AIMB-640

Socket 478 miniATX SBC

User Manual

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This manual is for the AIMB-640.

Part No. 2006064011   2nd Edition

Printed in Taiwan   May. 2005

Packing List

Before you begin installing your card, please make sure that the following materials have been shipped:

- 1 AIMB-640 SBC
- 1 Startup manual
- 1 Utility CD
- 1 UDMA/66 40pin IDE flat cable   p/n:1701400452
- 1 DMA/33 IDE 40 to 44pin IDE flat cable p/n:1701440350
- 1 COM port cable 45cm   p/n:1701140201
- 1 Jumper pack   p/n:9689000068
- 1 I/O port shield   p/n:1960003633
- 4 COM port cable kit 18CM   p/n:1701400181

Optional Accessories

- 1 USB cable (2.54mm)   p/n: 1700000719
- 1 FDD cable   p/n: 1700340640
- 2 Serial ATA HDD cable   p/n: 1700071000
- 4 COM port cable kit 45CM   p/n:1700000447

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

Model No. List   Description

AIMB-640F-00A2E	Socket 478 SBC, with Dual LAN/ DVI/TV-out/SATA/6COM
AIMB-640L-00A2E	Socket 478 SBC, with Single LAN/6COM
AIMB-640G-00A2E	Socket 478 SBC, with GigaLAN/DVI/TV-out/ SATA/6COM
AIMB-640L-S2A2E	AIMB-640L-00A2E with Mobile Celeron 1.2G
AIMB-640L2-00A2E	AIMB-640L-00A2E with Intel® 852GM

Additional Information and Assistance

1.Visit the Advantech web site at **www.advantech.com** where you can find the latest information about the product.

2.Contact your distributor, sales representative, or Advantech's customer service center for technical support if you need additional assistance.

Please have the following information ready before you call:

•Product name and serial number

•Description of your peripheral attachments

•Description of your software (operating system, version, application software, etc.)

•A complete description of the problem

•The exact wording of any error messages

FCC

This device complies with the requirements in part 15 of the FCC rules: Operation is subject to the following two conditions:

1.This device may not cause harmful interference, and

2.This device must accept any interference received, including interference that may cause undesired operation

This equipment 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 instruction manual, may cause harmful interference to radio communications. Operation of this device in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his/her own expense. The user is advised that any equipment changes or modifications not expressly approved by the party responsible for compliance would void the compliance to FCC regulations and therefore, the user's authority to operate the equipment.

Caution!

Achtung!

There is a danger of a new battery exploding if it is incorrectly installed. Do not attempt to recharge, force open, or heat the battery. Replace the battery only with the same or equivalent type recommended by the manufacturer. Discard used batteries according to the manufacturer's instructions

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General Information

This chapter gives background information on the AIMB-640.

Sections include:

- Introduction
- Features
- Specifications
- Board layout and dimensions

Chapter 1 Introduction

1.1 Introduction

The AIMB-640 is a Socket 478 miniATX SBC (Single Board Computing) with a high performance and lower power based on Pentium 4/ Celeron D processors. The AIMB-640, in conjunction with Intel® 852GME chipset, supports processors clocked at up to 3.06GHz, six USB 2.0 compatible ports, a PCI Fast or Gigabit Ethernet interface, Hirose connector support 2 channel (36 bit) LVDS LCD panel, and support CRT+LVDS,DVI+LVDS,CRT+DVI combination display, and accommodate up to 2GB of ECC DDR RAM memory.
The AIMB-640 adopts the new form factor "miniATX" which can be compatible with EmbATX/MicroATX mounting hole but with smaller size. Moreover,AIMB-640 has the high expansion ability,such as PCI,CF and miniPCI etc, therefore, AIMB-640 has full function and general application.

1.2 Features

- AIMB-640 is compatible with EmbATX/MicroATX

- Supports Socket 478 Pentium® 4/Celeron® D

- Intel® 852GME supports DDR 266/333 SDRAM, Intel® 852GM supports DDR 200/266 SDRAM

- Intel® 852GME chipset 400/533 MHz FSB, Intel® 852GM chipset 400 MHz FSB

- Integrated Graphic

- Dual Display Function support CRT + LVDS, DVI + LVDS

- Supports 2 10/100Base-T Ethernet or 2 10/100/1000Base-T Ethernet, 6 USB 2.0 ports, 6 COM, 3 PCI slots and 1 mini PCI

- Supports 2 Serial ATA devices

- Supports TV Out

1.3 Specifications

1.3.1 Standard SBC Functions
• **CPU:** 478 support Intel® Celeron D Pentium 4
• **System Memory:** DDR DIMM *2, Max.2 GB
• **2nd Cache Memory:** Depends 256KB on the Celeron D 335 processor/ 512KB on the Pentium 4 processor
• **System Chipset:** Intel® 852GME or Intel® 852GM/ ICH4 chipset
• **BIOS:** 4 Mbit Flash BIOS
• **Watchdog timer:** 255 levels timer interval
• **Expansion Interface:** 3 x PCI slots, 1 x miniPCI socket
• **Battery:** Lithium 3V/220 mAH
• **Power management:** Supports Advanced Power Management, ACPI compliant.
• **IDE interface:** One channels supports up to two IDE devices. PIO mode 3, 4 with Bus Mastering up to 14MB/sec, supports UDMA 100 mode up to 100MB/sec
• **FDD Interface:** Supports various type of FDD
• **Serial ports:** Six serial RS-232 ports, COM1,3~6: RS-232, COM2: RS-232/422/485
• **Parallel port:** One parallel port, supports SPP/EPP/ECPmode
• **Keyboard/mouse connector:** PS/2 Keyboard connector
• **Audio:** Support AC97 Audio stereo sound
• **USB:** Six USB 2.0 compliant universal serial bus ports
     -4 ports on board (external)
     -2 ports pin header (internal)
• Solid State Disk (SSD) Supports one 50-pin socket for CFC type I/II

1.3.2 VGA/LVDS Interface
• **Chipset:** Intel® 852GME or Intel® 852GM/ICH 4
• **Memory Size:** Optimized Shared Memory Architecture, support up to 64MB frame buffer using system memory
• **Resolution:**
     CRT display Mode: pixel resolution up to 1600 x 1200 @85-Hz and 2048 x 536 @75Hz
     LVDS display Mode: up to UXGA panel resolution with frequency range from 25-MHz to 112-MHz
• **Dual Independent Display:** CRT/LVDS/DVI
• **LVDS:** support 2 channel 36/48 bits LVDS Panel

• **Combination:** CRT+LVDS,DVI+LVDS,CRT+DVI

1.3.3 Ethernet Interface
• **Chipset supports:** 10/100Mbps - Intel 82551ER
10/100/1000Mbps - Intel 82541PI
• **Ethernet Interface:** IEEE 802.3u (100Base-T) protocol compatible or
IEEE 802.3 z/ab (1000Base-T)

1.3.4 Audio Function
• **Chipset:** Intel® 82801DB I/O Controller Hub 4 (ICH4)

• **Audio controller:** Support AC97 3D Audio stereo sound

• **Audio interface:** Microphone in, line out

1.3.5 Mechanical and Environmental
• **Dimensions:** 244 x 180 mm
• **Power Supply Type:** ATX
• **Power Requirement:** +5V ±5%, +12V ±5%(Optional), +5V for ATX
mode
• **Power Consumption:**

   (Pentium 4 3.06G, 256MB DDR266)
   Max(HCT):1.46A@5V, 5.93A@12V
   Typical:1.44A@5V, 5.46A@12V

   (Celeron D 2.66G, 256MB DDR266)
   Max(HCT):1.46A@5V, 5.59A@12V
   Typical:1.46A@5V, 5.48A@12V

   (Celeron 2.0G, 256MB DDR266)
   Max(HCT):1.46A@5V,4.14A@12V
   Typical:1.42A@5V, 4.14A@12V

• **Operating temperature:** 0 ~ 60°C   (32 ~ 140°F)

• **Weight:** 0.85 kg (reference weight of single board)

1.4 Board layout: dimensions
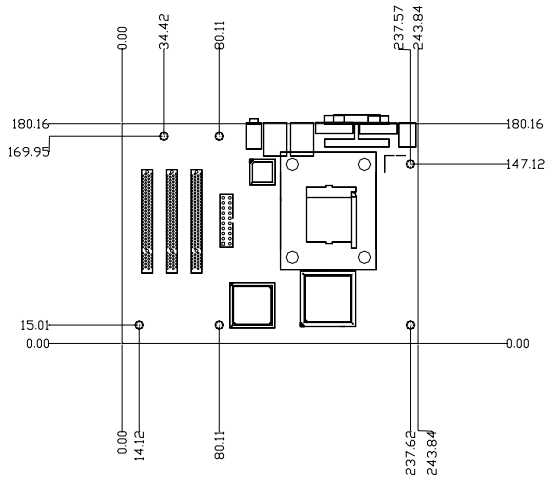
Figure 1.1: Board layout: Dimensions (Component Side)

Installation

This chapter explains the setup procedures of the AIMB-640 hardware, including instructions on setting jumpers and connecting peripherals, switches and indicators. Be sure to read all safety precautions before you begin the installation procedure.

Chapter 2 Installation

2.1 Jumpers

The AIMB-640 has a number of jumpers that allow you to configure your system to suit your application. The table below lists the functions of the various jumpers.

2.1.1 Jumper Location
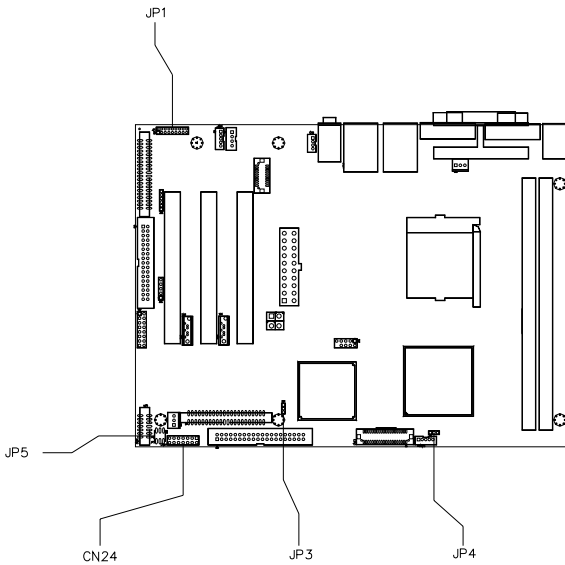
Table 2.1: Jumpers

Label	Function
JP1	COM Port 1~6 Voltage Select Connector
JP3	Clear CMOS Jumper
JP4	LVDS/LCD Power Select
JP5	Com2 (RS232/422/485) Select Connector
CN24	Front Panel Connector

2.1.2 Jumper Settings

2.1.2.1 LVDS/LCD Power Select (JP4)

Table 2.2: LVDS/LCD Power Select		
JP4	**LVDS/LCD POWER**	***: Default value 3.3V**
Close pins	Result	
1-2	5V	
2-3	3.3V	

2.1.2.2 Com2 (RS232/422/485) Select Connector (JP5)

Table 2.3:	*Com2 (RS232/422/485) Select Connector(JP5)*
JP5	**COM2 (RS232/422/485)Select Jumper**
Close pins	COM2
1-2	RXD485
3-4	RXD422
5-6	RXD232 (Default: Close)

2.1.2.3 Clear CMOS Jumper (JP3)

Table 2.4:	*Clear CMOS Jumper (JP3)*	
JP3	**Clear RTC**	***: Default value (1-2)**
Close pins	Result	
1-2	NORMAL	
2-3	CLEAR RTC	

2.2 Connectors

On-board connectors link the AIMB-640 to external devices such as hard disk drives, a keyboard, or floppy drives. The table below lists the function of each connectors.

