (L x H)</td>
<td>160 x 100 mm (6.9&quot; x 3.9&quot;) with 3U/6U Bracket</td>
</tr>
<tr>
<td>Power Consumption</td>
<td>Typical: +5 V @ 850 mA, +12 V @ 600 mA</td>
</tr>
<tr>
<td>Max.</td>
<td>+5 V @ 1 A, +12 V @ 700 mA</td>
</tr>
<tr>
<td>Temperature</td>
<td>Operating: 0 – 60° C (32 – 158° F) (refer to IEC 68-2-1, 2)</td>
</tr>
<tr>
<td></td>
<td>Storage: -20 – 85° C (-4 – 158° F)</td>
</tr>
<tr>
<td>Relative Humidity</td>
<td>Operating: 5 – 85% RH non-condensing (refer to IEC 68-1, -2, -3)</td>
</tr>
<tr>
<td></td>
<td>Storage: 5 – 95% RH non-condensing (refer to IEC 68-1, -2, -3)</td>
</tr>
<tr>
<td>Certification</td>
<td>CE certified</td>
</tr>
</tbody>
</table>

### Note
The sampling rate and throughput depends on the computer hardware architecture and software environment. The rates may vary due to programming language, code efficiency, CPU utilization and other factors.
**MIC-3723**

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

**Features**
- 16-bit high resolution
- 8 Analog output channels
- Support hot swap function
- Auto-calibration
- BoardID™ switch

**Introduction**

MIC-3723 is a non-isolated multiple channel analog output card for the PCI bus, and each analog output channel is equipped with a 16-bit, double-buffered DAC. It also features an auto-calibration function and BoardID™ switch. MIC-3723 is an ideal solution for industrial applications where multiple analog output channels are required.

**Plug & Play Function**

MIC-3723 is a Plug & Play device that fully complies with the PCI Specification Rev 2.2. During card installation, there is no need to set jumpers or DIP switches. Instead, all bus-related configurations such as base I/O address and interrupt are automatically done by the Plug & Play function.

**Specification**

**Analog Output**
- **Channels**: 8
- **Resolution**: 16-bit
- **Operation Mode**: Single output, synchronized output
- **Output Range**: -10 – +10 V, 0 – 20 mA, 4 – 20 mA (Internal Reference only)
- **Accuracy**: Relative ±6 LSB, Differential Non-linearity ±6 LSB (monotonic)
- **Offset**: < 6 LSB
- **Output Impedance**: 0.1 Ω max.
- **Throughput**: PC dependent, Software update (Direct AO)
- **Setting Time**: 30 µs

**Auto-Calibration Function**

**Digital Input/Output**
- **Channels**: 16 (bi-directional)
- **Number of Ports**: 2
- **Input Voltage**: Low 0.8 V max, High 2.0 V min
- **Output Voltage**: Low 0.5 V max, @ 24 mA (sink), High 2.4 V min, @ -15 mA (source)

**General**
- **I/O Connector Type**: 68-pin SCSI-II female
- **Dimensions (L x H)**: 160 x 100 mm (6.9” x 3.9”)
- **Operating Temperature**: 0 – 60°C (32 – 140°F) (refer to IEC 68-2-1,2)
- **Storage Temperature**: -20 – 70°C (-4 – 158°F)
- **Operating Humidity**: 5–95% RH non-condensing (refer to IEC 68-2-3)
- **Hot-Swap Support**: BoardID™ Switch

**Ordering Information**
- **MIC-3723**: 16-bit, 8-ch Non-isolated Analog Output Card
- **PL-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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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
Auto-Calibration Function
MIC-3723 provides an auto-calibration function by using a calibration utility. The built-in calibration circuitry of MIC-3723 corrects gain and offset errors in analog output channels, thereby eliminating the need for external equipment and user adjustments.

Flexible Voltage Output Range
MIC-3723 provides a fixed voltage output range of ±10 V for applications that need a flexible range. You can define the specific voltage output range and output data format via the enclosed software utility and driver.

