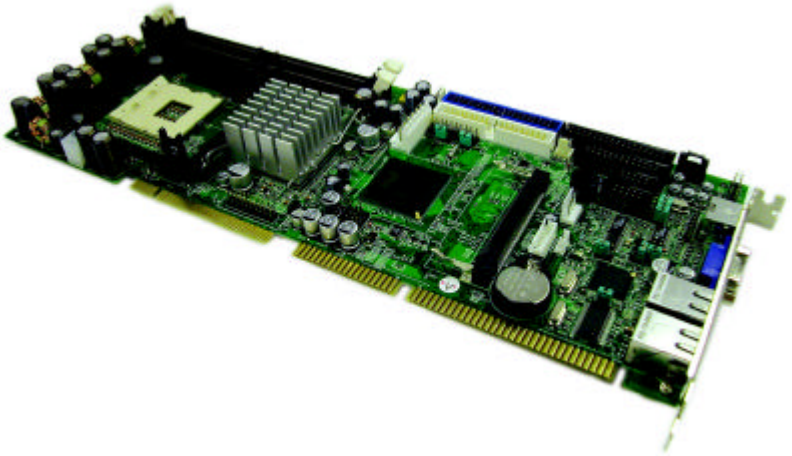
PCI-749-VE2 Single Board Computer User's Guide



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Before You Begin

Before handling the PCI-749-VE2 single board computer, read the instructions and safety guidelines on the following pages to prevent damage to the product and to ensure your own personal safety. Refer to the "Advisories" section in the Preface for advisory conventions used in this user's guide, including the distinction between Warnings, Cautions, Important Notes, and Notes.

- Always use caution when handling/operating the computer. Only qualified, experienced, authorized electronics service personnel should access the interior of the computer. The power supplies produce high voltages and energy hazards, which can cause bodily harm.

- Use extreme caution when installing or removing components. Refer to the installation instructions in this user's guide for precautions and procedures. If you have any questions, please contact Kontron Post-Sales Technical Support.

WARNING

High voltages are present inside the chassis when the unit's power cord is plugged into an electrical outlet. Turn off system power, turn off the power supply, and then disconnect the power cord from its source before removing the chassis cover. Turning off the system power switch does not remove power to components.

When Working Inside a Computer

Before taking covers off a computer, perform the following steps:

1) Turn off the computer and any peripherals.

2) Disconnect the computer and peripherals from their power sources or subsystems to prevent electric shock or system board damage. This does not apply when hot swapping parts.

3) Follow the guidelines provided in "Preventing Electrostatic Discharge" on the following page.

4) Disconnect any telephone or telecommunications lines from the computer.

In addition, take note of these safety guidelines when appropriate:

- To help avoid possible damage to system boards, wait five seconds after turning off the computer before removing a component, removing a system board, or disconnecting a peripheral device from the computer.

- When you disconnect a cable, pull on its connector or on its strain-relief loop, not on the cable itself. Some cables have a connector with locking tabs. If you are disconnecting this type of cable, press in on the locking tabs before disconnecting the cable. As you pull connectors apart, keep them evenly aligned to avoid bending any connector pins. Also, before connecting a cable, make sure both connectors are correctly oriented and aligned.

CAUTION

Do not attempt to service the system yourself except as explained in this user's guide. Follow installation and troubleshooting instructions closely.

Preventing Electrostatic Discharge

Static electricity can harm system boards. Perform service at an ESD workstation and follow proper ESD procedure to reduce the risk of damage to components. Kontron strongly encourages you to follow proper ESD procedure, which can include wrist straps and smocks, when servicing equipment.

You can also take the following steps to prevent damage from electrostatic discharge (ESD):

- When unpacking a static-sensitive component from its shipping carton, do not remove the component's antistatic packing material until you are ready to install the component in a computer. Just before unwrapping the antistatic packaging, be sure you are at an ESD workstation or grounded. This willl discharge any static electricity that may have built up in your body.
- When transporting a sensitive component, first place it in an antistatic container or packaging.
- Handle all sensitive components at an ESD workstation. If possible, use antistatic floor pads and workbench pads.
- Handle components and boards with care. Don't touch the components or contacts on a board. Hold a board by its edges or by its metal mounting bracket.
- Do not handle or store system boards near strong electrostatic, electromagnetic, magnetic, or radioactive fields.

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Preface

Contents

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How to Use This Guide

This guide is designed to be used as step-by-step instructions for installation, and as a reference for operation, troubleshooting, and upgrades.

Note: Additional technical information, BIOS updates, and drivers are available on our web site, *www.kontron.com*, under Technical Support.

The following is a summary of the chapter contents:

- **Chapter 1, Introduction,** presents the product overview, specifications and system architecture for the PCI-749-VE2 single board computer.
- **Chapter 2, Hardware Settings,** shows the definitions and locations of jumpers and connectors that you can easily configure for your system.
- **Chapter 3,System Installation,** describes how to properly mount the CPU, main memory, and install the board into a chassis.
- **Chapter4, BIOS Setup Information,** specifies the meaning of each setup parameter and describes how to get advanced BIOS performance.
- **Appendix A, I/O Port Address Map and IRQ Definitions,** provides base addresses and IRQ definitions for configuring I/O devices.
- **Appendix B, Watchdog Timer,** describes how to setup and configure the PCI-749-VE2's onboard watchdog timer .

Customer Comments

If you have any difficulties using this user's guide, discover an error, or just want to provide some feedback, please send us a message using the online form under "Contact Us" on our web site (*www.kontron.com*) under "Technical Support." Detail any errors you find. We will correct the errors or problems as soon as possible and post the revised user's guide in our online Support Library. Thank you.

Note: You may also use the online form on our web site to submit comments or concerns about our products, or request technical support.

Advisory Conventions

Four types of advisories are used throughout this user's guide to provide helpful information or to alert you to the potential for hardware damage or personal injury. They are Notes, Cautions, and Warnings. The following is an example of each type of advisory. Use caution when servicing any electrical component.

Note: A note is used to make helpful information stand out.

Important: An important note indicates information that is important for you to know.

CAUTION

A CAUTION indicates potential damage to hardware and tells you how to avoid the problem.

WARNING

A WARNING indicates the potential for bodily harm and tells you how to avoid the problem.

Disclaimer: We have tried to identify all situations that may pose a warning or caution condition in this user's guide. However, Kontron does not claim to have covered all situations that might require the use of a Caution or Warning.

Unpacking

When unpacking, follow these steps:

1) After opening the box, save it and the packing material for possible future shipment.

2) Remove all items from the box. If any items listed on the purchase order are missing, notify Kontron customer service immediately.

3) Inspect the product for damage. If there is damage, notify Kontron customer service immediately. Refer to “Guarantee and Warranty Policy” for the return procedure.

Regulatory Compliance Statements

This section provides the FCC compliance statement for Class A devices and describes how to keep the system CE compliant.

FCC Compliance Statement for Class A Devices

The product(s) described in this user's guide has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the user's guide, may cause harmful interference to radio communications. Operation of this equipment in a residential area (domestic environment) is likely to cause harmful interference, in which case the user will be required to correct the interference (take adequate measures) at their own expense.

Changes or modifications not expressly approved by Kontron could void the user's authority to operate the equipment.

Note: The assembler of a personal computer system may be required to test the system and/or make necessary modifications if a system is found to cause harmful interference or to be noncompliant with the appropriate standards for its intended use.

CE Certification

CE

The product(s) described in this user's guide complies with all applicable European Union (CE) directives if it has a CE marking. The CE declaration of conformity is provided on the last page of this user's guide. For computer systems to remain CE compliant, only CE-compliant parts may be used. Maintaining CE compliance also requires proper cable and cabling techniques. Although Kontron offers accessories, the customer must ensure that these products are installed with proper shielding to maintain CE compliance. Kontron does not offer engineering services for designing cabling systems. In addition, Kontron will not retest or recertify systems or components that have been reconfigured by customers.

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Guarantee and Warranty Policy

Guarantee

A thirty day money-back guarantee is provided on all standard products sold. Special order products are covered by our Limited Warranty, *however they may not be returned for refund or credit. EPROMs, RAM, Flash EPROMs or other forms of solid electronic media are not returnable for credit - but for replacement* only. An extended warranty is available. Consult the factory.

Refunds

In order to receive a refund on a product for the purchase price, the product must not have been damaged by the customer or by the common carrier chosen by the customer to return the goods and the product must be returned complete (meaning all user's guides, software, cables, etc.) within 30 days of receipt and in an as-new and resalable condition. The "Return Procedure" must be followed to assure a prompt refund.

Restocking Charges

Product returned *after* 30 days, and *before* 60 days, of the purchase will be subject to a minimum 20% restocking charge and charges for any damaged or missing parts. Products not returned within 60 days of purchase, or products which are not in an as-new and resalable condition, are not eligible for a credit return and will be returned to the customer.

Limited Warranty

Effective April 1, 1998, all products carry a 2-year limited warranty. Within 2 years of purchase, Kontron will repair or replace, at our option, any defective product. Kontron will service the warranty for all standard catalog products for the first two years from the date of shipment. Please note: The 2-year warranty may not apply to special promotion items. Please consult the factory for warranty verification.

The limited warranty is void if the product has been subjected to alteration, neglect, misuse, or abuse; if any repairs have been attempted by anyone other than Kontron or its authorized agent; or if the failure is caused by accident, acts of God, or other causes beyond the control of Kontron or the manufacturer. Neglect, misuse, and abuse shall include any installation, operation, or maintenance of the product other than in accordance with the user's guide.

No agent, dealer, distributor, service company, or other party is authorized to change, modify, or extend the terms of this Limited Warranty in any manner whatsoever. Kontron reserves the right to make changes or improvements in any product without incurring any obligation to similarly alter products previously purchased.

Return Procedure

For any Guarantee or Limited Warranty return, please contact Kontron Customer Service at 800-480-0044 or 858-677-0877 and obtain a Return Material Authorization (RMA) Number. All product(s) returned to Kontron for service or credit **must** be accompanied by a Return Material Authorization (RMA) Number. Freight on all returned items **must** be prepaid by the customer who is responsible for any loss or damage caused by common carrier in transit. Returns for Warranty **must** include a Failure Report for each unit, by serial number(s), as well as a copy of the original invoice showing the date of purchase.

To reduce risk of damage, returns of product must be in an Kontron shipping container. If the original container has been lost or damaged, new shipping containers may be obtained from Kontron Customer Service at a nominal cost.

Kontron owns all parts removed from repaired products. Kontron uses new and reconditioned parts made by various manufacturers in performing warranty repairs and building replacement products. If Kontron repairs or replaces a product, its warranty term is not extended.

Kontron will normally return your replacement or repaired items via Second Day Air. Overnight delivery or delivery via other carriers is available at an additional charge.

Shipments not in compliance with this Guarantee and Limited Warranty Return Policy will not be accepted by Kontron.

Limitation of Liability

In no event shall Kontron be liable for any defect in hardware, software, loss, or inadequacy of data of any kind, or for any direct, indirect, incidental, or consequential damages in connection with or arising out of the performance or use of any product furnished hereunder. Kontron's liability shall in no event exceed the purchase price of the product purchased hereunder. The foregoing limitation of liability shall be equally applicable to any service provided by Kontron or its authorized agent.

Some sales items and customized systems are **not** subject to the guarantee and limited warranty. However in these instances, any deviations will be disclosed prior to sales and noted in the original invoice. **Kontron reserves the right to refuse returns or credits on software or special order items.**

Maintaining Your Computer

Cleaning Components

Internal fans cool the computer by drawing in air through air vents in the front of the computer and blowing it out the rear-side panels. Dust and other debris is drawn in with the air and, if allowed to build up, will interfere with the operation of various system components and insulate components, preventing heat from dissipating. To prevent this, an air filter has been installed in front of the air vents in the front panel to block dust and other debris from entering the computer.

Dust and debris builds up on the air filter over time. When the air filter becomes very dirty, it is difficult for cooling air to pass through the air filter and enter the computer. So, the air filter must be cleaned to prevent the computer from overheating. Remove and clean the air filter on a regular basis following the steps described in the "Air Filter" section of Chapter 2. Also, regularly vacuum the exterior of the chassis to remove dust that has accumulated around the air vents.

Environmental Factors

Temperature

The ambient temperature within an enclosure may be greater than room ambient temperature. Installation in an enclosure should be such that the amount of air flow required for safe operation is not compromised. Consideration should be given to the maximum rated ambient temperature. Overheating can cause a variety of problems, including premature aging and failure of chips or mechanical failure of devices.

If the system has been exposed to abnormally cold temperatures, allow a two-hour warm-up period to bring it up to normal operating temperature before turning it on. Failure to do so may cause damage to internal components, particularly the hard disk drive.

Humidity

High-humidity can cause moisture to enter and accumulate in the system. This moisture can cause corrosion of internal components and degrade such properties as electrical resistance and thermal conductivity. Extreme moisture buildup inside the system can result in electrical shorts, which can cause serious damage to the system.

Buildings in which climate is controlled usually maintain an acceptable level of humidity for system equipment. However, if a system is located in an unusually humid location, a dehumidifier can be used to maintain the humidity within an acceptable range. Refer to the "Specifications" section of this user's guide for the operating and storage humidity specifications.

Altitude

Operating a system at a high altitude (low pressure) reduces the efficiency of the cooling fans to cool the system. This can cause electrical problems related to arcing and corona effects. This condition can also cause sealed components with internal pressure, such as electrolytic capacitors, to fail or perform at reduced efficiency.

Power Protection

The greatest threats to a system's supply of power are power loss, power spikes, and power surges caused by electrical storms, which interrupt system operation and/or damage system components. To protect your system, always properly ground power cables and one of the following devices.