Table 2.5: Connectors

Label	Function
CN1	CRT Connector
CN2	COM1 Connector
CN3	LPT Connector
CN4	TV-OUT Connector (Option)
CN6	Audio Connector
CN7	KB/MS Connector
CN9	LAN2+USB 3/4 Connector
CN10	LAN1+USB 1/2 Connector
CN25	Panel Inverter Connector
CN5	CD-In Connector
CN8	Internal Speaker Connector
CN12	DVI Connector
CN19	Internal USB 5/6 Port Connector
CN16	SIR Connector
CN27	Compact Flash Connector
CN22	Primary IDE Connector
CN20	Secondary IDE Connector
CN14	Floppy Connector
CN21	COM 2 Connector
CN11	COM 3~6 Connector
CN18	Digital IO Connector
CN26	Mini PCI Connector
SA1	SATA 1 Connector
SA2	SATA 2 Connector
CN15	ATX Power Connector
CN17	ATX12V Power Connector

Table 2.5: Connectors

CN23	LVDS Connector
FAN2	SYSTEM FAN
FAN1	CPU FAN
PCI1	PCI SLOT
PCI2	PCI SLOT
PCI3	PCI SLOT

2.3 Locating Connectors
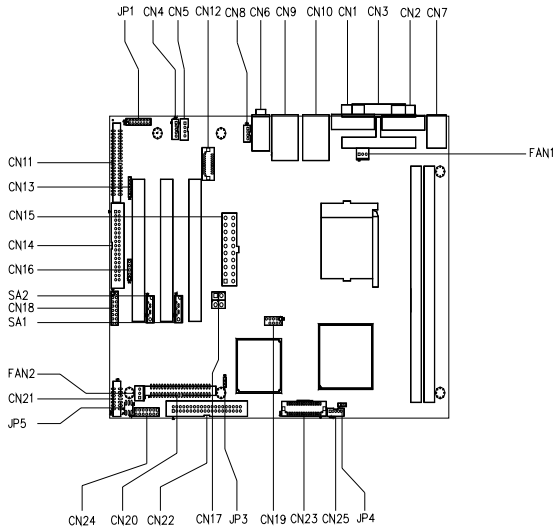
Figure 2.1: Jumpers and Connectors Drawing (component side)
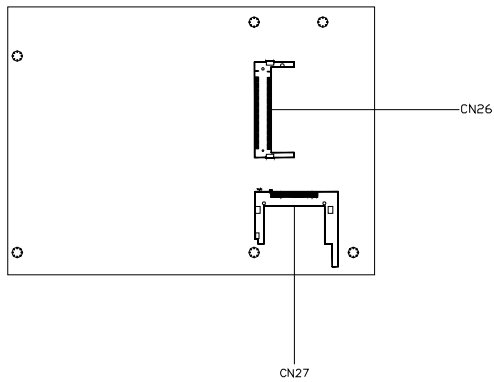
Figure 2.2: Connectors (solder side)

2.4 Setting Jumpers

You may configure your board to match the needs of your application by setting jumpers. A jumper is a metal bridge used to close an electric circuit. It consists of two metal pins and a small metal clip (often protected by a plastic cover) that slides over the pins to connect them. To "close" a jumper, you connect the pins with the clip. To "open" a jumper, you remove the clip. Sometimes a jumper will have three pins. In this case you would connect either pins 1 and 2, or 2 and 3.
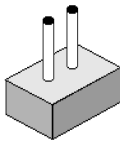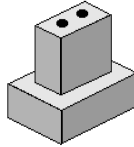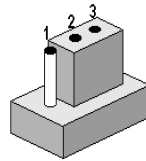
| open | closed | closed 2-3 |

The jumper settings are schematically depicted in this manual as follows:.
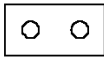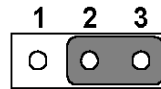
| open | closed | closed 2-3 |

A pair of needle-nose pliers may be helpful when working with jumpers.

If you have any doubts about the best hardware configuration for your application, contact your local distributor or sales representative before you make any changes.

Generally, you simply need a standard cable to make most connections.

2.5 Installing DDR DIMM

The procedures for installing DDR DIMMs are described below. Please follow these steps carefully. You can install SDRAM memory modules using 184-pin DDR DIMMs (Small Outline Dual In-line Memory Modules).

1.   Ensure that all power supplies to the system are switched off.

2.   Tilt the DDR DIMM card approximately above the board, and move it in the direction of the housing card slot. Make sure that the key in the module and the key in the housing are aligned.

3.   Push the module into the socket until the module bottoms. There should be a slight insertion force to engage the module into the contacts.

2.6 IDE Drive Connectors (CN20,22)

The board provides two IDE connectors, are for connecting IDE drives to the motherboard.

The IDE controller on the motherboard supports IDE

devices running in all modes up through ATA-100. There are two IDE

drive connectors. Each connector supports two drives, a "Master" and a "Slave" which connect to the motherboard with a ribbon cable. The supplied cable supports transfer modes through ATA-100.

2.6.1 Connecting the hard drive

Connecting drives is done in a daisy-chain fashion. This package includes One 44PIN IDE cable that can connect to 1.8" and 2.5" drives.

1.   Connect one end of the cable to Hard Drive connector. Make sure that the red (or blue) wire corresponds to pin 1 on the connector, which is labeled on the board.

2.   Plug the other end of the cable into the Enhanced IDE hard drive, with pin 1 on the cable corresponding to pin 1 on the hard drive. (See your hard drive's documentation for the location of the connector.)

If desired, connect a second drive as described above.

Unlike floppy drives, IDE hard drives can connect to either end of the cable. If you install two drives, you will need to set one as the master and one as the slave by using jumpers on the drives. If you install only one drive, set it as the master.

2.7 Solid State Disk

The board provides a CompactFlash™ card type I/II socket.

2.7.1 CompactFlash (CN27)
The CompactFlash card shares a secondary IDE channel which can be enabled/disabled via the BIOS settings.

2.8 LPT connector (CN3)

Normally, the parallel port is used to connect the Boardto a printer. The board includes a multi-mode (ECP/EPP/SPP) parallel port accessed via CN3 and a 26-pin flat-cable connector. You will need an adapter cable if you use a traditional DB-25 connector. The adapter cable has a 26-pin connector on one end, and a DB-25 connector on the other.

The parallel port is designated as LPT1.

The parallel port interrupt channel is designated to be IRQ7.

You can select EPP/ECP DMA channel via BIOS setup.

2.9 Keyboard and PS/2 mouse connector (CN7)

The board provides a keyboard connector that supports both a keyboard and a PS/2 style mouse. In most cases, especially in embedded applications, a keyboard is not used. If the keyboard is not present, the standard PC/AT BIOS will report an error or fail during power-on self-test (POST) after a reset. The AIMB-640's BIOS standard setup menu allows you to select "All, But Keyboard" under the "Halt On" selection. This allows no-keyboard operation in embedded system applications, without the system halting under POST.

2.10 Audio interfaces (CN6)

2.10.1 Audio connector (CN6)
The board provides all major audio signals on a 13-pin cable connector, These audio signals include Microphone in (mono), Line in (stereo) (Option) and Line out (stereo).

2.11 COM port connector (CN2,CN21,CN11)

The AIMB-640 provides six serial ports COM1 in one DB-9 connector in one DB-9 connector and COM2 in 14-pin dual-inline and COM3~6 in 40-pin dual-inline., male header. It provides connections for serial devices (a mouse, etc.) or a communication network. You can find the pin assignments for the COM port connector in Appendix B.

2.11.1 COM2 RS-232/422/485 setting (JP5)

COM2 can be configured to operate in RS-232, RS-422, or RS-485 mode. This is done via JP5

Table 2.6: JP5: COM2 (RS232/422/485) Select Jumper

Setting	Function
1-2	RXD485
3-4	RSD422
5-6	RXD232 (Default: Close)

2.12 LVDS connections (CN23)

The board supports 2 channel 36-bit (48-bit optional) LVDS LCD panel displays. Users can connect to either an 36-bit or 48-bit LVDS LCD on it.

2.13 USB and LAN ports

The board provides up to six USB (Universal Serial Bus) ports, which gives complete Plug & Play and hot swapping for up to 127 external devices.The USB interface complies with USB Specification Rev. 2.0 support transmission rate up to 480 Mbps. The USB interface can be disabled in the system BIOS setup.The AIMB-640 is equipped with one or two high-performance Ethernet interfaces, which are fully compliant with IEEE 802.3/u 10/100 Mbps CSMA/CD standards. Also, the board provides the option of supporting single or dual 10/10/1000 Mbps Ethernet LANs. They are supported by all major network operating systems. The RJ-45 jacks on the rear plate provide convenient 10/100 Base-T or 10/100/1000 Base-T RJ45 operation which is equipped with a high performance 32-bit PCI-bus Ethernet interface which is fully compliant with IEEE 802.3U 10/100Mbps and IEEE 802.3 z/ab 1000BASE-T standards. It is supported by all major network operating systems.

2.13.1 10/100Base-T/1000Base-T connector (CN9, CN10)

100Base-T connections are made via the on-board RJ-45 connector

2.13.2 Network boot (Depends on Ethernet Controller)

The Network Boot feature can be utilized by incorporating the Boot ROM image files for the appropriate network operating system. The Boot ROM BIOS files are included in the system BIOS, which is on the utility CD disc.

2.14 CRT Connector (CN1)

The board includes a VGA interface that can drive conventional CRT displays. CN1 is a standard 15-pin D-SUB connector commonly used for VGA. Pin assignments for CRT connector CN1 are detailed in Appendix B

2.15 TV-OUT (CN4)(Option)

The board include a TV-OUT connector enable to display the PC on your Television via S-Video.

2.16 CD-IN Connector (CN5)

The CD IN is a connector for CD-ROM to input the audio signal.

2.17 Floppy Disk Drive Connector (CN14)

The floppy disk drive connector supports connecting one floppy disk drive to the motherboard. The "Floppy" drive connector uses a standard FDD ribbon cable. The floppy disk drive connected to the end of the cable will function as Drive A. A second drive can be added as DriveB: if required.

2.18 CPU & System Fan Connectors (FAN1, FAN2)

The board supports one CPU cooling fan connector and one systemhousing cooling fan connector on the motherboard. All the connectors are 3-pin headers. Both the CPU and system fan connectors support fan speed monitoring. A temperature monitor detects the CPU and internal system temperatures, which are displayed in the PC Health section of the CMOS Setup Utility. You can set a system shutdown temperature in that section

that will automatically shut down the computer to protect the CPU if it reaches one of the three temperature options listed.

2.19 ATX Power Connectors (CN15, CN17)

There are two power connectors on the motherboard for leads from an ATX power supply. The power supply leads plug into the connectors. The connector designs prevent incorrect orientation. There are two connectors, the standard 20-pin ATX connector and the extra ATX12V 4-pin connector which supplies additional 12-volt current.

2.20 Internal USB 5/6 Port Connector (CN19)

The board provides two additional Hi-Speed USB 2.0 ports that have their own Root Hub. they are directly on the board for connecting internal USB 2.0 devices.

2.21 PCI Slots (PCI1, PCI2, PCI3)

This motherboard has three Bus Master capable PCI expansion slots. The slots are 32-bit, 33MHz slots and are PCI 2.2-compliant. The slots provide a fast high-bandwidth pathway between the motherboard and expansion cards.

2.22 Panel Inverter Connector (CN25)

The board provides a Panel Inverter Connector.

2.23 Internal Speaker Connector (CN8)

The board provides a 4-pin connector for an internal speaker.

2.24 DVI Connector (CN12)

The board provides a DVI connector allows you to maximize the quality of flat panel LCD monitors.

2.25 SATA Connectors (SA1, SA2)

The board provides two SATA connectors. SATA connector provides the opportunity for devices to be plugged.

2.26 Digital I/O Connector (CN18)

The board supports 8-bit GPIO through DIO connector. The 8 digital in- and out-puts can be programmed to read or control devices, with input or out- put defined. The default setting is 4 bits input and 4 bits output.

Chipset Software
Installation Utility

Chapter 3 Chipset Software Installation Utility

3.1 Before you begin

To facilitate the installation of the enhanced display device drivers and utility software, you should read the instructions in this chapter carefully before you attempt installation. The device drivers for the board are located on the software installation CD. The auto-run function of the driver CD will guide and link you to the utilities and device drivers under a Windows system. Updates are provided via Service Packs from Microsoft*.

Note: *The files on the software installation CD are compressed. Do not attempt to install the drivers by copying the files manually. You must use the supplied SETUP program to install the drivers.*

Before you begin, it is important to note that most display drivers need to have the relevant software application already installed in the system prior to installing the enhanced display drivers. In addition, many of the installation procedures assume that you are familiar with both the relevant software applications and operating system commands. Review the relevant operating system commands and the pertinent sections of your application software's user's manual before performing the installation.

3.2 Introduction

The Intel® Chipset Software Installation (CSI) utility installs to the target system the Windows INF files that outline to the operating system how the chipset components will be configured. This is needed for the proper functioning of the following features:

- Core PCI and ISA PnP services.
- USB 1.1 support (USB 2.0 driver needs to be installed separately. By OS difference, 2K, XP using service padc and 98/ME using device driver on CD)
- Identification of Intel® chipset components in the Device Manager.

