KEEX-2010

Industrial 3.5" Embedded SBC

User's Guide

Rev. 2.00
May 1, 2008

Quanmax

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Revision	Date	Edited by	Changes
1.00	04/02/2007	JC	Initial Release
2.00	05/01/2008	JC	Convert to Quanmax

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◆ Safety Instructions

Contents

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◆ *Before You Begin*

Before handling the KEEX-2010, 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 a computer. Only qualified, experienced, authorized electronics service personnel should access the interior of a 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 Quanmax 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. Quanmax 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: Driver downloads and additional information are available under *Downloads* on our web site: **www.quanmax.com.**

The following is a summary of the chapter contents:

♦ **Chapter 1, Introduction,** presents the product specifications and system architecture for the KEEX-2010.

♦ **Chapter 2, Jumpers and Connectors,** 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, heatsink and main memory.

♦ **Chapter 4, BIOS Setup Information,** specifies the meaning of each setup parameter and describes how to get advanced BIOS performance.

♦ **Chapter 5, Driver Installation,** provides information on installing installing the drivers for the KEEX-2010.

♦ **Appendix A, System Resources,** provides information on IRQ lines, DMA channels, memory and I/O address maps, PCI devices, and I2C bus.

◆ *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 Quanmax customer service immediately.

3) Inspect the product for damage. If there is damage, notify Quanmax customer service immediately. Refer to "Warranty Policy" for the return procedure.

◆ *Regulatory Compliance Statements*

This section provides the FCC compliance statement for Class A devices.

◆ *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 Quanmax 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.

◆ *Warranty Policy*

◆ Limited Warranty

Quanmax Inc.'s detailed Limited Warranty policy can be found under *Support* at **www.quanmax.com**. Please consult your distributor 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 Quanmax or its authorized agent; or if the failure is caused by accident, acts of God, or other causes beyond the control of Quanmax 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. Quanmax 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 Limited Warranty return, please contact *Support* at **www.quanmax.com** and login to obtain a Return Material Authorization (RMA) Number. If you do not have an account, send an email to *support@quanmax.com* to apply for one.

All product(s) returned to Quanmax 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 a Quanmax shipping container. If the original container has been lost or damaged, new shipping containers may be obtained from Quanmax Customer Service at a nominal cost.

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

Shipments not in compliance with this Limited Warranty Return Policy will not be accepted by Quanmax.

◆ Limitation of Liability

In no event shall Quanmax 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. Quanmax'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 Quanmax or its authorized agent.

◆ *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

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◆ *Overview*

The KEEX-2010 is an 3.5" Form Factor embedded single board computer (SBC) that combines the high performance and low power consumption of the VIA C7 processor with CN896/VT8251 chipset and supports DDR2 400/533/667 SODIMM up to 2GB. This SBC offers the latest performance, features and I/O interfaces at an extremely attractive price/performance ratio.

The KEEX-2010 measures 105mm x 146mm, a 75 percent space reduction over micro-ATX boards. This SBC features integrated VGA and 24-bit dual channel LVDS panel and DVI-D support, IDE ATA-133, SATA 3 Gb/s, RS-232/422/485 serial port, 8-bit DIO, parallel port, Gigabit Ethernet, USB 2.0, keyboard/mouse, and HD audio via optional daughter board. A PCI Express x4 slot provides expansion capability.

◆ Checklist

1. Take out the KEEX-2010 series unit from the carton box, check if the unit is properly secure in the plastic bag.

2. Check the contents of the carton box:

  ♦ Motherboard
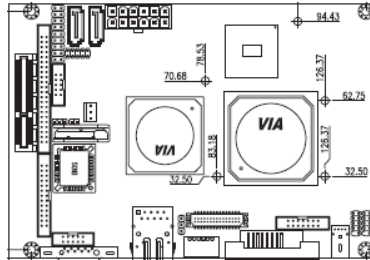
  ♦ 44-pin IDE ribbon cable

  ♦ SATA cable

  ♦ ATX Power cable adapter

  ♦ Keyboard/Mouse Y-cable

If any of these items is damaged or missing, please contact Quanmax. Save all packing materials for future replacement and maintenance.

◆ **Features**

◆ **Processor**

The VIA C7 processor in NanoBGA2 package has the following features:

- ♦ Extremely low power consumption

- ♦ World's fastest AES encryption

- ♦ Thermal monitor; catastrophic thermal protection

- ♦ MMS, SSE, SSE2, SSE3 compatible instructions

- ♦ 2x 64kB, 4-way Level 1 caches

- ♦ 128kB Level 2 victim cache (32-way)

- ♦ L2 Hardware Prefetch

- ♦ Bus speeds up to 800MHz (limited to 533MHz by CN800)

- ♦ NanoBGA2 package (21mm x 21mm)

◆ **Chipset**

The KEEX-2010 is based on the **VIA CN896 Northbridge** and **VT8251 Southbridge** chipset.

The **VIA CN896 Northbridge** features:

- ♦ FSB speed options of 400, 533 and 800 MHz

- ♦ Advanced 64-bit SDRAM controller supporting DDR2 667/533/400

- ♦ 533 MB/sec V-Link Southbridge interface

- ♦ Advanced System Power Management (ACPI 2.0)

- ♦ Chrome9 HC Graphics core

  - ◆ CRT: up to 1920x1440 x24bpp

  - ◆ 24-bit dual channel LVDS up to 1600x1200 via VT1636

  - ◆ Dual monitor support

The **VIA VT8251 Southbridge** features:

- ♦ 32-bit/33MHz external PCI bus, supports 4 external REQ / GNT devices

- ♦ 5x USB 2.0 ports

- ♦ 2x SATA II ports

- ♦ IDE up to UltraDMA-133

- ♦ HD/AC'97 audio

- ♦ LPC bus

- ♦ Watchdog Timer

◆ **Onboard Ethernet Controller**

The KEEX-2010 provides Gigabit Ethernet connectivity using a Marvell 88E8053 Gigabit Ethernet Controller.

◆ **Super I/O**

The LPC-based Winbond W83627EHG Super I/O controller provides the following functionality:

- ♦ One RS-232/422/485 and one RS-232 serial port

- ♦ PS/2 Keyboard/Mouse

- ♦ Watchdog Timer: 1 to 255 step, (sec/min), software programmable.

- ♦ Hardware Monitor: temperature and voltage monitoring

◆ **BIOS**

AwardBIOS Plug & Play FWH BIOS - 4Mb ROM.

◆ *Product Specifications*

Form Factor	• 3.5" Embedded SBC 105mm x 146mm
CPU	• VIA C7, 1GHz & 1.5GHz (NanoBGA2 package)
Chipset	• VIA CN896 + VT8251
Memory	• DDR2 400/533/667 200-pin SO-DIMM Socket, up to 2GB
Ethernet	• Gigabit Ethernet - Marvell 88E8053 Controller
VGA Controller	• Integrated Chrome9 HC Graphics core on CN896 • Up to 1920x1440 CRT resolution (pin header)
LCD Support	• 24-bit dual channel LVDS up to UXGA (via VT1636) • DVI-D (via VT1632A) – rear I/O
Peripheral Support	• One IDE channel, ATA-133 (primary) • 2x SATA 3Gb/s • 5x USB 2.0 ports (4x by pin header, 1x on I/O bracket) • 1x RS-232, 1x RS232/422/485 serial ports • 4x DI/DO • 1x parallel port with SPP/ECP/EPP mode support • HD Audio via optional Daughter Board
Expansion	• PCI Express x2 on PCIe x4 connector (via 2x PCIe x1, VT8251)
BIOS	• Award-based FWB
Watchdog Timer	• 1-255 steps (sec/min), software configurable on Super I/O
Hardware Monitor	• Hardware monitor for supply voltages, CPU, fans
Operation Temp.	• 0ºC – 60ºC
Storage Temp.	• -10ºC – 85ºC
Humidity	• 0% – 90%
Certifications	• CE, FCC Class A

Table 1-1. KEEX-2010 Specifications

Article	Part No.	VIA C7	24-bit LVDS	DVI	PCIe x2
KEEX-2010	B3EX2010-001000T	1.0GHz	✓	✓	✓
KEEX-2011	B3EX2010-011000T	1.5GHz	✓	✓	✓