Surge Protector

Surge protectors are available in a variety of types and usually provide a level of protection proportional with the cost of the device. Surge protectors prevent voltage spikes from entering a system through the AC power cord. Surge protectors, however, do not offer protection against brownouts, which occur when the voltage drops more than 20 percent below the normal AC line voltage level.

Line Conditioner

Line conditioners go beyond the overvoltage protection of surge protectors. Line conditioners keep a system's AC power source voltage at a fairly constant level and, therefore, can handle brownouts. Because of this added protection, line conditioners cost more than surge protectors. However, line conditioners cannot protect against a complete loss of power.

Uninterruptible Power Supply

Uninterruptible power supply (UPS) systems offer the most complete protection against variations on power because they use battery power to keep the server running when AC power is lost. The battery is charged by the AC power while it is available, so when AC power is lost, the battery can provide power to the system for a limited amount of time, depending on the UPS system.

UPS systems range in price from a few hundred dollars to several thousand dollars, with the more expensive unit s allowing you to run larger systems for a longer period of time when AC power is lost. UPS systems that provide only 5 minutes of battery power let you conduct an orderly shutdown of the system, but are not intended to provide continued operation. Surge protectors should be used with all UPS systems, and the UPS system should be Underwriters Laboratories (UL) safety approved.

Chapter 1

Introduction

Contents

Overview

The PCI-749-VE2 is one of the world's highest performance PICMG Full-Size Single Board Computers (SBC). It integrates the latest Intel 845G chipset with 82801DB ICH4 technology supporting a Socket 478 connector for 0.13 µ Pentium 4(Northwood) processors with frequencies of up to 2.53GHz. The system memory accommodates a maximum of 2GB of DDRAM.

The board is equipped with one Standard MiniPCI socket and one CompactFlash socket. The MiniPCI socket allows users to extend their system by adding MiniPCI cards to the onboard socket. The CompactFlash socket is a 50-pin socket that accommodates CompactFlash cards.

Other features include the AC'97 CODEC, Intel 82551QM Ethernet, IrDA, RJ-45 LAN Connectors, External USB 2.0, WakeOnLAN and Watchdog Timer.

The integration of the PCI-749-VE2 components on two layers of the Printed Circuit Board (PCB) can reduce production failure rates by integrating all components on to two sides of the PCB. With components on two PCB layers, better design and improved quality control is achieved.

Checklist

Please check that your package is complete and contains the items below. If you discover damaged or missing items, please contact your dealer.

- The PCI-749-VE2 Single Board Computer
- Two Serial Port Ribbon Cables attached to a mounting bracket
- One Parallel Port attached to a mounting bracket
- One Audio Cable W/Ext EXTVGM Board
- One Universal Serial Bus (USB) cable attached to a mounting bracket
- One Y-cable for PS/2 Keyboard and Mouse
- One Kontron Single Board Computer Driver CD

- One Kontron Single Board Computer Technical Reference CD

Specifications

- **Main processor:** Intel® Pentium4® (Northwood) socket 478 processors with 400/533MHz front side bus (FSB) up to 2.53GHz
- **BIOS:** Award system BIOS with 256KB Flash ROM, Year 2000-compliant, Plug and Play (PnP) support, Advanced Power Management (APM), DMI, ISA PnP extension, and ACPI power management
- **DMI BIOS Support:** Desktop Management Interface (DMI) allows users to download system hardware-level information such as CPU type, CPU speed, internal/external frequencies and DIMM memory size.
- **Advanced Power Management (APM):** Power management via BIOS, activated through mouse/keyboard movement
- **Main Memory:** Two 184-pin non-ECC DDR (Double Data Rate Synchronous DRAM) DIMMs, single-sided and/ or double-sided up to 2GB at 200MHz or 266MHz
- **Chipset:** Intel 845G chipset with 82801DB (ICH4)
- **Bus Interface:** Follows PICMG 1.0 Rev 2.0 standard (32-bit PCI and 16-bit ISA) and fully complies with PCI Local Bus specification V2.1 (supports 4 master PCI slots)
- **PCI IDE Interface:** Supports two enhanced IDE ports accommodating up to four HDD or peripheral devices with PIO mode 4/5 and Ultra DMA/33/66/100 mode transfer
- **DVI Support:** Silicon image 164 (TMDS) chip supports DVI and Panel Link
- **Floppy Drive Interface:** Supports one FDD port for up to two floppy drives and 5-1/4"(360K, 1.2MB), 3-1/2" (720K, 1.2MB, 1.44MB, 2.88MB, LS-120) diskette format
- **Serial Ports:** Supports two high-speed 16550 compatible UARTs with 16-byte T/R FIFOs, COM1 functions as RS232, and COM2 as RS232/422/485

- **IrDA Interface:** Supports one 6-pin header for optional IrDA external connector
- **Parallel Port**: Support one parallel port with SPP, EPP and ECP modes
- **USB 2.0 Interface:** Support two Universal Serial Bus (USB) ports for high-speed I/O peripheral devices, compliant with USB specification Rev. 2.0
- **PS/2 Mouse and Keyboard Interface:** Supports one 6-pin Mini-DIN keyboard/mouse Y-cable with a 5-pin shrouded header for the keyboard and a 5-pin shrouded header for the mouse.
- **1st I/O LPC:** Winbond W83627HF
- **PCI to ISA Bridge:** Winbond W83626F
- **Auxiliary I/O Interfaces:** System reset switch, external speaker, keyboard lock and HDD active LED
- **Real Time Clock/Calendar (RTC):** Support Y2K Real Time Clock/calendar with battery backup for 7-year data retention
- **Watchdog Timer:** Support 256-level programmable WDT function
- **AC'97:** AC'97 2.1-compliant link for audio telephony CODECs
- **Compact Flash Socket:** Compliant with IDE interface operations (Type I and II)
- **MiniPCI:** 124-pin miniPCI socket supports standard miniPCI cards
- **Onboard Ethernet LAN:** Intel 82551QM LAN Chip
  - The ICH4 is a highly integrated I/O Controller Hub that provides the interface to the PCI Bus and integrates many of the functions needed in today's PC platform. The Intel 82801DB ICH4 integrated LAN functions and capabilities were included in the ICH4 architecture.
  - The Intel 82551QM integrates Intel's fourth generation Gigabit MAC design with fully integrated, physical-layer circuitry to provide a standard IEEE 802.3 Ethernet interface for 10/100 Base-TX applications (802.3, 802.3u, 802.3ab).

- **Onboard VGA:** Intel 845G display chipset internal graphics controller with 4MB cache up to 1920x 1440 CRT resolution at 85 Hz and up to 1280x 1024 resolution at 60 Hzwith 512MB DDRAM for digital flat panels; supports dual CRT display; 64-bits memory bus in 2/4/8/16/32 MB SGRAM configurations supporting DDR; LCD panel supports DVI

- **Wake On LAN:** Initiates power-on in systems with ATX power supplies from the power-off state via a network connection

- **Modem Wake On Ring**: Allows system to power on through an external modem and ATX power supply

- **System Monitoring Feature:** Monitor CPU and system temperature

- **Windows Power-Off Function:** Allows a power-off control within Windows 95/98/2000/ME/XP environments on systems with ATX power supplies

- **Physical and Environmental Requirements:**

  - Outline Dimensions (L X W): 338mm (13.33") X 122mm (4.8")
  - PCB layout: 8 layer
  - Operating Temperature: 0 to 60 ^{o}C(32 to 108 ^{o}F)
  - Storage Temperature: -25 to 65 ^{o}C (-45 to 117 ^{o}F)
  - Humidity: 5 to 95%

- **Power Requirements:**

  - 10A @ +5V (max), +/- 12V: 100mA (max)

Chapter 2

Hardware Settings

Contents

Overview

This chapter provides the definitions and locations of jumpers, switches, headers, and connectors. All of the configuration jumpers on the PCI-749-VE2 single board computer are shipped with the default settings. The default settings are marked with a star (*).

Jumpers

In general, the jumpers are used to select options for certain features (Figure 2-1). Some of the jumpers are user-configurable, allowing system enhancement. Other jumpers are used for testing purposes only and should not be altered. To select any option, insert the jumper cap (Short) or remove (NC) the jumper cap from the jumper pins according to the following instructions. (Here NC stands for "Not Connected".)

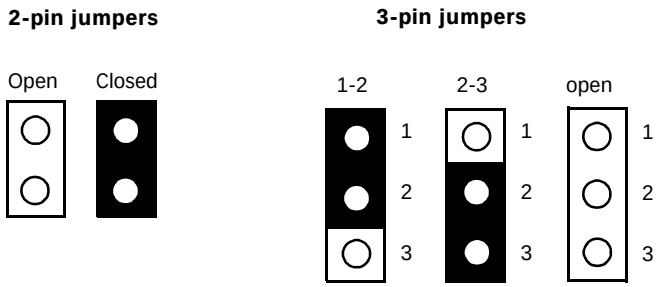


Figure 2-1. Examples of 2-pin and 3-pin jumpers

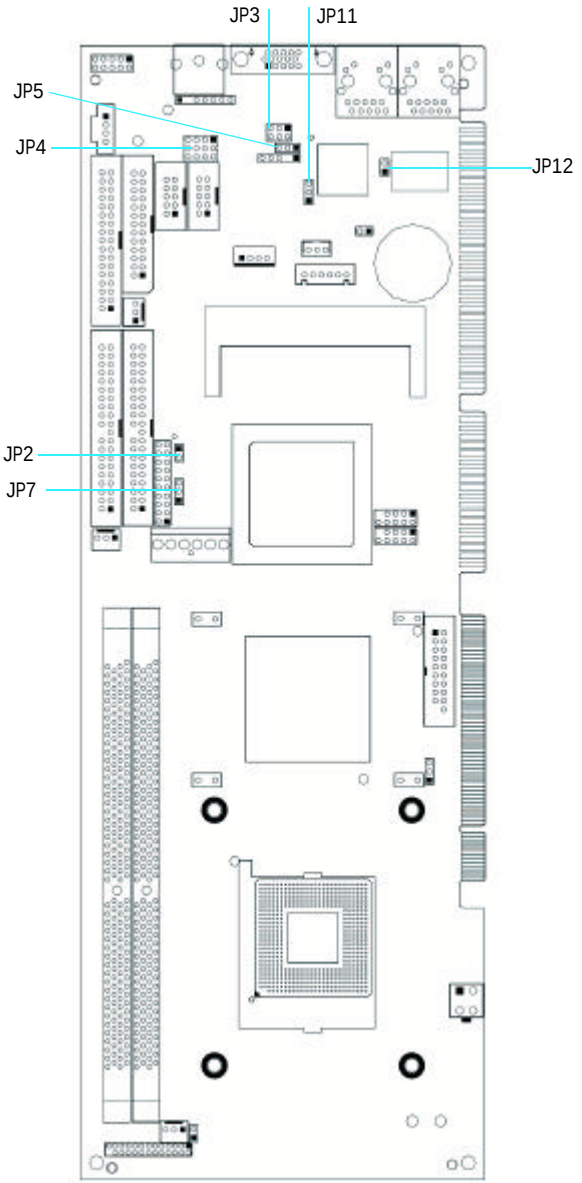
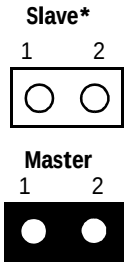


Figure 2-2. Jumper Locations

JP2: CompactFlash Disk Function		
Pins	**Description**	**Function**
1-2	Open*	Slave
1-2	Closed	Master



The following table describes the jumper settings for JP3.

JP3: RS232/422/485 COM2 Selection		
RS-232	**RS-422**	**RS-485**
1-2	3-4	5-6

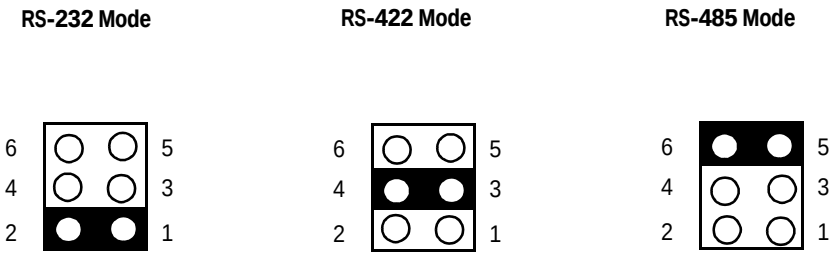


Figure 2-3. JP3: RS-232/422/485 Mode Selection

The following table describes the jumper settings for JP4.

JP4: RS232/422/485 COM2 Selection		
RS-232	**RS-422**	**RS-485**
10-11	11-12	11-12
7-8	8-9	8-9
4-5	5-6	5-6
1-2	2-3	2-3

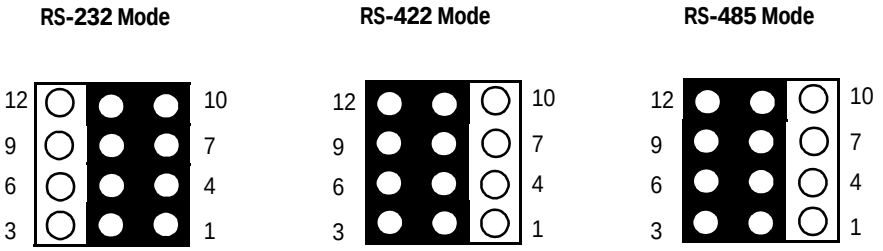
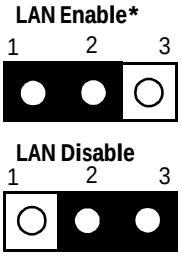


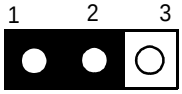
Figure 2-4. JP4: RS-232/422/485 Mode Selection

JP5: Onboard LAN1		
Pins	**Description**	**Function**
1-2	Closed	LAN Enable*
2-3	Closed	LAN Disable

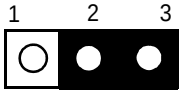


JP7: Clear CMOS		
Pins	**Description**	**Function**
1-2	Closed	Normal Operation*
2-3	Closed	Clear CMOS

Normal Operation*

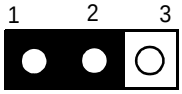


Clear CMOS

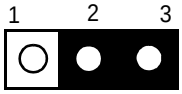


JP11: AT/ATX Power Mode		
Pins	**Description**	**Function**
1-2	Closed	ATX Power Mode*
2-3	Closed	AT Power Mode

ATX Power Mode*

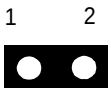


AT Power Mode

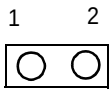


JP12: Onboard LAN2 Function		
Pins	**Description**	**Function**
1-2	Closed*	Enable
1-2	Open	Diaable

Enable*



Disable



Connectors

I/O peripheral devices are connected to the connectors as described in this section (Figure 2-5).

