MIC-3000 Series

USER'S Manual

MIC-3368

6U-size CompactPCI™ Low Power Pentium® III 700MHz Master Single Board Computer

Advantech CompactPCI™

Modular Industrial Computer

Acknowledgements

CE Notification

The MIC-3368, developed by Advantech CO., LTD., has passed the CE test for environment specification when shielded cables are used for external wiring. We recommend the use of shielded cables.

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Product warranty

Advantech warrants to you, the original purchaser, that each of its products will be free from defects in materials and workmanship for one year from the date of purchase. This warranty does not apply to any products which have been repaired or altered by persons other than repair personnel authorized by Advantech, or which have been subject to misuse, abuse, accident or improper installation. Advantech assumes no liability under the terms of this warranty as a consequence of such events. Because of Advantech's high quality-control standards and rigorous testing, most of our customers never need to use our repair service. If an Advantech product is defective, it will be repaired or replaced at no charge during the warranty period. For out-of-warranty repairs, you will be billed according to the cost of replacement materials, service time and freight. Please consult your dealer for more details.

If you think you have a defective product, follow these steps:

1. Collect all the information about the problem encountered. (For example, CPU speed, Advantech products used, other hardware and software used, etc.) Note anything abnormal and list any on-screen messages you get when the problem occurs.
2. Call your dealer and describe the problem. Please have your manual, product, and any helpful information readily available.
3. If your product is diagnosed as defective, obtain an RMA (return merchandize authorization) number from your dealer. This allows us to process your return more quickly.
4. Carefully pack the defective product, a fully-completed Repair and Replacement Order Card and a photocopy proof of purchase date (such as your sales receipt) in a shippable container. A product returned without proof of the purchase date is not eligible for warranty service.
5. Write the RMA number visibly on the outside of the package and ship it prepaid to your dealer.

Packing List

Before installing your board, ensure that the following materials have been received:

- 1 MIC-3368 all-in-one single board computer
- 1 Utility CD-ROM disc
- 1 Heat sink (Assembled)
- 1 Thermal pad (Assembled)
- 1 Y-type keyboard/mouse cable
- 1 RJ-45 to RS-232 COM port adaptor
- 1 Hard drive isolation pad
- 1 Solder-side cover (Assembled)
- Several screws
- 1 warranty certificate
- This user's manual

If any of these items are missing or damaged, contact your distributor or sales representative immediately.

Technical Support and Sales Assistance

If you have any technical questions about the MIC-3368 or any other Advantech products, please visit our support website at:

- **http://support.advantech.com.tw**

For more information about Advantech's products and sales information, please visit:

- **http://www.advantech.com.**

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Hardware Configuration

1.1 Introduction

The MIC-3368 is a 6U-size CompactPCI™ all-in-one single board with low power Pentium® III 700MHz CPU on-board which complies with PICMG 2.0 R2.1 CompactPCI™ specifications. Targeting performance-demanding applications like computer telephony and communications. Based on Intel® 's 440GX chipset, the MIC-3368 enhances its performance with 100 MHz front side bus.

High Performance Pentium® III Processor

The MIC-3368 integrated an Intel® low power Pentium® III 700MHz processor with the BGA2 package. The low power Pentium® III 700MHz processor has on-chip 256 KB cache providing high performance with low cost. With the support of a 100MHz CPU bus clock, the MIC-3368 can fulfill customer's expectations of high-performance computing capability.

Compact Mechanical Design

The MIC-3368 has many functions on a single board with only one-slot width. Advantech provides a CPU heat sink specially designed for the low power Pentium® III processor, enabling the MIC-3368 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-3368 to use a Pentium® III CPU within a mere 1-slot wide space.

Single P2P Bridge

The MIC-3368 with single PCI-to-PCI Bridge (Intel® DEC21155) is applicable up to 8-slot enclosure (MIC-3032/MIC-3038) and drive up to seven bus master PCI slots.

PMC (PCI Mezzanine Card) IEEE1386.1 Compliant

The MIC-3368 support up to two PMC sites and compliant with PICMG 2.3 (PCI Mezzanine Card) specification. These two 32-bit PMC interface provides front access capability by PMC modules for various function demanding.

Complete I/O Functions

The MIC-3368 offers all the I/O functions of an industrial computer with the rugged Eurocard form factor. Since two PMC sites knockouts most area of front panel, only few I/O connectors are available on the front panel including one Ethernet interface, one serial port, and one PS/2 K/B and mouse. The rest of I/O have fully connected to the rear I/O module via user-define connector (J3 ~ J5) on the backplane. These I/O contain two Fast Ethernet interfaces, secondary serial port, one USB port, one VGA connector, and one PS/2 keyboard/mouse connector. The front panel also has

a reset button and LEDs for power status, HDD operation and Ethernet communication. The built-in high speed IDE controller provides two separate IDE channels with Ultra DMA/33 mode. The user-defined J3 connector is designed to support up to four IDE devices and two floppy drives. These drives can simply be connected to the backplane or to the rear transition board for easy service and maintenance.

Meets Industrial and Computer-Telephony Applications Requirements

The MIC-3368 is designed for use in mission critical applications. It accepts a CompactFlash™ memory card on either the rear transition board or MIC-3368 itself, thus eliminating the need to use a fragile rotating hard drive. A watchdog timer can automatically reset the system if the system stops due to a program bug or EMI. The two-layer front panel design complies with IEEE 1101.10. Connectors are firmly screwed to the front panel, and the replaceable shielding gasket is attached to the panel edge. This reduces emissions and gives better protection against external interference.

1.2 Specifications

Standard SBC Functions

• **CPU:** BGA2 Low Power Pentium® III Coppermine CPU 700 MHz

• **BIOS:** Award 2 Mb flash memory

• **Chipset:** Intel® 440GX / 440BX Chipset

• **Front Side Bus Clock:** 100 MHz for Intel® Pentium® III CPU

• **Bus Interface:** 32-bit, 33 MHz, PICMG 2.0 compliant

• **2nd level cache:** CPU built-in 256 KB (Pentium®III) on die

• **RAM:** Two 144-pin SO-DIMM sockets. Support PC-100 SDRAMs with memory capacity up to 1GB (MIC-3368) and 512MB for MIC-3368B. Support ECC.

• **Enhanced IDE interface:** Two channels handles up to 4 IDE HDDs or other IDE devices via J3 connector. Supports PIO mode 4 and Ultra DMA/33 mode.

• **Floppy disk drive interface:** Supports up to two floppy disk drives through the J3 connector

• **Serial ports:** Two RS-232 ports with 16C550 compatible UARTs

• **USB interface:** One USB connector with fuse protection. Complies with USB specification 1.0

• **Keyboard / mouse connectors:** One 6-pin mini-DIN connector on the front panel

• **Watchdog timer:** Can generate a system reset. Software enabled/disabled. Time interval is from 1 to 63 seconds, jumperless with run-time setup.

PCI-to-PCI Bridge

• **Controller chip:** One (MIC-3368) Intel® DEC 21155 transparent controller chips, drives up to seven PCI master peripherals

• Supports up to seven bus masters on each bus segment

• Provides seven pairs of GNT# and REQ# signals on each bus segment

10/100Base-TX Ethernet Interface

• **Controller chips:** Two Intel® 82559 Fast Ethernet controller chips

• Dual LAN ports (RJ-45)

• 10 Mbps or 100 Mbps auto-switching

AGP VGA Interface

• **Controller:** Intel® C&T 69030

• AGP 1.0 compliant, 66 MHz

• **Display memory:** On-chip 4MB SDRAM

• **Display Resolution Number of Colors:**

640 x 480, 800 x 600,

1024 x 768, 1280 x 1024 256 (8 bits)

640 x 480, 800 x 600, 1024 x 768 65, 536 (16 bits)

640 x 480, 800 x 600 16.8 million (24 bits)

640 x 480, 800 x 600 16.8 million (32 bits).

