EMB-9670/9673 Series

**Intel Socket 478/479 Pentium® M/Celeron® M /
Onboard Mobile Intel Celeron 600 MHz 0K L2 Cache
ITX Main Board with AC97 Audio,
Dual 10/100 Base-Tx Ethernets,
VGA, 2 Ch. LVDS and PCI Interface**

User's Manual

1st Ed – 25 April 2005

Part No. 2047967000

FCC Statement

THIS DEVICE COMPLIES WITH PART 15 FCC RULES. OPERATION IS SUBJECT TO THE FOLLOWING TWO CONDITIONS:

(1) THIS DEVICE MAY NOT CAUSE HARMFUL INTERFERENCE.

(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 AGAINTST HARMFUL INTERFERENCE WHEN THE EQUIPMENT IS OPERATED IN A COMMERCIAL ENVIRONMENT. THIS EQUIPMENT GENERATES, USES, AND CAN RADIATE RADIO FREQUENCY ENERGY AND, IF NOT INSTATLLED AND USED IN ACCORDANCE WITH THE INSTRUCTION MANUAL, MAY CAUSE HARMFUL INTERFERENCE TO RADIO COMMUNICATIONS.

OPERATION OF THIS EQUIPMENT IN A RESIDENTIAL AREA IS LIKELY TO CAUSE HARMFUL INTERFERENCE IN WHICH CASE THE USER WILL BE REQUIRED TO CORRECT THE INTERFERENCE AT HIS OWN EXPENSE.

Notice

This guide is designed for experienced users to setup the system within the shortest time. For detailed information, please always refer to the electronic user's manual.

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Product Warranty

Evalue warrants to you, the original purchaser, that each of its products will be free from defects in materials and workmanship for two years from the date of purchase.

This warranty does not apply to any products which have been repaired or altered by persons other than repair personnel authorized by Evalue, or which have been subject to misuse, abuse, accident or improper installation. Evalue assumes no liability under the terms of this warranty as a consequence of such events. Because of Evalue's high quality-control standards and rigorous testing, most of our customers never need to use our repair service. If any of Evalue's products is defective, it will be repaired or replaced at no charge during the warranty period. For out-of-warranty repairs, you will be billed according to the cost of replacement materials, service time, and freight. Please consult your dealer for more details. If you think you have a defective product, follow these steps:

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

Contents

1. Getting started

1.1 Safety Precautions

Warning!

Always completely disconnect the power cord from your chassis whenever you work with the hardware. Do not make connections while the power is on. Sensitive electronic components can be damaged by sudden power surges. Only experienced electronics personnel should open the PC chassis.

Caution!

Always ground yourself to remove any static charge before touching the CPU card. Modern electronic devices are very sensitive to static electric charges. As a safety precaution, use a grounding wrist strap at all times. Place all electronic components in a static-dissipative surface or static-shielded bag when they are not in the chassis.

1.2 Packing List

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

- 1 x EMB-9670 Series Intel Socket 479 Pentium® M/Celeron® M ITX Main Board (Onboard Mobile Intel Celeron 600 MHz 0K L2 Cache CPU for EMB-9673 Series)
- 1 x Quick Installation Guide
- 1 x CD-ROM contains the followings:
  - User's Manual (this manual in PDF file)
  - Ethernet driver and utilities
  - VGA drivers and utilities
  - Audio drivers and utilities
- Cable set includes the followings:
  - 1 ATA IDE cable (40-pin, pitch 2.54mm)
  - 1 ATA IDE cable (44-pin, pitch 2.0mm)
  - 1 FDD cable (34-pin, pitch 2.54mm)
  - 1 Serial port cable (10-pin, pitch 2.54mm)
  - 1 Serial port cable (40-pin, pitch 2.54mm)

If any of the above items is damaged or missing, contact your retailer.

1.3 Document Amendment History

Revision	Date	By	Comment
1st	Apr. 2005	Vicky Lin	Initial Release

1.4 Manual Objectives

This manual describes in detail the Evalue Technology EMB-9670/9673 series Single Board.

We have tried to include as much information as possible but we have not duplicated information that is provided in the standard IBM Technical References, unless it proved to be necessary to aid in the understanding of this board.

We strongly recommend that you study this manual carefully before attempting to interface with EMB-9670/9673 series or change the standard configurations. Whilst all the necessary information is available in this manual we would recommend that unless you are confident, you contact your supplier for guidance.