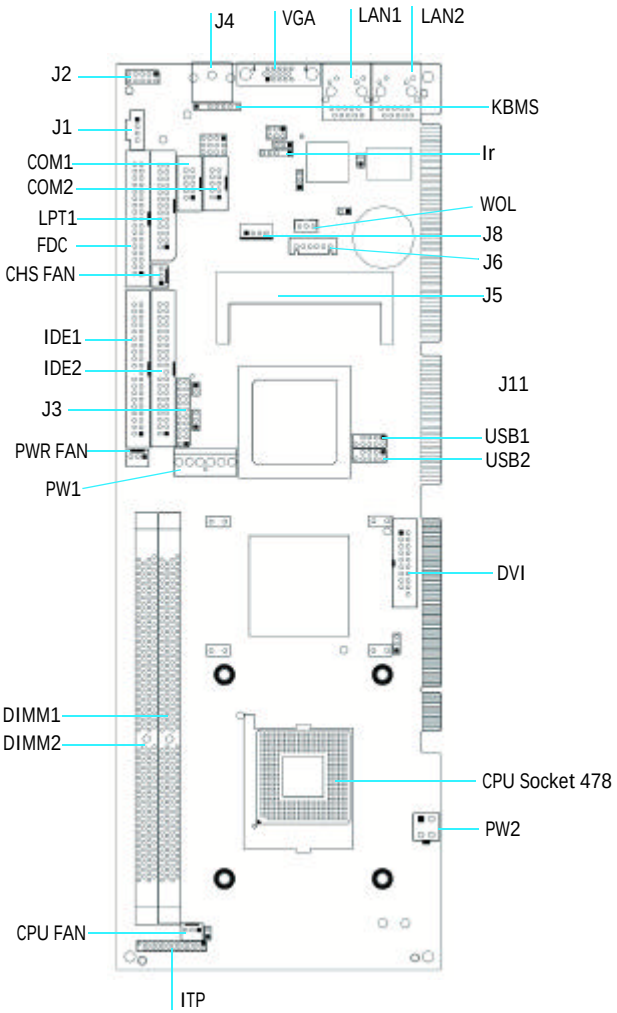


Figure 2-5. Connector Locations

Table 2-1. Connector Functions

Connector	Function	Remark
J1	CD-ROM Audio In Connector	
J2	Audio In Connector	
J3	Front Bezel Connector	
J4	PS/2 Keyboard/Mouse Connectors	
J5	MiniPCI Socket	
J6	External ATX Power Connector	
J8	Peripheral Power Connector	
KBMS	Keyboard/Mouse External Connector	
USB1	USB Header (1-2)	
USB2	USB Header (3-4)	
DVI	DVI Panel External Connector	
IDE1/IDE2	IDE Connectors	shrouded 40-pin
FDC	Floppy Drive Connector	
PW1	AUX External ATX Power Connector	
PW2	ATX12V Power Connector	
Ir	IrDA Connector	
VGA	VGA CRT Connector	DB15
WOL	Wake-On-LAN Connector	
LPT1	Parallel Port Connector	
LAN1/IAN2	Ethernet interface	RJ-45 port
COM1/COM2	Serial Ports	DB9
CPU Fan	CPU fan Power Connector	3-pin header
CHS Fan	Chassis Fan Power Connector	3-pin header

Table 2-1. Connector Functions (Continued)		
Connector	**Function**	**Remark**
PWR Fan	Chassis Fan Power Connector	3-pin header
CF	Compact Flash Disk Connector	

Connector Pin Assignments

Front Bezel Connector (J3)

The front panel of the case has a control panel that provides LEDs to indicate current computer activities and switches to change the computer status. J3 is a 20-pin header that provides interfaces for the following functions.

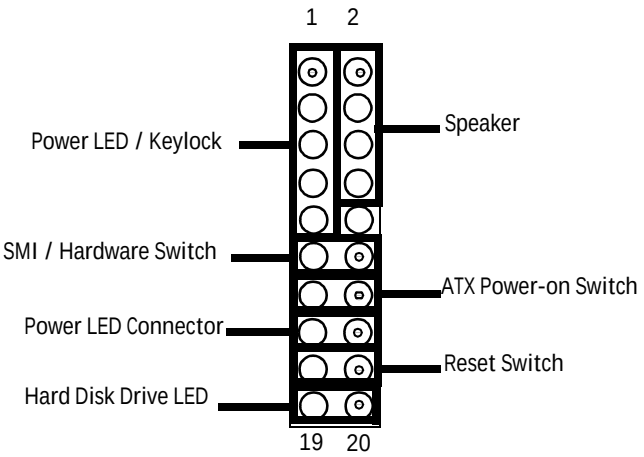
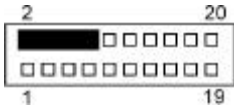


Figure 2-6. Front Panel Connector Pin Assignments

➤ Speaker: pins 1-4

This connector provides an interface to a speaker for audio tone generation. An 8-ohm speaker is recommended.

Pin	Signal
2	Speaker out
4	NC
6	VCC
8	GND



➤ Power LED / Keylock: pins 11-15

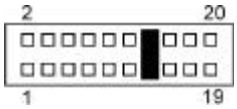
The power LED indicates the status of the main power switch. The keylock switch, when closed, will disable the keyboard function.

Pin	Signal
11	Power LED
12	NC
13	GND
14	Keylock
15	GND

➤ SMI / Hardware Switch: pins 6 and 16

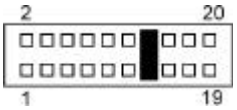
This connector supports the "Green Switch" on the control panel, which, when pressed, will force the system into the power-saving mode immediately.

Pin	Signal
6	Sleep
16	GND



➤ ATX Power-on Switch: pins 7 and 17

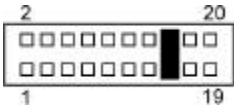
This 2-pin connector is an "ATX Power Supply On/Off Switch" on the system that connects to the power switch on the case. When pressed, the power switch will force the system to power on. When pressed again, it will force the system to power off.



Pin	Signal
7	Power On
17	5VSB

➤ Turbo LED Connector: pins 8 and 18

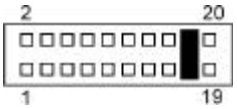
There is no turbo/deturbo function on the CPU card. The Turbo LED on the control panel will always be On when attached to this connector.



Pin	Signal
8	+5V
18	GND

➤ Reset Switch: pins 9 and 19

The reset switch allows the user to reset the system without turning the main power switch off and then on again. Orientation is not required when making a connection to this header.

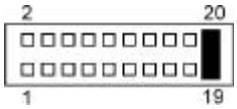


Pin	Signal
9	Reset
19	GND

➤ Hard Disk Drive LED Connector: pins 10 and 20

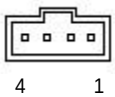
This connector connects to the hard drive activity LED on control panel. This LED will flash when the HDD is being accessed.

Pin	Signal
10	GND
20	+5V

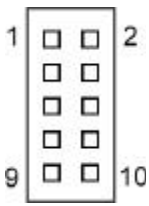


➤ *All Other Connectors*

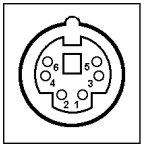
J1: CD-ROM Audio In Connector	
Pin	**Signal**
1	Left
2	GND
3	GND
4	Right



J2: Audio In Connector			
Pin	**Signal**	**Pin**	**Signal**
1	LineOut-L	2	LineOut-R
3	GND	4	GND
5	LineIn-L	6	LineIn-R
7	GND	8	GND
9	Mic-In	10	GND

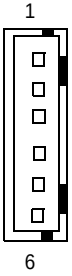


J4: PS/2 Keyboard/Mouse Connector	
Pin	**Signal**
1	Keyboard Data
2	Mouse Data
3	GND
4	+5V
5	Keyboard Clock
6	Mouse Clock



J6 is a 6- pin connector for ATX Power. Cable ATX/6P should be used with this connector. The function of this header supports ATX Power shutdown from the power button.

J6: External ATX Power Connector	
Pin	**Signal**
1	PWRBTN
2	GND
3	PWRBTN
4	GND
5	PS-ON (soft on/off)
6	5V SB (standby +5V)

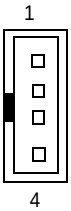


The pin assignments for the J5 MiniPCI Socket are as follows:

J5: MiniPCI Socket					
Pin	**Signal**	**Pin**	**Signal**	**Pin**	**Signal**
1	X	2	X	3	X
4	X	5	X	6	X
7	X	8	X	9	X
10	X	11	X	12	X
13	X	14	X	15	X
16	X	17	-INTB	18	VCC
19	VCC3	20	-INTA	21	X
22	X	23	GND	24	V3.3 Aux
25	CLK	26	-RST	27	GND
28	VCC3	29	-REQ	30	-GNT
31	VCC3	32	GND	33	AD31
34	-PME	35	AD29	36	X
37	GND	38	AD30	39	AD27
40	VCC3	41	AD25	42	AD28
43	RESV	44	AD26	45	-CBE3
46	AD24	47	AD23	48	IDSEL
49	GND	50	GND	51	AD21
52	AD22	53	AD19	54	AD20
55	GND	56	PAR	57	AD17
58	AD18	59	-CEB2	60	AD16
61	-IRDY	62	GND	63	VCC3
64	-FRAME	65	-CLKRUN	66	-TRDY
67	-SERR	68	-STOP	69	GND

J5: MiniPCI Socket					
Pin	**Signal**	**Pin**	**Signal**	**Pin**	**Signal**
70	VCC3	71	-PERR	72	-DEVSEL
73	-CBE1	74	GND	75	AD14
76	AD15	77	GND	78	AD13
79	AD12	80	AD11	81	AD10
82	GND	83	GND	84	AD9
85	AD8	86	-CBE0	87	AD7
88	ACC3	89	ACC3	90	AD6
91	AD5	92	AD4	93	X
94	AD2	95	AD3	96	AD0
97	VCC	98	X	99	AD1
100	R-WIP	101	GND	102	GND
103	X	104	X	105	X
106	X	107	X	108	X
109	X	110	X	111	X
112	X	113	AUDIOGND	114	GND
115	X	116	X	117	X
118	X	119	AUDIOGND	120	AUDIOGND
121	X	122	-MPCIACT	123	X
124	3.3VAUX				

J8: Peripheral Power Connector	
Pin	**Signal**
1	GND
2	-5V
3	GND
4	-12V



J15: COM1/COM2 Serial Ports				
COM1		**COM2**		
Pin	**RS-232 Signal**	**Pin**	**RS-422 Signal**	**RS-485 Signal**
1	DCD, Data Carrier Detect	11	TXD-	TRXD-
2	RXD, Receive Data	12	TXD+	TRXD+
3	TXD, Transmit Data	13	RXD+	NC
4	DTR, Data Terminal Ready	14	RXD-	NC
5	GND	15	GND	GND
6	DSR, Data Set Ready	16	NC	NC
7	RTS, Request To Send	17	NC	NC
8	CTS, Clear To Send	18	NC	NC
9	RI, Ring Indicator	19	NC	NC
10	NC	20	NC	NC

Note: COM1 is fixed as RS-232. COM2 is configurable as RS-232/422/485.

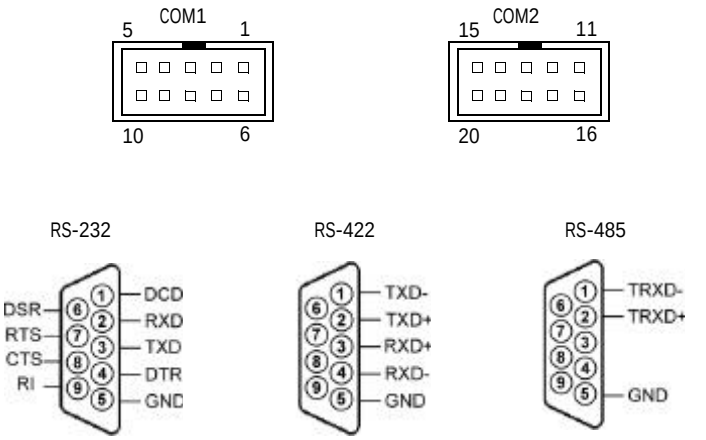
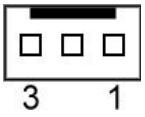


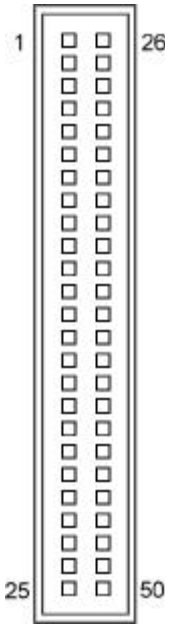
Figure 2-7. COM1/COM2 Pin Assignments

CPU Fan/CHS Fan/PWR Fan: CPU, System and Chassis Fan Power Connectors	
Pin	**Signal**
1	GND
2	+12V
3	Rotation



Note: Fans connected to the CPU Fan, CHS Fan, and PWR fan power connectors must be rated at 12V.