Table 1-2. KEEX-2010 Derivative Models

◆ *System Block Diagram*

```
                              ┌─────────────┐
                              │    CPU      │
                              │   VIA C7    │
                              │  NanoBGA2   │
                              └──────┬──────┘
                                     ↕
┌───────┐  ┌────────┐  DVP2  ┌───────────────┐         ┌──────────────────────┐
│ DVI-D │◄─│VT1632A │◄──────►│               │◄───────►│ DDR2 400/533/667     │
└───────┘  └────────┘        │  Northbridge  │         │ 2GB SO-DIMM socket   │
┌───────┐  ┌────────┐  DVP1  │               │         └──────────────────────┘
│ LVDS  │◄─│VT1636  │◄──────►│   VIA CN896   │  PCIe x1  ┌──────────┐
└───────┘  └────────┘        │               │◄────────►│   GbE    │
┌───────┐            CRT     │               │          └──────────┘
│  VGA  │◄───────────────────►│              │
└───────┘                    └───────┬───────┘
                                     ↕  533 MB/s
                                        V-Link Interface
┌────────────┐              ┌───────────────┐  SMB  ┌────────┐  ┌──────────┐
│  IDE 1x    │◄────────────►│               │◄─────►│W83601  │◄►│  DI/DO   │
└────────────┘              │  Southbridge  │       └────────┘  └──────────┘
┌────────────┐              │               │ HD CODEC          ┌──────────┐
│SATA 3Gb/s 2x│◄───────────►│   VIA VT8251  │◄─────────────────►│ HD Audio │
└────────────┘              │               │                   └──────────┘
┌────────────┐              │               │ 2x PCIe x1        ┌──────────┐
│ USB 2.0 5x │◄────────────►│               │◄─────────────────►│ PCIe x2  │
└────────────┘              └───────┬───────┘                   └──────────┘
                                    ↕  LPC      ┌────────────┐
                                    ├──────────►│ Award BIOS │
                                    ↕           └────────────┘
┌──────┐                   ┌────────────────┐          ┌──────────┐
│ COM1 │───────────────────│  W83627EHF     │──────────│    KB    │
└──────┘                   │  LPC Super I/O │          └──────────┘
┌──────┐                   │                │          ┌──────────┐
│ COM2 │───────────────────│                │──────────│  Mouse   │
└──────┘                   └────────────────┘          └──────────┘
```
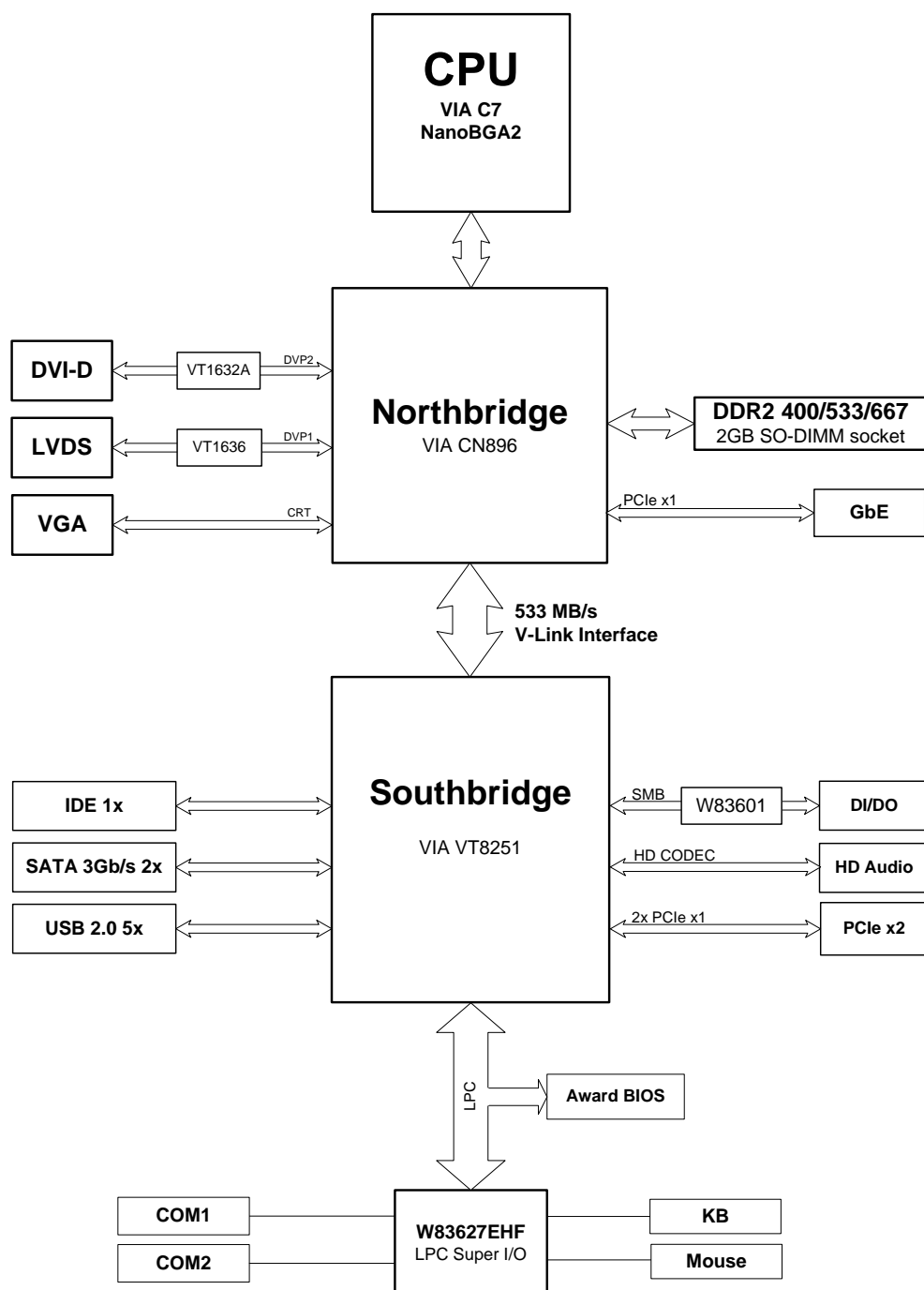
Figure 1-1. KEEX-2010 System Block Diagram

◆ Mechanical Drawing
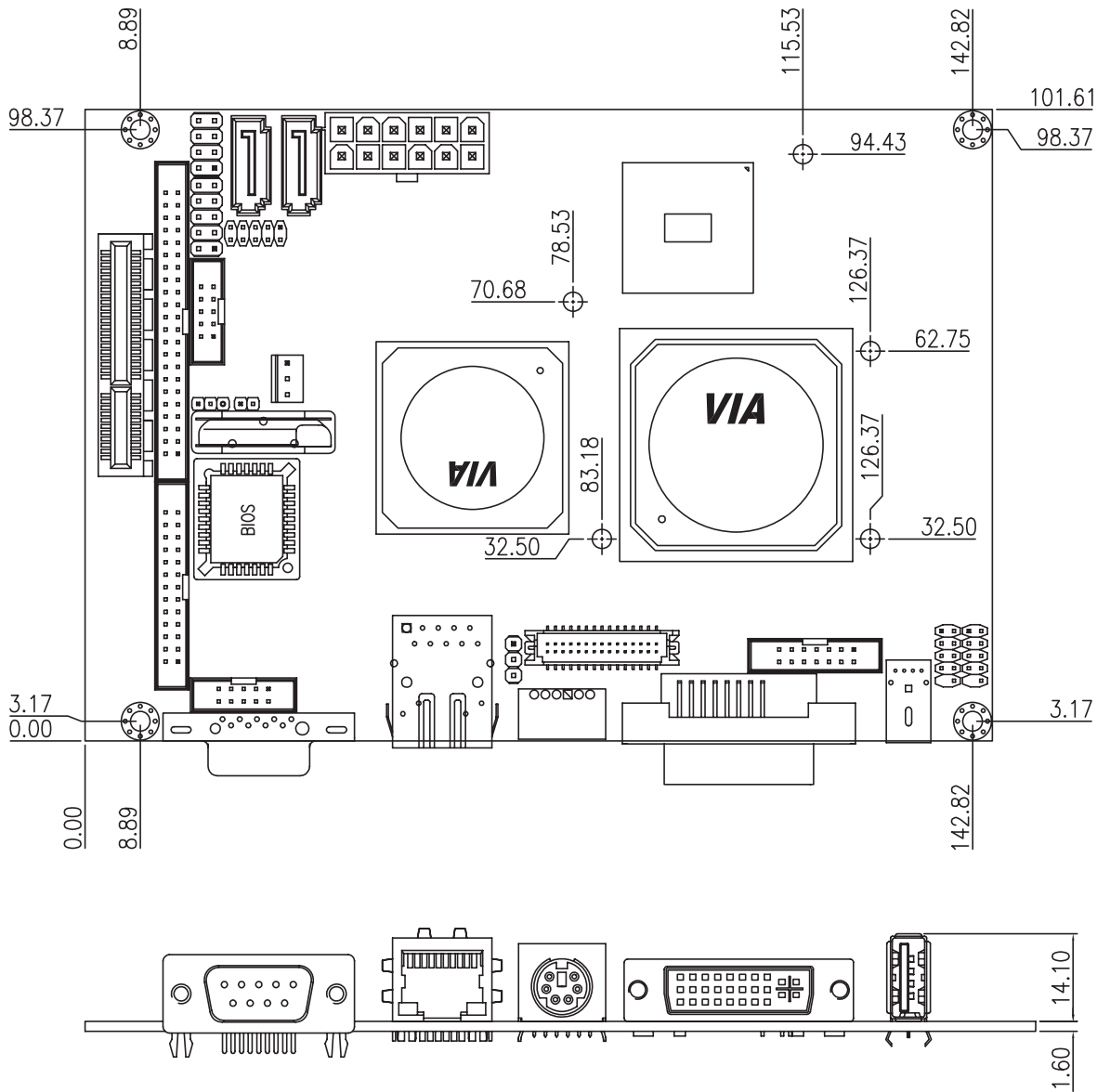
Figure 1-2. KEEX-2010 Mechanical Dimensions

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Chapter 2

◆ Hardware Settings

Contents

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◆ *Overview*

This chapter provides the definitions and locations of jumpers, connectors, and headers.

◆ *Jumpers*

The KEEX-2010 Series Embedded Boards have several jumpers which must be properly configured to ensure correct operation.
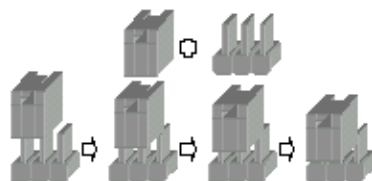
Figure 2-1. Jumper Connector

For three-pin jumpers (see figure), the jumper setting is designated "1-2" when the jumper connects pins 1 and 2. The jumper setting is designated "2-3" when pins 2 and 3 are connected and so on. You will see that one of the lines surrounding a jumper pin is thick, or that the pin is square, which indicates *pin 1*.

To move a jumper from one position to another, use needle-nose pliers or tweezers to pull the pin cap off the pins and move it to the desired position.