Keeps Output Values after System Reset
You can independently set the eight outputs to different ranges: ±10 V, 0 – 20 mA or 4 – 20 mA, and all ranges are software selectable. When the system is hot reset (power not shut down), MIC-3723 can either retain the last analog output values, or return to its default configuration, depending on the jumper setting. This practical function eliminates danger caused by improper operation during unexpected system resets.

BoardID™ Switch
MIC-3723 has a built-in DIP Switch that helps define each card’s ID when multiple MIC-3723 cards have been installed on the same PC chassis. The BoardID switch function is very useful when users build their system with multiple MIC-3723 cards. With correct BoardID switch settings, you can easily identify and access each card during hardware configuration and software programming.

Pin Assignments

<table>
<thead>
<tr>
<th>Pin</th>
<th>NC</th>
<th>3</th>
<th>4</th>
<th>NC</th>
</tr>
</thead>
<tbody>
<tr>
<td>Vref</td>
<td>67</td>
<td>33</td>
<td>37</td>
<td>23</td>
</tr>
<tr>
<td>A0</td>
<td>66</td>
<td>32</td>
<td>A0D</td>
<td>30</td>
</tr>
<tr>
<td>GND</td>
<td>65</td>
<td>31</td>
<td>GND</td>
<td>29</td>
</tr>
<tr>
<td>NC</td>
<td>64</td>
<td>30</td>
<td>NC</td>
<td>28</td>
</tr>
<tr>
<td>A1</td>
<td>63</td>
<td>28</td>
<td>A1D</td>
<td>27</td>
</tr>
<tr>
<td>Sw0</td>
<td>62</td>
<td>27</td>
<td>Sw0</td>
<td>26</td>
</tr>
<tr>
<td>NC</td>
<td>61</td>
<td>26</td>
<td>NC</td>
<td>25</td>
</tr>
<tr>
<td>A2R</td>
<td>58</td>
<td>23</td>
<td>A2D</td>
<td>22</td>
</tr>
<tr>
<td>Sw1</td>
<td>57</td>
<td>23</td>
<td>Sw1</td>
<td>22</td>
</tr>
<tr>
<td>NC</td>
<td>56</td>
<td>22</td>
<td>NC</td>
<td>21</td>
</tr>
<tr>
<td>A3R</td>
<td>54</td>
<td>21</td>
<td>A3D</td>
<td>20</td>
</tr>
<tr>
<td>Sw2</td>
<td>53</td>
<td>19</td>
<td>Sw2</td>
<td>18</td>
</tr>
<tr>
<td>NC</td>
<td>52</td>
<td>18</td>
<td>NC</td>
<td>17</td>
</tr>
<tr>
<td>A4R</td>
<td>50</td>
<td>17</td>
<td>A4D</td>
<td>16</td>
</tr>
<tr>
<td>Sw3</td>
<td>49</td>
<td>16</td>
<td>Sw3</td>
<td>15</td>
</tr>
<tr>
<td>NC</td>
<td>48</td>
<td>15</td>
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<td>1</td>
<td>-12V</td>
<td>1</td>
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</table>
Introduction

The MIC-3753 is a 72-channel digital I/O card for the PCI bus. The card emulates mode 0 of the 8255 PPI chip, but the buffered circuits offer a higher driving capability than the 8255. The 72 I/O lines are divided into nine 8-bit I/O ports: A0, B0, C0, A1, B1, C1, A2, B2, C2. Users can configure each port as input or output via software.

Easy to Install: Plug & Play

The MIC-3753 uses a PCI controller to interface the card to the PCI bus. The controller fully implements the PCI bus specification Rev 2.1. All bus relative configurations, such as the base address and interrupt assignments, are automatically controlled by software.

Dry Contact Support for Digital Input

Each digital input channel of the MIC-3753 accepts either 0 ~ 5 V DC wet contact or dry contact inputs. This dry contact capability allows the channels to respond to changes in external circuitry (e.g., the closing of a switch in the external circuitry) when no voltage is present in the external circuit.

Reset Protection Fulfills the True Requirement of Industrial Applications

When the system is hot reset (the power is not turned off), the MIC-3753 can either retain the value of the last I/O port settings and outputs, or return to its default configuration, depending on the jumper setting. This function protects the system from wrong operations during unexpected system resets.