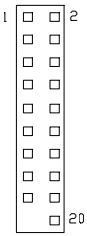
CF: CompactFlash Connector			
Pin	**Signal**	**Pin**	**Signal**
1	GND	2	SDD3
3	SDD4	4	SDD5
5	SDD6	6	SDD7
7	-SDCS1	8	GND
9	GND	10	GND
11	GND	12	GND
13	VCC	14	GND
15	GND	16	GND
17	GND	18	SDA2
19	SDA1	20	SDA0
21	SDD0	22	SDD1
23	SDD2	24	GND
25	GND	26	GND
27	SDD11	28	SDD12
29	SDD13	30	SDD14
31	SDD15	32	-SDCS3
33	GND	34	-SDIOR
35	-SDIOW	36	VCC
37	PIRQ15	38	VCC
39	PIN2	40	N/C
41	-PRSTBUF	42	SIORDY
43	N/C	44	VCC
45	-IDEACTS	46	N/C



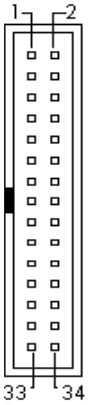
CF: CompactFlash Connector			
Pin	**Signal**	**Pin**	**Signal**
47	SDD8	48	SDD9
49	SDD10	50	GND

DVI is a 20-pin header that supports the DVI function. The pin assignments for the DVI Connector are as follows:

DVI: DVI Connector			
Pin	**Signal**	**Pin #**	**Signal**
1	TMDS Data1+	2	TMDS Data2+
3	TMDS Data1-	4	TMDS Data2-
5	GND	6	GND
7	GND	8	GND
9	TMDS Data3+	10	TMDS Data4+
11	TMDS Data3-	12	TMDS Data4-
13	GND	14	GND
15	PWR	16	HTPLG Detect
17	GND	18	DDC ATA
19	GND	20	DDC CLK



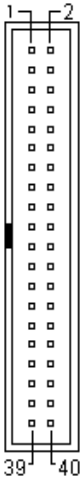
FDC: Floppy Drive Connector			
Pin	**Signal**	**Pin**	**Signal**
1	GND	2	RM/LC
3	GND	4	NC
5	GND	6	NC
7	GND	8	Index
9	GND	10	Motor Enable 0
11	GND	12	Drive Select 1
13	GND	14	Drive Select 0
15	GND	16	Motor Enable 1
17	GND	18	Direction
19	GND	20	Step
21	GND	22	Write Data
23	GND	24	Write Gate
25	GND	26	Track 00
27	GND	28	Write Protect
29	GND	30	Read Data
31	GND	32	Side 1 Select
33	GND	34	Disk Change



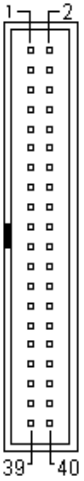
Ir: IrDA Connector	
Pin	**Signal**
1	+5V
2	NC
3	Ir RX
4	GND
5	Ir TX

KBMS: External Keyboard/Mouse Connector	
Pin	**Signal**
1	Keyboard Data
2	Key
3	Mouse Data
4	GND
5	Vcc
6	Keyboard Clock
7	Mouse Clock

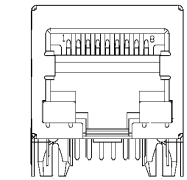
IDE1: Primary IDE Connector			
Pin	**Signal**	**Pin**	**Signal**
1	RESET#	2	GND
3	Host Data 7	4	Host Data 8
5	Host Data 6	6	Host Data 9
7	Host Data 5	8	Host Data 10
9	Host Data 4	10	Host Data 11
11	Host Data 3	12	Host Data 12
13	Host Data 2	14	Host Data 13
15	Host Data 1	16	Host Data 14
17	Host Data 0	18	Host Data 15
19	GND	20	Key
21	DRQ0	22	GND
23	Host IOW	24	GND
25	Host IOR	26	GND
27	IOCHRDY	28	Host ALE
29	DACK0	30	GND
31	IRQ 14	32	NC
33	Address 1	34	NC
35	Address 0	36	Address 2
37	Chip Select 0	38	Chip Select 1
39	Activity	40	GND



IDE2: Secondary IDE Connector			
Pin	**Signal**	**Pin**	**Signal**
1	RESET#	2	GND
3	Host Data 7	4	Host Data 8
5	Host Data 6	6	Host Data 9
7	Host Data 5	8	Host Data 10
9	Host Data 4	10	Host Data 11
11	Host Data 3	12	Host Data 12
13	Host Data 2	14	Host Data 13
15	Host Data 1	16	Host Data 14
17	Host Data 0	18	NC
19	GND	20	Key
21	DRQ1	22	GND
23	Host IOW	24	GND
25	Host IOR	26	GND
27	IOCHRDY	28	Host ALE
29	DACK1	30	GND
31	IRQ 15	32	NC
33	Address 1	34	NC
35	Address 0	36	Address 2
37	Chip Select 0	38	Chip Select 1
39	Activity	40	GND

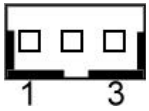


LAN1/LAN2: RJ-45 Connectors		
Pin	**10/100 Signal**	**10/100/1000 Signal**
1	TX+	MDI0+
2	TX-	MDI0-
3	RX+	MDI1+
4	NC	MDI2+
5	NC	MDI2-
6	RX-	MDI1-
7	NC	MDI3+
8	NC	MDI3-
Left LED	Link Active	Link Active
Right LED	100/10	1000/100

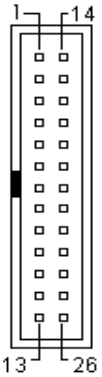


WOL is a 3-pin header for the Wake On LAN function on the CPU card. The following table shows the pin out assignments of this connector. Wake On LAN will function properly only with an ATX power supply with 5VSB that has 200mA.

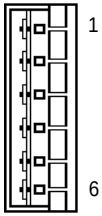
WOL: Wake On LAN	
Pin	**Signal**
1	+5VSB
2	Ground
3	Wake on LAN



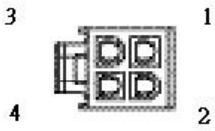
LPT1: Parallel Port Connector			
Pin	**Signal**	**Pin**	**Signal**
1	Line printer strobe	14	AutoFeed
2	PD0, parallel data 0	15	Error
3	PD1, parallel data 1	16	Initialize
4	PD2, parallel data 2	17	Select
5	PD3, parallel data 3	18	GND
6	PD4, parallel data 4	19	GND
7	PD5, parallel data 5	20	GND
8	PD6, parallel data 6	21	GND
9	PD7, parallel data 7	22	GND
10	ACK, acknowledge	23	GND
11	Busy	24	GND
12	Paper empty	25	GND
13	Select	26	N/A



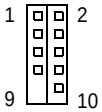
PW1: Aux ATX Power Connector	
Pin	**Signal**
1	GND
2	GND
3	GND
4	+3.3V
5	+3.3V
6	+5V



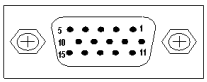
PW2: ATX +12V Power Connector	
Pin	**Signal**
1	GND
2	GND
3	+12V
4	+12V



USB1/USB2: USB Connectors (Ports 1-4)			
Pin	**Signal**	**Pin**	**Signal**
1	Vcc	6	Vcc
2	D0-	7	D1-
3	D0+	8	D1+
4	GND	9	GND
5	Key	10	NC



VGA: VGA CRT Connector			
Pin	**Signal**	**Pin**	**Signal**
1	Red	2	Green
3	Blue	4	NC
5	GND	6	GND
7	GND	8	GND
9	NC	10	GND
11	NC	12	NC
13	H Sync	14	V Sync
15	NC		



Chapter 3

System Installation

Contents

Overview

This chapter describes how to mount a socket 478 processor, add DIMM memory, and install the PCI-749-VE2 single board computer into a chassis.

Socket 478 Processor

The PCI-749-VE2 single board computer has a Socket 478 connector that supports Intel Pentium 4 or Celeron processors.

Installing a CPU

CAUTION

Before touching anything inside the chassis or on the CPU board, move to an ESD station and follow proper ESD procedure. Failure to do so may result in electrostatic discharge damaging the computer or its components. For more information, see "Protecting Against Electrostatic Discharge".

Note: Refer to the manual provided with the processor for additional installation instructions.

1) Lift the handling lever of CPU socket outwards and upwards to the other end.

2) Align the processor pins with pinholes on the socket. Make sure that the notched corner or dot mark (pin 1) of the CPU corresponds to the socket's bevel end. Then press the CPU gently until it fits into place. If this operation is not easy or smooth, don't do it forcibly. You need to check and rebuild the CPU pin uniformly.

3) Push down the lever to lock the processor into the socket once it is in position.

4) Follow the installation guide for the cooling fan or heat sink to mount it on CPU surface and lock it on the socket 478.

Note: Ensure that the CPU heat sink and the CPU top surface are in total contact to avoid CPU overheating problem that would cause your system to hang or be unstable.

Removing a CPU

1) Unlock and remove the cooling fan and heatsink.

2) Lift the lever of the CPU socket outwards and upwards to the other end.

3) Carefully lift up the existing CPU to remove it from the socket.

4) Refer to "Installing a CPU" on page 3 - 3 to replace the CPU or press down on the CPU socket lever to close the opened socket.

Configuring System Bus

The PCI-749-VE2 will automatically detect the CPU used in the system and set its processing speed.

DIMM Memory

CAUTION

DIMM sockets are very durable but can be broken. Use extreme care when removing a DIMM from a socket. Make sure the DIMM is in the correct orientation before installation. **Any DIMM sockets broken due to abuse, mishandling or accident are not covered under the warranty.**

CAUTION

Be sure to take proper electrostatic precautions **before** starting any work. See “Protecting Against Electrostatic Discharge” on page xiv.

The PCI-749-VE2 single board computer supports two 184-pin DIMM sockets or a maximum total memory of 2GB DDRAM.

To add a DIMM card to the single board computer, follow these steps:

1) Move the module release levers on the SBC (one on each end of the socket) outward, away from the socket (Figure 3-1).

2) Place the DIMM card so that the two notches on the contact edge line up with the two alignment nodes in the DIMM socket. Insert the DIMM card into the socket.

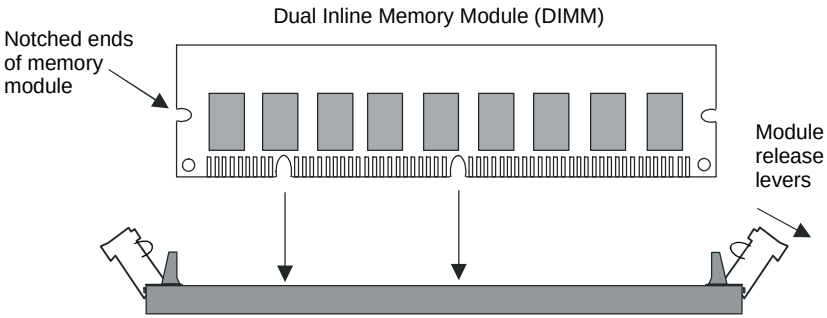


Figure 3-1. DIMM Installation

Using both hands, press downward and guide the DIMM card into the socket until it snaps into place. The module release levers will return to their upright position when the DIMM card is completely seated in the socket. The pegs on the tips of the release levers should align with the notches on both ends of the DIMM card.

In populating the DIMM sockets, any of the DIMM banks can be populated first.

Single Board Computer

CAUTION

Before touching anything inside the chassis or on the CPU board, move to an ESD station and follow proper ESD procedure. Failure to do so may result in electrostatic discharge damaging the computer or its components. For more information, see “Protecting Against Electrostatic Discharge”.

To install your PCI-749-VE2 single board computer into a standard chassis or proprietary environment, perform the following steps:

1) Check that all jumper settings are in their proper positions.

2) Install and configure the CPU and memory modules.

3) Install the PCI-749-VE2 into the backplane in your system by aligning the board with the PICMG slot on the backplane and firmly sliding the board into the slot. Do not force the board into the slot, if it does not slide in,realign the board and try again.

4) Attach cables to existing peripheral devices and secure the board bracket to the chassis’ rear panel with a screw.

5) Use the Kontron Single Board Computer Driver CD-ROM to load the PCI-749-VE2 audio, chipset, LAN, VGA, and USB 2.0 drivers.

CAUTION

Please ensure that your SBC is properly inserted. Otherwise, the system might be unstable or fail to operate due to poor installation.

Chapter 4

BIOS Setup Information

Contents

Overview

The Award BIOS (Basic Input/Output System) installed in your computer system's ROM supports Intel Pentium III/Celeron Tualatin processors in a standard IBM-AT compatible I/O system. The BIOS provides critical low-level support for a standard device such as disk drives, serial ports and parallel ports. It also adds virus and password protection as well as special support for detailed fine-tuning of the chipset controlling the entire system.

Entering Setup

When you enter the Setup utility, the Main Menu screen will appear on the screen. The Main Menu allows you to select from various setup functions and exit choices.

1) Turn on or reboot the computer. When the message "Hit <DEL> if you want to run SETUP" appears, press <Del> key immediately to enter BIOS setup program.

2) If the message disappears before you respond, but you still wish to enter Setup, please restart the system to try "COLD START" again by turning it OFF and then ON, or touch the "RESET" button. You may also restart from "WARM START" by pressing <Ctrl>, <Alt>, and <Delete> keys simultaneously. If you do not press the keys at the right time and the system will not boot, an error message will be displayed and you will again be asked to,

   - Press <F1> or <DEL> to Run SETUP or Resume

   - In BIOS setup, you can use the keyboard to choose among options or modify the system parameters to match the options with your system. The table below will show you all of keystroke functions in BIOS setup.