◆ *Jumper Settings and Pin Definitions*

For jumper and connector locations, please refer to the diagrams below.
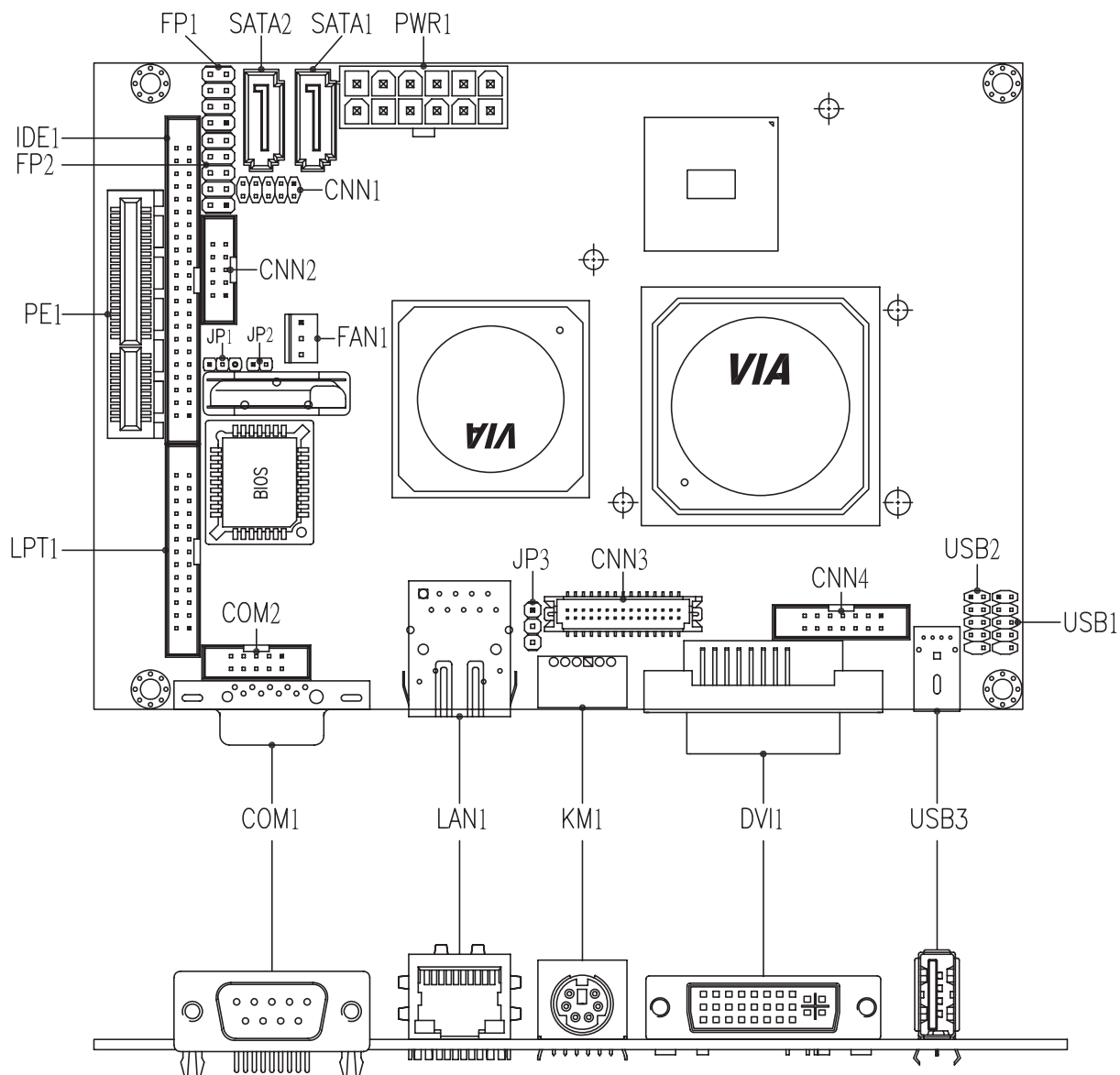
Figure 2-2. KEEX-2010 Jumper and Connector Locations

◆ Jumper Settings

To ensure correct system configuration, the following section describes how to set the jumpers to enable/disable or change functions. For jumper descriptions, please refer to the table below.

Jumper	Function
JP1	Clear CMOS
JP2	AT/ATX Power mode Selection
JP3	LCD Voltage Selection

Table 2-1. Jumper Descriptions

◆ *Clear CMOS Jumper (JP1: 3-pin 2.0mm pitch header):*

Function	JP3
Normal (Default)	1-2 Short
Clear CMOS	2-3 Short

Table 2-2. Clear CMOS Jumper

◆ *AT/ATX Mode Selector (JP2: 2-pin 2.0mm pitch header):*

Function	JP2
ATX Mode (Default)	1-2 Open
AT Mode	1-2 Short
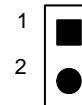
Table 2-3. AT/ATX Mode Selector

◆ *LCD Voltage Selector (JP3: 3-pin 2.0mm pitch header):*

Function	JP1
+5V	1-2 Short
+3.3V (Default)	2-3 Short
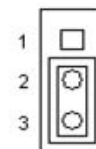
Table 2-4. LCD Voltage Selector

◆ Connector Pin Definitions

For connector and header descriptions, please refer to the table below.

Connector	Function
CNN1	Digital I/O Pin Header
CNN2	HD Audio Pin Header
CNN3	LVDS Channel Pin Header
CNN4	VGA-out Pin Header
COM1-2	RS-232/422/485 Serial Port Connectors
DIMM1	200-pin DDR2 SO-DIMM Socket (on underside)
FAN1	CPU Fan Connector
FP1	Front Panel 1 Pin Header (Reset/ HD Led/ Speaker/)
FP2	Front Panel 2 Pin Header (P_LED/ P_BT /KB_Lock/SMB)
IDE1	IDE Connector
LPT1	LPT Port Connector
PE1	PCI Express x4 Socket
PWR1	ATX Power Control Connector
SATA1-2	Serial ATA Connectors
USB1-2	USB Pin Headers

Table 2-5. Connector and Header Descriptions

◆ *Digital I/O Pin Header (CNN1: 5x2-pin header 2.0mm pitch):*

PIN	SIGNAL	PIN	SIGNAL
1	DO0	2	DI0
3	DO1	4	DI1
5	DO2	6	DI2
7	DO3	8	DI3
9	+5V	10	GND
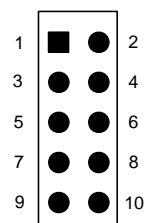
Table 2-6. Digital I/O Pin Header pin definition

◆ *HD Audio Header (CNN2: 5x2-box header 2.0mm pitch):*

PIN	SIGNAL	PIN	SIGNAL
1	HD_RST-	2	HD_SYNC
3	GND	4	HD_DAOUT
5	HD_DAIN2	6	GND
7	GND	8	HD_BCLK
9	+5V	10	+3.3V
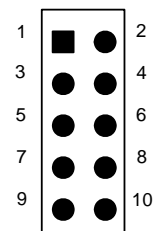
Table 2-7. CN7: HD Audio Header pin definition

◆ *LVDS Connector (CNN3: Hirose DF13 30-pin 1.25mm)*

PIN	SIGNAL	PIN	SIGNAL
2	BKLEN	2	BKLCTL
4	PPVCC	4	PPVCC
6	CH1_CLK#	6	CH2_CLK#
8	CH1_CLK	8	CH2_CLK
10	GND	10	GND
12	CH1_TX0#	12	CH2_TX0#
14	CH1_TX0	14	CH2_TX0
16	CH1_TX1#	16	CH2_TX1#
18	CH1_TX1	18	CH2_TX1
20	CH1_TX2#	20	CH2_TX2#
22	CH1_TX2	22	CH2_TX2
24	CH1_TX3#	24	CH2_TX3#
26	CH1_TX3	26	CH2_TX3
28	GND	28	GND
30	I2C_DATA	30	I2C_CLK
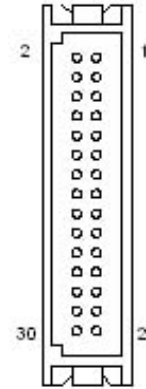
Table 2-8. LVDS Connector pin definition

◆ *VGA Connector (CNN4: 5x2-box header 2.0mm pitch):*

PIN	SIGNAL	PIN	SIGNAL
1	VGA_R	2	VGA_G
3	VGA_B	4	N.C.
5	GND	6	GND
7	GND	8	GND
9	+5V	10	GND
11	N.C.	12	VGA_SDATA
13	VGA_HS	14	VGA_VS
15	VGA_SCLK	16	GND
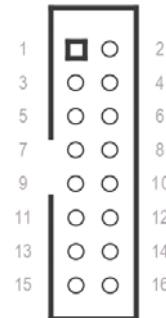
Table 2-9. CN7: VGA Connector pin definition

◆ *RS232/422/485 Serial Port Connector (COM2: 5x2 box header 2.54mm pitch):*

PIN	SIGNAL	PIN	SIGNAL
1	RS-232：DCD RS-422：TX+ RS-485：RTX+	2	RS-232：RXD RS-422：RX+ RS-485：N/A
3	RS-232：TXD RS-422：TX- RS-485：RTX-	4	RS-232：DTR RS-422：RX- RS-485：N/A
5	GND	6	DSR
7	RTS	8	CTS
9	RI	10	NC
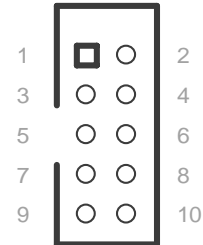
Table 2-10. COM2 RS232/422/485 Serial Port Connector pin definition

◆ *CPU Fan Connector (FAN1: Wafer 2.54mm. pitch):*

PIN	SIGNAL
1	Ground
2	+5V
3	Speed Sense
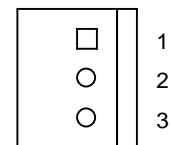
Table 2-11. CPU Fan Connector pin definition

◆ *Front Panel 1 Pin Header (FP1: 4x2-pin 2.54mm pitch):*

PIN	SIGNAL	PIN	SIGNAL
1	Reset Button +	2	Speaker +
3	Reset Button -	4	NC
5	HDD LED +	6	NC
7	HDD LED -	8	Speaker -
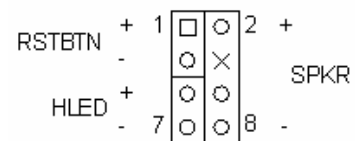
Pins 2, 8: External Speaker wire
Pins 6-8 shorted: Internal Speaker Enable (default)

Table 2-12. Front Panel 1 Pin Header pin definition

◆ *Front Panel 2 Pin Header(FP2: 5x2-pin 2.54mm pitch):*

PIN	SIGNAL	PIN	SIGNAL
1	Power LED (+)	2	Power On Button (+)
3	NC	4	Power On Button (-)
5	Power LED (-)	6	NC
7	KeyBoard Lock (+)	8	I2C Bus SMB Data
9	GND	10	I2C Bus SMB Clock

Table 2-13. Front Panel 2 Pin Header pin definition

◆ *IDE Connector (IDE1: 22x2 box header 2.0mm pitch):*

PIN	SIGNAL	PIN	SIGNAL
1	Reset IDE	2	GND
3	IDE Data 7	4	IDE Data 8
5	IDE Data 6	6	IDE Data 9
7	IDE Data 5	8	IDE Data 10
9	IDE Data 4	10	IDE Data 11
11	IDE Data 3	12	IDE Data 12
13	IDE Data 2	14	IDE Data 13
15	IDE Data 1	16	IDE Data 14
17	IDE Data 0	18	IDE Data 15
19	Ground	20	NC
21	DREQ0	22	GND
23	IDEIOW#	24	GND
25	IDEIOR#	26	GND
27	IDEIORDY	28	CBSEL
29	DACK0#	30	GND
31	IDEIRQ14	32	NC
33	IDE Address 1	34	PDIAG#
35	IDE Address 0	36	IDE Address 2
37	IDE Chip select 1#	38	IDE Chip select 3#
39	IDE activity	40	GND
41	+5V	42	+5V
43	GND	44	NC