- Integrates superior video features. These include filtered sealing of 480 x 720 pixel DVD content, and MPEG-2 motion compensation for software DVD

3.3 Installing the CSI Utility

1.   Insert the driver CD into your system's CD-ROM drive. In a few seconds, the cd main menu appears. Move to "\\AIMB-640\1_FIRST_INST". And click "INFINST_ENU" icon..
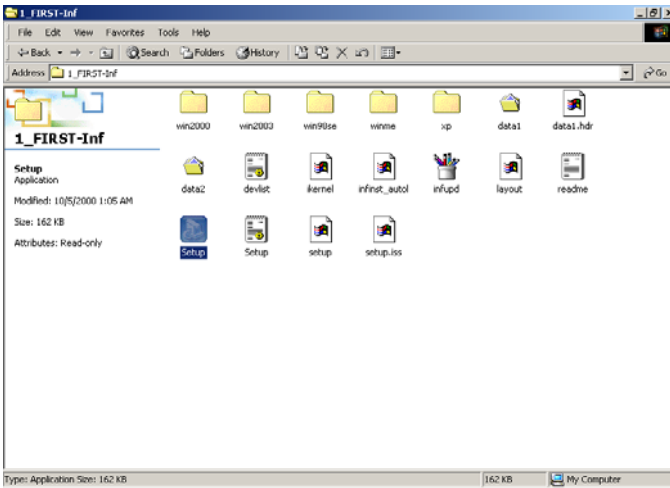
2.   Click "Next" when you see the following message.
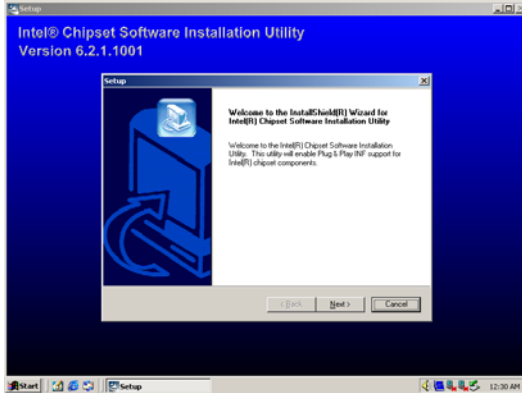
3.   Click "Yes" when you see the following message.
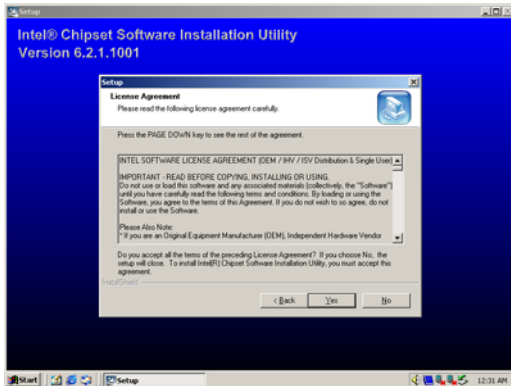
4. Click "Next" when you see the following message.
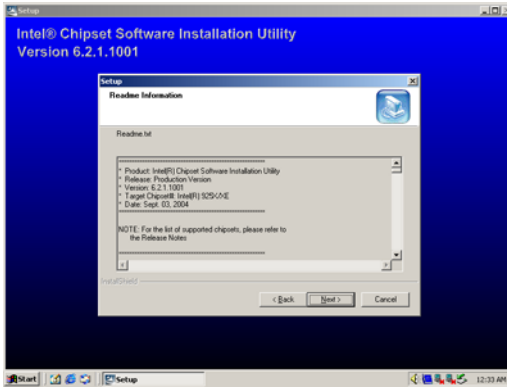
5. When the following message appears, click "Finish" to complete the installation and restart Windows.
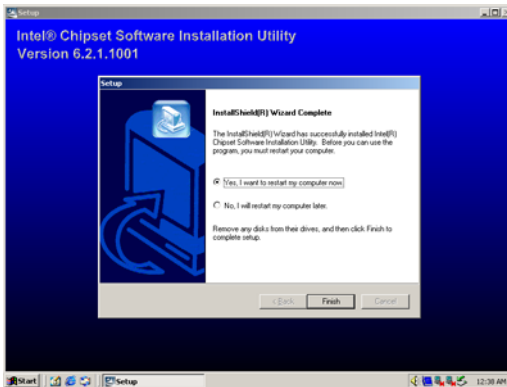
Award BIOS Setup

Chapter 4 Award BIOS Setup

4.1 Introduction

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

4.1.1 CMOS RAM Auto-backup and Restore

The CMOS RAM is powered by an onboard button cell battery. When you finish BIOS setup, the data in CMOS RAM will be automatically backed up to Flash ROM. If operation in harsh industrial environment cause a soft error, BIOS will recheck the data in CMOS RAM and automatically restore the original data in Flash ROM to CMOS RAM for booting.

> *Note:*   *If you intend to change the CMOS setting without restoring the previous backup, you have to click on "DEL" within two seconds of the "CMOS checksum error..." display screen message appearing. Then enter the "Setup" screen to modify the data. If the "CMOS checksum error..."message appears again and again, please check to see if you need to replace the battery in your system.*

4.2 Entering Setup

Turn on the computer and check for the "patch code". If there is a number assigned to the patch code, it means that the BIOS supports your CPU.

If there is no number assigned to the patch code, please contact Advantech's applications engineer to obtain an up-to-date patch code file. This will ensure that your CPU's system status is valid. After ensuring that you have a number assigned to the patch code, press <Del> to allow you to enter the setup.

Figure 4.1: Award BIOS Setup initial screen

4.3 Standard CMOS Setup

Choose the "Standard CMOS Features" option from the "Initial Setup Screen" menu, and the screen below will be displayed. This menu allows users to configure system components such as date, time, hard disk drive, floppy drive, display, and memory.
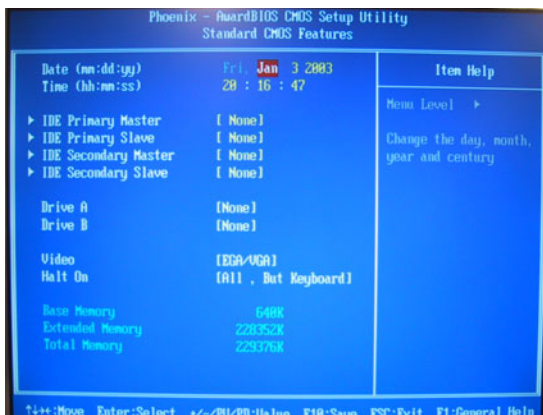
Figure 4.2: Standard CMOS features screen

4.4 Advanced BIOS Features

The "Advanced BIOS Features" screen appears when choosing the "Advanced BIOS Features" item from the "Initial Setup Screen" menu. It allows the user to configure the AIMB-640 according to his particular requirements. Below are some major items that are provided in the Advanced BIOS Features screen. A quick booting function is provided for your convenience. Simply enable the Quick Booting item to save yourself valuable time.
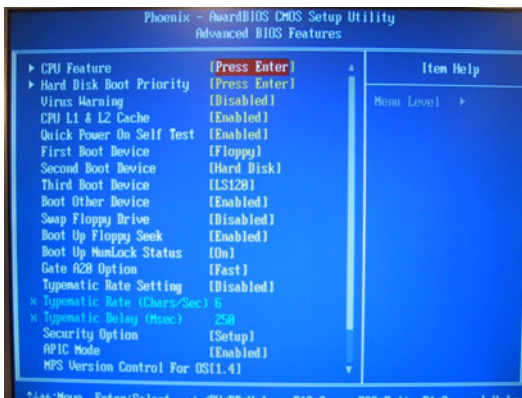
Figure 4.3: Advanced BIOS features screen

4.4.1 Virus Warning

If enabled, a warning message and alarm beep activates if someone attempts to write here. The commands are "Enabled" or "Disabled."

4.4.2 L1 & L2 Cache

Enabling this feature speeds up memory access. The commands are "Enabled" or "Disabled."

4.4.3 Quick Power On Self Test

This option speeds up the Power-On Self Test (POST) conducted as soon as the computer is turned on. When enabled, BIOS shortens or skips some of the items during the test. When disabled, the computer conducts nor- mal POST procedures.

4.4.4 First/Second/Third/Other Boot Device

The BIOS tries to load the OS with the devices in the sequence selected.

Choices are: Floppy, LS/ZIP, HDD, SCSI, CDROM, LAN, Disabled.

4.4.5 Swap Floppy Drive

Logical name assignments of floppy drives can be swapped if there is more than one floppy drive. The commands are "Enabled" or "Disabled."

4.4.6 Boot UP Floppy Seek

Selection of the command "Disabled" will speed the boot up. Selection of "Enabled" searches disk drives during boot up.

4.4.7 Boot Up NumLock Status

This feature selects the "power on" state for NumLock. The commands are "Enabled" or "Disabled."

4.4.8 Gate A20 Option

Normal: A pin in keyboard controller controls GateA20

Fast (Default):   Chipest controls GateA20.

4.4.9 Typematic Rate Setting

The typematic rate is the rate key strokes repeat as determined by the keyboard controller. The commands are "Enabled" or "Disabled." Enabling allows the typematic rate and delay to be selected.

4.4.10 Typematic Rate (Chars/Sec)

BIOS accepts the following input values (characters/second) for typematic rate: 6, 8, 10, 12, 15, 20, 24, 30.

4.4.11 Typematic Delay (msec)

Typematic delay is the time interval between the appearance of two consecutive characters, when holding down a key. The input values for this category are: 250, 500, 750, 1000 (msec).

4.4.12 Security Option

This setting determines whether the system will boot up if the

password is denied. Access to Setup is always limited.

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 SET-*
>   *TING" in the main menu. At this point, you will*
>   *be asked to enter a password. Simply press*
>   *<Enter> to disable security. When security is*
>   *disabled, the system will boot, and you can*
>   *enter Setup freely.*

4.4.13 APIC Mode

This setting allows selecting an OS with greater than 64MB of RAM. Commands are "Non-OS2" or "OS2."

4.4.14 MPS Version Control For OS

This reports if an FDD is available for Windows 95. The commands are "Yes" or "No."

4.5 Advanced Chipset Features

By choosing the Advanced Chipset Features option from the Initial Setup Screen menu, the screen below is displayed. This sample screen contains the manufacturer's default values for the AIMB-640 Series.

Figure 4.4: Advanced Chipset Features setup

4.6 Integrated Peripherals

4.6.1 IDE Master/Slave PIO/UDMA Mode,

IDE Primary (Secondary) Master/Slave PIO/UDMA Mode (Auto) Each channel (Primary and Secondary) has both a master and a slave, making four IDE devices possible. Because each IDE device may have a different Mode timing (0, 1, 2, 3, 4), it is necessary for these to be independent. The default setting "Auto" will allow auto detection to ensure optimal performance.

4.6.2 On-Chip Primary/Secondary PCI IDE

If you enable IDE HDD Block Mode, the enhanced IDE driver will be enabled. Leave IDE HDD Block Mode on the default setting.
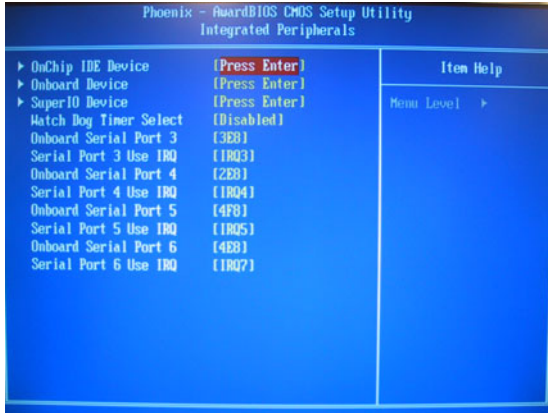
Figure 4.5: Integrated peripherals

4.6.3 IDE HDD Block Mode

You can enable the Primary IDE channel and/or the Secondary IDE channel. Any channel not enabled is disabled. This field is for systems with only SCSI drives.

4.6.4 USB Controller

Select Enabled if your system contains a Universal Serial Bus (USB) controller and you have USB peripherals. The choices: Enabled, Disabled.

4.6.5 USB Keyboard/Mouse Support

Select Enabled if user plan to use an USB keyboard. The choice: Enabled, Disable.

4.6.6 AC97 Audio

Select Disable if you do not want to use AC-97 audio.   Option is Auto, Disable.

4.6.7 Init Display First

This item allows you to choose which one to activate first, PCI Slot or on-chip VGA. The choices: PCI Slot, Onboard.

4.6.8 Onboard FDC Controller

When enabled, this field allows you to connect your floppy disk drives to the onboard floppy disk drive connector instead of a separate controller card. If you want to use a different controller card to connect the floppy disk drives, set this field to Disabled.

4.6.9 Onboard Serial Port

This field sets the address of the on-board serial port connector. You can select 3E8/IRQ3, 2E8/IRQ4, 4F8/IRQ5, 4E8/IRQ7 or disabled.

4.6.10 UART Mode Select

This item allows you to select UART mode. The choices: IrDA, ASKIR, Normal.

4.6.11 RxD, TxD Active

This item allows you to determine the active of RxD, TxD. The Choices: "Hi, Hi," "Lo, Lo," "Lo, Hi," "Hi, Lo."

4.6.12 IR Transmission Delay

This item allows you to enable/disable IR transmission delay. The choices: Enabled, Disabled.