BIOS Setup Navigation Keys

Key	Functions
Up Arrow	Move to the previous item
Down Arrow	Move to the next item
Left Arrow	Move to the item on the left (menu bar)
Right Arrow	Move to the item on the right (menu bar)
Move Enter	Move to the item you desired
PgUp key	Increase the numeric value or make changes
PgDn key	Decrease the numeric value or make changes
+ key	Increase the numeric value or make changes
- key	Decrease the numeric value or make changes
Esc key	Main Menu -- Quit and not save changes into CMOS Status Page Setup Menu and Option Page Setup Menu -- Exit current page and return to Main Menu
F1 key	General help on Setup navigation keys
F5 key	Load previous values from CMOS
F6 key	Load the fail-safe defaults from BIOS default table
F7 key	Load the optimized defaults
F10 key	Save all the CMOS changes and exit

Main Menu

Once you enter the PCI-749-VE2 AWARD BIOS CMOS Setup Utility, you should start with the Main Menu. The Main Menu allows you to select from eleven setup functions and two exit choices. Use arrow keys to switch among items and press <Enter> key to accept or bring up the sub-menu.

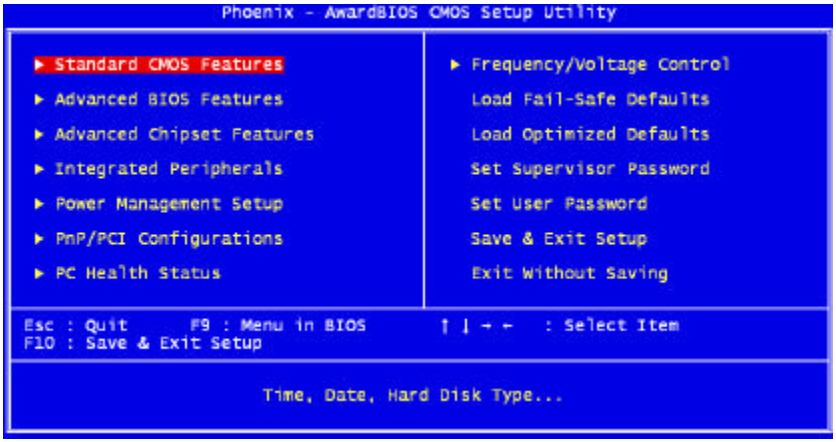


Figure 4-1. Main Menu – Screen Shot

Note: It is strongly recommended to reload the Optimized Default Settings if CMOS is lost or the BIOS is updated.

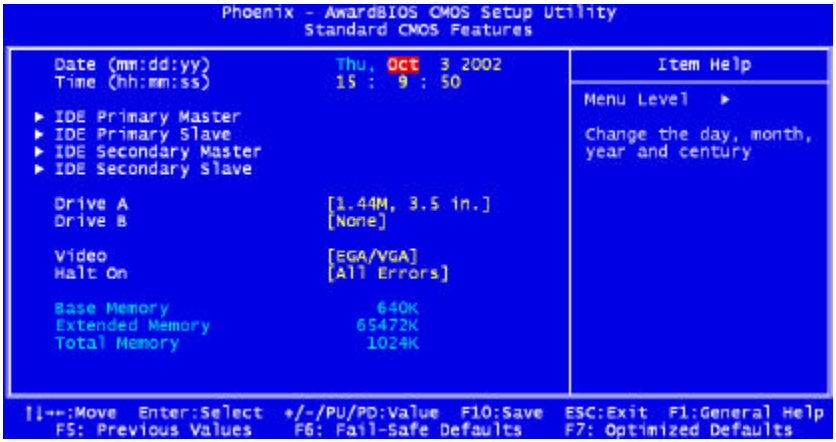
CAUTION

It is not recommended to make changes to the chipset defaults. These defaults have been carefully selected by the manufacturer to provide maximum performance and reliability.

Standard CMOS Setup Menu

This setup page includes all the items in a standard compatible BIOS. Use the arrow keys to highlight the item and then use the <PgUp>/<PgDn> or <+>/<-> keys to select the value or number you want in each item and press <Enter> key to certify it.

Follow command keys in CMOS Setup table to change **Date**, **Time**, **Drive type**, and **Boot Sector Virus Protection Status**.



Menu Selections

Item	Options	Description
Date	Mm:dd:yy	Set the system date. Note that the 'Day' automatically changes when you set the date
Time	Hh:mm:ss	Set the system time
IDE Primary Master	Options are in its sub menu	Press <Enter> to enter the sub menu of detailed options
IDE Primary Slave	Options are in its sub menu	Press <Enter> to enter the sub menu of detailed options
IDE Secondary Master	Options are in its sub menu	Press <Enter> to enter the sub menu of detailed options
IDE Secondary Slave	Options are in its sub menu	Press <Enter> to enter the sub menu of detailed options
Drive A Drive B	None 360K, 5.25 in 1.2M, 5.25 in 720K, 3.5 in 1.44M, 3.5 in 2.88M, 3.5 in	Select the type of floppy disk drive installed in your system
Video	EGA/VGA (default) CGA 40 CGA 80 MONO	EGA, VGA, SEGA, SVGA or PGA adapters Power up in 40 column mode Power up in 80 column mode For Hercules or MDA adapters
Halt On	No Errors (default) All Errors All, but Keyboard All, but Diskette All, but Disk/Key	Select the situation in which you want the BIOS to stop the POST process and notify you

IDE Adaptors Setup Menu

The onboard PCI IDE connectors provide Primary and Secondary channels for connecting up to four IDE hard disks or other IDE devices. Each channel can support up to two hard disks; the first is the "Master" and the second is the "Slave".

To enter the specifications for a hard disk drive, you must first select a "Type". There are 45 predefined types and 4 user definable types are for Enhanced IDE BIOS. Type 1 to 45 are predefined. Type "User" is user-definable. For the Primary Master/Slave as well as Secondary Master/Slave, you can select "Auto" under the TYPE and MODE fields. This will enable auto detection of your IDE drives and CD-ROM drive during POST.

Press <PgUp>/<PgDn> to select a numbered hard disk type or type the number and press the <Enter> key. The hard disk will not work properly if you enter incorrect information for this field.

If your hard disk drive type is not matched or listed, you can use select Type User to define your own drive type manually.

IDE Primary Master

IDE HDD Auto-Detection	Press Enter	
IDE Primary Master	Auto	Item Help
Access Mode	Auto	
Capacity	20491 MB	Menu Level ➢
Cylinder	39703	
Head	16	
Precomp	0	To auto-detect the HDD's size, head… on this channel
Landing Zone	39702	
Sector	63	

↑↓→←Move Enter: Select +/-/PU/PD:Value F10:Save ESC:Exit F1:General Help

F5:Previous Values F6:Fail-Safe Defaults F7:Optimized Defaults

Figure 4-2. Example of IDE Primary Master sub-menu

Menu Seletions

Item	Options	Description
IDE HDD Auto-detection	Press Enter	Press Enter to auto-detect the HDD on this channel. If detection is successful, it fills the remaining fields on this menu.
IDE Primary Master	None Auto User	Selecting 'manual' lets you set the remaining fields on this screen. Selects the type of fixed disk. "User Type" will let you select the number of cylinders, heads, etc. Note: PRECOMP=65535 means NONE !
Mode	Auto Normal Large LBA	(Auto-detect enabled) (HDD < 528MB) (MS-DOS only) (HDD > 512MB with Logical Block Addressing)
Capacity	Auto Display your disk drive size	Disk drive capacity (Approximated). Note that this size is usually slightly greater than the size of a formatted disk given by a disk checking program.

The following options are selectable only if the 'IDE Primary Master' item is set to 'Manual

Cylinder	Min = 0 Max = 65535	Set the number of cylinders for this hard disk.
Head	Min = 0 Max = 255	Set the number of read/write heads
Precomp	Min = 0 Max = 65535	**** **Warning**: Setting a value of 65535 means no hard disk
Landing zone	Min = 0 Max = 65535	****
Sector	Min = 0 Max = 255	Number of sectors per track

Advanced BIOS Features

This section allows you to configure your system for basic operation. You have the opportunity to select the system's default speed, boot-up sequence, keyboard operation, shadowing and security.

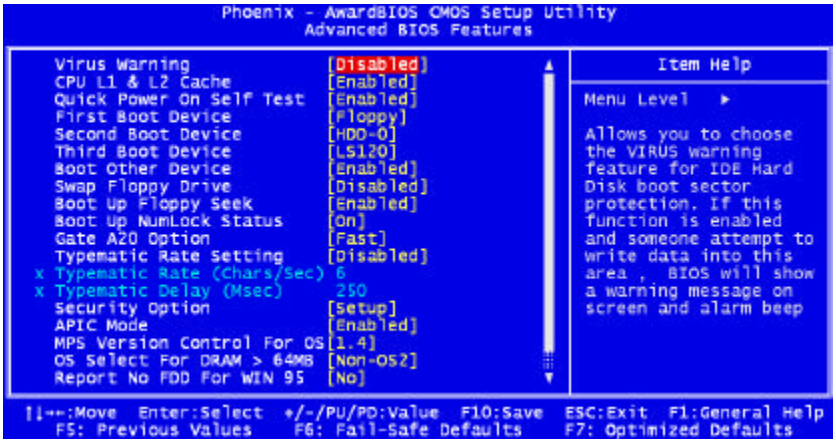


Figure 4-3. Advanced BIOS Features – Screen Shot

Virus Warning

This item protects the boot sector and partition table of your hard disk against accidental modifications. If an attempt is made, the BIOS will halt the system and display a warning message. If this occurs, you can either allow the operation to continue or run an anti-virus program.

CPU L1 and L2 Cache

When the CPU requests data, the system transfers the requested data from the main DRAM into cache memory, for even faster access by the CPU. These items allow you to enable (speed up memory access) or disable the cache function. By default, these items are *Enabled*.

➤ *Quick Power On Self Test*

When enabled, this field speeds up the Power On Self Test (POST) after the system is turned on. If it is set to *Enabled*, BIOS will skip some items.

➤ *First/Second/Third Boot Device*

These fields determine the drive that the system searches first for an operating system.

Options: *Floppy*, *LS/ZIP*, *HDD-0*, *SCSI*, *CDROM*, *HDD-1*, *HDD-2*, *HDD-3*, *LAN* and *Disable*.

➤ *Boot Other Device*

These fields allow the system to search for an operating system from other devices other than the ones selected in the First/Second/Third Boot Device.

➤ *Swap Floppy Drive*

This item allows you to determine whether or not to enable Swap Floppy Drive. When enabled, the BIOS swaps floppy drive assignments so that Drive A becomes Drive B, and Drive B becomes Drive A. By default, this field is set to *Disabled*.

➤ *Boot Up Floppy Seek*

When enabled, the BIOS will seek whether or not the floppy drive installed has 40 or 80 tracks. 360K type has 40 tracks while 760K, 1.2M and 1.44M all have 80 tracks. By default, this field is set to *Enabled*.

➤ *Boot Up NumLock Status*

This allows you to activate the NumLock function after you power up the system. By default, the system boots up with *NumLock* On.

➤ *Gate A20 Option*

This field allows you to select how Gate A20 is worked. Gate A20 is a device used to address memory above 1 MB.

➤ *Typematic Rate Setting*

When disabled, continually holding down a key on your keyboard will generate only one instance. When enabled, you can set the two typematic controls listed next. By default, this field is set to *Disabled*.

➤ *Typematic Rate (Chars/Sec)*

When the typematic rate is enabled, the system registers repeated keystrokes speeds. You can select speed range from 6 to 30 characters per second. By default, this item is set to *6*.

➤ *Typematic Delay (Msec)*

When the typematic rate is enabled, this item allows you to set the time interval for displaying the first and second characters. By default, this item is set to *250msec.*

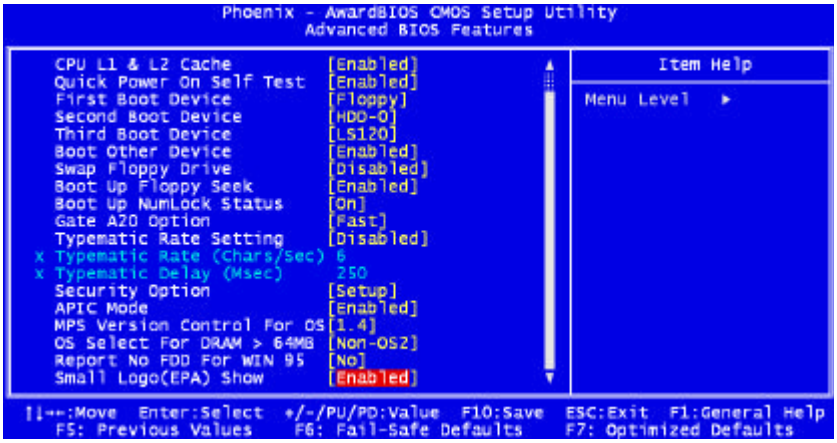


Figure 4-4. Advanced BIOS Features – Screen Shot (continued)

➤ *Security Option*

This field allows you to limit access to the System and Setup. The default value is *Setup*. When you select *System,* the system prompts for the User Password every time you boot up. When you select *Setup,* the system always boots up and prompts for the Supervisor Password only when the Setup utility is called up.

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.

➤ *APIC Mode*

This field is used to enable or disable the Advanced Programmable Interrupt Controller (APIC). Due to compliance with PC2001 design guide, the system is able to run in APIC mode. Enabling APIC mode will expand available IRQ resources for the system.