Table 2-14. IDE1 Connector pin definition

◆ *Parallel Port Connector (LPT1: 13x2 box header 2.0mm pitch):*

PIN	SIGNAL	PIN	SIGNAL
1	#STROBE	2	#AFD
2	DATA0	4	#ERROR
3	DATA1	6	#INIT
4	DATA2	8	#SLIN
5	DATA3	10	GND
6	DATA4	12	GND
7	DATA5	14	GND
8	DATA6	16	GND
9	DATA7	18	GND
10	#ACK	20	GND
11	BUSY	22	GND
12	PE	24	GND
13	SELECT	26	N.C.
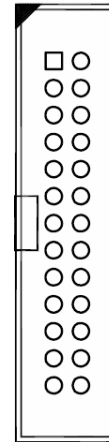
Table 2-15. Parallel Port Connector pin definition

◆ *ATX Power Connector (PWR1: 6x2 pin female):*

PIN	SIGNAL	PIN	SIGNAL
1	GND	7	GND
2	VCC	8	GND
3	VCC	9	VCCSB
4	GND	10	PSON
5	VCC	11	GND
6	VCC	12	+12V
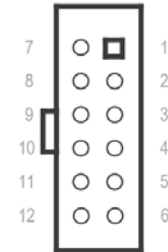
Table 2-16. ATX Power Connector pin definition

◆ *Serial ATA Connector (SATA1-2: 7-pin "L" type - KEEX-2000 only):*

PIN	SIGNAL	PIN	SIGNAL
1	GND	2	SATA_TXP
3	SATA_TXN	4	GND
5	SATA_RXN	6	SATA_RXP
7	GND		
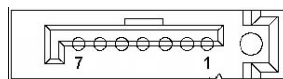
Table 2-17. Serial ATA Connector pin definition

◆ *USB Pin Headers (USB1-2: 5x2-pin header 2.54mm pitch):*

PIN	SIGNAL	PIN	SIGNAL
1	+5V	2	+5V
3	USBD0/2-	4	USBD1/3-
5	USBD0/2+	6	USBD1/3+
7	GND	8	GND
9	"key"	10	GND
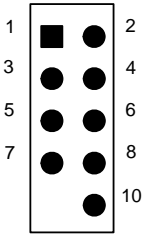
Table 2-18. USB Header pin definition

◆ Pin Definitions - Rear Panel

Connector	Function
KM1	PS2 Mouse / Keyboard Connector
COM1	RS-232 Serial Port Connector
LAN1	LAN Connector
USB3	USB Connector
DVI1	DVI-D Display Connector

Table 2-19. KEEX-2010 Rear Panel Connector Descriptions

◆ *Keyboard/Mouse Connector (KM1: 6-pin Mini DIN):*

PIN	SIGNAL	PIN	SIGNAL
1	Keyboard data	2	Mouse data
3	Ground	4	+5V
5	Keyboard clock	6	Mouse clock
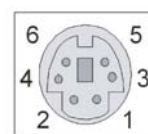
Table 2-20. Keyboard/Mouse Connector pin definition

◆ *COM1 RS-232 Serial Port Connector (COM1: D-Sub 9-pin male):*

PIN	SIGNAL	PIN	SIGNAL
1	DCD (Data Carrier Detect)	6	DSR (Data Set Ready)
2	RXD (Receive Data)	7	RTS (Request to Send)
3	TXD (Transmit Data)	8	CTS (Clear to Send)
4	DTR (Data Terminal Ready)	9	RI (Ring Indicator)
5	Ground		
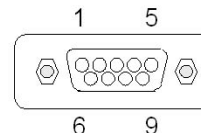
Table 2-21. COM1 RS-232 Serial Port Connector pin definition

◆ *Gigabit Ethernet Connector (LAN1: RJ-45):*

PIN	SIGNAL	PIN	SIGNAL
1	MDI 0+	2	MDI 0-
3	MDI 1+	4	MDI 1-
5	MDI 2+	6	MDI 2-
7	MDI 3+	8	MDI 3-

LAN LED	Function
Yellow	LINK / ACTIVE
OFF / Green / Orange	Speed 10 / Speed 100 / Speed 1000
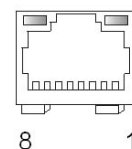
Table 2-22. LAN1 Gigabit Ethernet Connector pin definition

◆ *USB3 Connector (USB3: 4-pin Type-A female):*

PIN	SIGNAL
1	VCC
2	USB5 -
3	USB5 +
4	GND

Table 2-23. USB4 Connector pin definition

◆ *DVI-D Display Connector (DVI1: D-Sub 15-pin female):*

PIN	SIGNAL	PIN	SIGNAL
1	TX2-	16	EDGE
2	TX2+	17	TX0-
3	GND	18	TX0+
4	NC	19	GND
5	NC	20	NC
6	SCL	21	NC
7	SDA	22	GND
8	NC	23	TXC+
9	TX1-	24	TXC-
10	TX1+	C1	NC
11	GND	C2	NC
12	NC	C3	NC
13	NC	C4	NC
14	+5V	C5	GND
15	GND	C6	GND
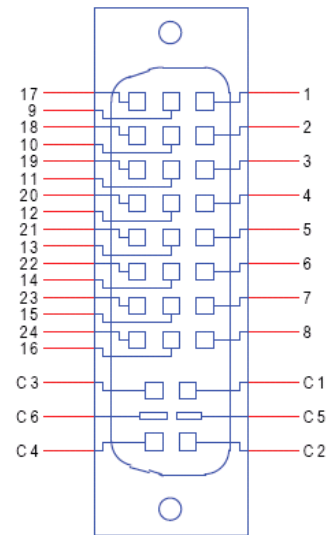
Table 2-24. DVI-D Display Connector pin definition

Chapter 3

◆ System Installation

Contents

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◆ *Memory Module Installation*

DDR2 SO-DIMMs have 200-pins and one notch that will match with the onboard SO-DIMM socket. Make sure that your module is the correct specification for your board.

◆ Installing a SO-DIMM

◆ Carefully follow the steps below in order to install the SO-DIMMs:

1) To avoid generating static electricity and damaging the SO-DIMM, ground yourself by touching a grounded metal surface or use a ground strap before you touch the SO-DIMM.

2) Do not touch the connectors of the SO-DIMM. Dirt or other residue may cause a malfunction.

3) Hold the SO-DIMM with its notch aligned with the memory socket of the KEEX-2010 and insert it at a 30-degree angle into the socket.
.
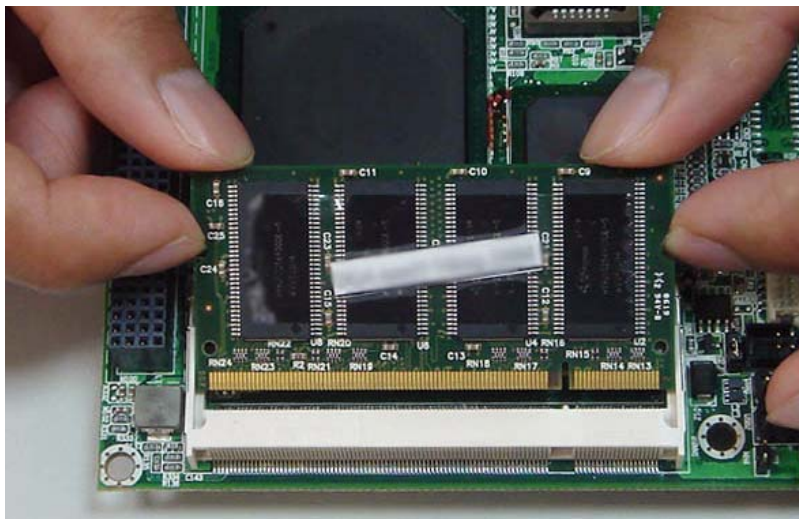
Figure 3-1. Align the SO-DIMM Memory Module with the onboard socket

4) Fully insert the module into the socket until a "click" is heard.

.
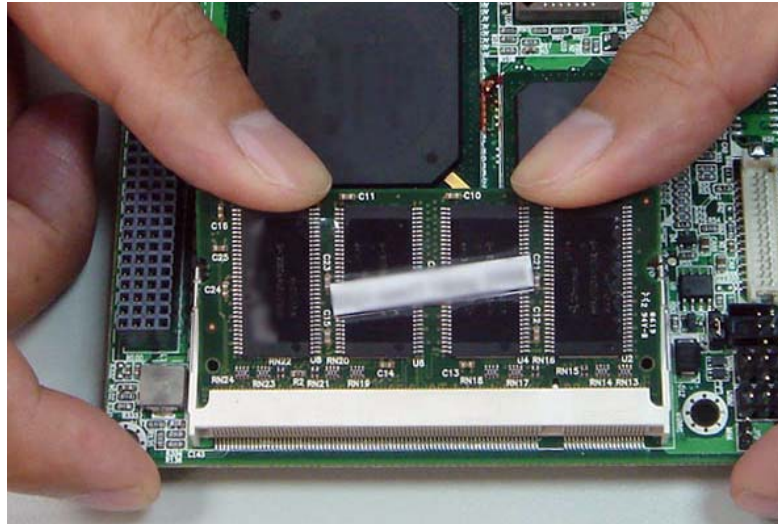
Figure 3-2. Fully insert the SO-DIMM Memory Module into the onboard socket

5) Press down on the SO-DIMM so that the tabs of the socket lock on both sides of the module.