Optional Rear I/O Boards

• **For MIC-3368**: MIC-3308

• **For MIC-3368B**: MIC-3308

Mechanical and Environmental Specifications

• **Operating temperature:** 0 ~ 55° C (32 ~ 131° F)

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

• **Humidity (operating and storage):** 5 ~ 95% (non-condensing)

• **Power Consumption:** +5 V@ 2.1 A; +3.3 V @ 2.5 A; +12 V @ 640 mA

• **Board size:** 233.35 x 160 mm (6U size), 1-slot (4 TE) wide

• **Weight:** 0.8 kg (1.8 lb)

• **Shock:** 20 G (operating); 50 G (storage/transit)

• **Random vibration:** 1.5 Grms.

1.3 Functional Block Diagram

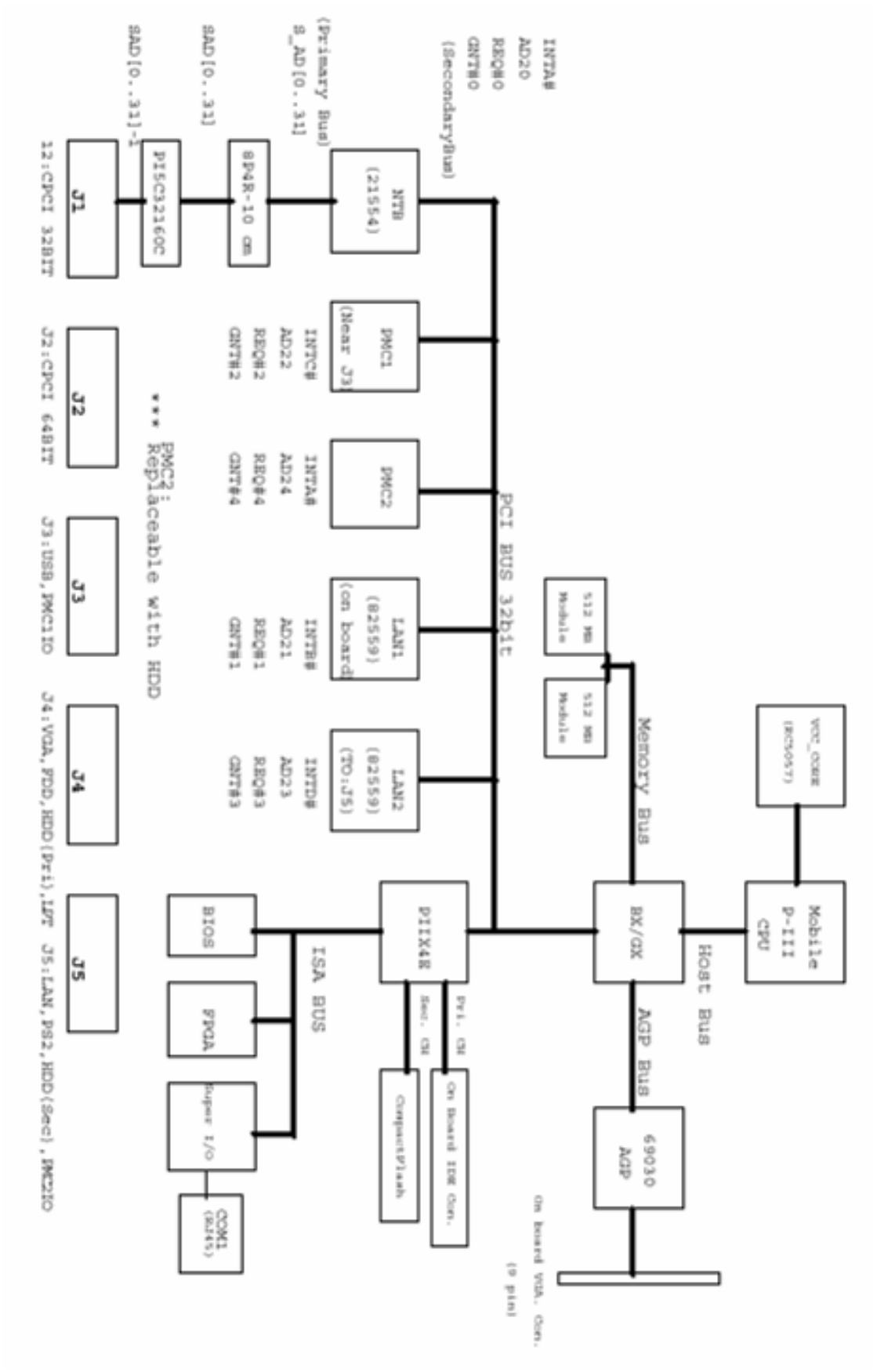


Figure 1-1: MIC-3368 functional block diagram.

1.4 Jumpers

1.4.1 Jumper Locations

The MIC-3368 provides a jumper (JP2) for configuring your board for specific applications other than the default settings. Table 1-1 lists the jumper function. Figure 1-2 illustrates the jumper location. Read this section carefully before changing the jump setting on your MIC-3368 card.

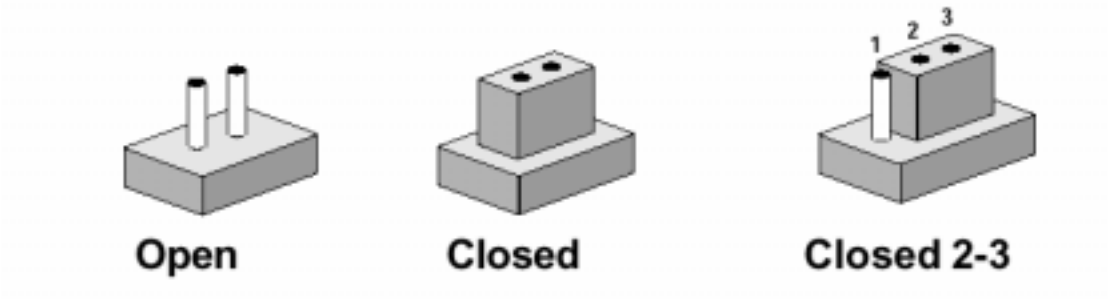
Table 1-1: MIC-3368 jumper descriptions

Number	Function
JP1	Clear CMOS
JP2	CF Mode (CF Master / Slave)
JP3	Hot-swap connector (For MIC-3368C only)
JP6	Primary PCI VIO
JP7	Secondary PCI VIO
JP8	PMC Module voltage

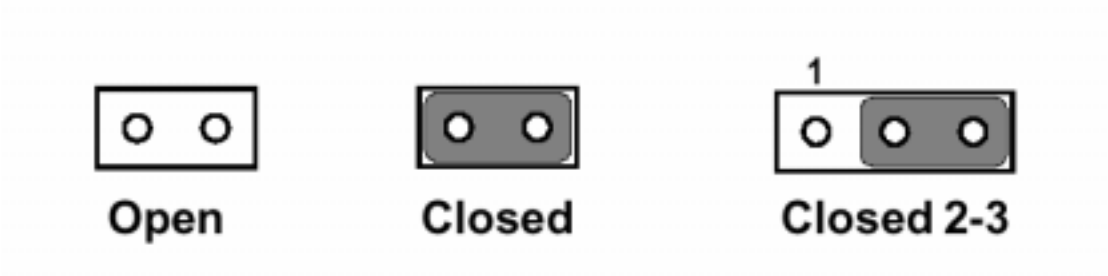
1.4.2 Jumper Settings

This section tells how to set the jumpers to configure your card. It gives the card default configuration and your options for each jumper. After you set the jumpers and install the card, you will also need to run the BIOS Setup program (discussed in Chapter 6) to configure the serial port addresses, floppy/hard disk drive types and system operating parameters. Connections, such as hard disk cables, appear in Chapter 2. For the locations of each jumper, see the board layout diagram depicted earlier in this chapter.