Options: *Enable*, *Disable*

➤ *MPS Version Control for OS*

This field allows you to select which multi-processor specification (MPS) version should be used with the operating system. Select the MPS version for the operating system on your system. Consult the operating system manufacturer to find out which version to use with your system.

Options: *1.4, 1.1*

➤ *OS Select for DRAM > 64MB*

This option allows the system to access greater than 64MB of DRAM memory when used with OS/2 that depends on certain BIOS calls to access memory. The default setting is *Non-OS/2*.

➤ *Report No FDD For WIN 95*

This option allows Windows 95 to share with other peripherals IRQ6 which is assigned to a floppy disk drive if the drive is not existing. The default setting is *No*.

➤ *Small Logo (EPA) Show*

This option offers you to let the EPA Logo presents or not. The default setting is *Disabled*.

Advanced Chipset Features

This section allows you to configure the system based on the specific features of the Intel 845G chipset. This chipset manages bus speeds and access to system memory resources, such as dynamic random access memory (DRAM) , synchronized dynamic random access memory (SDRAM) and the external cache. It also coordinates communications between the conventional ISA bus and the PCI bus. It must be stated that these items should never need to be altered. The default settings have been chosen because they provide the best operating conditions for your system. The only time you might consider making any changes would be if you discovered that data was being lost while using your system.

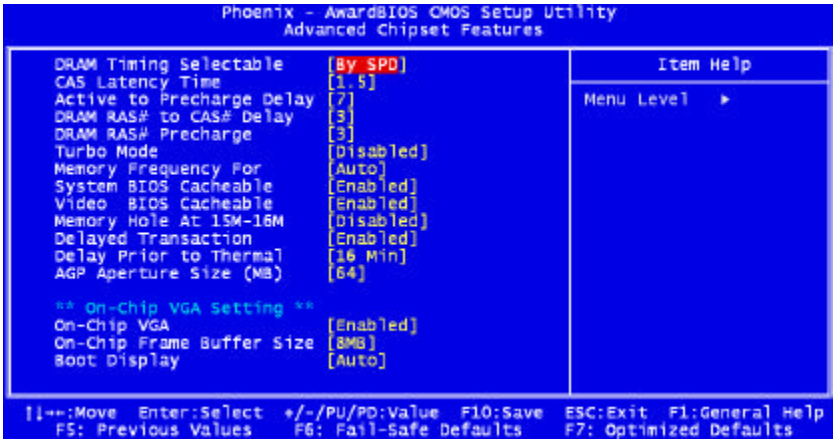


Figure 4-5. Advanced Chipset Features – Screen Shot

DRAM Timing Selectable

This option is used to select DRAM timing.

Options: By SPD, Manual

➤ *SDRAM CAS Latency Time*

You can select CAS latency time in HCLKs of 2/2 or 3/3. The system board designer should set the values in this field, depending on the DRAM installed. Do not change the values in this field unless you change specifications of the installed DRAM or the installed CPU.

Options: 1.5, 2, *2.5* and *3*

➤ *Activity to Precharge Delay*

This setting controls the number of active DRAM clock cycles that are allowed to precharge from the active state.

Options: 7, 6 and 5

➤ *SDRAM RAS-to-CAS Delay*

You can select RAS to CAS Delay time in HCLKs of 2/2 or 3/3. The system board designer should set the values in this field, depending on the DRAM installed. Do not change the values in this field unless you change specifications of the installed DRAM or the installed CPU.

Options : *2, 3*

➤ *SDRAM RAS Precharge Time*

This option defines the length of time for Row Address Strobe is allowed to precharge.

Options: *2, 3*

➤ *Turbo Mode*

This setting controls whether the DRAM runs in turbo mode or normal mode. Disabled is the default setting.

Options: *Disabled*, *Enabled*

Memory Frequency

Use this item to configure the clock frequency of the SDRAM. The default setting is *Auto*.

Options: *Auto*, *PC100* and *PC133*

System BIOS Cacheable

The setting of *Enabled* allows caching of the system BIOS ROM at C000h-FFFFFh, resulting in better system performance. However, if any program writes to this memory area, a system error may result.

Video BIOS Cacheable

The *Enabled* setting allows caching of the video BIOS ROM at C0000h-F7FFFh, resulting in better video performance. However, if any program writes to this memory area, a system error may result.

Memory Hole At 15M-16M

In order to improve performance, certain space in memory can be reserved for ISA cards. This memory must be mapped into the memory space below 16 MB.

Options: *Enabled*, *Disabled*

Delayed Transaction

The chipset has an embedded 32-bit posted write buffer to support delay transactions cycles. Select *Enabled* to support compliance with PCI specification version 2.1.

Delay Prior to Thermal

When the CPU temperature reaches a factory preset level, a thermal monitoring mechanism will be enabled following the appropriate timing delay specified in this field. With the thermal monitoring enabled, clock modulation controlled by the processor's internal sensor is also activated to keep the processor within allowable temperature limit.

Options: *4 min*, *8 min*, *16 min* and *32 min*

➤ *AGP Graphics Aperture Size*

The field sets aperture size of the graphics. The aperture is a portion of the PCI memory address range dedicated for graphics memory address space. Host cycles that hit the aperture range are forwarded to the AGP without any translation. The default setting is ***64M***.

Options: *4M*, *8M*, *16M*, *32M* and *64M*

➤ *On-Chip VGA*

The default setting for On-Chip VGA is *Enabled*.

Options: *Enabled*, *Disabled*

➤ *On-Chip Frame Buffer Size*

The default setting for On-Chip Frame Buffer Size is *8MB*.

Options: *8MB*, *1MB*

➤ *Boot Display*

THe default setting for Boot Display is *Auto*.

Options: *Auto*, *CRT*, *TV* and *EFP*

Integrated Peripherals

This option sets your hard disk configuration, mode, and port.

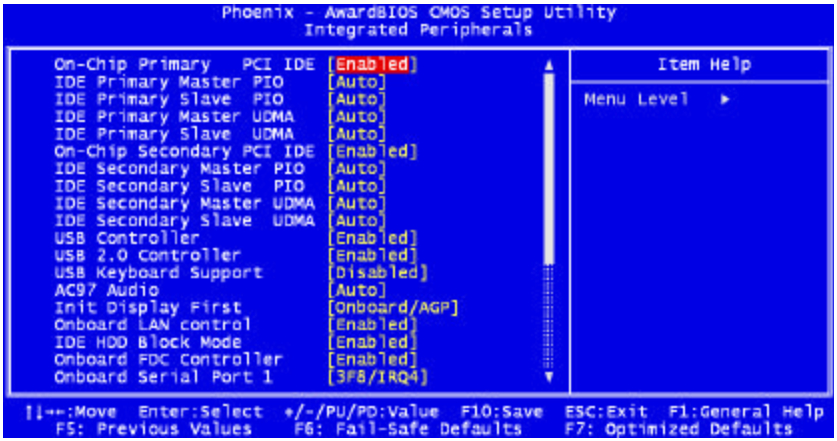


Figure 4-6. Integrated Peripherals – Screen Shot

On-Chip Primary/Secondary PCI IDE

The chipset contains a PCI IDE interface with support for two IDE channels. Select Enabled to activate each channel separetely.

Options: *Enabled*, *Disabled*

IDE Primary/Secondary Master/Slave PIO

The four IDE PIO (Programmed Input/Output) fields let you set a PIO mode (0-4) for each of the four IDE devices that the onboard IDE interface supports. Modes 0 through 4 provide successively increased performance. In Auto mode, the system automatically determines the best mode for each device.

Options: Auto, Mode 0, Mode 1, Mode 2, Mode 3, Mode 4.

➤ *IDE Primary/Secondary Master/Slave UDMA*

Ultra DMA/33 implementation is possible only if your IDE hard drive supports it and the operating environment includes a DMA driver (Windows 95 OSR2 or a third-party IDE bus master driver). If your hard drive and your system software both support Ultra DMA/33, select Auto to enable BIOS support.

Options: *Auto*, *Disabled*

➤ *USB Controller*

This item allows you to enable or disable the USB function. The default setting is *Enabled*.

Options: *Enabled*, *Disabled*

➤ *USB 2.0 Controller*

This item allows you to enable or disable the USB 2.0 option. The default setting is *Enabled*.

Options: *Enabled*, *Disabled*

➤ *USB Keyboard Support*

Select *Enabled* if your system has a USB controller and a USB keyboard

Options: *Enable, Disabled*

➤ *AC'97 Audio*

This item enables or disables the AC'97 audio driver. The default setting for this function is *Auto*.

Options: *Auto*, *Disabled*

➤ *Init Display First*

This item allows you to select the first display port to be initialized. The default setting is *Onboard/AGP*.

Options: *PCI Slot* (off-board video adaptor), *Onboard/AGP*

Onboard LAN Controller

This item is used to enable or disable the onboard LAN function. The default setting is *Enabled*.

Options: *Enabled*, *Disabled*

IDE HDD Block Mode

This item allows you to enable/disable IDE HDD Block Mode. This function collects data that is near data being read and leaves it in the system buffer. Buffered data can be used with a faster transfer rate, enhancing system performance.

Options: *Enable, Disabled*

Onboard FDC Controller

This item allows you to enable/disable onboard Floppy disk controller. The default setting is *Enabled*.

Options: *Enabled*, *Disabled*

Onboard Serial / Parallel Port

These fields allow you to select the onboard serial and parallel ports and their addresses. By default these values are:

Serial Port 1: 3F8/IRQ4
Serial Port 2: 2F8/IRQ3
Parallel Port: 378/IRQ7

UART Mode Select

This item allows users to select Infrared transmission mode. The default value is *Normal*.

Normal	Disable Infrared function
IrDA	Select IrDA mode transmission
ASKIR	Select ASKIR mode transmission

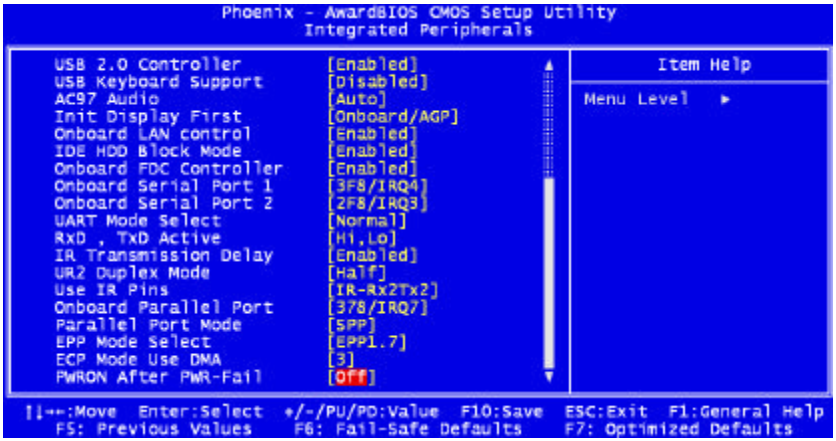


Figure 4-7. Integrated Peripherals – Screen Shot (continued)

➤ *RxD, TxD Active*

This item is to configure Infrared transmission rate. Four options are available :

Hi, Hi	High rate for receiving / High rate for transmitting
Hi, Lo	High rate for receiving / Low rate for transmitting
Lo, Hi	Low rate for receiving / High rate for transmitting
Lo, Lo	Low rate for receiving / Low rate for transmitting

➤ *IR Transmission Delay*

This option will be available when IR is enabled. The default setting is *Enabled*.

Options: *Enabled*, *Disabled*

➤ *UR2 Duplex Mode*

The available choices are full duplex mode and half duplex mode. The default setting is *Half*.

Options: *Full*, *Half*

➤ *Use IR Pins*

The default setting for this function is IR-Rx2Tx2.

Options: *IR-Rx2Tx2, RxD2 and TxD2*

➤ *Onboard Parallel Port*

This item allows you to configure I/O address of the onboard parallel port. The default setting is 378/IRQ7.

Options : Disabled, 378/IRQ7, 278/IRQ5, 3BC/IRQ7

➤ *Parallel Port Mode*

There are three different modes for the onboard parallel port :

SPP	Normal Printer Port
EPP	Enhanced Parallel Port
ECP	Extended Capabilities Port
ECP+EPP	Enhanced Parallel and Extended Capabilities Port
Normal	Normal Parallel Port

➤ *ECP Mode Select*

The default setting is *EPP1.7*.

Options: *EPP1.7, EPP1.9*

➤ *ECP Mode Use DMA*

The default setting is *3*.

Options: 1, 3

➤ *PWRON After PWR-Fail*

This item allows user to configure the power status of using ATX power supply after a serious power loss occurs. The default setting is *Off*.

On	System automatically restores power back
Off	System stays at power –off
Former-Sts	System restores back to previous status (On or Off)

Power Management Setup

The Power Management Setup allows you to configure you system to most effectively save energy while operating in a manner consistent with your own style of computer use.

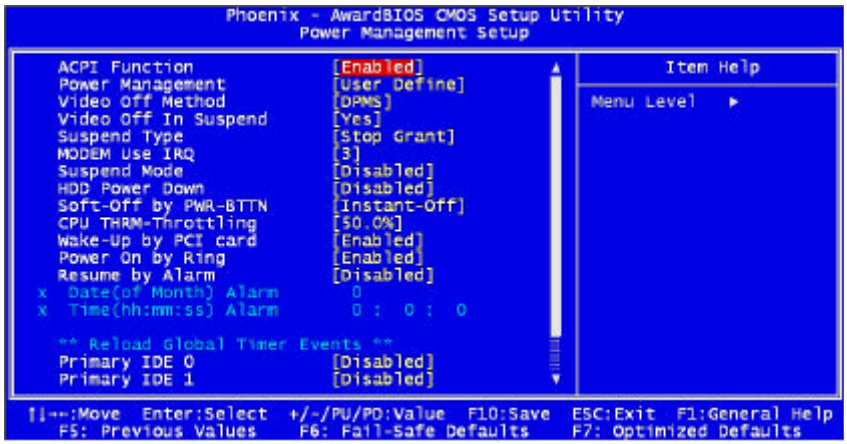


Figure 4-8. Power Management Setup – Screen Shot

ACPI Function

This item allows you to enable/disable the Advanced Configuration and Power Management (ACPI).