4.6.13 UR2 Duplex Mode

This item allows you to select the IR half/full duplex function. The choices: Half, Full.

4.6.14 Onboard Parallel Port

This field sets the address of the on-board parallel port connector. You can select either 3BCH/IRQ7, 378H/IRQ7, 278H/IRQ5 or Disabled. If you install an I/O card with a parallel port, make sure there is no conflict in the address assignments. The CPU card can support up to three parallel ports, as long as there are no conflicts for each port.

4.6.15 Parallel Port Mode

This field allows you to set the operation mode of the parallel port. The setting "Normal" allows normal speed operation, but in one direction only. "EPP" allows bidirectional parallel port operation at maximum speed. "ECP" allows the parallel port to operate in bi-directional mode and at a speed faster than the maximum data transfer rate. "ECP + EPP" allows normal speed operation in a two-way mode.

4.6.16 EPP Mode Select

This field allows you to select EPP port type 1.7 or 1.9. The choices:

EPP1.7, 1.9.

4.6.17 ECP Mode Use DMA

This selection is available only if you select "ECP" or "ECP + EPP" in the Parallel Port Mode field. In ECP Mode Use DMA, you can select DMA channel 1, DMA channel 3, or Disable. Leave this field on the default setting.

4.7 Power Management Setup

The power management setup controls the CPU card's "green" features to save power. The following screen shows the manufacturer's defaults::

Figure 4.6: Power management setup screen

4.7.1 ACPI function

The choice: Enabled, Disabled.

4.7.2 Power Management

This category allows you to select the type (or degree) of power saving and is directly related to the following modes:

　　　1. HDD Power Down

　　　2. Suspend Mode

There are four 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 (Default)	Allows you to set each mode individually. When not disabled, each of the ranges are from 1 min. to 1 hr. except for HDD Power Down which ranges from 1 min. to 15 min. and disable.

4.7.3 Video Off In Suspend
When system is in suspend, video will turn off.

4.7.4 Modem Use IRQ
This determines the IRQ in which the MODEM can use.The choices: 3, 4, 5, 7, 9, 10, 11, NA.

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

4.7.6 Soft-Off by PWR-BTTN
If you choose "Instant-Off", then pushing the ATX soft power switch button once will switch the system to "system off" power mode. You can choose "Delay 4 sec." If you do, then pushing the button for more than 4 seconds will turn off the system, whereas pushing the button momentarily (for less than 4 seconds) will switch the system to "suspend" mode.

4.7.7 CPU THRM-Throttling
This field allows you to select the CPU THRM-Throttling rate. The choices: 12.5%, 25.0%, 37.5%, 50.0%, 62.5%, 75.0%, 87.5%.

4.7.8 Wake-up By PCI card
This item allows you to wake up the system via LAN from the remote-host. The choices: Enabled, Disabled.

4.7.9 PowerOn By Ring
When Enabled, an input signal on the serial Ring Indicator (RI) line (in other words, an incoming call on the modem) awakens the system from a soft off state. The choices: Enabled, Disabled.

4.7.10 Resume By Alarm

When Enabled, your can set the date and time at which the RTC (real-time clock) alarm awakens the system from Suspend mode. The choices: Enabled, Disabled.

4.7.11 Primary IDE 0 (1) and Secondary IDE 0 (1)

When Enabled, the system will resume from suspend mode if Primary IDE 0 (1) or Secondary IDE 0 (1) is active.   The choice: Enabled, Disabled.

4.7.12 FDD, COM, LPT PORT

When Enabled, the system will resume from suspend mode if FDD, COM port, or LPT port is active.   The choice: Enabled, Disabled.

4.7.13 PCI PIRQ [A-D]#

When Enabled, the system will resume from suspend mode if interrupt occurs.   The choice: Enabled, Disabled.

4.8 PnP/PCI Configurations

4.8.1 PnP OS Installed

Figure 4.7: PnP/PCI configurations screen

4.8.2 Reset Configuration Data

Default is Disable. Select Enable to reset Extended System Configuration Data (ESCD) if you have installed a new add-on and system econfiguration has caused such a conflict that OS cannot boot.

4.8.3 Resources controlled by:

The commands here are "Auto" or "Manual." Choosing "manual" requires you to choose resources from each following sub-menu. "Auto" automatically configures all of the boot and Plug and Play devices but you must be using Windows 95 or above.

4.8.4 PCI/VGA Palette Snoop

This is left at "Disabled."

4.9 PC Health Status

Figure 4.8: PC Health Status

By choosing the Frequency/Voltage Control option from the Initial Setup Screen menu, the screen below is displayed. This sample screen contains the manufacturer's default values for the AIMB-640.
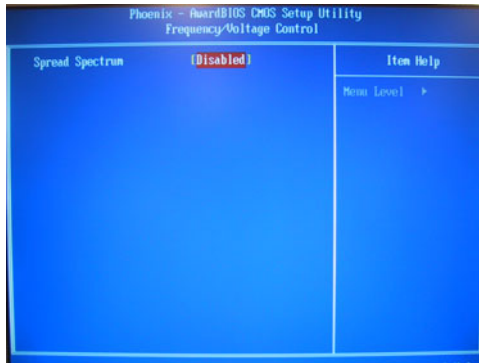
Figure 4.9: Frequency/Voltage Control

4.10 Password Setting

To change the password:

1.   Choose the "Set Password" option from the "Initial Setup Screen" menu and press <Enter>.

The screen will display the following message:

<div style="background:black;color:white">

Please Enter Your Password

</div>

Press <Enter>.

2.   If the CMOS is good or if this option has been used to change the default password, the user is asked for the password stored in the CMOS. The screen will display the following message:

<div style="background:black;color:white">

Please Confirm Your Password

</div>

Enter the current password and press <Enter>.

3.   After pressing <Enter> (ROM password) or the current password (user-defined), you can change the password stored in the CMOS. The password must be no longer than eight (8) characters.

Remember, to enable the password setting feature, you must first select either "Setup" or "System" from the "Advanced BIOS Features" menu.

4.11 Save & Exit Setup

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

4.12 Exit Without Saving

Selecting this option and pressing <Enter> lets you exit the setup program without recording any new values or changing old ones.

PCI SVGA/LCD Setup

This chapter details the software configuration information. It shows you how to configure the board to match your application requirements. The AWARD System BIOS is covered in Chapter 4.

Sections include:

- Installation of SVGA drivers

    -for Windows 98
    -for Windows NT/2000/XP
- Connections for standard LCDs

- Further information

Chapter 5 PCI SVGA/LCD Setup

5.1 Introduction

The board has an onboard Intel 852GME chipset for its AGP/SVGA controller. It supports LVDS LCD displays and conventional analog CRT monitors with 64MB frame buffer shared with system memory. The VGA controller can drive CRT displays with resolutions up to 1600 x 1200@85-Hz and 2048 x 536 @75Hz and support 2 channel LVDS display mode up to UXGA panel resolution with frequency range from 25-MHz to 112-MHz

5.1.1 CMOS setting for panel type

The AIMB-640 system BIOS and custom drivers are located in a 512 Kbyte, Flash ROM device, designated U29. A single Flash chip holds the system BIOS, VGA BIOS and network Boot ROM image. The display can be configured via CMOS settings. This method minimized the number of chips and different type of LCD panels, please choose "Boot display" from the "Advanced chipset Features" menu in CMOS setting.

5.1.2 Display type

The AIMB-640 can be set in one of three configurations: on a CRT, on a flat panel display, or on both dual independent display. The system is initially set to dual display mode.

5.1.3 Dual Independent Display

The AIMB-640 uses a Intel 852GME controller that is

capable of providing multiple views and simultaneous display with mixed video and graphics on a flat panel and CRT.

To set up dual display under Windows 98, Windows NT/2000/XP follow these steps:

1. Select "Windows98", "Control panel", "Setting", "Advanced", "Graphics Properties" "Device".
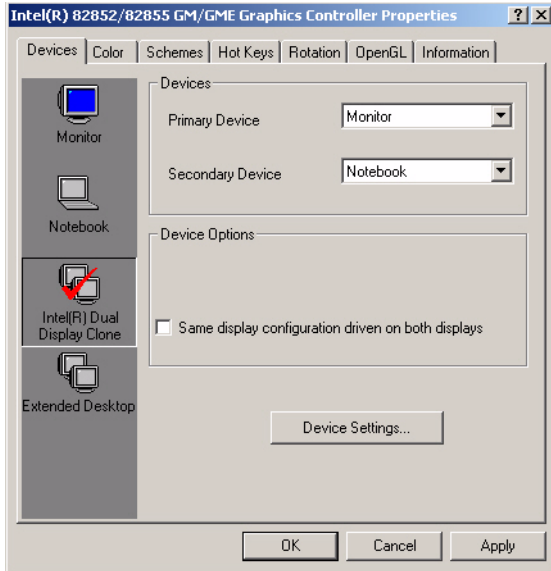
2. Select "1" for current display, or "2" for second display.
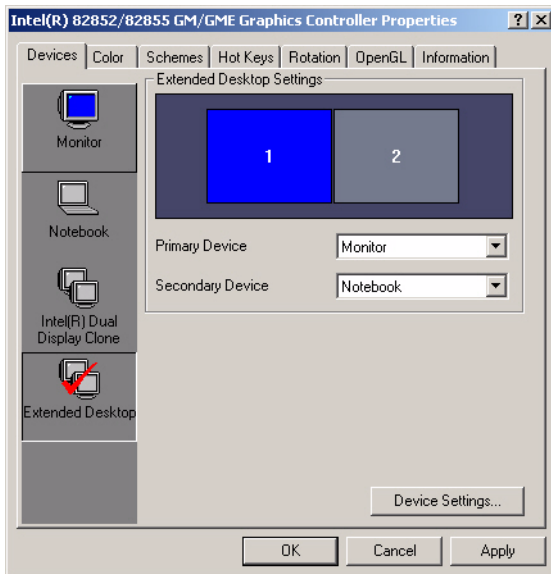
3. Enable "Extend my Windows desktop onto this monitor".

4. Click "OK".

5.2 Installation of the SVGA Driver

Complete the following steps to install the SVGA driver. Follow the procedures in the flow chart that apply to the operating system that you are using within your AIMB-640.

Notes: *1. The windows illustrations in this chapter are intended as examples only. Please follow the listed steps, and pay attention to the instructions which appear on your screen.*