Interrupt Functions Ensure Faster System Response

Two lines of each port C (i.e., ports C0, C1 and C2) are connected to an interrupt circuit. The “Interrupt Control Register” of the MIC-3753 controls how these signals generate an interrupt. Two interrupt request signals can be generated at the same time, and the software can process these two request signals by ISR. The dual interrupt sources provide the card with more capability and flexibility.

The MIC-3753 also provides a “Pattern Match” interrupt function for port A0. The card monitors the states of port A0 and compares them with a pre-set pattern. When the received state matches the pre-set pattern, the MIC-3753 generates an interrupt signal to the system.

A “Change of State” interrupt function is provided at port B0. When any signal line of port B0 changes its state, the card generates an interrupt to the system to handle this event. These interrupt functions release the CPU from the burden of pulling all I/O points, enabling a PC to handle more I/O points with higher performance.

Features

- 72 TTL digital I/O lines
- Emulates mode 0 of 8255 PPI
- Buffered circuits for higher driving capacity than 8255
- Multiple-source interrupt handling
- Interrupt output pin for simultaneously triggering external devices with the interrupt
- Output status read-back
- “Pattern match” and “Change of state” interrupt functions for critical I/O monitoring
- Keeps I/O setting and digital output values when hot system reset
- Supports dry contact and wet contact

Specifications

- I/O Channels: 72 digital I/O lines
- Programming Mode: 8255 PPI mode 0
- Input Signal:
  - Logic level 0: 0.8 V max.
  - Logic level 1: 2.0 V min.
- Output Signal:
  - Logic level 0: 0.44 V max. @ 24 mA (sink)
  - Logic level 1: 3.76 V min. @ 24 mA (source)
- Transfer Rate: 1.6 MB/s (tested under DOS, K6 300 MHz CPU)
- Power Consumption:
  - +5 V @ 400 mA (typical), +5 V @ 0.7 A (max.)
- Operating Temperature: 0 ~ 60° C (32 ~ 140° F) (refer to IEC 68-2-1, 2)
- Storage Temperature: -20 ~ 70° C (-4 ~ 158° F) (refer to IEC 68-2-3)
- Operating Humidity: 5 ~ 95% RH non-condensing
- Connector: One 78-pin D-type female connector
- Dimensions (LxH): 160 x 100 mm (6.3" x 3.9"), 3U/6U Bracket

Ordering Information

- MIC-3753/3: 3U 72-channel Digital I/O Card, user's manual and driver CD-ROM. (cable not included)
- MIC-3753/6: 6U 72-channel Digital I/O Card, user’s manual and driver CD-ROM. (cable not included)
- PCL-10178-1: DB-78 cable assembly, 1 m
- ADAM-3978: DB-78 wiring terminal for DIN-rail mounting
Applications

- Industrial AC/DC I/O devices for monitoring and controlling
- Relay and switch monitoring and controlling
- Parallel data transfer
- TTL, DTL and CMOS logic signal sensing
- Indicator LED driving

Block Diagram

MIC-3753 Block Diagram

Pin Assignments

<table>
<thead>
<tr>
<th>Pin</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>GND</td>
<td>Ground</td>
</tr>
<tr>
<td>PA00 - PA07</td>
<td>I/O pins of Port A0</td>
</tr>
<tr>
<td>PA10 - PA17</td>
<td>I/O pins of Port A1</td>
</tr>
<tr>
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<td>I/O pins of Port A2</td>
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<td>PC10 - PC17</td>
<td>I/O pins of Port C1</td>
</tr>
<tr>
<td>PC20 - PC27</td>
<td>I/O pins of Port C2</td>
</tr>
<tr>
<td>GND</td>
<td>Ground</td>
</tr>
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</table>

All product specifications are subject to change without notice.

Last updated: January 2005
Introduction
The MIC-3756 card offers 32 isolated digital input channels as well as 32 isolated digital output channels with isolation protection up to 2,500 V<sub>DC</sub>, which makes it ideal for industrial applications where high-voltage isolation is required. In addition, all output channels are able to keep their last values after a hot system reset. Furthermore, the MIC-3756 provides a channel-freeze function that keeps the current output status unchanged for each channel during operation.