.
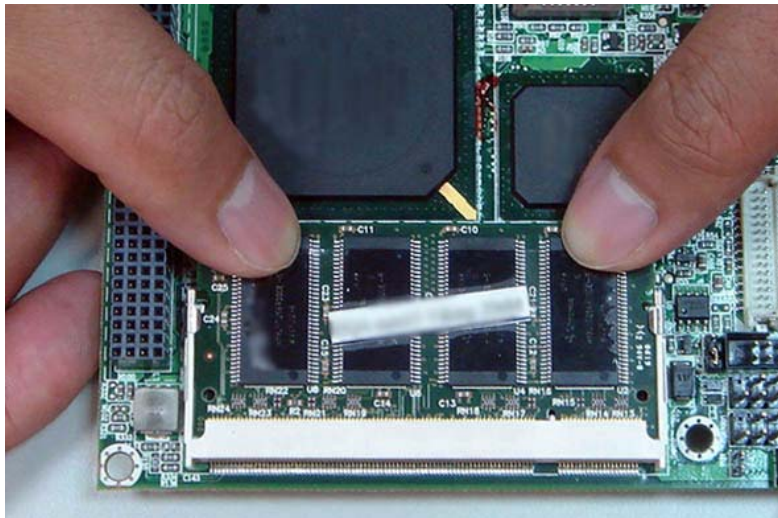
Figure 3-3. Press down on the SO-DIMM Memory Module to lock it in place

◆ Removing a SO-DIMM:

To remove the SO-DIMM, use your fingers or a small screwdriver to carefully push away the tabs that secure either side of the SO-DIMM. Lift it out of the socket.

Make sure you store the SO-DIMM in an anti-static bag. The socket must be populated with memory modules of the same size and manufacturer.

Chapter 4

◆ Award BIOS Setup

Contents

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◆ *Overview*

This chapter provides a description of the Award BIOS. The BIOS setup menus and available selections may vary from those of your product. For specific information on the BIOS for your product, please contact Quanmax.

> **Note:** The BIOS menus and selections for your product may vary from those in this chapter. For the BIOS manual specific to your product, please contact Quanmax.

Award's ROM BIOS provides a built-in Setup program, which allows the user to modify the basic system configuration and hardware parameters. The modified data will be stored in a battery-backed CMOS, so that data will be retained even when the power is turned off. In general, the information saved in the CMOS RAM will not need to be changed unless there is a configuration change in the system, such as a hard drive replacement or when a device is added.

It is possible for the CMOS battery to fail, which will cause data loss in the CMOS only. If this happens you will need to reconfigure your BIOS settings.

◆ *Main Menu*

Once you enter the AwardBIOS™ CMOS Setup Utility, the Main Menu will appear on the screen. The Main Menu allows you to select from several setup functions and two exit choices. Use the arrow keys to select among the items and press <Enter> to accept your choice and enter the sub-menu.

```
                    Phoenix - AwardBIOS CMOS Setup Utility
  ┌─────────────────────────────────────────────────────────────────────┐
  │  ➢Standard CMOS Features          ➢Frequency/Voltage Control         │
  │  ➢Advanced BIOS Features            Load Fail-Safe Defaults          │
  │  ➢Advanced Chipset Features         Load Optimized Defaults          │
  │  ➢Integrated Peripherals            Set Supervisor Password          │
  │  ➢Power Management Setups           Set User Password                │
  │  ➢PnP/PCI Configurations            Save & Exit Setup                │
  │  ➢PC Health Status                  Exit Without Saving              │
  ├─────────────────────────────────────────────────────────────────────┤
  │  Esc: Quit                            ↑↓→←: Select Item              │
  │  F10: Save & Exit Setup                                              │
  ├─────────────────────────────────────────────────────────────────────┤
  │                  Time, Date, Hard Disk Type....                     │
  └─────────────────────────────────────────────────────────────────────┘
```

Table 4-1. Main Menu

Note: A brief description of each highlighted selection appears at the bottom of the screen.

◆ *Setup Items*

The main menu includes the following main setup categories. Recall that some systems may not include all entries. Each category is described in detail in the sections which follow.

◆ Standard CMOS Features

Use this menu for basic system configuration.

◆ Advanced BIOS Features

Use this menu to set the Advanced Features available on your system.

◆ Advanced Chipset Features

Use this menu to change the values in the chipset registers and optimize your system's performance.

◆ Integrated Peripherals

Use this menu to specify your settings for integrated peripherals.

◆ Power Management Setup

Use this menu to specify your settings for power management.

◆ **PnP / PCI Configuration**

This entry appears if your system supports PnP / PCI.

◆ **PC Health Status**

This menu displays the current CPU temperature, the fan speeds, voltages etc.

◆ **Frequency/Voltage Control**

This menu displays the Frequency and Voltage Control settings.

◆ **Load Failsafe Defaults**

Use this menu to load the BIOS default values for the minimal/stable performance required for your system to operate.

◆ **Load Optimized Defaults**

Use this menu to load the BIOS default values that are factory settings for optimal performance and system operations. While Award has designed the custom BIOS to maximize performance, the factory has the right to change these defaults to meet their needs.

◆ **Set Supervisor/User Password**

Use this menu to set User and Supervisor Passwords.

◆ **Save & Exit Setup**

Save CMOS value changes to CMOS and exit setup.

◆ **Exit Without Save**

Abandon all CMOS value changes and exit setup.

◆ *Standard CMOS Features*

The items in the Standard CMOS Setup Menu are divided into 10 categories. Each category includes no, one or more setup items. Use the arrow keys to highlight the item and <PgUp> or <PgDn> keys to select the value you want for each item. Note the "Halt On" option which allows you to select the situation in which you want the BIOS to stop the POST process and notify you.

```
                    Phoenix - AwardBIOS CMOS Setup Utility
                          Standard CMOS Features
 ┌─────────────────────────────────────────────────┬──────────────────────────┐
 │   Date (mm:dd:yy):          Mon, Mar 6 2006      │        Item Help         │
 │   Time (hh:mm:ss):          16:19:20             │ _____ │
 │                                                  │                          │
 │ ➢ IDE Channel 0 Master      [13579 MB]           │ Menu Level      ➢        │
 │ ➢ IDE Channel 0 Slave       [None]               │                          │
 │ ➢ IDE Channel 2 Master      [None]               │ Change the day, month, year and │
 │ ➢ IDE Channel 2 Slave       [None]               │ century                  │
 │                                                  │                          │
 │   Video                     [EGA/VGA]            │                          │
 │   Halt On                   [All, But Keyboard]  │                          │
 │                                                  │                          │
 │   Based Memory              640K                 │                          │
 │   Extended Memory           515072K              │                          │
 │   Total Memory              516096K              │                          │
 │                                                  │                          │
 ├─────────────────────────────────────────────────┴──────────────────────────┤
 │ ↑↓→←Move  Enter: Select  +/-/PU/PD: Value  F10: Save  ESC: Exit  F1: General Help │
 │ F5: Previous Values    F6: Fail-safe defaults       F7: Optimized Defaults  │
 └─────────────────────────────────────────────────────────────────────────────┘
```

Table 4-2. Standard CMOS Features

◆ **Date**

Options - Month/DD/YYYY

Set the system date. Note that the 'Day' automatically changes when you set the date.

◆ **Time**

Options - HH : MM : SS

Set the system time.

◆ **IDE Channel 0/2 Master/Slave**

Options are available in the sub-menu (described in the IDE Adapters section below)

Press <Enter> to enter the sub-menu and select detailed options.

> **Note:** Channel 0 corresponds to the Primary IDE port. Channel 2 corresponds to the SATA ports. Channel 1 is allocated to the Secondary IDE port, which is not supported on this board.

◆ **Video**

Options - EGA/VGA/CGA 40/CGA 80/MONO

Select the default video device.

◆ **Halt On**

Options - All Errors/No 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.

◆ **Base Memory**

Options - N/A

Displays the amount of conventional memory detected during boot.

◆ **Extended Memory**

Options - N/A

Displays the amount of extended memory detected during boot.

◆ **Total Memory**

Options - N/A

Displays the total memory available on the system.

◆ IDE Adapters

The IDE adapters control the hard disk drive. Use a separate sub-menu to configure each hard disk drive.

```
                  Phoenix - AwardBIOS CMOS Setup Utility
                           IDE Channel 0 Master
 ┌─────────────────────────────────────────┬──────────────────────────────┐
 │ IDE HDD Auto-Detection      Press Enter  │         Item Help            │
 │                                          │ _____ │
 │ IDE Channel 0 Master        Auto         │                              │
 │ Access Mode                 Auto         │ Menu Level    ➢➢             │
 │                                          │                              │
 │ Capacity                    13579 MB     │ To auto-detect the HDD's size,│
 │                                          │ head... on this channel      │
 │ Cylinder                    26310        │                              │
 │ Head                        16           │                              │
 │ Precomp                     0            │                              │
 │ Landing Zone                26309        │                              │
 │ 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 │
 └─────────────────────────────────────────────────────────────────────────┘
```

Table 4-3. IDE Primary Master

◆ **IDE HDD Auto-Detection**

Options - Press Enter

Press Enter to auto-detect the HDD on this channel. If detection is successful, the utility will fill the remaining fields on this menu.

◆ **IDE Channel 0/2 Master/Slave**

Options - None, Auto and Manual

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!

◆ **Access Mode**

Options - CHS, LBA, Large and Auto

Choose the access mode for this hard disk

◆ **Capacity**

Options - Auto Display your disk drive size

Disk drive capacity (approximate). 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/Secondary Master' item is set to 'Manual'

◆ **Cylinder**

Options - Min = 0, Max = 65535

Set the number of cylinders for this hard disk.

◆ **Head**

Options - Min = 0, Max = 255

Set the number of read/write heads.