You configure your card to match the needs of your application by setting jumpers. A jumper is the simplest kind of electric switch. It consists of two metal pins and a small metal cap (often protected by a plastic cover) that slides over the pins to connect them. To "close" a jumper you connect the pins with the cap. To "open" a jumper you remove the cap. Sometimes a jumper will have three pins, labeled 1, 2 and 3. In this case you connect either pins 1 and 2 or 2 and 3.



The jumper settings are schematically depicted in this manual as follows:



You may find a pair of needle-nose pliers useful for setting the jumpers.
If you have any doubts about the best hardware configuration for your application, contact your local distributor or sales representative before you make any changes.

1.4.3 Clear CMOS (JP1)

This jumper is used to erase CMOS data and reset system BIOS information. Follow the procedures below to clear the CMOS.

1. Turn off the system.
2. Close jumper JP2 (2-3) for about 3 seconds.
3. Close jumper JP2 (1-2).
4. Turn on the system. The BIOS is reset to its default setting.

Table 1-2: Clear CMOS

CMOS JP1	
Clear	
Normal (default)	

1.5 Connectors

On-board connectors link to external devices such as hard disk drives, keyboards, or floppy drives, etc. Table 1-3 lists the function of each connector and Figure 1-2 and Figure 1-3 illustrate each connector location. Chapter 2 gives instructions for connecting external devices to your card.

Table 1-3 MIC-3368 connector descriptions

Number	**Function**
CN1	Secondary IDE (CF)
CN2	Primary IDE
CN4	SODIMM Socket
CN5	Ethernet RJ-45 Connector

CN7 COM1 RJ-45 Connector

CN8 CPU fan power connector

CN9 CompactFlash socket (optional)

J1/J2 Primary CompactPCI™ bus

J3 Rear I/O transition

J4 (MIC-3368) Rear I/O transition

J4/J5 (MIC-3368) Secondary CompactPCI™ bus

LED1 HDD LED and Power LED

SW1 Reset switch

Please refer to Appendix B for pin assignments.

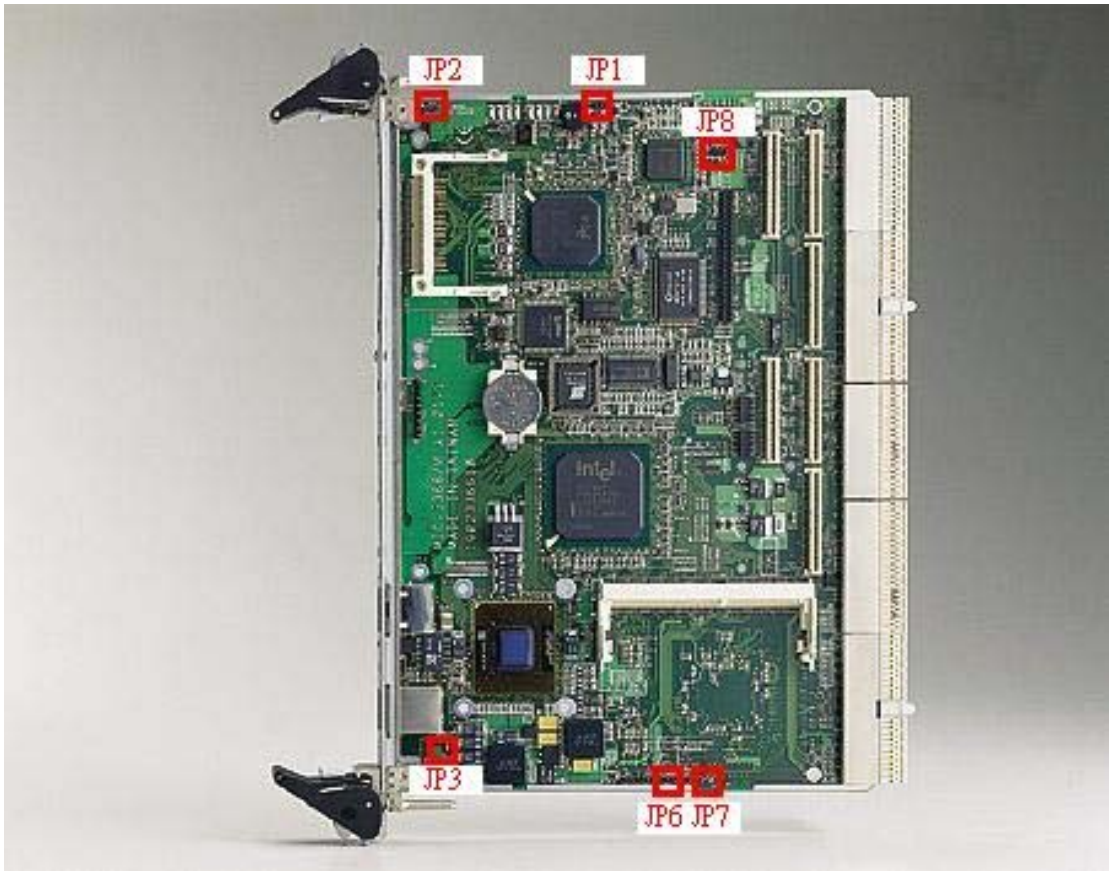


Figure 1-2: MIC-3368 jumper and connector locations.

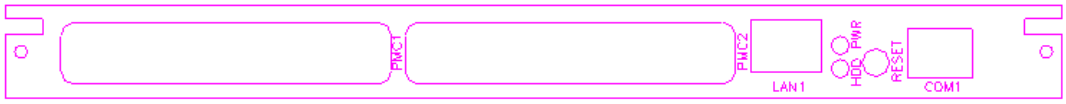


Figure 1-3: MIC-3368 front panel connector and indicator locations

1.6 Safety Precautions

Follow these simple precautions to protect yourself from harm and the products

from damage.

1. To avoid electric shock, always disconnect the power from your PC chassis before you work on it. Don't touch any components on the CPU card or other cards while the PC is on.
2. Disconnect power before making any configuration changes. The sudden rush of power as you connect a jumper or install a card may damage sensitive electronic components.
3. Always ground yourself to remove any static charge before you touch your CPU card. Be particularly careful not to touch the chip connectors. Modern integrated electronic devices, especially CPUs and memory chips, are extremely sensitive to static electric discharges and fields. Keep the card in its antistatic packaging when it is not installed in the PC, and place it on a static dissipative mat when you are working with it. Wear a grounding wrist strap for continuous protection.

1.7 Installing SDRAM (SODIMMs)

The MIC-3368 provides two 144-pin SODIMM sockets. Each socket accepts either 16, 32, 64, 128 or 256 MB SDRAM (for MIC-3368B). Also the 512MB SODIMM support for MIC-3368. The sockets can be filled in any combination with SODIMMs of any size, giving a total memory capacity between 16 and 512 MB. If only one SODIMM module is required, it can be installed in either SODIMM socket.

Since the MIC-3368 can operate at 66 or 100 MHz, we recommend using PC100-compliant SODIMMs. To enable the chipset's Error Checking and Correction (ECC) function, please use SODIMMs which support the ECC function. The procedure for installing SODIMMs appears below. Please follow these steps carefully.

1. Ensure that all power supplies to the system are switched off.
2. Install the SODIMM module. Install the SODIMM so that its gold pins point down into the SODIMM socket.
3. Slip the SODIMM into the socket at a 45 degree angle and carefully fit the bottom of the card against the connectors.
4. Gently push the SODIMM into the socket until the clips on the ends of the SODIMM sockets snap into place.
5. Check to ensure that the SODIMM is correctly seated and all connector contacts touch. The SODIMM should not move around in its socket.