The MIC-3756 features robust isolation protection for applications in industrial, lab and machinery automation. It can durably withstand voltage up to 2,500 V<sub>DC</sub>, preventing your host system from any incidental harm. If connected to an external input source with surge-protection, the MIC-3756 can offer up to a maximum of 2,000 V<sub>DC</sub> ESD (Electrostatic Discharge) protection for input channels. Even if the input voltage rises up to 70 V<sub>DC</sub>, the input channels of MIC-3756 can still manage to work properly for a short period of time.

Specifications

**General**
- I/O Connector Type: One female 78-pin D-type connector
- Dimensions: 160 x 100 mm (6.3” x 3.9”) with 3U/6U Bracket
- Power Consumption: Typical: +5 V @ 285 mA
  Max: +5V @ 475 mA
- Operating Temperature: 0 – 60° C (32 – 140° F) IEC 68-2-1,2)
- Storage Temperature: -20 – 70° C (-4 – 158° F)
- Relative Humidity: 5 – 95% RH non-condensing (IEC-68-2-3)

**Isolated Digital Input**
- Channels: 32
- Interrupt Inputs: 2 (DI00, DI16)
- Optical isolation: 2500 V<sub>DC</sub>
- Over-voltage Protection: 70 V<sub>DC</sub>
- Input Resistance: 1 kΩ (50 V), 4 kΩ (5 V)
- Input Voltage:
  - VIH (max.): 50 V<sub>DC</sub>
  - VIH (min.): 5 V<sub>DC</sub>
  - VIL (max.): 2 V<sub>DC</sub>

**Isolated Digital Output**
- Channels: 32
- Optical Isolation: 2500 V<sub>DC</sub>
- DO Response Time:
  - OFF delay ±20%: 5 μs
  - ON delay ±20%: 120 μs
- Supplied Voltage: 5–40 V<sub>DC</sub>
- Sink Current: 200 mA max/channel

<table>
<thead>
<tr>
<th>Photo-Couple Response Time</th>
<th>Input Voltage</th>
<th>*OFF delay (±20%)</th>
<th>*ON delay (±20%)</th>
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<tr>
<td></td>
<td>5 V</td>
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<tr>
<td></td>
<td>50 V</td>
<td>200 μs</td>
<td>4 μs</td>
</tr>
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</table>

*OFF delay means the photo-couple turn OFF delay time when DI input is removed
*ON delay means the photo-couple turn ON delay time when DI input voltage is connected.

Ordering Information
- MIC-3756/3: 3U 64-channel isolated digital I/O Card, user’s manual and driver CD-ROM. (cable not included)
- MIC-3756/6: 6U 64-channel isolated digital I/O Card, user’s manual and driver CD-ROM. (cable not included)
- PCL-10178-1: DB-78 cable assembly 1 m
- ADAM-3978: DB-78 wiring terminal for DIN-rail mounting
Feature Details

Wide Input/Output Range
The MIC-3756 has a wide range of input voltage from 10 to 50 Vdc, and it is suitable for most industrial applications with 12 Vdc, 24 Vdc, and 48 Vdc input voltage. It also features a wide output voltage range from 5 to 40 Vdc, suitable for most industrial applications with 12 Vdc/24 Vdc output voltage. You can also request tailored solutions for specific input/output voltage ranges.

BoardID™ Switch
The MIC-3756 has a built-in DIP switch that helps define each card's unique ID when multiple MIC-3756 cards have been installed on the same PC chassis. The BoardID switch setting is very useful when users build their system with multiple MIC-3756 cards. With correct Board ID settings, you can easily identify and access each card during hardware configuration and software programming.

Pin Assignments

<table>
<thead>
<tr>
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<tr>
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<td>PC22</td>
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</table>

Channel-Freeze Function
The MIC-3756 provides a Channel-Freeze function, which can be enabled either in dry contact or wet contact mode (selected by the on-board jumper). When the Channel-Freeze function is enabled, the last status of each digital output channel will be safely kept for emergency use. Moreover, you can enable this function through software since it is useful in software simulations and testing programs.

Reset Protection Fulfills Requirement for Industrial Applications
If the system has undergone a hot reset (i.e., without turning off the system power), the MIC-3756 can either retain the output values of each channel or return to its default configuration as open status, depending on its on-board jumper setting. This function protects the system from wrong operations during unexpected system resets.