2. For convenience, the CD-ROM drive is designated as "D" throughout this chapter.

5.2.1 Installation of Windows 98/2000
1. Find Win2000 VGA driver from CD at the directory of AIMB-640 CD-ROM, VGA\win2k_xp145.
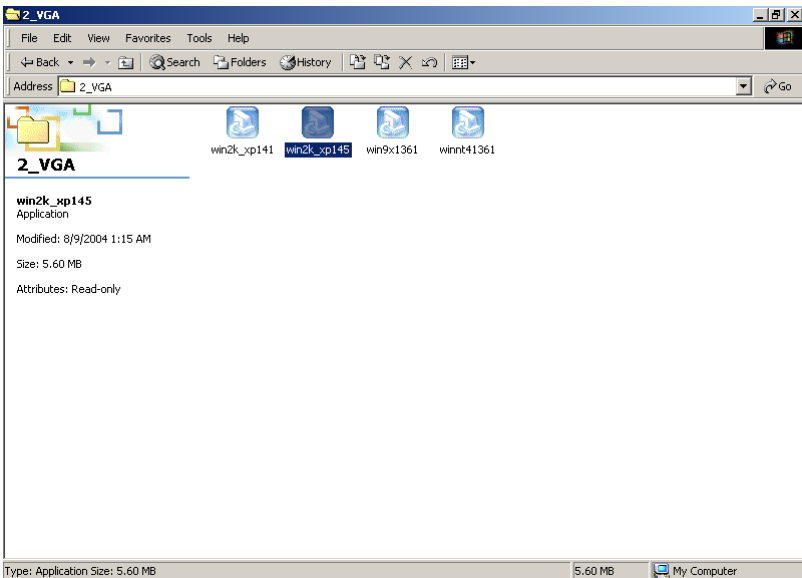
2. Double click "setup" and "next" into setup wizard.
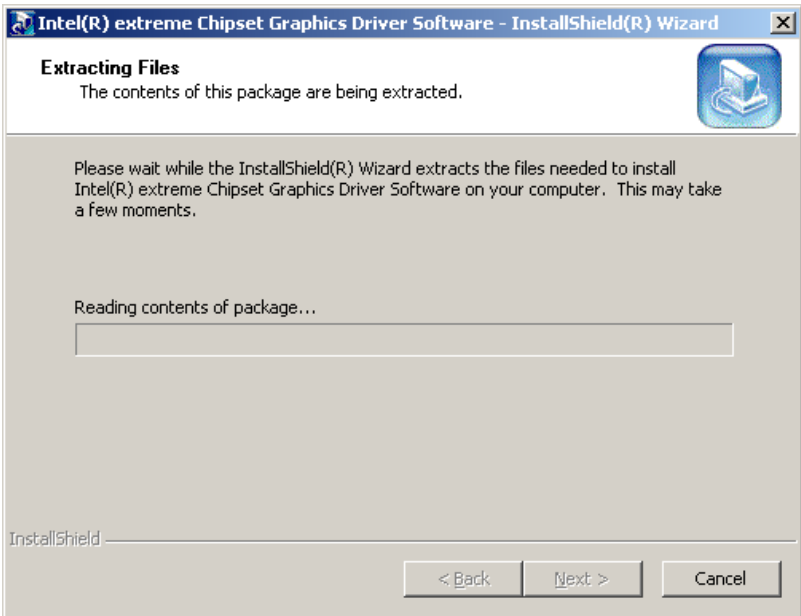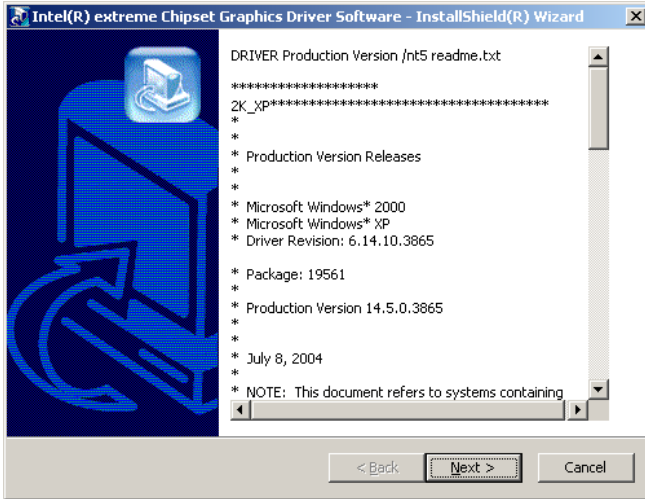
3. Click "Next" to install Intel(R) Graphices Media Accelerator Driver.
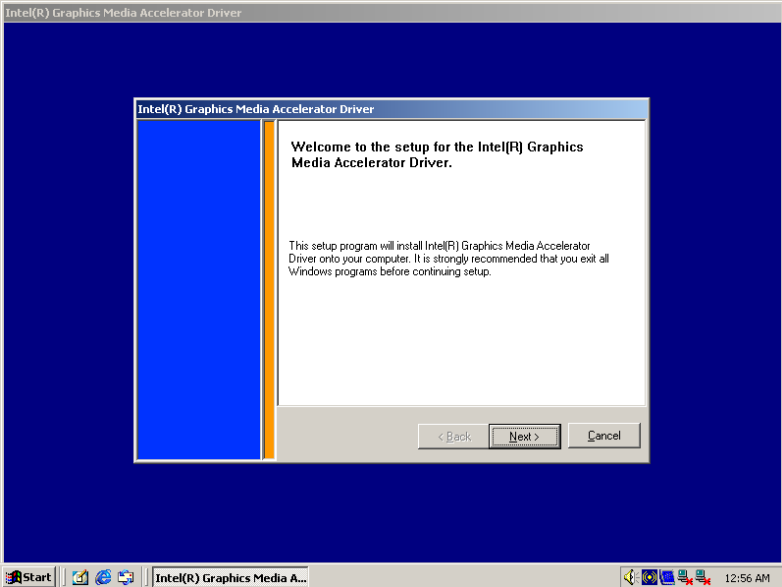
4. Click "Yes" to continue setup.

Installing version 6.14.10.3865....
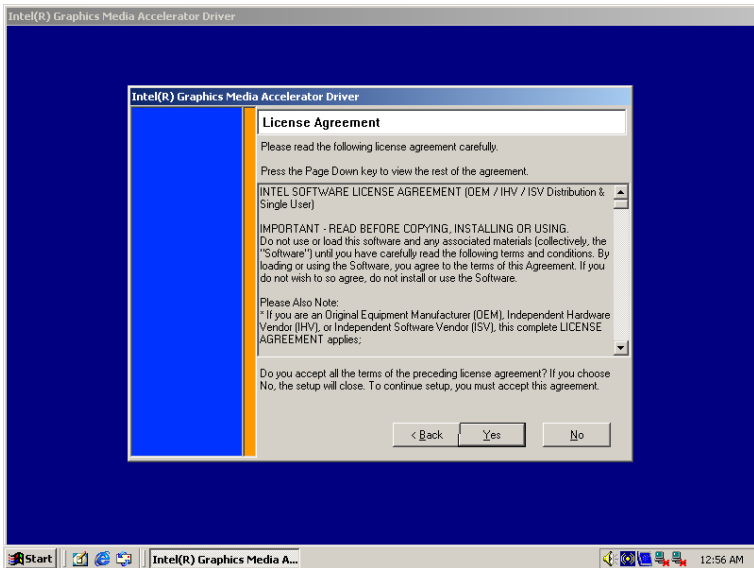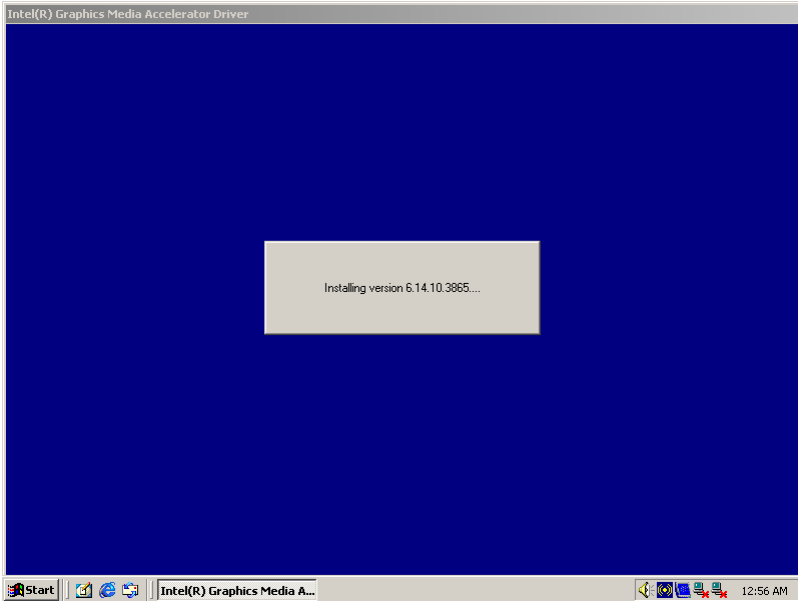
5. Restart computer when installation finished.

Intel(R) Graphics Media Accelerator Driver

The setup for the Intel(R) Graphics Media Accelerator Driver is complete.

You must restart your computer for changes to take effect. Would you like to restart your computer now?

⦿ Yes, I want to restart my computer now.

◯ No, I will restart my computer later.

Remove any disks from their drives, and then click Finish.

< Back   Finish
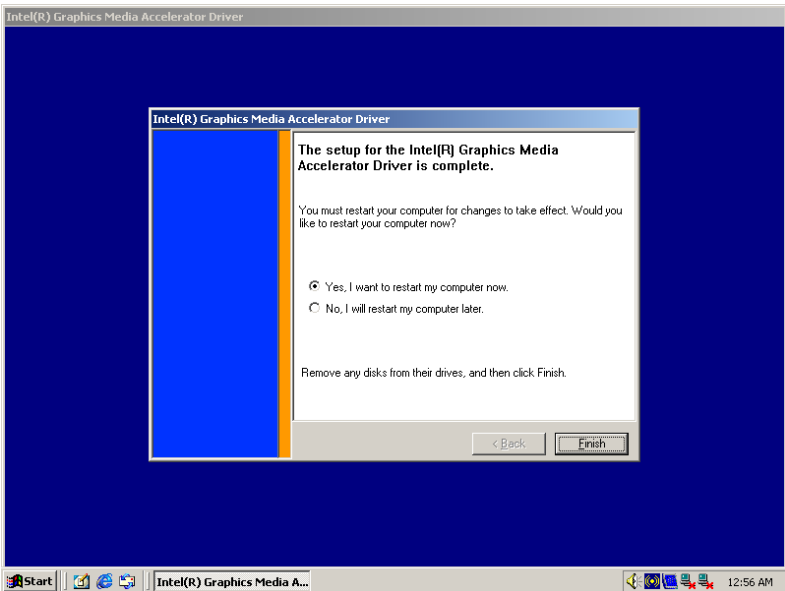
5.3 Further Information

For further information about the AGP/VGA installation in your AIMB-640, including driver updates, troubleshooting guides and FAQ lists, visit the following web resources:

Intel website: *www.intel.com*

Advantech websites: *www.advantech.com*

www.advantech.com.tw

Audio Setup

The AIMB-640 is equipped with an audio interface that records and plays back CD-quality audio. This chapter provides instructions for installing the software drivers included on the audio driver diskettes.

Chapter 6 Audio Setup

6.1 Introduction

The AIMB-640's on-board audio interface provides high-quality stereo sound and FM music synthesis (ESFM) by using the Intel ICH4 audio controller. The audio interface can record, compress, and play back voice, sound, and music with built-in mixer control.

6.2 Driver installation

6.2.1 Before you begin
Please read the instructions in this chapter carefully before you attempt installation. The audio drivers for the AIMB-640 board are located on the audio driver CD. Run the supplied SETUP program to install the drivers; don't copy the files manually.

Note: *The files on the software installation diskette are compressed. Do not attempt to install the drivers by copying the files manually. You must use the supplied SETUP program to install the drivers.*

6.2.2 Windows 98 drivers

1. Find Win98/2000 Audio driver folder from CD at the directory of AIMB-640 CD, click "setup" to start the installation process.
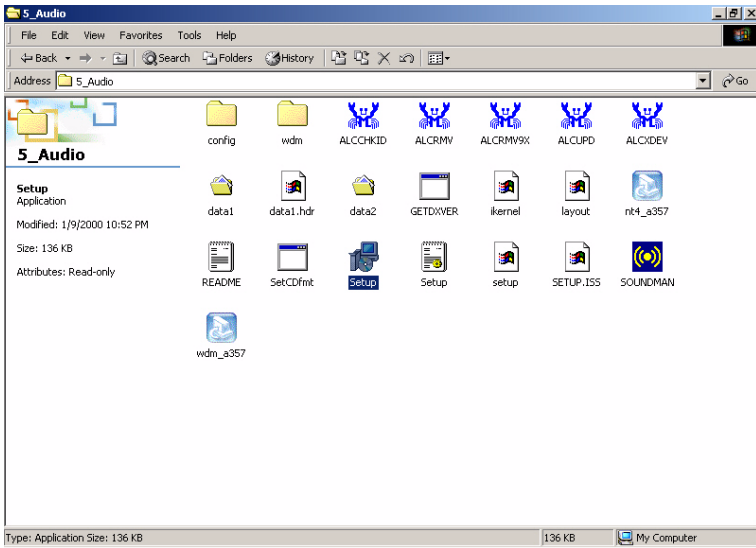
2. Click "yes" to reboot your computer.
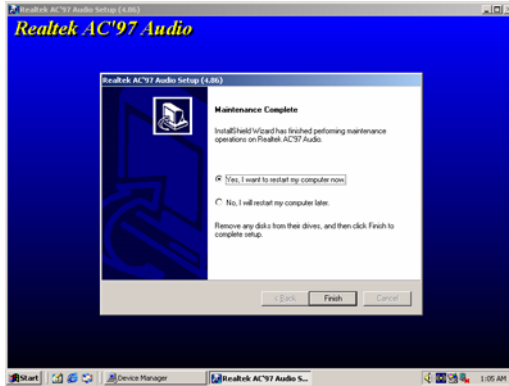
CHAPTER **7**

Ethernet Interface

This chapter provides information on Ethernet configuration.

Sections include:

- Introduction
- Installation of Ethernet drivers for Windows 98/2000/NT
- Further information

Chapter 7 Ethernet Interface

7.1 Introduction

The AIMB-640 is equipped with a high performance 32-bit Ethernet chipset which is fully compliant with IEEE 802.3 100 Mbps CSMA/CD standards. It is supported by major network operating systems. It is also both 1000Base-T and 100Base-T compatible. The network boot feature can be utilized by incorporating the boot ROM image files for the appropriate network operating system. The boot ROM BIOS files are combined with system BIOS, which can be enabled/disabled in the BIOS setup.

7.2 Installation of Ethernet driver

Before installing the Ethernet driver, note the procedures below. You must know which operating system you are using in your AIMB-640 Series, and then refer to the corresponding installation flow chart. Then just follow the steps described in the flow chart. You will quickly and successfully complete the installation, even if you are not familiar with instructions for MS-DOS or Windows.