NOTE: The SODIMM modules can only fit into sockets one way, in accordance with the keyed notches along the bottom edge of the modules. Their gold pins must point down into the SODIMM socket.

1.8 Installing CPU Heat Sink

The MIC-3368 integrates Intel® Low Power Pentium® III Coppermine CPU. In order to meet critical environmental conditions and the physical space of the MIC-3368 at the same time, Advantech designed a heat sink to fulfill its primary needs. Please refer to Figure 1-4 for an illustration of the heat sink used for the MIC-3368.
The small aluminum plate is default fastened on the CPU in the factory.

Figure 1-4: Heat sink installation.

Figure 1-5: Complete assembly with heat sink and hard disk

1.9 Software support

The MIC-3368 comes with a utility CD-ROM disc, which includes drivers and utility programs of Ethernet and SVGA interfaces. The 440GX and 440BX chipset may not be recognized by some old-versioned Windows 95. Please visit Intel®'s website to download the required files:

http://developer.intel.com/design/chipsets/drivers/inf_update.htm.

2

Connecting Peripherals

2.1 IDE Device (CN10)

The MIC-3368 provides two IDE (Integrated Device Electronics) channels via the J3 connector to the rear transition board (RIO-3308 for MIC-3368). Four IDE drives can be connected to the MIC-3368 through the rear transition board. Users can connect two IDE drives to each IDE channel. If two drives are installed on one channel, remember to set one as the master and the other one as the slave. You may do this by setting the jumpers on the drives. Refer to the documentation that came with your drive for more information. A jumper diagram usually appears on the top side of a hard disk drive.

Warning: Plug the other end of the cable into the drive with pin #1 on the cable corresponding to pin #1 on the drive. Improper connection will damage the drive.

2.2 VGA Display Connector (CN3)

The MIC-3368 provides a VGA chipset (CHIPs 69030) built-in display for high performance application. The RIO-3308's CN3 is a DB-15 connector for VGA monitor input. Pin assignments for the VGA display are detailed in Appendix B.

2.3 PS/2 Keyboard and Mouse Connector (CN5)

The MIC-3368 provides a 6-pin mini-DIN connector (CN5) on the front panel for connection of PS/2 keyboard and PS/2 mouse. The MIC-3368 comes with a cable to convert from the single 6-pin mini-DIN connector to a double PS/2 keyboard connector and PS/2 mouse connector. Since these two connectors are identical, please, follow the icons on the cable to plug the keyboard and the mouse into their correct connectors.

2.4 Serial Ports (CN1 and CN2)

The MIC-3368 offers two serial ports: COM1 and COM2, both in RS-232. With limited front panel access, only COM1 can be connected via a RJ-45 to RS-232 adaptor and COM2 interface has to via rear I/O module (RIO-3308) for implement. These ports allow users to connect to serial devices (a mouse, printers, etc.) or a communication network. You can select the address for each port (For example, 3F8H [COM1], 2F8H [COM2]) or disable it, using the BIOS Advanced Setup program, covered in Chapter 5. Different devices implement the RS-232 standard in different ways. If you are having problems with a serial device, be sure to check the pin assignments for the connector. The IRQ and address range for both ports are fixed. However, if you wish to disable the port or change these parameters later, you can do this in the system BIOS setup. The table below shows the settings for the MIC-3368 board's ports:

Table 2-1: MIC-3368 serial port default settings

Port Address Default

COM1 3F8, 3E8 3F8/IRQ4

COM2 2F8, 2E8 2F8/IRQ3

2.5 Ethernet Configuration (CN6 and CN7)

The MIC-3368 is equipped with dual high performance 32-bit PCI-bus Fast Ethernet interfaces which are fully compliant with IEEE 802.3u 10/100Base-TX specifications. It is supported by all major network operating systems and is 100% Novell NE-2000 compatible. One on-board RJ-45 jacks provide convenient connection to the network. Another one has to go through RIO module as well as COM port. The medium type can be configured via the software program included on the utility CD-ROM disc. (See Chapter 3 for detailed information.).

2.6 USB Connector (CN4)

The MIC-3368 provides one USB (Universal Serial Bus) interface via the rear I/O module panel. The USB interface gives complete plug and play, hot attach/detach for up to 127 external devices. The MIC-3368 USB interface complies with USB specification rev. 1.0 and is fuse protected. The USB interface can be disabled in the system BIOS setup. The USB controller default is "Enabled" but the USB keyboard support default is "Disabled".

2.7 PMC Connector (CN4)

The MIC-3368 support two PMC (PMC Mezzanine Card) modules on PCI bus 0. The MIC-3368 support two PMC (PMC Mezzanine Card) modules on PCI bus 0. This 32-bit, 3.3 V PCI bus is available at connectors J11 and J12. J14 is used for PMC rear panel I/O per the PMC specification (IEEE P1386.1/Draft 2.2). Front panel access is provided for the PMC interface. Signals from PMC modules that support rear panel I/O are routed out the rear of the board through backplane connector J3. A second PMC position is also available as an option. This position replaces the EIDE drive capability, front panel video, and Serial Port access. This 32-bit, 3.3 V PCI bus is available at connectors J21 and J22. J24 is used for PMC rear panel I/O per the PMC specification (IEEE P1386.1/Draft 2.2). Rear panel I/O from this PMC site is routed out the rear of the board through backplane connector J5.

2.8 Card Installation

The CompactPCI™ connectors are firm and rigid, and require careful handling while plugging and unplugging. Improper installation of a card can easily damage the backplane of the chassis. The inject/eject handles of MIC-3368 help you install and

remove the card easily and safely. Follow the procedure below to install the MIC-3368 into a chassis:

To install a card:

1. Hold the card vertically. Be sure that the card is pointing in the correct direction. The components of the card should be pointing to the right-hand side.
2. Pull out both handles to unlock it.

Caution: Keep your fingers away from the hinge to prevent your fingers from getting pinched.

3. Insert the card into the chassis by sliding the upper and lower edges of the card into the card guides.
4. Push the card into the slot gently by sliding the card along the card guide until the handles meet the rectangular holes of the cross rails. Note: If the card is correctly positioned and has been slid all the way into the chassis, the handle should match the rectangular holes. If not, remove the card from the card guide and repeat step 3 again. Do not try to install a card by forcing it into the chassis.
5. Pull the upper handle down and lift the lower handle up to push the card into place.
6. Secure the card by pushing in the red handle to lock it into place.

To remove a card:

1. Unscrew the screws on the front panel.
2. Lift the upper handle up and press the lower handle down to release the card from the backplane.
3. Slide the card out.

Figure 2-1: Installing the card into the chassis

3

Ethernet Software Configuration

3.1 Introduction

The MIC-3368 has two on-board high-performance fast Ethernet interfaces which comply with IEEE 802.3/802.3u for 10Base-T and 100 Base-TX data rates.
The module uses two Intel® 82559 fast Ethernet controllers with integrated PHY and is compatible with the Intel® PRO/100+ Server and Client Adapter. The dual Ethernet channel design provides several options for increasing throughput and fault tolerance when running Windows NT 4.0 or NetWare 4.1x and newer versions of these, includes:

• Adapter Fault Tolerance (AFT) - provides automatic redundancy for your Ethernet channel. If the primary channel fails, the secondary takes over.

• Adaptive Load Balancing (ALB) - creates a team of 2 channels to increase transmission throughput. Also includes AFT and ALB. This function works with any 100BASE-TX switch.

• Fast EtherChannel (FEC) - creates a team of 2 to 4 channels to increase transmission and reception throughput. Also includes AFT. This function requires a Cisco switch with FEC capability. The MIC-3368 comes with drivers for a wide variety of networks and operating systems. The MIC-3368 is an excellent choice for operation in standalone and harsh industrial environments.