Applications
- Industrial ON/OFF control
- Switch status sensing
- BCD interfacing
- Digital I/O control
- Industrial and lab automation
- SMT/PCB machinery
- Semi-conductor machinery
- PC-based Industrial Machinery
- Testing & Measurement
- Laboratory & Education

Block Diagram

[Diagram of the MIC-3756 block diagram with control logic, address bus, data bus, and various connections to the PLX PCI 9052 connector and pin assignments.]
MIC-3761

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

Introduction
The MIC-3761 relay actuator and isolated D/I card is an add-on card for the PCI bus. It provides 8 opto-isolated digital inputs with isolation protection of 3,750 V_{dc} for collecting digital inputs in noisy environments, and 8 relay actuators for serving as ON/OFF control devices or small power switches. For easy monitoring, each relay is equipped with one red LED to show its ON/OFF status. The MIC-3761’s eight optically-isolated digital input channels are ideal for digital input in noisy environments or with floating potentials.

Rugged Protection
The MIC-3761 digital input channels feature rugged protection for industrial, lab and machinery automation applications. It durably withstands voltage up to 3,750 V_{dc}, protecting your host system from any incidental harms. If connected to an external input source with surge-protection, the MIC-3761 can offer up to a maximum of 2,000 V_{dc} ESD (Electrostatic Discharge) protection. Even with an input voltage rising up to 70 V_{dc}, the MIC-3761 can still manage to work properly for a short period of time.

Reset Protection Fulfills Requirement for Industrial Applications
When the system has undergone a hot reset (i.e. without turning off the system power), the MIC-3761 can either retain output values of each channel, or return to its default configuration as open status, depending on its on-board jumper setting. This function protects the system from unwanted operations during unexpected system resets.

Specifications
Isolated Digital Input
- Channels 8
- Optical Isolation 3,750 V_{dc}
- Opto-Isolator 25 µs
- Over-Voltage Protection 70 V_{dc}
- Input Voltage 10 - 50 V_{dc}
- Input Current 1.6 mA @ 10 V_{dc}, 8.9 mA @ 50 V_{dc}

Relay Output
- Channels 8
- Relay Type SPDT (4 Form C and 4 Form A)
- Rating (resistive) 3 A @ 250 V_{ac} or 3 A @ 24 V_{dc}
- Max. Switching Power 750 AV, 72 W
- Max. Switching Load 10 mA @ 5 V_{dc}
- Insulation Resistance 1,000 MΩ min. (at 500 V_{ac})
- Operate Time 15 ms max.
- Release Time 5 ms max.

General
- Connector One 37-pin D-type female connector
- Dimensions (L x H) 175 x 100 mm (6.9” x 3.9”)
- Power Consumption +5 V @ 220 mA (typical), +5 V @ 750 mA (max.)
- Operating Temperature 0 ~ 60° C (32 ~ 140° F) (refer to IEC 68-2-1, 2)
- Storage Temperature -20 ~ 70° C (-4 ~ 158° F)
- Operating Humidity 5 ~ 95 % RH non-condensing (refer to IEC 68-2-3)
- Certifications CE Class A certified

Isolated Digital Input
- Input Channels 8
- Optical Isolation 3750 V_{dc}
- Opto-isolator 25 µs
- Over-voltage Protection 70 V_{dc}
- Input Voltage VIH (max.) 50 V_{dc}, VIH (min.) 10 V_{dc}, VIL (max.) 3 V_{dc}
- 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)
Relay Output
- Output Channels: 8
- Relay Type: SPDT (4 Form C and 4 Form A)
- Rating (resistive): 3 A @ 250 Vdc or 3 A @ 24 Vdc
- Max. Switching Power: 750 VA, 72 W
- Max. Switching Voltage: 250 Vdc, 24 Vdc
- Max. Switching Current: 3 A
- Min. Switching Load: 10 mA @ 5 Vdc
- Breakdown Voltage: 5,000 Vdc for 1 min. (Between coil and contacts)
- Operate time: 15 ms max.
- Release time: 5 ms max.
- Insulation Resistance: 1,000 MΩ min. (at 500 Vdc)
- Life Expectancy: Electrical 2 x 10^5 ops. min. (contact rating)

Note:
The current specifications are limited by the cable and wiring terminal board.