Note: *The windows illustrations in this chapter are examples only. Follow the steps and pay attention to the instructions which appear on your screen.*

7.2.1 Installation for Windows 2000

1.   a. Select "Start", "Settings". "Control Panel".

b. Double click "Add/Remove Hardware".
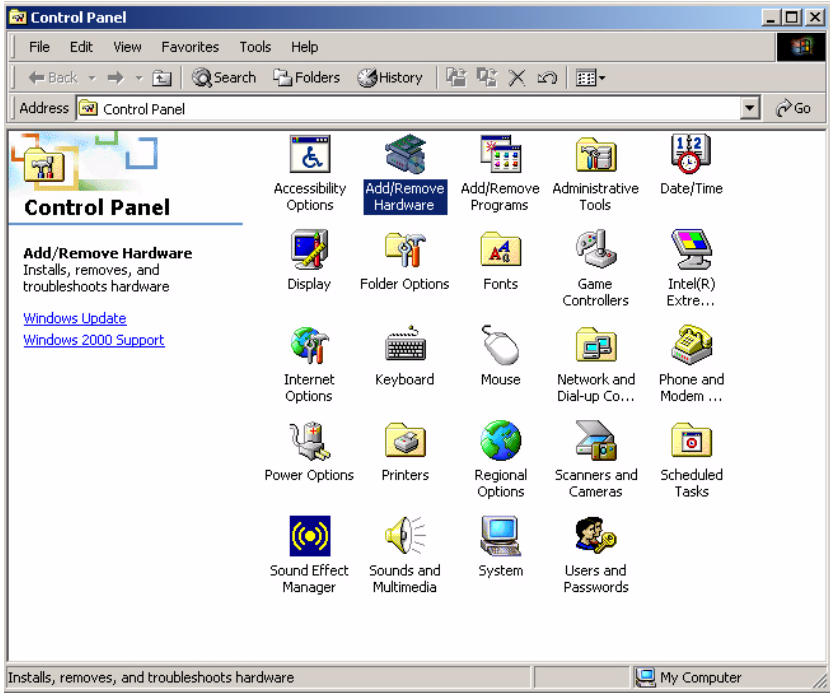
2. a. Click "Next" and prepare to install network function

b. Choose "Add/Troubleshoot a device" and click "Next".
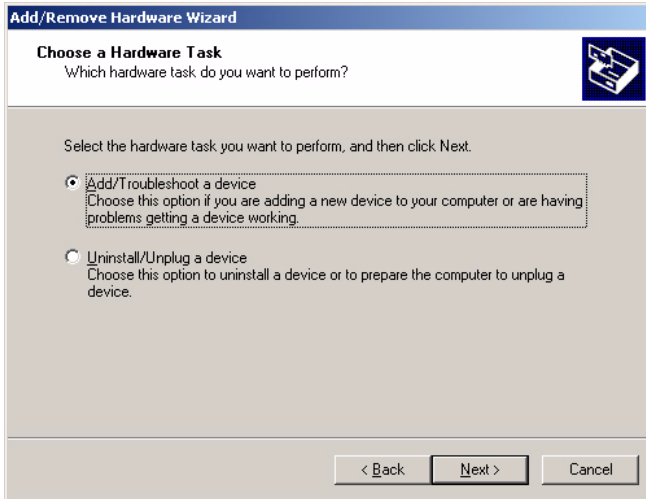
3.   Choose Hardware Device "Ethernet Controller"

Upgrade Device Driver Wizard

Install Hardware Device Drivers
A device driver is a software program that enables a hardware device to work with an operating system.

This wizard upgrades drivers for the following hardware device:

Ethernet Controller

Upgrading to a newer version of a device driver may add functionality to or improve the performance of this device.

What do you want the wizard to do?

○ Search for a suitable driver for my device (recommended)

● Display a list of the known drivers for this device so that I can choose a specific driver

[< Back] [Next >] [Cancel]

Upgrade Device Driver Wizard

Hardware Type
What type of hardware do you want to install?

Select a hardware type, and then click Next.

Hardware types:

- Intel(R) Unified Graphics Drivers
- Memory technology driver
- Modems
- Multi-port serial adapters
- Network adapters
- NT Apm/Legacy Support
- Other devices
- PCMCIA adapters
- Ports (COM & LPT)

[< Back] [Next >] [Cancel]

4.   Insert the CD into D: drive

a. Fill in the Find the LAN chipset folder at the directory of AIMB-640 win2000 folder from CD ROM drive

b. Click "OK".
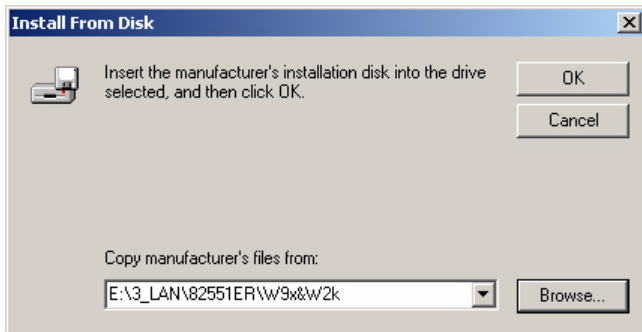
5. Choose the "Intel(R) GD82559ER PCI Adapter" item

Click "Next"

Upgrade Device Driver Wizard

Start Device Driver Installation
The device driver will be installed with the default settings.

The wizard is ready to install the driver for the following hardware device:

Intel(R) GD82559ER PCI Adapter

Windows will use default settings to install the software for this hardware device. To install the software for your new hardware, click Next.

< Back   Next >   Cancel

6   a. Click "Yes" to continue the installation.

Digital Signature Not Found

The Microsoft digital signature affirms that software has been tested with Windows and that the software has not been altered since it was tested.

The software you are about to install does not contain a Microsoft digital signature. Therefore, there is no guarantee that this software works correctly with Windows.

Intel(R) GD82559ER PCI Adapter

If you want to search for Microsoft digitally signed software, visit the Windows Update Web site at http://windowsupdate.microsoft.com to see if one is available.

Do you want to continue the installation?

Yes   No   More Info

b. Click "OK"

7.3 Further information

Intel website: **www.intel.com**
Advantech websites:**www.advantech.com**
www.advantech.com.t

Programming the GPIO and Watchdog Timer

The AIMB-640 is equipped with a watchdog timer that resets the CPU or generates an interrupt if processing comes to a standstill for any reason. This feature ensures system reliability in industrial standalone or unmanned environments.

Appendix A Programming GPIO & Watchdog Timer

A.1 Supported GPIO Register

Bellow are detailed description of the GPIO addresses and programming sample.

A.1.1 GPIO Registers

CRF0 (GP10-GP17 I/O selection register. Default 0xFF)

When set to a '1', respective GPIO port is programmed as an input port.

When set to a '0', respective GPIO port is programmed as an output port.

CRF1 (GP10-GP17 data register. Default 0x00)

If a port is programmed to be an output port, then its respective bit can be read/written.

If a port is programmed to be an input port, then its respective bit can only be read.

CRF2 (GP10-GP17 inversion register. Default 0x00)

When set to a '1', the incoming/outgoing port value is inverted.

When set to a '0', the incoming/outgoing port value is the same as in data register.

Extended Function Index Registers (EFIRs)

The EFIRs are write-only registers with port address 2Eh or 4Eh on PC/AT systems.

Extended Function Data Registers(EFDRs)

the EFDRs are read/write registers with port address 2Fh or 4Fh on PC/AT systems.

A.1.2 GPIO Example program-1

 Enter the extended function mode, interruptible double-write

----

```
MOV DX,4EH
MOV AL,87H
OUT DX,AL
OUT DX,AL
```

Configurate logical device 7(GP10~GP17), configuration register
CRF0,CRF1,CRF2

```
MOV DX,4EH
MOV AL,07H ; point to Logical Device Number Reg.
OUT DX,AL
MOV DX,4FH
MOV AL,07H ; select logical device 7
OUT DX,AL ;
MOV DX,4EH
MOV AL,F0
OUT DX,AL
MOV DX,4FH
MOV AL,00H  ; 01:Input  00:output  for  GP10~GP17
OUT DX,AL
MOV DX,4EH
MOV AL,F2H ;
OUT DX,AL
MOV DX,4FH
MOV AL,00H    ;Set GPIO is normal not inverter
OUT DX,AL;
MOV DX,4EH
MOV AL,F1H
```

```
OUT DX,AL
MOV DX,4FH
MOV AL,??H ;  Put the output value into AL
OUT DX,AL
```

 Exit extended function mode |

```
MOV DX,4EH
MOV AL,AAH
OUT DX,AL
```

A.2 Watchdog programming

Bellow is a sample of programming code for controlling the Watchdog Timer function.

```
-------------------------------------------------------------------------------
Enter the extended function mode ,interruptible double-write |
-------------------------------------------------------------------------------
MOV DX,2EH
MOV AL,87H
OUT DX,AL
OUT DX,AL
----------------------------------------------------------------------------
 Configurate logical device 8, configuration register CRF6 |
----------------------------------------------------------------------------
MOV DX,2EH
MOV AL,07H ; point to Logical Device Number Reg.
OUT DX,AL
MOV DX,2FH
MOV AL,08H ; select logical device 8
OUT DX,AL ;
MOV DX,2EH
MOV AL,30H ;Set watch dog activate or inactivate
OUT DX,AL
MOV DX,2FH
MOV AL,01H  ; 01:activate 00:inactivate
OUT DX,AL ;
MOV DX,2EH
MOV AL,F5H ; Setting counter unit is second
OUT DX,AL
MOV DX,2FH
MOV AL,00H
OUT DX,AL;
```

```
MOV DX,2EH
MOV AL,F6H
OUT DX,AL
MOV DX,2FH
MOV AL,05H ; Set 5 seconds
OUT DX,AL
;----------------------------------------
; Exit extended function mode |
;----------------------------------------
MOV DX,2EH
MOV AL,AAH
OUT DX,AL
```

Pin Assignments

This appendix contains information of a detailed or specialized nature. It includes:

- CPU/System Fan Connector
- Audio Connector
- ATX Power Connector
- ATX12V Power Connector
- Front Panel Connector
- Keyboard and PS/2 Mouse Connector
- Primary IDE Connector
- Second Slave IDE Connector
- Floppy Drive Connector
- CRT Connector
- COM1 Connector
- COM3-6 Connector
- Digital I/O Connector
- SATA Connector
- LPT Connector
- LAN2 USB3/4/LANl USB1/2 Conn.
- LCD/LVDS inverter Connector
- COM2 Connector
- CF Card Connector
- CD -In Connector
- SATA Connector
- COM Port 1~6 Voltage Select Conn.
- TV-OUT Connector
- Internal Speaker Connector
- DVI Connector

Appendix B   Pin Assignments

B.1 CPU/System Fan Connector (FAN1, FAN2)

```
3 ○
2 ○
1 □
```

Table B.1: CPU/System fan Connector

Description	Wafer Box 2.0mm 3P180D w/Lock

Pin	Signal
1	FAN_PWM CONTROL
2	+12V
3	FAN DETECT

B.2 Audio Connector (CN6)

Table B.2: Audio Connector (CN6)

Pin	Signal	Pin	Signal
B1	GND	B2	LINE OUT R
B3	NC	B4	NC
B5	LINE OUT L	12	GND
C1	GND	C2	MIC_IN2
C3	MIC IN	C4	NC
C5	MIC_IN1		

B.3 ATX Power Connector (CN15)

```
 2  4                  18 20
┌─────────────────────────┐
│○ ○ ○ ○ ○ ○ ○ ○ ○ ○│
│□ ○ ○ ○ ○ ○ ○ ○ ○ ○│
└─────────────────────────┘
 1  3                  17 19
```
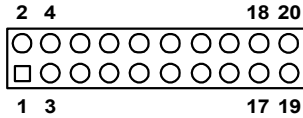
Table B.3: ATX Power Connector (CN15)

Description	Power CONN. 6*2 180D		
Pin	**Signal**	**Pin**	**Signal**
1	3.3V	11	3.3V
2	3.3V	12	-12V
3	GND	13	GND
4	+5V	14	PSON*
5	GND	15	GND
6	+5V	16	GND
7	GND	17	GND
8	PWROK	18	-5V
9	5VSB	19	+5V
10	+12V	20	+5V

*low active

B.4 ATX 12V Connector (CN17)

```
4 ○ ○ 3
2 ○ □ 1
```
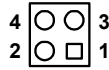
Table B.4: ATX 12V Connector (CN17)

Description	Wafer ATX PWR 4P		
Pin	**Signal**	**Pin**	**Signal**
1	GND	2	GND
3	+12V	4	+12V

B.5 Front Panel Connector (CN24)

```
13 11  9  7  5  3  1
○ ○ ○ ○ ○ ○ □
○ ○ ○ ○ ○ ○ ○
14 12 10  8  6  4  2
```
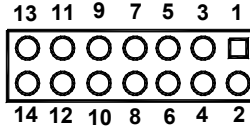
Table B.5: Front Panel Connector (CN24)