3.2 Utility and Drivers

The MIC-3368's on-board Ethernet interface supports all major network operating systems. The installation instructions and drivers for different operating systems are located in the following directories of the utility CD-ROM disc:

General Information:

• **\MIC3368\LAN\README.TXT:** General information about the drivers.

For Microsoft Windows:

• **\MIC3368\LAN\INFO\MS\MS.TXT:** Installation instructions for Microsoft Windows

• **\MIC3368\LAN\E100BNT.SYS (NDIS 4.0), \MIC3368\LAN\ OEMSETUP.INF:** Drivers for Windows NT 4.0

• **\MIC3368\LAN\E100B.SYS (NDIS 3), \MIC3368\LAN\ OEMSETUP.INF:** Drivers for Windows NT 3.51

• **\MIC3368\LAN\NET82557.INF:** Drivers for Windows 98

• **\MIC3368\LAN\E100BNT.SYS (NDIS 4.0), \MIC3368\LAN\NET82557.INF:** Drivers for Windows 95

• **MIC3368\LAN\WFW\E100B.38_, \MIC3368\LAN\WFW\OEMSETUP.INF:** Drivers for Windows 3.1

For Novell NetWare

• **\MIC3368\LAN\INFO\NETWARE\NETWARE.TXT:** Installation instructions for Novell NetWare

• **\MIC3368\LAN\NWSERVER\3X4X.OLD\E100B.LAN:** Drivers for NetWare 3.12 and 4.10

• **\MIC3368\LAN\NWSERVER\311LAN\E100B.LAN:** Drivers for NetWare 3.11

• **\MIC3368\LAN\OS2\E100BODI.SYS:** Drivers for NetWare OS/2 ODI Client

• **\MIC3368\LAN\DOS\E100BODI.COM:** Drivers for DOS ODI Client

For UNIX

• **\MIC3368\LAN\INFO\UNIX\UNIX.TXT:** Installation instructions for UNIX

For Other Operating Systems

• **\MIC3368\LAN\INFO\OTHER\OTHER.TXT:** Installation instructions for other operating systems

• **\MIC3368\LAN\DOS\E100B.DOS:** Drivers for IBM LAN support for AS/400 and NetWare (for LANSUP).

• **\MIC3368\LAN\DOS\E100BODI.COM:** Drivers for IBM LAN support for AS/400 and NetWare (for ODINSUP)

• **\MIC3368\LAN\OS2\E100B.OS2:** Drivers for LAN server (OS/2 driver)

• **\MIC3368\LAN\DOS\E100B.DOS:** Drivers for LAN server (DOS driver)

• **\MIC3368\LAN\DOS\E100B.DOS:** Drivers for BANYAN NDIS workstation

• **\MIC3368\LAN\DOS\E100B.DOS:** Drivers for LANTASTIC 6.0

• **\MIC3368\LAN\DOS\E100B.DOS:** Drivers for general NDIS 2.X (DOS driver)

• **\MIC3368\LAN\OS2\E100B.OS2:** Drivers for general NDIS 2.X (OS/2 driver)

Before installing drivers, please refer to the installation instructions of each operating system.

Note: Do not use the driver recommended by the Windows 95/98/NT Add New Hardware wizard. Choose the driver from the utility CD-ROM disc.

Note: Operating system vendors may post driver updates on their web sites. Please visit the web sites of OS vendors to download updated drivers.

3.3 Installation for Windows NT 4.0

Before installing; create a new folder [ ], \MIC3368\LAN\, in your disk drive, and download all files from the directory, \MIC3368\LAN\, on the utility CD-ROM to it.

1. In the Windows NT screen, select "Start", click "Settings". Click the "Control Panel" item and choose "Network".
2. Click "Yes".
3. Click "Wired to the Network", or users may choose "Remote access to the

network" if applicable.

4. Click "Select from list".
5. Click "Have Disk".
6. Type in "E:\MIC3368\LAN" in the blank column and click "OK". (E: your hard disk drive).
7. Click "OK".
8. Click "Next".
9. Click "Next".
10. Click "Next".
11. Click "Next".
12. Insert Windows NT source disc in drive E. Type "E:\I386" in the blank column or any other directory that contains the Windows NT files. Click "Continue".
13. Wait for the installation to finish.
14. Complete the settings with users' network settings. Click "OK".
15. Click "Next".
16. Click "Next".
17. Click "Yes" to restart the computer and enable the changes to take effect.

4

AGP-SVGA Setup

4.1 Introduction

The MIC-3368 uses an Intel® C&T 69030 chipset as its AGP VGA controller. The

VGA controller has an integrated 4 MB SDRAM operating at 83 MHz, and can drive CRT displays with resolutions up to 1600 x 1200 @ 64 K colors. It supports interlaced and non-interlaced analog monitors (color and monochrome VGA) in high-resolution modes while maintaining complete IBM VGA compatibility. Digital monitors (i.e. MDA, CGA, and EGA) are NOT supported. Multiple frequency (multi-sync) monitors are handled as if they were analog monitors.

4.2 Installation of SVGA Driver

The MIC-3368 is supplied with a utility CD-ROM disc that holds the necessary file for setting up the VGA display under the directory \MIC3368\VGA. The contents and pathnames of this directory are listed below:

- **MIC3368\VGA\Win31:** VGA utility for Windows 3.1
- **MIC3368\VGA\Win95\w95500:** VGA utility for Windows 95
- **MIC3368\VGA\Win98\w98600:** VGA utility for Windows 98
- **MIC3368\VGA\WINNT:** Utility for Windows NT 4.0
- **MIC3368\VGA\OS2:** VGA utility for OS/2

Complete the following steps to install the VGA driver. Follow the procedures in the flow chart that apply to the operating system you are using with your MIC-3368.

4.3 Installation for Windows NT 4.0

1. Select "Settings" "Control Panel" from the "Start" menu.
2. Click "Display".
3. Select the "Settings" tab and click the "Display Type" button.
4. Click "Change" button in the "Adapter Type" block.
5. Click "Have Disk" button in the "Change Display" Windows.
6. Insert the utility CD-ROM disc in drive E. Type "E:\MIC3368\VGA\WINNT" in the blank column. Click "OK".
7. Click "OK".
8. Click "OK" to install the VGA driver.
9. Wait for installation to finish.
10. Click "OK" and restart the computer to enable the change to take effect.

5

Award BIOS Setup

5.1 AWARD BIOS Setup

Figure 5-1: Setup program initial screen

Award's BIOS ROM has a built-in Setup program that allows users to modify the basic system configuration. This type of information is stored in battery-backed CMOS so that it retains the Setup information when the power is turned off.

5.1.1 Entering Setup

Turn on the computer and check for the "patch code". If there is a number assigned to the patch code, it means that the BIOS support your CPU. If there is no number assigned to the patch code, please contact Advantech's application engineer to obtain an up-to-date patch code file. This will ensure that your CPU's system status is valid. After ensuring that you have a number assigned to the patch code, press <DEL> and you will immediately be allowed to enter Setup.

5.1.2 Standard CMOS Setup

Choose the "STANDARD CMOS SETUP" option from the INITIAL SETUP SCREEN Menu, and the screen below will be displayed. This standard setup menu allows users to configure system components such as date, time, hard disk drive, floppy drive, display, and memory.

Figure 5-2: CMOS setup screen.

5.1.3 BIOS Features Setup

The "BIOS FEATURES SETUP" screen will appear after the BIOS FEATURES SETUP item from the CMOS SETUP UTILITY Menu was chosen. This screen allows the user to configure the MIC-3368 according to his particular requirements. Below are some major items that are provided in the BIOS FEATURES SETUP screen:

Figure 5-3: BIOS features setup screen

Virus Warning

During and after the system boots up, any attempt to write to the boot sector or partition table of the hard disk drive will halt the system. If this happens, a warning message will be displayed. You can run the anti-virus program to locate the problem. If Virus Warning is disabled, no warning message will appear if anything attempts to access the boot sector or hard disk partition.