Ordering Information
- MIC-3761/3: 3U 8-ch Relay Actuator and 8-ch Isolated D/I Card, user’s manual and driver CD-ROM. (cable not included)
- MIC-3761/6: 6U 8-ch Relay Actuator and 8-ch Isolated D/I Card, user’s manual and driver CD-ROM. (cable not included)
- 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

Pin Assignments

<table>
<thead>
<tr>
<th>Pin Description</th>
<th>Pin Number</th>
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</tr>
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<td>R1_COM</td>
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<td>R1_NC</td>
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<td>IDI 7A</td>
<td>19</td>
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</tbody>
</table>

Block Diagram
Features
- 8 independent 16-bit counters
- 8 programmable clock source
- 8 digital TTL outputs and 8 digital TTL inputs
- Up to 20 MHz input frequency
- Multiple counter clock source selectable
- Counter output programmable
- Counter gate function
- Flexible interrupt source select
- BoardID™ switch

Introduction
The MIC-3780 is a general purpose multiple channel counter/timer card for the 3U/6U CompactPCI® system. It targets the AM9513 to implement the counter/timer function by CPLD. Plus, it provides eight 16-bit counter channels and 8 digital outputs and 8 digital inputs. Advantech has designed in powerful counter functions to fulfill your industrial or laboratory applications.

Flexible Counter Modes
The MIC-3780 features up to 12 programmable counter modes, to provide one shot output, PWM output, periodic interrupt output, time-delay output, and to measure the frequency and the pulse width. The MIC-3780 is an ideal solution for variant counter/timer applications.

Special Shielded Cable for Noise Reduction
The PCL-10168 shielded cable is specially designed for the MIC-3780 to reduce noise. Its wires are all twisted pairs, and the input signals and output signals are separately shielded, providing minimal cross talk between signals and solid protection against EMI/EMC problems.

BoardID™ switch
The MIC-3780 has a built-in DIP switch that helps define each card’s ID when multiple cards have been installed on the same PC chassis. The board ID setting function is very useful when users build their system with multiple MIC-3780 cards. With correct Board ID settings, you can easily identify and access each card during hardware configuration and software programming.

Plug & Play Function
The MIC-3780 is a Plug & Play device, which fully complies with PICMG 2.0, Ver 2.1 CompactPCI specifications. During card installation, there is no need to set jumpers or DIP switches. Instead, all bus-related configurations such as base I/O address and interrupt are automatically done by the Plug & Play function.

Specifications
Programmable Counter
- Channels: 8 (independent)
- Resolution: 16-bit
- Programmable Clock Source: 8 (independent)
- Programmable Counter Modes: 12
- Max. Frequency: 20 MHz
- Interrupt Source: 8 counter outputs

Digital Input/Output
- Input Channels: 8
- Input Voltage: Low: 0.8 V max.  High: 2.4 V min.
- Interrupt Source: Channel 0
- Output Channels: 8
- Output Voltage: Low: 0.5 V max. @ 24 mA (sink)  High: 2.4 V min. @ -15 mA (source)

General
- I/O Connector Type: 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: <5 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, 8-ch. Counter/Timer Card, user’s manual and driver CD-ROM. (cable not included)
- MIC-3780/6  6U, 8-ch. Counter/Timer Card, user’s manual and driver CD-ROM. (cable not included)
- 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
Applications

- Event counting
- One shot output
- Programmable frequency output
- Frequency measurement
- Pulse width measurement
- PWM output
- Periodic interrupt generation
- Time-delay generation