Description	Pin-Header 14-Pin 2.54mm		
Pin	**Signal**	**Pin**	**Signal**
1	VCC	2	HDLED#
3	VCC (POWER_LED)	4	GND
5	5VSB(SUS_LED)	6	GND
7	3VSB(LAN_ACKLED)	8	LAN_ACKLED#
9	VCC(STAT_LED)	10	
11	5VSB	12	PWRBTN#
13	GND	14	RESET#

B.6 Keyboard and PS/2 Mouse Connector (CN7)

Table B.6: Keyboard and mouse Connector (CN7)

Description	MINI DIN 6P Short body W/Shielding
Pin	**Signal**
1	KB DATA
2	MS DATA
3	GND
4	VCC
5	KB CLOCK
6	MS CLOCK

B.7 Primary IDE Connector (CN22)

Table B.7: Primary IDE Connector (CN22)

Description   **Box-Header 40-Pin 2.54mm (Blue)**

Pin	Signal	Pin	Signal
1	IDE_RST *	2	GND
3	IDE_PDD7	4	IDE_PDD8
5	IDE_PDD6	6	IDE_PDD9
7	IDE_PDD5	8	IDE_PDD9
9	IDE_PDD4	10	IDE_PDD 11
11	IDE_PDD3	12	IDE_PDD 12
13	IDE_PDD2	14	IDE_PDD 13
15	IDE_PDD1	16	IDE_PDD 14
17	IDE_PDD0	18	IDE_PDD 15
19	GND	20	N/C
21	IDE_PDDREQ	22	GND
23	IDE_PDIOW*	24	GND
25	IDE_PDIOR*	26	GND
27	IDE_PIORDY	28	IDE_PCSEL
29	IDE_PDDACK*	30	GND
31	IDE_IRQ14	32	N/C
33	IDE_PAD1	34	IDE_PATADET
35	IDE_PAD0	36	IDE_PAD2
37	IDE_PDCS1*	38	IDE_PDCS3*
39	IDE_PDACTIVE*	40	GND
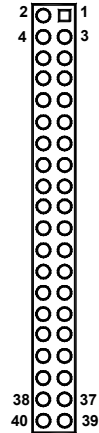
*low active

B.8 Secondary Slave IDE Connector (CN20)

Table B.8: Secondary Slave IDE Connector (CN20)

Description	BOX HEADER SMD 22*2P 180 D(M) 2.0mm IDIOT-PROOF		
Pin	Signal	Pin	Signal
1	IDE RESET	2	GND
3	DATA 7	4	DATA 8
5	DATA 6	6	DATA 9
7	DATA 5	8	DATA 10
9	DATA 4	10	DATA 11
11	DATA 3	12	DATA 12
13	DATA 2	14	DATA 13
15	DATA 1	16	DATA 14
17	DATA 0	18	DATA 15
19	GND	20	N/C
21	DRQ	22	GND
23	IO WRITE	24	GND
25	IO READ	26	GND
27	HD READY	28	N/C
29	HDACK 0	30	GND
31	IDE IRQ	32	IOCS16
33	ADDR 1	34	N/C
35	ADDR 0	36	ADDR 2
37	HARD DISK SELECT 0	38	HARD DISK SELECT 1*
39	IDE ACTIVE	40	GND
41	Vcc	42	Vcc
43	GND	44	NC

B.9 FDD Connector (CN14)

```
33 31                                    3  1
┌─────────────────────────────────────────┐
│ ○ ○ ○ ○ ○ ○ ○ ○ ○ ○ ○ ○ ○ ○ ○ ○ □ │
│ ○ ○ ○ ○ ○ ○ ○ ○ ○ ○ ○ ○ ○ ○ ○ ○ ○ │
└─────────────────────────────────────────┘
34 32                                    4  2
```
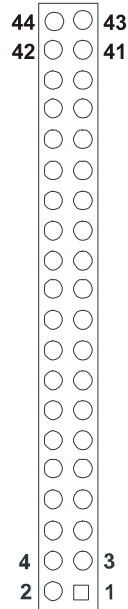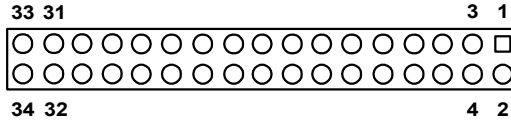
Table B.9: FDD Connector (CN14)

Description	Box-Header 34-Pin 2.54mm		
Pin	Signal	Pin	Signal
1	GND	2	DRVDEN A
3	GND	4	NC
5	GND	6	NC
7	GND	8	INDEX*
9	GND	10	MTR A*
11	GND	12	DS B*
13	GND	14	DS A*
15	GND	16	MTR B*
17	GND	18	DIR*
19	GND	20	STEP*
21	GND	22	WDATA*
23	GND	24	WGATE*
25	GND	26	TRAK0*
27	GND	28	WR*
29	GND	30	RDATA*
31	GND	32	HDSEL*
33	GND	34	DSKCHG*

*low active

B.10 CRT Connector (CN1)

```
 5  ○ ○ ○ ○ □   1
10  ○ ○ ○ ○ ○   6
15  ○ ○ ○ ○ ○  11
```
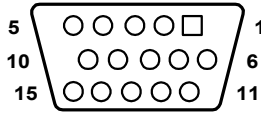
Table B.10: CRT Connector (CN1)

Description	D-SUB 15-Pin				
Pin	Signal	Pin	Signal	Pin	Signal
1	RED	6	GND	11	NC
2	GREEN	7	GND	12	DDC DATA
3	BLUE	8	GND	13	H-SYNC
4	NC	9	NC	14	V-SYNC
5	GND	10	GND	15	DDC CLOCK

B.11 COM1 Connector (CN2)

```
    9  8  7  6
   ┌───────────┐
  /  ○ ○ ○ ○   \
 /  ○ ○ ○ ○ ○   \
 └───────────────┘
    5  4  3  2  1
```
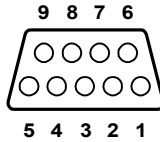
Table B.11: COM1 Connector (CN2)

Description   D-SUB 9-Pin

Pin	Signal	Pin	Signal
1	DCD*	6	DSR*
2	RX	7	RTS*
3	TX	8	CTS*
4	DTR*	9	RI
5	GND		

*low active

B.12 COM3~6 Connector (CN11)

Table B.12: COM3~6 Connector (CN11)

Description   Box-Header 40-Pin 2.0mm

Pin	Signal	Pin	Signal
1	NDCD1*	2	DSR1*
3	RX1	4	RTS1*
5	TX1	6	CTS1*
7	DTR1*	8	RI_1
9	GND	10	GND
11	NDCD2*	12	DSR2*
13	RX2	14	RTS2*
15	TX2	16	CTS2*
17	DTR2*	18	RI_2
19	GND	20	GND
21	NDCD3*	22	DSR3*
23	RX3	24	RTS3*
25	TX3	26	CTS3*
27	DTR3*	28	RI_3
29	GND	30	GND
31	NDCD4*	32	DSR4*
33	RX4	34	RTS4*
35	TX4	36	CTS4*
37	DTR4*	38	RI_4
39	GND	40	GND
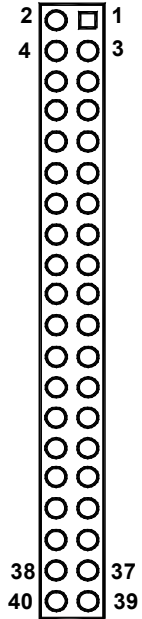
*low active

B.13 Digital I/O Connector (CN18)

```
 2  4           14 16
○○○○○○○○
□○○○○○○○
 1  3           13 15
```
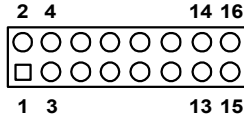
Table B.13: Digital I/O Connector (CN18)

Description   Pin-Header 16-Pin 2.54mm

Pin	Signal	Pin	Signal
1	DIO_IN0	2	5V
3	DIO_IN1	4	DIOOUT0
5	DIO_IN2	6	GND
7	DIO_IN3	8	DIOOUT1
9	GND	10	12V
11	NC	12	NC
13	DIO_OUT	14	GND
15	DIO_OUT	16	12V

*low active

B.14 LPT Connector (CN3)

```
      13 ○○○○○○○○○○○○○ 1
         ○○○○○○○○○○○○
      25                    14
```
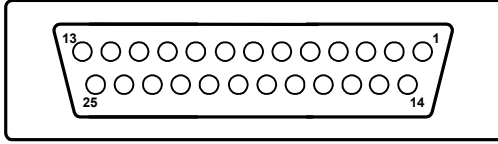
Table B.14: LPT Connector (CN3)

Description   D-SUB 25-Pin

Pin	Signal	Pin	Signal
1	STROBE*	2	AUTO FEED*
3	PD0	4	ERROR*
5	PD1	6	INIT*
7	PD2	8	SELECT IN*
9	PD3	10	GND
11	PD4	12	GND
13	PD5	14	GND
15	PD6	16	GND
17	PD7	18	GND
19	ACK*	20	GND
21	BUSY	22	GND
23	PE	24	GND
25	SELECT		

*low active

B.15 LAN2 USB3/4/LAN1 USB1/2 Conn. (CN9, CN10)

Table B.15: LAN2 USB3/4/LAN1 USB1/2 Conn. (CN9,CN10)

Description   RJ45+2 USB Ports

Pin	Signal	Pin	Signal
1	LAN_V25	2	LAN_MDI0+
3	LAN_MDI0-	4	LAN_MDI1+
5	LAN_MDI1-	6	LAN_MDI2+
7	LAN_MDI2-	8	LAN_MDI3+
9	LAN_MDI3-	10	GND
11	LINK_LED#	12	ACT_LED#
13	LINK1000_LED#	14	LINK100_LED#
15	USB1_5V	16	USBD1-
17	USBD1+	18	GND
19	USB2_5V	20	USBD2-
21	USBD2+	22	GND
23	GND	24	GND
25	GND	26	GND
27	GND	28	GND
29	GND	30	GND

B.16 LCD/LVDS INVERTER Connector (CN25)
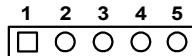
Table B.16: LCD/LVDS INVERTER Connector (CN25)

Description   Wafer 5Pin 2.0mm

Pin	Signal
1	+12V
2	GND
3	BKLTEN
4	VBR
5	+5V

B.17 LVDS Connector (CN23)

```
40 38                                                    4   2
○ ○ ○ ○ ○ ○ ○ ○ ○ ○ ○ ○ ○ ○ ○ ○ ○ ○ ○ ○
○ ○ ○ ○ ○ ○ ○ ○ ○ ○ ○ ○ ○ ○ ○ ○ ○ ○ ○ □
39 37                                                    3   1
```
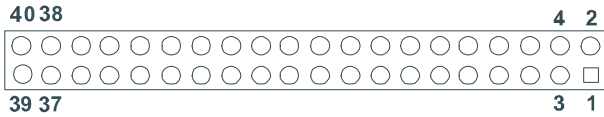
Table B.17: LVDS Connector (CN23)
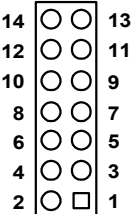
Description   *CONN. DF13-40DP-1.25V

Pin	Signal	Pin	Signal
1	VDDSAFE	2	VDDSAFE
3	GND	4	GND
5	VDDSAFE	6	VDDSAFE
7	LVDS0_N0	8	LVDS1_N0
9	LVDS0_P0	10	LVDS1_P0
11	GND	12	GND
13	LVDS0_N1	14	LVDS1_N1
15	LVDS0_P1	16	LVDS1_P1
17	GND	18	GND
19	LVDS0_N2	20	LVDS1_N2
21	LVDS0_P2	22	LVDS1_P2
23	GND	24	GND
25	LVDS0_CLKN	26	LVDS1_CLKN
27	LVDS0_CLKP	28	LVDS1_CLKP
29	GND	30	GND
31	LVDS_DDCPCLK	32	LVDS_DDCPDATA
33	GND	34	GND
35	LVDS0_N3	36	LVDS1_N3
37	LVDS0_P3	38	LVDS1_P3
39	NC	40	LVDS_VCON

Note: *The model number of the CN23 socket is DF13A-40DP-1.25V (Hirose Electric Co., Ltd.)*

B.18 COM2 RS232/422/485 series port (CN21)

Table B.18: COM2 RS-232/422/485 series port

Description   Box-Header 14-Pin 2.0mm

Pin	Pin name	Pin	Pin name
1	DCD	2	DSR
3	RX	4	RTS
5	TX	6	CTS
7	DTR	8	RI
9	GND	10	GND
11	TXD485+	12	TXD485-
13	RXD485+	14	RXD485-

```
14 ○ ○ 13
12 ○ ○ 11
10 ○ ○ 9
 8 ○ ○ 7
 6 ○ ○ 5
 4 ○ ○ 3
 2 ○ □ 1
```