Options : *Enabled*, *Disabled*

Power Management

This category allows you to select the type (or degree) of power saving and is directly related to "HDD Power Down", "Suspend Mode".

Note: In order to enable the CPU overheat protection feature, the Power Management field should not be set to Disabled.

There are three selections for Power Management, three of which have fixed mode settings.

Min. Power Saving	Minimum power management. Suspend Mode = 1 hr., and HDD Power Down = 15 min.
Max. Power Saving	Maximum power management. Suspend Mode = 1 min., and HDD Power Down = 1 min.
User Defined	Allows you to set each mode individually. When not disabled, Suspend Mode ranges from 1 min. to 1 hr. and HDD Power Down ranges from 1 min. to 15 min.

➤ *Video Off Method*

This determines the manner in which the monitor is blanked.

V/H SYNC+Blank (Default)	This selection will cause the system to turn off the vertical and horizontal synchronization ports and write blanks to the video buffer.
Blank Screen	This option only writes blanks to the video buffer.
DPMS	Initial display power management signaling.

➤ *Video Off In Suspend*

This allows users to enable/disable video off in Suspend Mode.

Options: *Yes*, *No*

➤ *Suspend Type*

Options: *Stop Grant*, *Power On Suspend*

➤ *Modem Use IRQ*

This field names the interrupt request (IRQ) line assigned to the modem on your system (if any). Activity of the selected IRQ will wake up the system. By default the IRQ is set to 3.

➤ *Suspend Mode*

When enabled and after the set time of system inactivity, all devices except the CPU will be shut off.

Options : *Disabled*/*1Min*/*2Min*/*4Min* /*8Min* /*12Min* /*20Min*/*40Min*/*1Hour*.

➤ *HDD Power Down*

When enabled and after the set time of system inactivity, the hard disk drive will be powered down while all other devices remain active. The default setting is *Disabled*.

Options: *Disabled*/*1Min*/*2Min*/*3Min* /*4Min* /*5Min* /*6Min* /*7Min* /*8Min* /*9Min* /*10Min* /*11Min* /*12Min* /*13Min* /*14Min* /*15Min*.

➤ *Soft-Off by PWR-BTTN*

This item allows users to set the time to remove the power after the power button is pressed.

This field defines the power-off mode when using an ATX power supply. The Instant-Off mode allows powering off immediately upon pressing the power button. In the Delay 4 Sec mode, the system powers off when the power button is pressed for more than four seconds or places the system in a very low-power-usage state, with the circuitry receiving only enough power to detect power button activity or Resume by Ring activity (see next field) when pressed for less than 4 seconds. The default value is *Instant-Off*.

Options: *Instant-Off* , *Delay 4 Sec.*

➤ *CPU Thermal-Throttling*

When the CPU temperature reaches the preset standard, the CPU usage will be reduced to a selected level to avoid overheating. The default setting is 50.0%.

Options: 87.5%/ 75.5%/ 62.5%/ 50.0%/ 37.5%/ 25.0%/ 12.5%

➤ *Wake-Up by PCI card & Power-on by Ring*

These fields specify whether the system will be awakened from the power saving modes when activity or input signal of the specified hardware peripheral or component is detected. This option can be enabled to support Wake-Up-On-LAN or Wake-Up-On-Ring.

Note: To use the Wake-Up-On-Ring and Wake-On-LAN functions it is necessary to have a modem/LAN card supporting the power on function.

➤ *Resume by Alarm*

This item allows users to enable/disable the resume by alarm function. When *Enabled* is selected, systems using ATX power supplies can be powered on if a customized time and day is approached.

Options : *Enabled*, *Disabled*

➤ Masked : Date(of Month) Alarm

When “Resume by Alarm” is enabled, this item could allow users to configure the date parameter of the timing dateline on which to power on the systm.

Options : 0 ~ 31

➤ Masked : Time(hh:mm:ss) Alarm

When “Resume by Alarm” is enabled, this item could allow users to configure the time parameter of the timing dateline on which to power on the systm.

Options : hh (0~23), mm (0~59), ss (0 ~59)

➤ *Reload Global Timer Events*

The HDD, FDD, COM, LPT Ports, and PCI PIRQ are I/O events which can prevent the system from entering a power saving mode or can awaken the system from such a mode. When an I/O device wants to gain the attention of the operating system, it signals this by causing an IRQ to occur. When the operating system is ready to respond to the request, it interrupts itself and performs the service.

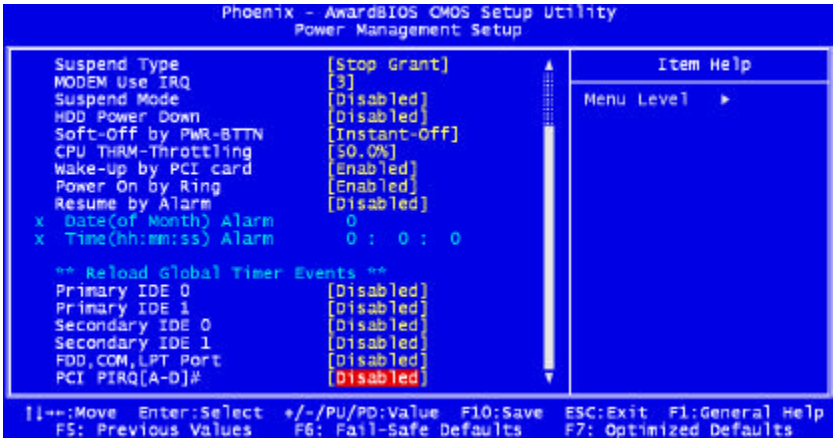


Figure 4-9. Power Management Setup – Screen Shot (Continued)

PnP/PCI Configuration Setup

This section describes configuring the PCI bus system. PCI, or **P**ersonal **C**omputer **I**nterconnect, is a system which allows I/O devices to operate at speeds nearing the speed the CPU itself uses when communicating with its own special components.

All PCI Bus systems on this system use INT#, thus all intalled PCI cards must be set to this value. This section covers some very technical items and it is strongly recommended that only experienced users should make any changes to the default settings.

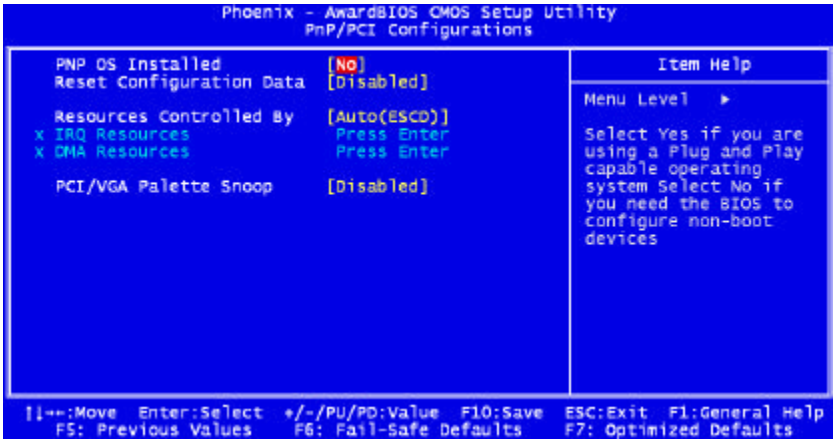


Figure 4-10. PnP/PCI Configurations – Screen Shot

PNP OS Installed

This field allows you to specify if the operating system installed on your system is Plug and Play aware.

Reset Configuration Data

The default setting for this field is Disabled. Select Enabled to reset Extended System Configuration Data (ESCD) when you exit Setup if you have installed a new add-on card and the system reconfiguration has caused such a serious conflict that the operating system can't boot.

Options: *Enabled*, *Disabled*

➤ *Resource controlled by*

The Award Plug and Play BIOS has the capacity to automatically configure all of the boot and Plug and Play compatible devices. However, this capability means absolutely nothing unless you are using a Plug and Play operating system such as Windows®95. If you set this field to Manual choose specific resources by going into each of the sub menus that follow this field (a sub menu is preceded by a "➢"). The default setting is *Manual.*

Options: *Auto (ESCD)*, *Manual*

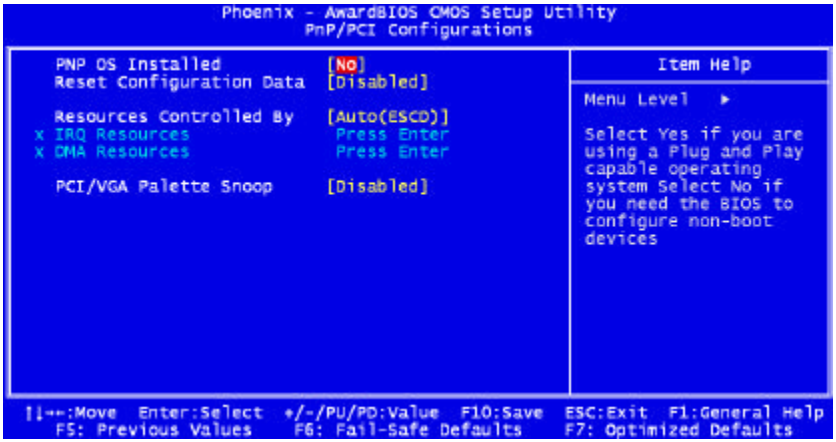


Figure 4-11. PNP/PCI Configurations – Screen Shot (Continued)

➤ *IRQ Resources/DMA Resources*

To configure the IRQ Resources/DMA Resources menu, the Resources Controlled By field should be set to Manual. When resources are controlled manually, assign each system interrupt a type, depending on the type of device using the interrupt. IRQs 3, 5, and 7 are assigned to ISA by default.

Options: Enter for more options

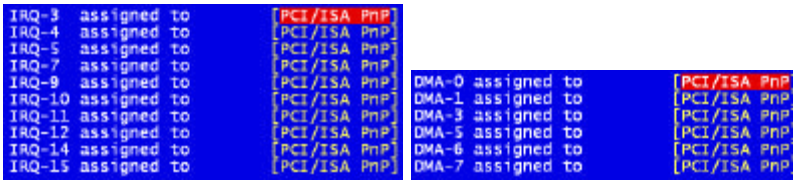


Figure 4-12. IRQ Resources/DMA Resources Sub-menu

➤ *PCI/VGA Palette Snoop*

Leave this field at Disabled.

Options : *Enabled*, *Disabled*

PC Health Status

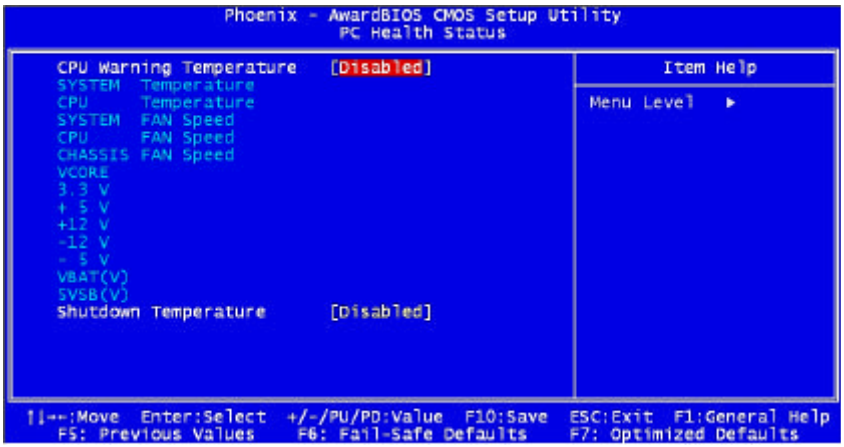


Figure 4-13. PC Health Status – Screen Shot

CPU Warning Temperature

If set to *Enabled*, this will warn the user when the CPU temperature reaches a certain temperature.

Options: *Enabled*, *Disabled*

Temperatures/Fan Speeds/Voltages

These fields are the parameters of the hardware monitoring function of the motherboard. The values are read-only values as monitored by the system and show the PC health status.

Shutdown Temperature

This option is for setting the Shutdown temperature level for the processor. When the processor reaches the temperature you set, this will shutdown the system.

Frequency/Voltage Control

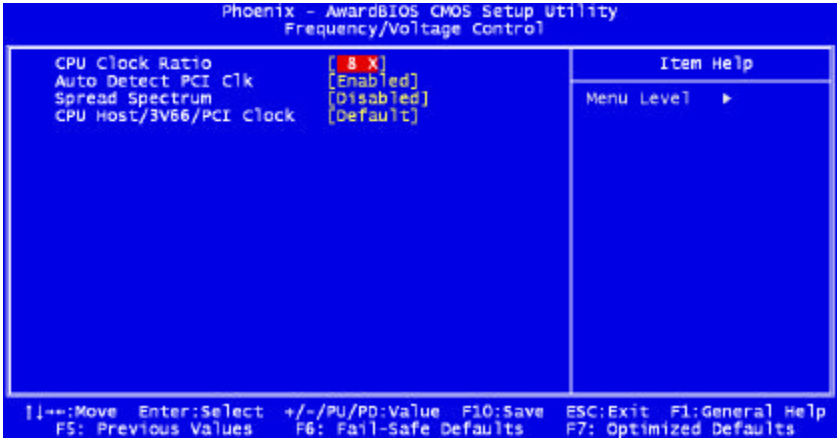


Figure 4-14. Frequency/Voltage Control – Screen Shot

CPU Clock Ratio

The CPU Ratio, also known as the CPU bus speed multiplier, can be configured to support values ranging from *8X* to *50X*.