Counter Mode Table

<table>
<thead>
<tr>
<th>Counter Mode</th>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D</th>
<th>E</th>
<th>F</th>
<th>G</th>
<th>H</th>
<th>I</th>
<th>J</th>
<th>K</th>
<th>L</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reload Source (CM5)</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Repetition (CM4)</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>1</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Gate Control (CM15 – CM12)</td>
<td>N</td>
<td>L</td>
<td>E</td>
<td>N</td>
<td>L</td>
<td>E</td>
<td>N</td>
<td>L</td>
<td>E</td>
<td>N</td>
<td>L</td>
<td>E</td>
</tr>
<tr>
<td>Count to T/C once, then disarm</td>
<td>√</td>
<td>√</td>
<td>√</td>
<td>√</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Count to T/C twice, then disarm</td>
<td>√</td>
<td>√</td>
<td>√</td>
<td>√</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Count to T/C repeatedly without disarming</td>
<td>√</td>
<td>√</td>
<td>√</td>
<td>√</td>
<td>√</td>
<td>√</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Gate input does not gate counter input</td>
<td>√</td>
<td>√</td>
<td>√</td>
<td>√</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Count only during active gate level</td>
<td>√</td>
<td>√</td>
<td>√</td>
<td>√</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Start count on active gate edge and stop count on next T/C</td>
<td>√</td>
<td>√</td>
<td>√</td>
<td>√</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Start count on active gate edge and stop count on second T/C</td>
<td>√</td>
<td>√</td>
<td>√</td>
<td>√</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>No hardware re-triggering</td>
<td>√</td>
<td>√</td>
<td>√</td>
<td>√</td>
<td>√</td>
<td>√</td>
<td>√</td>
<td>√</td>
<td>√</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Reload counter from Load Register on T/C</td>
<td>√</td>
<td>√</td>
<td>√</td>
<td>√</td>
<td>√</td>
<td>√</td>
<td>√</td>
<td>√</td>
<td>√</td>
<td>√</td>
<td>√</td>
<td>√</td>
</tr>
<tr>
<td>Reload counter on each T/C, alternating reload source between Load and Hold Registers</td>
<td>√</td>
<td>√</td>
<td>√</td>
<td>√</td>
<td>√</td>
<td>√</td>
<td>√</td>
<td>√</td>
<td>√</td>
<td>√</td>
<td>√</td>
<td>√</td>
</tr>
</tbody>
</table>

Note: Gate Control:

- N: No gate control
- L: Level gate control
- E: Edge gate control

Pin Assignments

Block Diagram
MIC-3612

4-port RS-232/422/485 Communication Card, w/Surge Protection

Introduction
The MIC-3612 is a 4 port RS-232/422/485 PCI communication card. It is compatible with the PCI 2.1 bus specification and has four surge protected, RS-232/422/485 ports. It features functions such as high transmission speed at 921.6 kbps, four independent RS-232/422/485 ports, optional surge protection etc. The MIC-3612 also comes with high-performance 16C954 UARTs with 128-byte FIFO to reduce CPU load. These components make it more stable and reliable. Thus, the MIC-3612 is especially suitable for multitasking environments.

To improve the performance of the system, the MIC-3612 allows transmission rates up to 921.6 kbps. To further increase reliability, the MIC-3612 offers surge protection technology, protecting your system from abrupt high voltage of 2500 VDC. Besides, Advantech also provides a convenient utility program, ICOM Tools, to help users test the CompactPCI® card performance by analyzing the port status. It's easy to use the menu commands and toolbar buttons. ICOM tools acts as a PC-based data scope that lets you set a trigger condition, capture the communication data and monitor the signal status. ICOM Tools is applicable to all series of Advantech ICOM cards.

Specifications
- **Bus Interface**
  - CompactPCI® bus specification 2.1 compliant
- **Communication Controller**
  - BUS controller: PLX9030
- **IRQ**
  - All ports use the same IRQ assigned by PCI Plug & Play
- **Data Bits**
  - 5, 6, 7, 8
- **Stop Bits**
  - 1, 1.5, 2
- **Parity**
  - None, even, odd
- **Speed (bps)**
  - 50 – 921.6 k
- **Data Signals**
  - TxD, RxD, RTS, CTS, DTR, DSR, DCD, RI, GND (for RS-232)
  - TxD, RxD, RTS, CTS (for RS-422)
  - DATA+, DATA- (for RS-485)
- **Surge Protection**
  - 2500 VDC
- **Power Consumption**
  - | Voltage | Typical | Max. |
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>+5 V</td>
<td>220 mA</td>
<td>285 mA</td>
</tr>
<tr>
<td>+3.3 V</td>
<td>100 mA</td>
<td>200 mA</td>
</tr>
<tr>
<td>+12 V</td>
<td>60 mA</td>
<td>80 mA</td>
</tr>
</tbody>
</table>
- **Dimensions (L x H)**
  - 160 x 100 mm (6.3” x 3.9”), 3U/6U bracket
- **Operating Temperature**
  - 0 – 70° C (IEC68-2-1, 2)
- **Operating Humidity**
  - 5 – 95% relative humidity, non-condensing (IEC 68-2-1, 2)
- **Operating Humidity**
  - 5 – 95% relative humidity, non-condensing (IEC 68-2-3)
- **Storage Temperature**
  - -20 – 80° C