B.19 CompactFlash Card Connector (CN27)

Table B.19: CompactFlash Card Connector (CN27)

Description   HEADER for CF typeII 50P 90D(M)SMD 3M W/O Ejector

Pin	Signal	Pin	Signal
1	GND	2	IDE_SDD3
3	IDE_SDD4	4	IDE_SDD5
5	IDE_SDD6	6	IDE_SDD7
7	IDE_SDCS1*	8	GND
9	GND	10	GND
11	GND	12	GND
13	VCC	14	GND
15	GND	16	GND
17	GND	18	IDE_SDA2
19	IDE_SDA1	20	IDE_SDA0
21	IDE SDD0	22	IDE SDD1
23	IDE SDD2	24	NC
25	GND	26	NC
27	IDE_SDD11	28	IDE_SDD12
29	IDE_SDD13	30	IDE_SDD14
31	IDE_SDD15	32	IDE_SDCS3*
33	NC	34	IDE_SDIOR*
35	IDE_SDIOW*	36	WE*

Table B.19: CompactFlash Card Connector (CN27)

Description   HEADER for CF typeII 50P 90D(M)SMD 3M W/O Ejector

Pin	Signal	Pin	Signal
37	IDE_IRQ15	38	VCC
39	CSEL*	40	NC
41	IDE_RST*	42	IDE_SIORDY
43	NC	44	REG*
45	IDE_SDACTIVE*	46	IDE_SATASET
47	IDE_SDD8	48	IDE_SDD9
49	IDE_SDD10	50	GND

* low active

B.20 CD-IN Connector (CN5)

```
 4   3   2   1
┌───────────────┐
│ ○   ○   ○   □ │
└───────────────┘
```
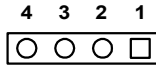
Table B.20: CD-IN Connector (CN5)

Description   Wafer-Box 4-Pin 2.54mm

Pin	Signal
1	CDIN-R
2	GND
3	GND
4	CDIN-L

B.21 SATA Connector (SA1/SA2)

Table B.21: SATA Connector (SA1/SA2)

Pin	Signal	Pin	Signal
1	GND	5	SATA_RXN0/1
2	SATA_TXP0/1	6	SATA_RXP0/1
3	SATA_TXN0/1	7	GND
4	GND		

B.22 COM Port 1~6 Voltage Select Connector (JP1)

Table B.22: COM Port 1~6 Voltage Select Connector (JP1)

Pin	Signal	Pin	Signal
1	+5V	2	+5V
3	COM1-RI	4	COM2-RI
5	+12V	6	+12V
7	+5V	8	+5V
9	COM3-RI	10	COM4-RI
11	+12V	12	+12V
13	+5V	14	+5V
15	COM5-RI	16	COM6-RI
17	+12V	18	+12V

Examples:

COM-1 Select +5V Output step => Pin-1, 3 short

COM-1 Select +12V Output step => Pin-3, 5 short

COM-2 Select +5V Output step => Pin-2, 4 short

COM-2 Select +12V Output step => Pin-4, 6 short

COM-3 Select +5V Output step => Pin-7, 9 short

COM-3 Select +12V Output step => Pin-9, 11 short

COM-4 Select +5V Output step => Pin-8, 10 short

COM-4 Select +12V Output step => Pin-10, 12 short

COM-5 Select +5V Output step => Pin-13, 15 short

COM-5 Select +12V Output step => Pin-15, 17 short

COM-6 Select +5V Output step => Pin-14, 16 short

COM-6 Select +12V Output step => Pin-16, 18 short

B.23 TV-OUT Connector (CN4)(option)

```
  5   4   3   2   1
 ┌───────────────┐
 │ ○   ○   ○   ○   □ │
 └───────────────┘
```
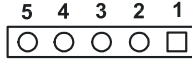
Table B.23: TV-OUT Connector (CN4)

Description	Wafer 5Pin 2.0mm
Pin	**Signal**
1	Y_OUT
2	C_OUT
3	GND
4	GND
5	CVBS_OUT

B.24 Internal Speaker Connector (CN8)

```
  4   3   2   1
 ┌───────────┐
 │ ○   ○   ○   □ │
 └───────────┘
```
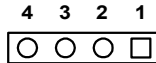
Table B.24: Internal Speaker Connector (CN8)

Description	Wafer-Box 4-Pin 2.54mm
Pin	**Signal**
1	OUTA-
2	OUTA+
3	OUTB+
4	OUTB-

B.25 DVI Connector (CN12)

```
2  4                18 20
○○○○○○○○○○
□○○○○○○○○○
1  3                17 19
```
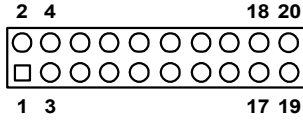
Table B.25: DVI Connector (CN12)

Description   DF13-20DP 1.25mm

Pin	Signal	Pin	Signal
1	TMDS_C0#	2	VCC_DVI
3	TMDS_C0	4	TMDS_CK#
5	GND	6	TMDS_CK
7	TMDS_C1#	8	GND
9	TMDS_C1	10	MDVI_CLK
11	GND	12	MDVI_DATA
13	TMDS_C2#	14	HP_DET
15	TMDS_C2	16	MI2C_DATA
17	VCC_DVI	18	MI2C_CLK
19	NC	20	NC

B.26 SIR Connector (CN16)

```
  5   4   3   2   1
┌─────────────────┐
│ ○   ○   ○   ○   □ │
└─────────────────┘
```
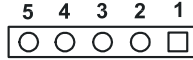
Table B.26: SIR Connector (CN16)

Description	Pin-Header 5-Pin 2.54mm

Pin	Signal
1	+5V
2	CIR RX
3	IR RX
4	GND
5	IR TX

System Assignments

This appendix contains information of a detailed nature. It includes:

- System I/O ports
- 1st MB memory map
- DMA channel assignments
- Interrupt assignments

Appendix C System Assignments

C.1 System I/O Ports

Table C.1: System I/O ports

Addr. range (Hex)	Device
000-01F	DMA controller
020-021	Interrupt controller 1, master
040-05F	8254 timer
060-06F	8042 (keyboard controller)
070-07F	Real-time clock, non-maskable interrupt (NMI) mask
080-09F	DMA page register
0A0-0BF	Interrupt controller 2
0C0-0DF	DMA controller
0F0	Clear math co-processor
0F1	Reset math co-processor
0F8-0FF	Math co-processor
1F0-1F8	Fixed disk
200-207	Reserved (Game I/O)
278-27F	Reserved (Parallel port 2,LTP3)
2E8-2EF	Reserved (Series port 4)
2F8-2FF	Serial port 2
300-31F	Prototype card
360-36F	Reserved
378-37F	Parallel printer port 1 (LPT 2)
380-38F	SDLC, bisynchronous 2
3A0-3AF	Bisynchronous 1
3B0-3BF	Monochrome display and printer adapter (LPT1)
3C0-3CF	Reserved
3D0-3DF	Color/graphics monitor adapter
3E8-3EF	Reserved (Series port 3)
3F0-3F7	Diskette controller
3F8-3FF	Serial port 1

* PNP audio I/O map range from 220 ~ 250H (16 bytes)

  MPU-401 select from 300 ~ 330H (2 bytes)

C.2 1st MB memory map

Table C.2: 1st MB memory map

Addr. range (Hex)	Device
F0000h - FFFFFh	System ROM
*CC000h - EFFFFh	Unused (reserved for Ethernet ROM)
C0000h - CBFFFh	Expansion ROM (for VGA BIOS)
B8000h - BFFFFh	CGA/EGA/VGA text
B0000h - B7FFFh	Unused
A0000h - AFFFFh	EGA/VGA graphics
00000h - 9FFFFh	Base memory

* If Ethernet boot ROM is disabled (Ethernet ROM occupies about 16 KB)

* E0000 - EFFFF is reserved for BIOS POST

C.3 DMA channel assignments

Table C.3: DMA channel assignments

Channel	Function
0	Available
1	Available (audio)
2	Floppy disk (8-bit transfer)
3	Available (parallel port)
4	Cascade for DMA controller 1
5	Available
6	Available
7	Available

* Audio DMA select 1, 3, or 5

C.4 Interrupt assignments

Table C.4: Interrupt assignments

Interrupt#	Interrupt source
IRQ 0	Interval timer
IRQ 1	Keyboard
IRQ 2	Interrupt from controller 2 (cascade)
IRQ 3	COM2
IRQ 4	COM1
IRQ 5	Reserved (COM4)
IRQ 6	FDD
IRQ 7	LPT1
IRQ 8	RTC
IRQ 9	Reserved (audio)
IRQ 10	Reserved (COM3)
IRQ 11	Reserved for watchdog timer
IRQ 12	PS/2 mouse
IRQ 13	INT from co-processor
IRQ 14	Primary IDE
IRQ 15	Secondary IDE for CFC

* Ethernet interface IRQ select: 9, 11, 15
* PNP audio IRQ select: 9, 11, 15
* PNP USB IRQ select: 9, 11, 15
* PNP ACPI IRQ select: 9, 11, 15

ATX Power setting

# Appendix D AT/ATX Power setting

D.1 Introduction

AIMB-640 supports ATX power mode to boot up system. ATX should connect standby power and power supply on# signal to turn on main power supply.

The power connector table & Power supply diagram tables are as bellow:

Table D.1: Power Connector	
Power Connector (CN15)	Power Type: ATX
Pin 1: GND	GND
Pin 2: GND	GND
Pin 3: VCC	+5V
Pin 4: GND	GND
Pin 5: VCC	+5V
Pin 6:VCCSB	Standby +5V
Pin 7: GND	GND
Pin 8: PWR_PSON#	PWR_PSON#
Pin 9: VCC	+5V
Pin 10: GND	GND
Pin 11: VCC	+5V
Pin 12: +12V	+12V

ATX power supply diagram

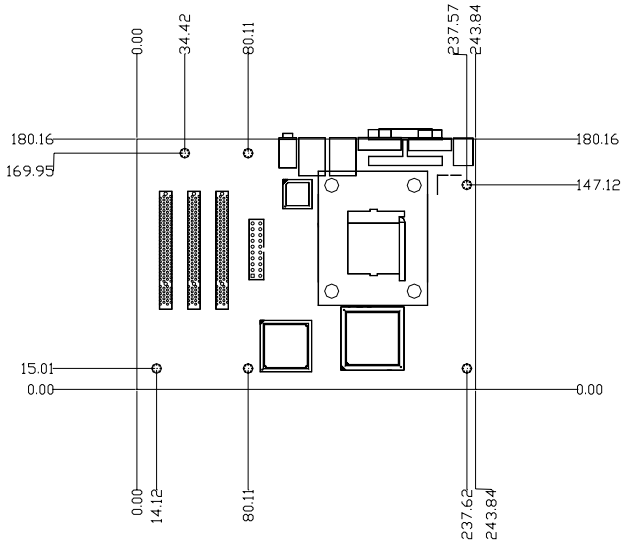# Mechanical Drawings
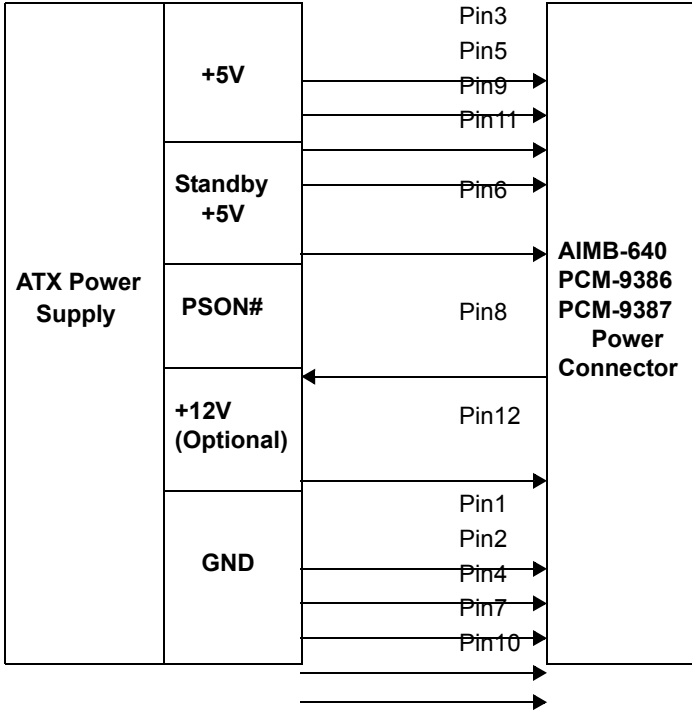
Appendix E Mechanical Drawings

E.1 Mechanical Drawings

Figure E.1: AIMB-640 Mech Drawing (Component)