CPU Internal Cache/External Cache

Depending on the CPU/chipset design, these options can speed up memory access

when enabled.

Quick Power On Self Test

This option speeds up the Power-On Self Test (POST) conducted as soon as the computer is turned on. When enabled, the BIOS shortens or skips some of the items during the test. When it disabled, normal POST procedures resume.

Boot Sequence

This function determines the sequence in which the computer will search the drives for the disk operating system (i.e. DOS). The default value is "C, A, SCSI". The following options are available:

A: Computer will boot from the A (floppy) disk drive

C: Computer will boot from the C (hard) disk drive

CDROM: Computer will boot from the CD-ROM disc drive

SCSI: Computer will boot from the SCSI drive

D: Computer will boot from the D drive

E: Computer will boot from the E drive

F: Computer will boot from the F drive

LS120: Computer will boot from the LS-120 drive

Boot Up Floppy Seek

During POST, the BIOS will determine if the floppy disk drive installed has 40 or 80 tracks. The 360 KB type has 40 tracks while the 720 KB, 1.2 MB, and 1.44 MB all have 80 tracks.

Enabled BIOS searches the floppy drive to determine if it has 40 or 80 tracks. Note that BIOS cannot differentiate 720 KB, 1.2 MB, and 1.44 MB type drives as they all have 80 tracks.

Disabled BIOS will not search for the floppy drive type by track number. Note that there will not be any warning message if the drive installed is 360 KB. I

Boot Up NumLock Status

The default is "On".

On: Keypad boots up to number keys.

Off: Keypad boots up to arrow keys.

Boot Up System Speed

High: Sets the speed to high

Low: Sets the speed to low

IDE HDD Block Mode

Enabled: Enable IDE HDD Block Mode. BIOS will detect the block size of the HDD and send a block command automatically.

Disabled: Disable IDE HDD Block Mode

Gate A20 option

Normal: The A20 signal is controlled by the keyboard controller or chipset hardware

Fast: (Default: Fast) The A20 signal is controlled by Port 92 or by a chipset specific method.

Typematic Rate Setting

The typematic rate determines the characters per second accepted by the computer. Typematic Rate setting enables or disables the typematic rate.

Typematic Rate (Char/Sec)

BIOS accept the following input values (character/second) for Typematic Rate: 6, 8, 10, 12, 15, 20, 24, and 30.

Typematic Delay (msec)

When holding down a key, the Typematic Delay is the time interval between the appearance of the first and second characters. The input values (msec) for this category are: 250, 500, 750, and 1000.

Security Option

This setting determines whether the system will boot if the password is denied, while limiting access to Setup.

System: The system will not boot, and access to Setup will be denied if the correct password is not entered at the prompt.

Setup: The system will boot, but access to Setup will be denied if the correct password is not entered at the prompt.

Note: To disable security, select PASSWORD SETTING in the main menu. At this point, you will be asked to enter a password. Simply hit the <ENTER> key to disable security. When security is disabled, the system will boot, and you can enter Setup freely.

OS Select for DRAM>64 MB

This setting is for use under the OS/2 operating system.

Video BIOS Shadow

This setting determines whether the video BIOS will be copied to RAM, which is optional according to the chipset design. When enabled, Video Shadow increases the video speed.

C8000 - CFFFF Shadow/DC000-DFFFF Shadow

These settings determine whether optional ROM will be copied to
RAM in blocks of 16 KB.

Enabled: Optional shadow is enabled

Disabled: Optional shadow is disabled.

5.1.4 CHIPSET Features Setup

Choosing the "CHIPSET FEATURES SETUP" option from the INITIAL SETUP SCREEN Menu causes the screen below to be displayed. This sample screen contains the manufacturer's default values for the MIC-3368.

Figure 5-4: CHIPSET features setup screen

VGA Shared Memory Size

Shared memory architecture can support 0.5 MB, 1MB, 1.5 MB, 2 MB, 3 MB, 3.5 MB and 4 MB of system memory.

5.1.5 Power Management Setup

The power management setup controls the CPU cards' "green" features. The following screen shows the manufacturer's default values.

Figure 5-5: Power management setup screen

Power Management

This option allows you to determine if the values in power management are disabled, user-defined, or predefined.

HDD Power Management

You can choose to turn the HDD off after one of the time intervals listed, or when the system is in Suspend mode. If in a power saving mode, any access to the HDD will wake it up.

Note: The HDD will not power down if the Power Management option is disabled.

IRQ Activity

IRQ can be set independently. Activity on any enabled IRQ will wake up the system.

5.1.6 PNP/PCI Configuration Setup

Figure 5-6: PNP/PCI configuration screen

5.1.7 Integrated Peripherals

Figure 5-7: Integrated peripherals

Note: If you enable the IDE HDD block mode, the enhanced IDE driver will be enabled.

5.1.8 Load Setup Defaults

"LOAD SETUP DEFAULTS" loads the values required by the system for maximum performance.

5.1.9 Password Setting

To change, confirm, or disable the password, choose the "PASS-WORD SETTING" option form the Setup main menu and press [Enter]. The password can be at most 8 characters long. Remember, to enable this feature. You must first select the Security Option in the BIOS FEATURES SETUP to be either "Setup" or "System." Pressing [Enter] again without typing any characters can disable the password setting function.

5.1.10 IDE HDD Auto Detection

"IDE HDD AUTO DETECTION" automatically self-detects the hard disk type.

5.1.11 Save & Exit Setup

If you select this and press the [Enter] key, the values entered in the setup utilities will be recorded in the CMOS memory of the chipset. The microprocessor will check this every time you turn your system on and compare this to what it finds as it checks the system. This record is required for the system to operate.

5.1.12 Exit Without Saving

Selecting this option and pressing the [Enter] key lets you exit the Setup program without recording any new values or changing old ones.

A

Programming Watchdog Timer

A.1 Programming the Watchdog Timer

To program the watchdog timer, you must write a program which writes a value to I/O port address 443 (hex). This output value represents time interval. The value range is from 01 (hex) to FF (hex), and the related time interval is 1 sec. to 255 sec.

Data Time Interval

01 1 sec.

02 2 sec.

03 3 sec.

04 4 sec.

••

••

••

3F 63 sec.

After data entry, your program must refresh the watchdog timer by rewriting the I/O port 443 and 043 (hex) while simultaneously setting it. When you want to disable the watchdog timer, your program should read I/O port 043 (hex). The following example shows how you might program the watchdog timer in BASIC:

```
10 REM Watchdog timer example program
20 OUT &H443, data REM Start and restart the watchdog
30 GOSUB 1000 REM Your application task #1,
40 OUT &H443, data REM Reset the timer
50 GOSUB 2000 REM Your application task #2,
60 OUT &H443, data REM Reset the timer
70 X=INP (&H043) REM, Disable the watchdog timer
80 END
1000 REM Subroutine #1, your application task
••
••
••
1070 RETURN
2000 REM Subroutine #2, your application task
••
••
••
2090 RETURN.
```