Ordering Information
- **MIC-3612/3**
  - 3U CompactPCI® 4-port RS-232/422/485 Card, user’s manual and driver CD-ROM. (30 cm DB-44 to DB-9 cable included)
- **MIC-3612/6**
  - 6U CompactPCI® 4-port RS-232/422/485 Card, user’s manual and driver CD-ROM. (30 cm DB-44 to DB-9 cable included)
MIC-3620

8-port RS-232 Communication Card

Features
- PCI Specification 2.1 compliant
- Speeds up to 921.6 kbps
- 16C954 UARTs with 12-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/NT/2000/XP
- Interrupt status register for increased performance
- Optional surge protection
- Space reserved for termination resistors

Introduction
The MIC-3620 is a 8 port RS-232 communication card that is compatible with the PCI 2.1 bus specification. The MIC-3620 provides eight optional surge protected RS-232 ports, and functions such as high transmission speed of 921.6 kbps, eight independent RS-232 ports, optional surge protection etc. The MIC-3620 also comes with high-performance 16PCI954 UARTs with 128-byte FIFO and 16C954 UARTs to reduce CPU load. These components increases stability and reliability. Thus, the MIC-3620 is especially suitable for multitasking environments.

To further increase reliability, The MIC-3620 offers surge protection technology, protecting your system from abrupt high voltage of 2500 VDC. Besides, Advantech also provides a convenient utility program, ICOM Tools, to help users test the CompactPCI card performance by analyzing the port status through easy-to-use menu commands and toolbar buttons. ICOM Tools acts as a PC-based data scope that lets you set a trigger condition, capture the communication data and monitor the signal status. In addition, ICOM Tools is applicable to all series of Advantech ICOM cards.

Specifications
- **Bus Interface**: CompactPCI® bus specification 2.1 compliant
- **IRQ**: All ports use the same IRQ assigned by PCI Plug & Play
- **Data Bits**: 5, 6, 7, 8
- **Stop Bits**: 1, 1.5, 2
- **Parity**: None, even, odd
- **Communication Controller**: PCI9030 + 16C954
- **Speed (bps)**: 50 – 921.6 k
- **Data Signals**: TxD, RxD, RTS, CTS, DTR, DSR, DCD, RI, GND
- **Surge Protection**: 2500 VDC
- **Power Consumption**: +5V, ±3.3V, ±12V
- **Dimensions (LxH)**: 160 x 100 mm (6.3" x 3.9"), 3U/6U Bracket
- **Operating Temperature**: 0 – 70° C (refer to IEC68-2-1, 2)
- **Operating Humidity**: 5 – 95% Relative Humidity, non-condensing (IEC 68-2-1, 2)
- **Operating Humidity**: 5 – 95% Relative Humidity, non-condensing (IEC 68-2-3)
- **Storage Temperature**: -20 – 80° C

Ordering Information
- **MIC-3620/3**: 3U CompactPCI® 8-port RS-232 Card, User’s manual and CD-ROM. (50 cm SCSI-68 to DB-9 cable included)
- **MIC-3620/6**: 6U CompactPCI® 8-port RS-232 Card, User’s manual and CD-ROM. (50 cm SCSI-68 to DB-9 cable included)
MIC-3000 Series

Dimensions

3U-size Card with 6U Bracket

3U-size Card with 3U Bracket

4U-size Enclosure

Unit: mm

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CompactPCI Systems

All product specifications are subject to change without notice

Last updated: January 2005