◆ **Precomp**

Options - Min = 0, Max = 65535

**** Warning: Setting a value of 65535 means no hard disk!

◆ **Landing zone**

Options - Min = 0, Max = 65535

◆ **Sector**

Options - 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.

```
                    Phoenix - AwardBIOS CMOS Setup Utility
                          Advanced BIOS Features
┌─────────────────────────────────────────────┬─────────────────────────────┐
│ ➤ CPU Feature                  [Press Enter] │          Item Help          │
│ ➤ Hard Disk Boot Priority      [Press Enter] │ _____ │
│   Virus Warning                [Disabled]    │                             │
│   CPU L1 & L2 Cache            [Enabled]     │ Menu Level      ➤           │
│   CPU L2 Cache ECC Checking    [Enabled]     │                             │
│   Quick Power On Self Test     [Enabled]     │                             │
│   First Boot Device            [Hard Disk]   │                             │
│   Second Boot Device           [CDROM]       │                             │
│   Third Boot Device            [LS-120]      │                             │
│   Boot Other Device            [Enabled]     │                             │
│   Boot Up Floppy Seek          [Disabled]    │                             │
│   Boot Up NumLock Status       [On]          │                             │
│   Typematic Rate Setting       [Disabled]    │                             │
│ x Typematic Rate (Chars/Sec)    6            │                             │
│ x Typematic Delay (Msec)        250          │                             │
│   Security Option              [Setup]       │                             │
│   MPS Version control For OS   [1.4]         │                             │
│   OS Select For DRAM > 64MB    [Non-OS2]     │                             │
│   HDD S.M.A.R.T. Capability    [Disabled]    │                             │
│   Video BIOS Shadow            [Enabled]     │                             │
│   Small Logo(EPA) Show         [Disabled]    │                             │
├─────────────────────────────────────────────┴─────────────────────────────┤
│ ↑↓→←Move  Enter: Select  +/-/PU/PD: Value  F10: Save  ESC: Exit  F1: General Help │
│ F5: Previous Values   F6: Fail-safe defaults      F7: Optimized Defaults   │
└────────────────────────────────────────────────────────────────────────────┘
```

Table 4-4. Advanced BIOS Features

◆ CPU Feature

Press Enter to select CPU Feature.

```
                              CPU Feature
┌────────────────────────────────────────────┬─────────────────────────────┐
│  Delay Prior to Thermal      [16 Min]       │          Item Help          │
│  Thermal Management          [Thermal Monitor 1] │ _____ │
│ x Thermal Monitor Bus Ratio   8 X           │                             │
│ x Thermal Monitor Bus VID     1.004V        │ Menu Level     ➤➤           │
│                                             │                             │
├────────────────────────────────────────────┴─────────────────────────────┤
│ ↑↓→←Move  Enter: Select  +/-/PU/PD: Value  F10: Save  ESC: Exit  F1: General Help │
│ F5: Previous Values   F6: Fail-safe defaults      F7: Optimized Defaults   │
└───────────────────────────────────────────────────────────────────────────┘
```

Table 4-5. Advanced CPU Feature

◆ **Delay Prior to Thermal**

Selecting this item allows a delay prior to thermal time.

Options - 4Min, 8Min, 16Min and 32Min.

◆ **Thermal Management**

Allows you to select the Thermal Monitor.

Options - Thermal Monitor1 (on-die throttling), Thermal Monitor2 (Ratio and VID transition).

◆ **Hard Disk Boot Priority**

Press Enter to select Hard Disk Boot Device Priority.

◆ **Virus Warning**

Allows you to choose the VIRUS Warning feature for IDE Hard Disk boot sector protection. If this function is enabled and someone attempts to write data into this area, the BIOS will show a warning message on the screen and sound an alarm beep.:

 • Enabled - Activates automatically when the system boots up and causes a warning message to appear when anything attempts to access the boot sector or hard disk partition table.

 • Disabled - No warning message will appear when anything attempts to access the boot sector or hard disk partition table.

◆ **CPU Internal Cache**

Options –Disabled, Enabled

◆ **Quick Power On Self Test:**

This option speeds up the Power On Self Test (POST) which runs when you power up the computer. If it is set to Enabled, BIOS will shorten or skip some check items during POST.

 • Enabled - Enable quick POST

 • Disabled - Normal POST

◆ **First/Second/Third Boot Device:**

The BIOS will attempt to load the operating system from the devices specified here as the first, second and third boot devices.

Options - Floppy, LS/ZIP, Hard Disk, CDROM, LAN and Disabled.

◆ **Boot Other Device:**

When enabled, the system will search all other possible locations for an operating system if it fails to find one in the devices specified under the first, second, and third boot devices.

Options - Enabled, Disabled

◆ **Boot Up Floppy Seek**

If enabled, the system will seek for disk drives during boot up. Disabling will speed boot up.

Options - Enabled, Disabled

◆ **Boot Up NumLock Status**

Select the powe- on state for NumLock.

Options - On, Off

◆ **Typematic Rate Setting**

Manually set the Typematic Rate or the Typematic Delay.

◆ **Typematic Rate (Chars/Sec)**

The highest number of characters that can be typed in a second on the keyboard.

◆ **Typematic Delay (Msec)**

The time (in milliseconds) needed before pressing again a key on the keyboard.

◆ **Security Option**

Select whether a password is required every time the system boots or only when you enter 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 at the Main Menu. You will be asked to enter password. Do not type anything and just press <Enter> to disable security. Once security is disabled, the system will boot and you can enter Setup freely.

◆ **MPS Version Control For OS**

This option is specifies the MPS (Multiprocessor Specification) version for your operating system. MPS version 1.4 added extended configuration tables to improve support for multiple PCI bus configurations and improve future expandability.

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.

Options - OS2, Non-OS2

◆ **HDD S.M.A.R.T. Capability**

Options - Enabled, Disabled

◆ **Video BIOS Shadow**

Options - Enabled, Disabled

◆ **Small Logo(EPA) Show**

This field enables the display of the EPA logo located at the upper right of the screen during boot up.

Options - Enabled, Disabled

◆ *Advanced Chipset Features*

This section allows you to configure the system based on the specific features of the installed chipset. Please note 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.

Phoenix - AwardBIOS CMOS Setup Utility
Advanced Chipset Features

		Item Help
➢ DRAM Clock/Drive Control	[Press Enter]	
➢ AGP & P2P Bridge Control	[Press Enter]	_____
Memory Hole	[Disabled]	
System BIOS Cacheable	[Enabled]	Menu Level ➢
Video RAM Cacheable	[Disabled]	
Top Performance	[Disabled]	

↑↓→←Move **Enter**: Select **+/-/PU/PD**: Value **F10**: Save **ESC**: Exit **F1**: General Help
F5: Previous Values   **F6**: Fail-safe defaults   **F7**: Optimized Defaults

Table 4-6. Advanced Chipset Features

◆ DRAM Clock/Drive Control

Press Enter to select DRAM Clock/Drive Control.

DRAM Clock/Drive Control

		Item Help
Current FSB Frequency	100MHz	_____
Current DRAM Frequency	266MHz	
DRAM Clock	[By SPD]	
DRAM Timing	[Auto by SPD]	Menu Level ➢
x SDRAM CAS Latency [DDR/DDR	[2.5/ 4]	
x Bank Interleave	Disabled	
x Precharge to Active(Trp)	4T	
x Active to Precharge(Tras)	07T	
x Active to CMD(Trcd)	4T	
x REF to ACT/REF (Trfc)	20T/21/T	
x ACT(0) to ACT(1) (TRRD)	3T	

↑↓→←Move **Enter**: Select **+/-/PU/PD**: Value **F10**: Save **ESC**: Exit **F1**: General Help
F5: Previous Values   **F6**: Fail-safe defaults   **F7**: Optimized Defaults

Table 4-7. DRAM Clock/Drive Control

◆ **DRAM Clock**

Selects the DRAM Clock frequency.

Options - By SPD, 200 MHz, 266 MHz, 333 MHz

◆ **DRAM Timing**

Selects the DRAM Timing.

Options - Auto by SPD, Manual

◆ AGP & P2P Bridge Control

Press Enter to select AGP & P2P Bridge Control.

AGP & P2P Bridge Control

AGP & P2P Bridge Control		
AGP Aperture Size	[128M]	Item Help
GVA Share Memory Size	[128M]	_____
Direct Frame buffer	[Enabled]	
Select Display Device	[CRT]	Menu Level ➢
Panel Type	[640x480]	
↑↓→←Move **Enter**: Select **+/-/PU/PD**: Value **F10**: Save **ESC**: Exit **F1**: General Help		
F5: Previous Values **F6**: Fail-safe defaults **F7**: Optimized Defaults		

Table 4-8. AGP & P2P Bridge Control

◆ **Select Display Device**

Selects the video display device.

Options - CRT, LCD, DVI, CRT+LCD, CRT+DVI

◆ **Panel Type**

Selects the LCD Panel resolution.

Options - 640x480, 800x600, 1024x768, 1280x768, 1280x1024, 1600x1200, 1440x900, 1280x800, 800x480

◆ **Memory Hole**

Options - Disabled, Enabled

◆ *Integrated Peripherals*

Phoenix - AwardBIOS CMOS Setup Utility
Integrated Peripherals

```
┌─────────────────────────────────────────────────────────────────────────┐
│  ➢ VIA OnChip IDE Device      [Press Enter]  │        Item Help          │
│  ➢ VIA OnChip PCI Device      [Press Enter]  │ _____   │
│  ➢ SuperIO Device             [Press Enter]  │                           │
│    PWRON After PWR-Fail       [Off]          │ Menu Level                │
│  ➢ USB Device Setting         [Press Enter]  │                           │
│                                              │                           │
│                                              │                           │
│                                              │                           │
│                                              │                           │
├─────────────────────────────────────────────────────────────────────────┤
│  ↑↓→←Move  Enter: Select  +/-/PU/PD: Value  F10: Save  ESC: Exit  F1: General Help │
│  F5: Previous Values    F6: Fail-safe defaults      F7: Optimized Defaults │
└─────────────────────────────────────────────────────────────────────────┘
```

Table 4-9. Integrated Peripherals

◆ VIA OnChip IDE Device

Press Enter to select VIA OnChip IDE Device.

VIA OnChip IDE Device

```
┌─────────────────────────────────────────────────────────────────────────┐
│  SATA Controller              [Enabled]      │        Item Help          │
│  SATA Controller Mode         [IDE]          │ _____   │
│  IDE DMA transfer access      [Enabled]      │                           │
│  OnChip IDE Channel0          [Enabled]      │ Menu Level      ➢         │
│  IDE Prefetch Mode            [Enabled]      │                           │
│  Primary Master PIO           [Auto]         │                           │
│  Primary Slave PIO            [Auto]         │                           │
│  Primary Master UDMA          [Auto]         │                           │
│  Primary Slave UDMA           [Auto]         │                           │
│  IDE HDD Block Mode           [Enabled]      │                           │
│                                              │                           │
├─────────────────────────────────────────────────────────────────────────┤
│  ↑↓→←Move  Enter: Select  +/-/PU/PD: Value  F10: Save  ESC: Exit  F1: General Help │
│  F5: Previous Values    F6: Fail-safe defaults      F7: Optimized Defaults │
└─────────────────────────────────────────────────────────────────────────┘
```

Table 4-10. VIA OnChip IDE Device

◆ **SATA Controller**

Options - Enabled, Disabled.

◆ **SATA Controller Mode**

Options - IDE, RAID, AHCI.