B

Pin Assignments

B.1 System Slot J1 Connector

Table A-1: System slot J1 connector

Pin	Z	A	B	C	D	E	F
25	GND	+5V	REQ64#	ENUM#	+3.3V	+5V	GND
24	GND	AD[1]	+5V	V(I/O)	AD[0]	ACK64#	GND
23	GND	+3.3V	AD[4]	AD[3]	+5V	AD[2]	GND
22	GND	AD[7]	GND	+3.3V	AD[6]	AD[5]	GND
21	GND	+3.3V	AD[9]	AD[8]	M66EN	C/BE[0]#	GND
20	GND	AD[12]	GND	V(I/O)	AD[11]	AD[10]	GND
19	GND	+3.3V	AD[15]	AD[14]	GND	AD[13]	GND
18	GND	SERR#	GND	+3.3V	PAR	C/BE[1]#	GND
17	GND	+3.3V	SDONE	SBO#	GND	PERR#	GND
16	GND	DEVSEL#	GND	V(I/O)	STOP#	LOCK#	GND
15	GND	+3.3V	FRAME#	IRDY#	BD/SEL#	TRDY#	GND
12-14	Key Area						
11	GND	AD[18]	AD[17]	AD[16]	GND	C/BE[2]#	GND
10	GND	AD[21]	GND	+3.3V	AD[20]	AD[19]	GND
9	GND	C/BE[3]#	**N/C**	AD[23]	GND	AD[22]	GND
8	GND	AD[26]	GND	V(I/O)	AD[25]	AD[24]	GND
7	GND	AD[30]	AD[29]	AD[28]	GND	AD[27]	GND
6	GND	REQ#	GND	+3.3V	CLK	AD[31]	GND
5	GND	**N/C**	**N/C**	RST#	GND	GNT#	GND
4	GND	**N/C**	Healthy#	V(I/O)	INTP	INTS	GND
3	GND	INTA#	INTB#	INTC#	+5V	INTD#	GND
2	GND	TCK	+5V	TMS	**N/C**	TDI	GND
1	GND	+5V	-12V	TRST#	+12V	+5V	GND

#: Low active

B.2 System Slot P2 Connector

Table A-2: System slot P2 connector

Pin	Z	A	B	C	D	E	F
22	GND	GA4	GA3	GA2	GA1	GA0	GND
21	GND	CLK6	GND	N/C	RSV	RSV	GND
20	GND	CLK5	N/C	N/C	GND	N/C	GND
19	GND	N/C	GND	N/C	N/C	N/C	GND
18	GND	N/C	N/C	N/C	GND	N/C	GND
17	GND	N/C	GND	PRST#	REQ6#	GNT6#	GND
16	GND	N/C	N/C	DEG#	GND	N/C	GND
15	GND	N/C	GND	FAL#	REQ5#	GNT5#	GND
14	GND	AD[35]	AD[34]	AD[33]	GND	AD[32]	GND
13	GND	AD[38]	GND	V(I/O)	AD[37]	AD[36]	GND
12	GND	AD[42]	AD[41]	AD[40]	GND	AD[39]	GND
11	GND	AD[45]	GND	V(I/O)	AD[44]	AD[43]	GND
10	GND	AD[49]	AD[48]	AD[47]	GND	AD[46]	GND
9	GND	AD[52]	GND	V(I/O)	AD[51]	AD[50]	GND
8	GND	AD[56]	AD[55]	AD[54]	GND	AD[53]	GND
7	GND	AD[59]	GND	V(I/O)	AD[58]	AD[57]	GND
6	GND	AD[63]	AD[62]	AD[61]	GND	AD[60]	GND
5	GND	C/BE[5]#	64EN#	V(I/O)	C/BE[4]#	PAR64#	GND
4	GND	V(I/O)	N/C	C/BE[7]#	GND	C/BE[6]#	GND
3	GND	CLK4	GND	GNT3#	REQ4#	GNT4#	GND
2	GND	CLK2	CLK3	SYSEN#	GNT2#	REQ3#	GND
1	GND	CLK1	GND	REQ1#	GNT1#	REQ2#	GND

#: Low active

Note: GA[4...0] shall be used for geographic addressing on the backplane

B.3 System and Peripheral Slots J3 Connector

Table A-3: System slot J3 connector

Pin	Z	A	B	C	D	E	F
19	GND	USBD1+	USBD1-	USBD0+	USBD0-	N/C	GND
18	GND	LPA_DA+	LPA_DA-	GND	LPA_DC+	LPA_DC-	GND
17	GND	LPA_DB+	LPA_DB-	GND	LPA_DD+	LPA_DD-	GND
16	GND	LPB_DA+	LPB_DA-	GND	LPB_DC+	LPB_DC-	GND
15	GND	LPB_DB+	LPB_DB-	GND	LPB_DD+	LPB_DD-	GND
14	GND	+3.3V	+3.3V	+3.3V	+5V	+5V	GND
13	GND	PMC1IO5	PMC1IO4	PMC1IO3	PMC1IO2	PMC1IO1	GND
12	GND	PMC1IO10	PMC1IO9	PMC1IO8	PMC1IO7	PMC1IO6	GND
11	GND	PMC1IO15	PMC1IO14	PMC1IO13	PMC1IO12	PMC1IO11	GND
10	GND	PMC1IO20	PMC1IO19	PMC1IO18	PMC1IO17	PMC1IO16	GND
9	GND	PMC1IO25	PMC1IO24	PMC1IO23	PMC1IO22	PMC1IO21	GND
8	GND	PMC1IO30	PMC1IO29	PMC1IO28	PMC1IO27	PMC1IO26	GND
7	GND	PMC1IO35	PMC1IO34	PMC1IO33	PMC1IO32	PMC1IO31	GND
6	GND	PMC1IO40	PMC1IO39	PMC1IO38	PMC1IO37	PMC1IO36	GND
5	GND	PMC1IO45	PMC1IO44	PMC1IO43	PMC1IO42	PMC1IO41	GND
4	GND	PMC1IO50	PMC1IO49	PMC1IO48	PMC1IO47	PMC1IO46	GND
3	GND	PMC1IO55	PMC1IO54	PMC1IO53	PMC1IO52	PMC1IO51	GND
2	GND	PMC1IO60	PMC1IO59	PMC1IO58	PMC1IO57	PMC1IO56	GND
1	GND	PMCVIO	PMC1IO64	PMC1IO63	PMC1IO62	PMC1IO61	GND

#: Low active

B.4 System Slot J4 Connector

Table A-4: System slot J4 connector

Pin	Z	A	B	C	D	E	F
25	GND	GND	HHCS1-	HHIRQ	HRST1PRI	N/C	GND
24	GND	HHIOW-	HHDRQ-	HHRDY	HHCS3-	HHACK-	GND
23	GND	IID15	HHDA0	HHDA1	HHIOR-	HHDA2	GND
22	GND	IID10	IID11	IID12	IID13	IID14	GND
21	GND	IID5	IID6	IID7	IID8	IID9	GND
20	GND	IID0	IID1	IID2	IID3	IID4	GND
19	GND	PDASP#	PDIAG	N/C	RED	GREEN	GND
18	GND	N/C	N/C	N/C	GND	BLUE	GND
17	GND	HLEDIO#	N/C	2RXD232	SCL	CRT-H	GND
16	GND	N/C	1RXD232	N/C	SDA	CRT-V	GND
15	GND	N/C	N/C	N/C	NTX2	N/C	GND
12-14	Key Area						
11	GND	NRLSD1	NDTR1	NRI1	NDSR2	NRX2	GND
10	GND	NCTS1	NDTR2	N/C	NTX1	NDSR1	GND
9	GND	NCTS2	NRTS2	NRTS1	NRLSD2	NRX1	GND
8	GND	RX1	NRI2	-RTS2	TX1	-RTS1	GND
7	GND	TX2	RX2	STB-	AFD-	LPTD2	GND
6	GND	INIT-	LPTD1	ERR-	LPTD0	LPTD6	GND
5	GND	LPTD5	LPTD4	LPTD3	SLIN-	SLCT	GND
4	GND	PE	BUSY	ACK-	LPTD7	RWC#	GND
3	GND	TRAK0#	WP#	RDATA#	HEAD#	DSKCHG#	GND
2	GND	MOB#	DIR#	STEP#	WD#	WE#	GND
1	GND	N/C	INDEX#	MOA#	DSB#	DSA#	GND