Auto Detect PCI Clk

This item allows you to enable/disable auto detect the PCI Clock.

Options: *Enabled*, *Disabled*

Spread Spectrum

This item allows you to set the CPU Clock / Spread Spectrum.

Options : *Enabled*, *Disabled*

CPU Host /3V66/PCI Clock

The CPU Host /3V66/PCI Clock has the setting of *Default* which supports 133MHz only, or it can be customized to match your system.

Load Fail-Safe Defaults

This option allows you to load the troubleshooting default values permanently stored in the BIOS ROM. The default settings are non-optimal and disable all high-performance features.

When you press <Enter> on this item you get a confirmation dialog box with a message similar to:

Load Fail-Safe Defaults (Y/N) ? N

Pressing 'Y' loads the BIOS default values for the most stable, minimal-performance system operations.

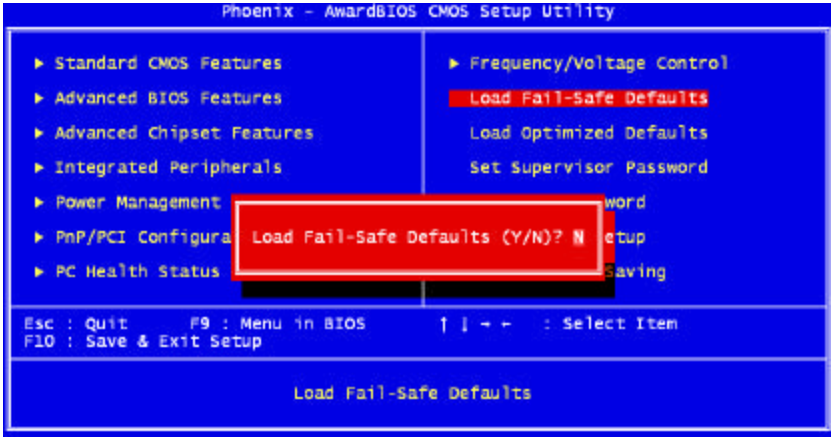


Figure 4-15. Load Fail-Safe Defaults – Screen Shot

Load Optimized Defaults

This option allows you to load the default values to your system configuration. These default settings are optimal and enable all high performance features.

When you press <Enter> on this item you get a confirmation dialog box with a message similar to:

Load Optimized Defaults (Y/N) ? N

Pressing 'Y' loads the default values that are factory settings for optimal performance system operations.

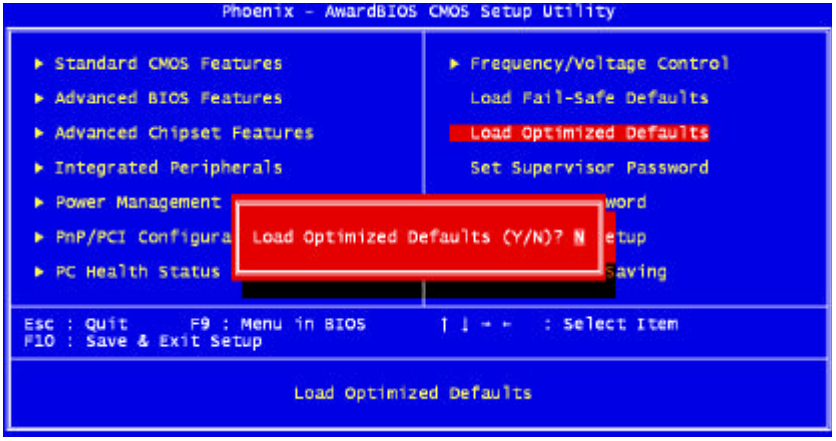


Figure 4-16. Load Optimized Defaults – Screen Shot

Supervisor/User Password Settin

These two options set the system password. *Supervisor Password* sets a password that will b to protect the system and Setup utility. *User Password* sets a password that will be used exclusively on the system.

When a password has been enabled, you will be prompted to enter it every time you try to Setup. This prevents an unauthorized person from changing any part of your system configuration. Additionally, when a password is enabled, you can also require the BIOS to request a password every time your system is rebooted. This would prevent unauthorized your computer.

You determine when the password is required within the BIOS Features Setup Menu and it Security option. If the Security option is set to "System", the password will be required b boot and at entry to Setup. If set to "Setup", prompting only occurs when trying to enter

You can set either supervisor or user password, or both of them. The differences are:

supervisor password: can enter and change the options of the setup menus.

user password: can enter but do not have the right to change the options of the setup me When you select this function, the following message will appear at the center of the scre assist you in creating a password.

ENTER PASSWORD

1) Type the password, up to eight characters in length, and press <Enter>. The pass typed will clear any previously entered password from CMOS memory. You will be to confirm the password.

2) Type the password again and press <Enter>. You may also press <Esc> to abort t selection and not enter a password.

PASSWORD DISABLED

1) To disable a password, just press <Enter> when you are prompted to enter the pas A message will confirm that the password will be disabled.

2) Once the password is disabled, the system will boot and you can enter Setup free

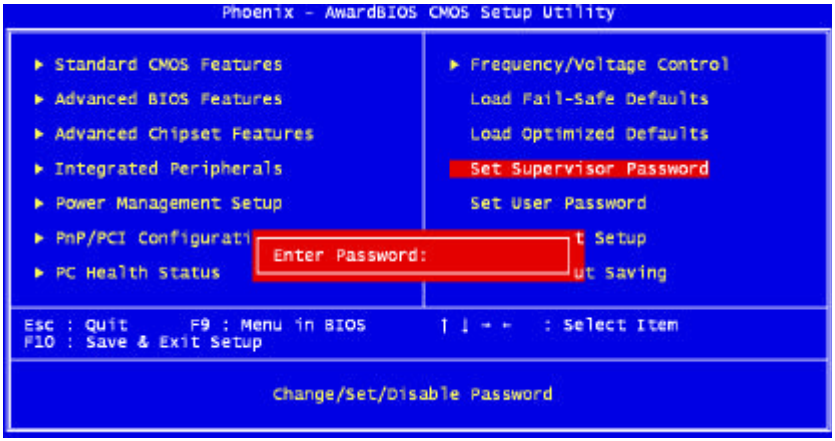


Figure 4-17. Supervisor/User Password Settings– Screen Shot

Exiting Selection

Save & Exit Setup

This option allows you to determine whether or not to accept modifications to CMOS.

Pressing <Enter> on this item asks for confirmation:

Save to CMOS and EXIT (Y/N)? Y

Typing "Y" stores the selections made in the menus in CMOS – a special section of memory stays on after you turn your system off. The next time you boot your computer, the BIOS configures your system according to the Setup selections stored in CMOS. After saving the the system is restarted again.

Typing "N" will exit to the setup utility.

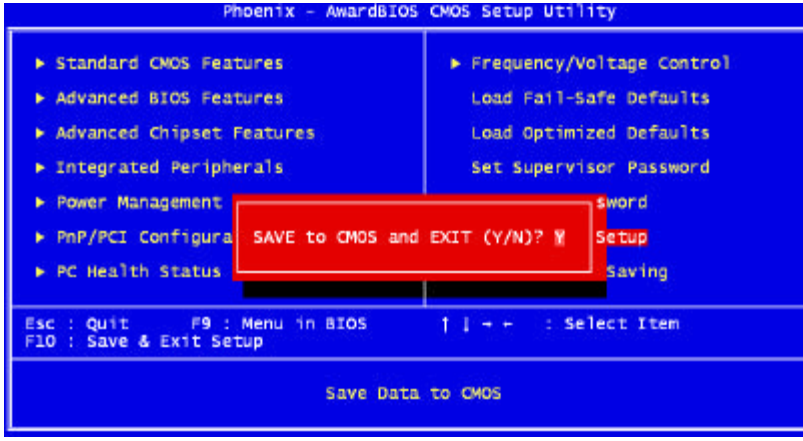


Figure 4-18. Exiting Selection – Screen Shot

➤ *Exit Without Saving*

Select this option to exit the Setup utility without saving the changes you have made to CMOS in this session. The previous selections remain in effect.

Pressing <Enter> on this item asks for confirmation:

Quit without saving (Y/N)? Y

Typing "Y" will quit the Setup utility without saving the modifications and reboot your system.

Typing "N" will return you to the Setup utility.

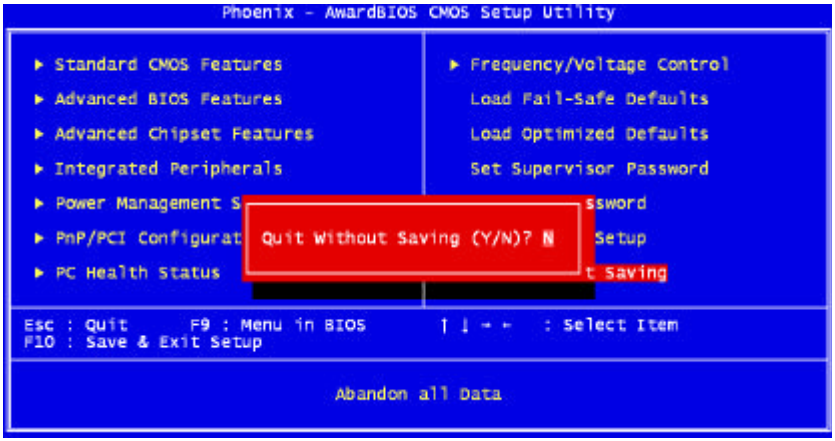


Figure 4-19. Exit Without Saving – Screen Shot

Appendix A

I/O Port Address Map and IRQ Definitions

Contents

Overview

This chapter provides I/O port addresses and IRQdefinitions for the PCI-749-VE2.

I/O Port Address Map

Each peripheral device in the system is assigned a set of I/O port addresses, which also becomes the identity of the device. There is a total of 1K port address space available. The following table lists the I/O port addresses used on the PCI-749-VE2.

Address	Device Description
000h - 01Fh	DMA Controller #1
020h - 03Fh	Interrupt Controller #1
040h - 05Fh	Timer
060h - 06Fh	Keyboard Controller
070h - 07Fh	Real Time Clock, NMI
080h - 09Fh	DMA Page Register
0A0h - 0BFh	Interrupt Controller #2
0C0h - 0DFh	DMA Controller #2
0F0h	Clear Math Coprocessor Busy Signal
0F1h	Reset Math Coprocessor
1F0h - 1F7h	IDE Interface
278 - 27F	Parallel Port #2(LPT2)
2F8h - 2FFh	Serial Port #2(COM2)
2B0 - 2DF	Graphics adapter Controller
378h - 3FFh	Parallel Port #1(LPT1)
360 - 36F	Network Ports
3B0 - 3BF	Monochrome & Printer adapter

Address	Device Description
3C0 - 3CF	EGA adapter
3D0 - 3DF	CGA adapter
3F0h - 3F7h	Floppy Disk Controller
3F8h - 3FFh	Serial Port #1(COM1)

Interrupt Request Lines (IRQ)

There are a total of 15 IRQ lines available on the PCI-749-VE2 single board computer. Peripheral devices use interrupt request lines to notify CPU for the service required. The following table shows the IRQ used by the devices on the Industrial CPU Card.

Level	Function
IRQ0	System Timer Output
IRQ1	Keyboard
IRQ2	Interrupt Cascade
IRQ3	Serial Port #2
IRQ4	Serial Port #1
IRQ5	Parallel Port #2
IRQ6	Floppy Disk Controller
IRQ7	Parallel Port #1
IRQ8	Real Time Clock
IRQ9	Software Redirected to Int 0Ah
IRQ10	Reserved
IRQ11	Reserved
IRQ12	Reserved
IRQ13	80287
IRQ14	Primary IDE
IRQ15	Secondary IDE

Appendix B

Watchdog Timer

Contents

Overview

This chapter describes how to use the onboard watchdog timer for the PCI-749-VE2.

Watchdog Timer Configuration

The function of the watchdog timer is to reset the system automatically and is defined at Winbond W83627HF. To enable the watchdog timer and allow the system to reset, the timer has a tolerance of 20% for its intervals.

The following example is writing in Intel 8086 assembly language and describes how the timer should be programmed.

The 'Active' setting allows you to select logic device 8.

```
MOV DX, 2EH
MOV AL, 87H
OUT DX, AL
OUT DX, AL

MOV DX, 2EH
MOV AL, 07H
OUT DX, AL      point to Logical Device Number Reg.

MOV DX, 2FH
MOV AL, 08H
OUT DX, AL      select logical device 8

MOV DX, 2EH
MOV AL, 30H
OUT DX, AL      select CR30

MOV DX, 2FH
MOV AL, 01H
OUT DX, AL      update CR30 with value 01H, Active GPIO2
```

Exit extended function mode

```
MOV DX, 2EH
MOV AL, F5H
OUT DX, AL

MOV, DX, 2FH
MOV AL, 00L
OUT DX, AL
```

Note: Use a value of 08 for the minutes setting and 00 for the seconds setting.

```
MOV DX, 2EH
MOV AL, F6H
OUT DX, AL

MOV, DX, 2F
MOV AL, 05
OUT DX, AL
```

Note: To enable the WDT choose a value from 1-255; to disable the WDT choose 0.

Sample settings are listed below for setting up the Watchdog Timer using the debug.exe file.

Table 4-1. Watchdog Timer Control

Level	Value	Time/sec
0	0	Disable
1	1	0.5
2	2	1.5
3	3	2.5
4	4	3.5
5	5	4.5

Level	Value	Time/sec
6	6	5.5
.	.	.
.	.	.
255	255	254.5