◆ **IDE DMA transfer access**

Options - Enabled, Disabled.

◆ **OnChip IDE Channel0**

Options - Enabled, Disabled.

◆ **IDE Prefetch Mode**

Options - Enabled, Disabled.

◆ **Primary Master/Slave Drive PIO Mode**

The four IDE PIO (Programmed Input/Output) fields let you set a PIO mode (0-4) for each of the two 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 and Mode 4

◆ **Primary 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

◆ **IDE HDD Block Mode**

Block mode is also called block transfer, multiple commands, or multiple sector read/write. If your IDE hard drive supports block mode (most new drives do), select Enabled for automatic detection of the optimal number of block read/writes per sector the drive can support.

Options - Enabled, Disabled

◆ VIA OnChip PCI Device

Press Enter to select VIA OnChip PCI Device.

VIA OnChip PCI Device

Azalia HDA Controller	[Auto]	Item Help
Giga LAN Controller	[Enabled]	_____
		Menu Level ➢

↑↓→←Move **Enter**: Select **+/-/PU/PD**: Value **F10**: Save **ESC**: Exit **F1**: General Help
F5: Previous Values   **F6**: Fail-safe defaults   **F7**: Optimized Defaults

Table 4-11. VIA OnChip PCI Device

◆ **Azalia HD Audio Controller**

Options - Auto, Disabled.

◆ **Giga LAN Controller**

Options - Enabled, Disabled.

◆ SuperIO Device

Press Enter to select SuperIO Device.

SuperIO Device

Onboard Serial Port 1	[3F8/IRQ4]	Item Help
Onboard Serial Port 2	[2F8/IRQ3]	_____
UART2 Transmission Type	[RS-232]	
Onboard Parallel Port	[378/IRQ7]	Menu Level ➤
Parallel Port Mode	[SPP]	
x EPP Mode Select	EPP1.7	
x ECP Mode Use DMA	3	

↑↓→←Move **Enter**: Select **+/-/PU/PD**: Value **F10**: Save **ESC**: Exit **F1**: General Help
F5: Previous Values   **F6**: Fail-safe defaults   **F7**: Optimized Defaults

Table 4-12. SuperIO Device

◆ **Onboard Serial Port 1/2**

Select an address and corresponding interrupt for the first and second serial ports.

Options - 3F8/IRQ4, 2E8/IRQ3, 3E8/IRQ4, 2F8/IRQ3, Disabled and Auto.

◆ **UART2 Transmission Type**

This item allows you to select the UART2 Transmission type.

Options - RS-232, RS-422, RS-485.

◆ **Onboard Parallel Port**

This item allows you to determine which access onboard parallel port controller goes with which I/O address.

Options - 3BC/IRQ7, 378/IRQ7, 278/IRQ5 and Disabled.

◆ **Parallel Port Mode**

Select an operating mode for the onboard parallel (printer) port. Select Normal, Compatible, or SPP unless you are certain your hardware and software both support one of the other available modes.

Options - SPP, EPP, ECP and ECP+EPP.

◆ **EPP Mode Select**

Select either EPP1.7 or EPP1.9.

◆ **ECP Mode Use DMA**

Select a DMA channel for the parallel port for use during ECP mode.

Options - 3, 1.

◆ **PWRON After PWR-Fail**

Allows you to set the the "Power On After Power Fail" function.

Options - Former-Status, On, Off

◆ **USB Device Setting**

Press Enter to select USB Device Setting.

USB Device Setting

Onboard USB 1.0 Controller	[Enabled]	Item Help
Onboard USB 2.0 Controller	[Enabled]	_____
USB Operation Mode	[High Speed]	Menu Level ➢
USB Keyboard Function	[Enabled]	
USB Mouse Function	[Enabled]	
USB Storage Function	[Enabled]	
*** USB Mass Storage Device Boot Setting ***		
USB Mass Storage Device	[Auto mode]	

↑↓→←Move **Enter**: Select **+/-/PU/PD**: Value **F10**: Save **ESC**: Exit **F1**: General Help
F5: Previous Values   **F6**: Fail-safe defaults   **F7**: Optimized Defaults

Table 4-13. USB Device Setting

◆ **Onboard USB 1.0 Controller**

Turns on/off the onboard Universal Host Controller.

Options - Enabled, Disabled

◆ **Onboard USB 2.0 Controller**

Turns on/off the onboard Enhanced Host Controller.

Options - Enabled, Disabled

◆ **USB Operation Mode**

High Speed mode will automatically operate at either high speed or full/low speed, depending on the device. Full/Low Speed mode will operate at full/low speed.

Options - High Speed, Full/Low Speed

◆ **Onboard Keyboard Function**

Enables/disables USB keyboard function for legacy operating systems (e.g. DOS).

Options - Enabled, Disabled

◆ **Onboard Mouse Function**

Enables/disables USB mouse function for legacy operating systems (e.g. DOS).

Options - Enabled, Disabled

◆ **Onboard Storage Function**

Enables/disables USB storage function for legacy operating systems (e.g. DOS).

Options - Enabled, Disabled

◆ **USB Mass Storage Device Boot Setting**

Auto mode will boot according to the contents of the USB Mass Storage Device. FDD mode will boot as a floppy disk. HDD mode will boot as a hard disk.

Options - Auto mode, FDD mode, HDD mode

◆ *Power Management Setup*

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

```
                    Phoenix - AwardBIOS CMOS Setup Utility
                            Power Management Setup
  ┌──────────────────────────────────────────────┬──────────────────────────┐
  │  ACPI Function              [Enabled]         │        Item Help         │
  │ x ACPI Suspend Type          S1(POS)          │ _____ │
  │  Power Management Option    [User Define]     │                          │
  │  HDD Power Down             [Disabled]        │ Menu Level    ➤          │
  │  Suspend Mode               [Disabled]        │                          │
  │  Video Off Option           [Suspend -> Off]  │                          │
  │  Video Off Method           [V/H SYNC+Blank]  │                          │
  │  MODEM Use IRQ              [3]               │                          │
  │  Soft-Off by PWR-BTTN       [Instant-Off]     │                          │
  │ ➤ Wakeup Event Detect       [Press Enter]     │                          │
  │                                               │                          │
  │                                               │                          │
  │                                               │                          │
  │                                               │                          │
  ├──────────────────────────────────────────────┴──────────────────────────┤
  │ ↑↓→←Move  Enter: Select  +/-/PU/PD: Value  F10: Save  ESC: Exit  F1: General Help │
  │ F5: Previous Values    F6: Fail-safe defaults      F7: Optimized Defaults  │
  └───────────────────────────────────────────────────────────────────────────┘
```

Table 4-14. Power Management Setup

◆ **ACPI Function**

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

Options - Enabled, Disabled

◆ **ACPI Suspend Type**

Power saving modes for the ACPI function.

  ⬧ S1 (POS): Power on Suspend

◆ **Power Management Option**

This field allows you to select the type (or degree) of power saving by changing the length of idle time that elapses before the Suspend mode and HDD Power Down fields are activated.

  ⬧ Min Saving: Minimum power saving time for the Suspend Mode (1 hour) and HDD Power Down (15 min.)

  ⬧ Max Saving: Maximum power saving time for the. Suspend Mode and HDD Power Down = 1 min.

  ⬧ User Define: Allows you to set the power saving time in the"Suspend Mode" and "HDD Power Down"fields.

◆ **HDD Power Down**

This is selectable only when the Power Management Option field is set to User Define. When the system enters the HDD Power Down mode according to the power saving time selected, the hard disk drive will be powered down.

Options -   Disable, 1 … 15 Min

◆ **Suspend Mode**

Sets the period of time after which the suspend mode activates.

Options - 1 Sec, 5 Sec, 10 Sec, 15 Sec, 30 Sec, 45 Sec, 1 Min, 5 Min, 10 Min, 15 Min, 30 Min, 45 Min, 60 Min, 90 Min. 120 Min

◆ **Video Off Option**

This field is used to activate the video off feature when the system enters the Suspend mode.

Options -   Always On, Suspend -> Off

◆ **Video Off Method**

This determines the manner in which the monitor is blanked.

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

◆ **MODEM Use IRQ**

This determines the IRQ, which can be applied in MODEM use.

Options: 3, 4, 5, 7, 9, 10, 11, NA

◆ **Soft-Off by PWR-BTTN**

This field allows you to select the method of powering off your system.

- Delay 4 Sec: Regardless of whether the Power Management function is enabled or disabled, if the power button is pushed and released in less than 4 sec, the system enters the Suspend mode. The purpose of this function is to prevent the system from powering off in case you accidentally "hit" or pushed the power button. Push and release again in less than 4 sec to restore. Pushing the power button for more than 4 seconds will power off the system.
- Instant-Off: Pressing and then releasing the power button at once will immediately power off your system.

◆ **Wakeup Event Detect**

Press Enter to select Wakeup Event Detect.

```
                              Wakeup Event Detect
┌─────────────────────────────────────────────┬──────────────────────────────┐
│  PowerOn by PCI Card           [By OS]       │          Item Help           │
│  Modem Ring Resume             [By OS]       │  _____    │
│  RTC Alarm Resume              [Disabled]    │                              │
│  x  Date (of Month)                0         │  Menu Level      ➢           │
│  x  Resume Time (hh:mm:ss)      0 : 0 : 0    │                              │
│                                              │                              │
│                                              │                              │
│                                              │                              │
│                                              │                              │
├─────────────────────────────────────────────┴──────────────────────────────┤
│  ↑↓→←Move  Enter: Select  +/-/PU/PD: Value  F10: Save  ESC: Exit  F1: General Help │
│  F5: Previous Values   F6: Fail-safe defaults      F7: Optimized Defaults    │
└─────────────────────────────────────────────────────────────────────────────┘
```

Table 4-15. Wakeup Event Detect

◆ **PowerOn by PCI Card**

If enabled any PCI interrupt will wake up the system.

Options – By OS, Enabled

◆ **Modem Ring Resume**

If enabled a modem ring will wake up the system.

Options – By OS, Enabled

◆ **RTC Alarm Resume**

When "Enabled", you can set the date and time at which the RTC (real-time clock) alarm awakens the system from Suspend mode.

Options - Enabled, Disabled.

◆ **Date / Resume Time**

Set the date and time you want the alarm to go off.