B.5 System Slot J5 Connector

Table A-5: System slot J5 connector

Pin	Z	A	B	C	D	E	F
22	GND	LANTX+2	LANRX+2	KDAT	HIRQ15	HRST1SEC	GND
21	GND	LANTX-2	LANRX-2	KCLK	HSDACK#	HSCS1#	GND
20	GND	GND	AUXVCC	RSTIN	HSIORDY	HSCS3#	GND
19	GND	LANTX+	LANRX+	MDAT	HSDIOW#	HSDREQ	GND
18	GND	LANTX-	LANRX-	MCLK	HSDIOR#	HSDA2	GND
17	GND	GND	AUXVCC	HSDD15	HSDA0	HSDA1	GND
16	GND	HSDD10	HSDD11	HSDD12	HSDD13	HSDD14	GND
15	GND	HSDD5	HSDD6	HSDD7	HSDD8	HSDD9	GND
14	GND	HSDD0	HSDD1	HSDD2	HSDD3	HSDD4	GND
13	GND	PMC2IO5	PMC2IO4	PMC2IO3	PMC2IO2	PMC2IO1	GND
12	GND	PMC2IO10	PMC2IO9	PMC2IO8	PMC2IO7	PMC2IO6	GND
11	GND	PMC2IO15	PMC2IO14	PMC2IO13	PMC2IO12	PMC2IO11	GND
10	GND	PMC2IO20	PMC2IO19	PMC2IO18	PMC2IO17	PMC2IO16	GND
9	GND	PMC2IO25	PMC2IO24	PMC2IO23	PMC2IO22	PMC2IO21	GND
8	GND	PMC2IO30	PMC2IO29	PMC2IO28	PMC2IO27	PMC2IO26	GND
7	GND	PMC2IO35	PMC2IO34	PMC2IO33	PMC2IO32	PMC2IO31	GND
6	GND	PMC2IO40	PMC2IO39	PMC2IO38	PMC2IO37	PMC2IO36	GND
5	GND	PMC2IO45	PMC2IO44	PMC2IO43	PMC2IO42	PMC2IO41	GND
4	GND	PMC2IO50	PMC2IO49	PMC2IO48	PMC2IO47	PMC2IO46	GND
3	GND	PMC2IO55	PMC2IO54	PMC2IO53	PMC2IO52	PMC2IO51	GND
2	GND	PMC2IO60	PMC2IO59	PMC2IO58	PMC2IO57	PMC2IO56	GND
1	GND	RIOINSTALL#	PMC2IO64	PMC2IO63	PMC2IO62	PMC2IO61	GND

B.6 EIDE Connector (CN1)

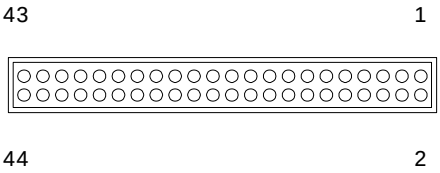


Table A-13: Hard Disk Drive Connector

Pin	Signal	Pin	Signal
1	PRST#	2	GND
3	PID7	4	PID8
5	PID6	6	PID9
7	PID5	8	PID10
9	PID4	10	PID11
11	PID3	12	PID12
13	PID2	14	PID13
15	PID1	16	PID14
17	PID0	18	PID15
19	GND	20	N/C
21	PDRQ#	22	GND
23	PIOW#	24	GND
25	PIOR#	26	GND
27	PRDY	28	Pull low
29	PACK#	30	GND
31	PIRQ	32	N/C
33	PDA1	34	Pull low
35	PDA0	36	PDA2
37	PCS1#	38	PCS3#
39	HDD_LED	40	GND
41	**VCC**	**42**	**VCC**
43	**GND**	**44**	**GND**

B.7 Ethernet RJ-45 Connectors (CN5)

Table B-6: MIC-3368 Ethernet RJ-45 connectors

Pin	Signal
1	TX+
2	TX-
3	RX+
4	N/C

5	N/C
6	RX-
7	N/C
8	N/C

B.8 VGA Display connector (CN6)

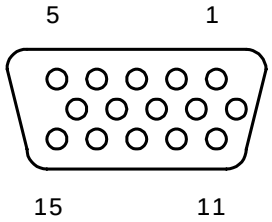


Table A-15: CRT display connector

Pin	Signal
1	RED
2	GREEN
3	BLUE
4	N/C
5	GND
6	GND
7	GND
8	GND
9	VGAVCC
10	GND
11	N/C
12	SDA
13	HSYNC
14	VSYNC
15	SCL

B.9 RJ45-COM1 Serial Ports (CN7)

Table B-2: MIC-3368 COM1 and com2 serial ports

Pin	**Signal**
1	NRLSD1
2	NRX1
3	NTX1

4	NDTR1
5	GND
6	NDSR1
7	NRTS1
8	NCTS1

B.10 Fan Module Connectors (CN8)

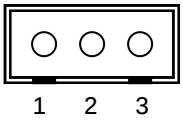


Table A-10: Fan Module Connectors

Pin	Assignment
1	Fan speed
2	+12V
3	GND

B.11 CompactFlash Socket (CN9)-Optional

Table B-7: MIC-3368 CompactFlash socket

Pin	Signal	Pin	Signal
1	GND	26	N/C
2	ID3	27	ID11
3	ID4	28	ID12
4	ID5	29	ID13
5	ID6	30	ID14
6	ID7	31	ID15
7	HCS1-	32	HCS3-
8	GND	33	N/C
9	GND	34	HIOR-
10	GND	35	HIOW-
11	GND	36	N/C
12	GND	37	HIRQ
13	VCC	38	VCC
14	GND	39	SANDISK
15	GND	40	N/C
16	GND	41	-HRST1
17	GND	42	HRDY
18	GDA2	43	N/C

19	HDA1	44	N/C
20	HDA0	45	SANLED
21	ID0	46	N/C
22	ID1	47	ID8
23	ID2	48	ID9
24	N/C	49	ID10
25	N/C	50	GND.

B.12 System I/O Ports

Table B-8: System I/O ports

Addr. range (Hex) Device

000-01F DMA controller

020-021 Interrupt controller 1, master

022-023 Chipset address

040-05F 8254 timer

060-06F 8042 (keyboard controller)

070-07F Real-time clock, non-maskable interrupt (NMI)

mask

080-09F DMA page register

0A0-0BF Interrupt controller 2

0C0-0DF DMA controller

0F0-0F8 Math co-processor

1F0-1F7 Fixed disk

2F8-2FF Serial port 2

3B0-3BB VGA adapter

3C0-3DF VGA adapter

3F0-3F5 Diskette controller

3F8-3FF Serial port 1.

B.13 Interrupt Assignments

Table B-9: Interrupt assignments

Interrupt# Interrupt source

IRQ 0 Interval timer

IRQ 1 Keyboard

IRQ 2 Interrupt from controller 2 (cascade)

IRQ 8 Real-time clock

IRQ 9 VGA

IRQ 10 Available

IRQ 11 Available

IRQ 12 PS/2 mouse

IRQ 13 INT from co-processor

IRQ 14 Fixed disk controller

IRQ 15 Available

IRQ 3 Serial communication port 2

IRQ 4 Serial communication port 1

IRQ 5 Available

IRQ 6 Diskette controller (FDC)

IRQ 7 Available

B.14 1st MB Memory Map

Table B-10:1st MB memory map

Addr. range (Hex) Device

F000h - FFFFh System ROM

CC00h - EFFFh Unused

CA00h - CBFFh Used

C000h - C9FFh Expansion ROM

B800h - BFFFh CGA/EGA/VGA text

B000h - B7FFh Unused

A000h - AFFFh EGA/VGA graphics

0000h - 9FFFh Base memory.