◆ *PnP/PCI Configurations*

This section describes the configuration of the PCI bus system. PCI, or Personal Computer Interconnect, 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. This section covers some very technical items and it is strongly recommended that only experienced users make any changes to the default settings.

```
                    Phoenix - AwardBIOS CMOS Setup Utility
                           PnP/PCI Configurations
┌────────────────────────────────────────────────┬─────────────────────────────┐
│   PNP OS Installed              [No]            │         Item Help           │
│   Init Display First            [Onboard]       │  _____  │
│   Reset Configuration Data      [Disabled]      │                             │
│                                                 │  Menu Level    ➢            │
│   Resources Controlled By       [Auto (ESCD)]   │                             │
│ X IRQ Resources                 Press Enter     │                             │
│                                                 │                             │
│   PCI/VGA Palette Snoop         [Disabled]      │                             │
│   Assign IRQ For VGA            [Enabled]       │                             │
│   Assign IRQ For USB            [Enabled]       │                             │
│                                                 │                             │
│   ** PCI Express rleative items **              │                             │
│   Maximum Payload Size          [4096]          │                             │
│                                                 │                             │
├────────────────────────────────────────────────┴─────────────────────────────┤
│  ↑↓→←Move  Enter: Select  +/-/PU/PD: Value  F10: Save  ESC: Exit  F1: General Help │
│  F5: Previous Values    F6: Fail-safe defaults      F7: Optimized Defaults     │
└───────────────────────────────────────────────────────────────────────────────┘
```

Table 4-16. PnP/PCI Configurations

◆ **PNP OS Installed**

Select Yes if you are using a Plug and Play capable operating system.

Select No if you need the BIOS to configure non-Boot devices.

◆ **Init Display First**

Allows you to choose to first activate the VGA on PCI slot, or the onboard VGA.

Options – PCI Slot, Onboard

◆ **Reset Configuration Data:**

Normally, you leave this field Disabled. Select "Enabled" to reset the Extended System Configuration Data (ESCD) when you exit Setup and you have installed a new add-on and the system reconfiguration has caused such a serious conflict that the operating system cannot boot.

Options - Enabled, Disabled.

◆ **Resources Controlled By:**

This item allows you to automatically configure all the boot- and Plug and Play-compatible devices. If you select Auto, all the interrupt request (IRQ) and DMA assignment fields are cleared, as the BIOS automatically assigns them.

Options – Auto(ESCD), Manual

◆ **IRQ Resources**

When you are controlling resources manually, assign each system interrupt a type, depending on the type of device using the interrupt.

◆ **PCI/VGA Palette Snoop**

Leave this field at "Disabled".

Options- Enabled, Disabled.

◆ *PC Health Status*

Phoenix - AwardBIOS CMOS Setup Utility
PC Health Status

Shutdown Temperature	[Disabled]	Item Help
CPU Warning Temperature	[Disabled]	_____
SYS Temp	33ºC/ 91ºF	
CPU Temp	20ºC/ 68ºF	Menu Level ➢
CPU Fan	8231 RPM	
CPU Vcore	1.00V	
+1.05V	1.04V	
+1.8V	1.82V	
+5V	5.01V	
+12V	11.67V	
VCC (V)	3.24V	
VBAT (V)	3.16V	
+3.3VSB	3.24V	

↑↓→←Move **Enter**: Select **+/-/PU/PD**: Value **F10**: Save **ESC**: Exit **F1**: General Help
F5: Previous Values **F6**: Fail-safe defaults **F7**: Optimized Defaults

Table 4-17. PC Health Status

◆ **Shutdown Temperature**

This item allows you to set up the CPU shutdown Temperature.

Options - Disabled, 60°C, 140°F, 65°C, 149°F, 70°C, 158°F

◆ **CPU Warning Temperature**

Sets the CPU warning temperature.

◆ *Frequency/Voltage Control*

Phoenix - AwardBIOS CMOS Setup Utility
Frequency/Voltage Control

CPU Clock Ratio [10 X]	Item Help
	_____
	Menu Level ➢
↑↓→←Move **Enter**: Select **+/-/PU/PD**: Value **F10**: Save **ESC**: Exit **F1**: General Help	
F5: Previous Values **F6**: Fail-safe defaults **F7**: Optimized Defaults	

Table 4-18. Frequency/Voltage Control

◆ **CPU Clock Ratio:**

By default, the CPU Clock Ratio, is set to 10X.

◆ *Load Fail-Safe Defaults*

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 operation.

◆ *Load Optimized Defaults*

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 which are the factory settings for optimal-performance system operation.

◆ *Supervisor/User Password Setting*

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

Supervisor: is allowed to enter Setup and change the options.
User: is allowed to enter Setup but not to change the options.

When you select either function, the following message will appear at the center of the screen to assist you in creating a password.
ENTER PASSWORD:

Type the new password, up to eight characters in length, and press <Enter>. The new password will clear any previously entered password from CMOS memory. You will be asked to confirm the password. Type the password again and press <Enter>. You may also press <Esc> to abort the change.

To disable a password, just press <Enter> when you are prompted to enter the password. A message will confirm that password protection will be disabled. Once the password is disabled, the system will boot and you can enter Setup freely.
PASSWORD DISABLED.

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

You can determine when the password is requested in the BIOS Features Setup Menu and its Security option (see above). If the Security option is set to "System", a password will be required both at boot and on entry into Setup. If set to "Setup", a password is required only when trying to enter Setup.

◆ *Exit Selection*

◆ Save & Exit Setup

Pressing <Enter> on this item asks for confirmation:
Save to CMOS and EXIT (Y/N)? Y

Pressing "Y" stores the selections you made in CMOS - a special section of memory that 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 values, the system is restarted.

◆ Exit Without Saving

Pressing <Enter> on this item asks for confirmation:
Quit without saving (Y/N)? Y

This allows you to exit Setup without storing any changes in CMOS. The previous selections remain in effect. This exits the Setup utility and restarts your computer.

Chapter 5

◆ Driver Installation

Contents

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◆ Overview

This chapter provides information on installing the necessary drivers for the KEEX-2010. The following sections describe driver installation procedures for Windows operating systems. Download the drivers from the Quanmax website and install them in the order they are listed below. For other operating systems, please contact Quanmax.

Note: Driver downloads and additional information are available under *Downloads* on our web site: **www.quanmax.com.**

◆ Chipset Driver Installation

Install the graphics driver by running the file "setup.exe" in **VIA_HyperionPro_KEEX-2010.zip**. After installation is complete, reboot the system.

◆ Graphics Driver Installation

Install the graphics driver by running the file "setup.exe" in **Graphics_KEEX-2010.zip**. After installation is complete, reboot the system.

◆ LAN Driver Installation

Download and extract the contents of **LAN_KEEX-2010.zip**. Install the **Marvell LAN Driver** (version 7.24.1.3) by using the Windows"Device Manager". Select the Ethernet controller marked with an exclamation mark ("!") under "Other Devices" and install the appropriate driver for your operating system.

◆ Audio Driver Installation (optional)

If you are using the optional **KEDB-1000 Audio Daughter Board**, download and extract the contents of **Audio_KEDB-1000.zip**. Install the driver by running "WDM_R189.exe". After installation is complete, reboot the system.

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Appendix A

◆ System Resources

Contents

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◆ *Interrupt Request (IRQ) Lines*

IRQ #	Used For	Comment
0	Timer0	
1	keyboard controller	
2	Cascade	
3	COM2	Note (1)
4	COM1	Note (1)
5	COM3 , COM4	Note (1)
6	Floppy disk controller	Note (1)
7	free	
8	Real Time Clock	
9	ACPI-Compliant System	
10	free	
11	free	
12	PS/2 Mouse	Note (1)
13	Floating point unit (FPU / NPU / Math coprocessor)	
14	Primary IDE channel	Note (1)
15	Secondary IDE channel	Note (1)

Table A-1. IRQ Assignments

Note: If the "Used For" device is disabled in setup, the corresponding interrupt is available for other devices.

◆ *DMA Channels*

DMA #	Used for	Available	Comment
0		Yes	
1		No	Note (1)
2	FDC	No	
3		No	
4	Cascade	No	
5		No	
6		Yes	
7		Yes	

Table A-2. DMA Assignments

Note: If the "Used For" device is disabled in setup, the corresponding interrupt is available for other devices.

◆ Memory Mapping

Upper Memory	Used for	Comment
C0000h - CFFFFh	VGA BIOS	
D0000h – D1FFFh	LAN PXE	
E0000h - FFFFFh	System BIOS	

Table A-3. Memory Mapping

◆ I/O Address Map

I/O Address	Used for	Comment
00h – 0Fh C0h – DFh	8237DMA Controller	
20h , 21h	8259A PIC	
2Eh, 2Fh	SuperIO Access Port	
A0h, A1h	8259A PIC	
40h – 43h (XT/AT) 44h – 47h (PS/2)	8254PIT	
60h – 64h	KeyBoard Controller	
90h – 96h	PS/2 P OS	
F0h – FFh	Math Co-Processor,X87 Unit	
170h – 177h	Secondary IDE	
1F0h – 1F7h	Primary IDE	
295h, 296h	HW Monitor Access Port	
279h , A79h	Plug and Play Configuration Register	
2E8h – 2EFh	COM4	
2F8h – 2FFh	COM2	
3B0h – 3BFh	MDA / MGA	
3C0h – 3CFh	EGA / VGA	
3D4h – 3D9h	CGA/CRT Register, Controller and Palette Register	
3E8h – 3EFh	COM3	
3F0h – 3F7h	Floppy Diskette	
3F6h, 3F7h	Enhanced IDE	
3F8h – 3FFh	COM1	
0CF8h	PCI Configuration Register/Address	
0CFCh	PCI Configuration Register/data	

Table A-4. I/O Address Map

◆ *PCI Devices*

PCI Device	PCI Interrupt	Comment
South Bridge	-	Uses an internal REQ/GNT pair

Table A-5. PCI Devices

◆ *PCI Express Devices*

PCIe Device	PCIe Interrupt	Comment
Slot1	INTA	
LAN1	INTH	

Table A-6. PCI Devices

◆ *Inter-IC Bus (I^2C)*

I2C Address	Used For	Comment
A0h	DDR SO-DIMM	

Table A-7. Inter-IC Bus (I^2C)

◆ *ISA I/O Port*

I2C Address	Used For	Comment
2Eh	Super I/O	
2Eh	WatchDog Timer	use F5h register in Super I/O

Table A-8. ISA I/O Port