Please be aware that it is possible to create configurations within the CMOS RAM that make booting impossible. If this should happen, clear the CMOS settings, (see the description of the Jumper Settings for details).

If you have any suggestions or find any errors concerning this manual and want to inform us of these, please contact our Customer Service department with the relevant details.

1.5 System Specifications

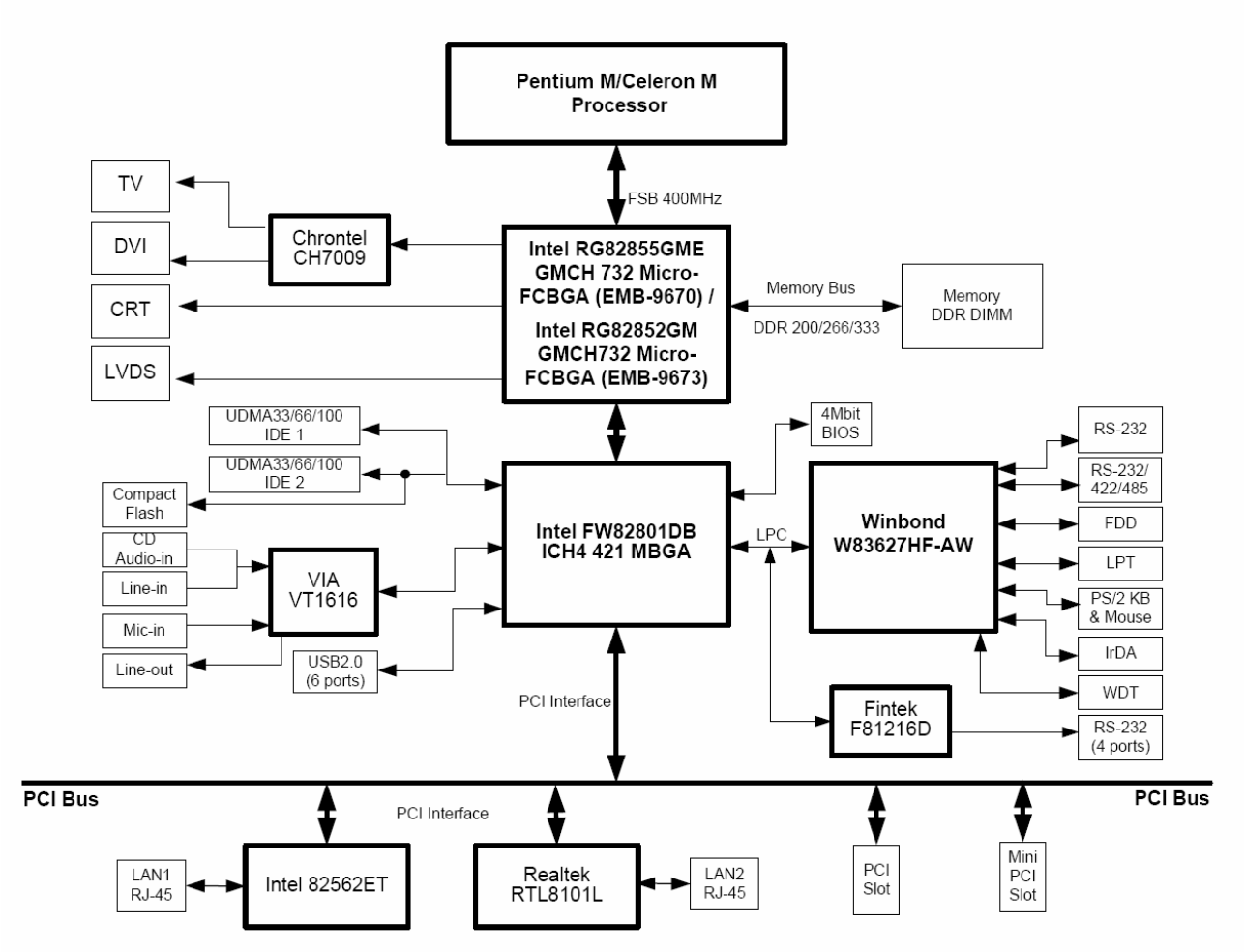
System	
CPU	Supports µFC-PGA 478 / µFC-BGA 479 Intel® Pentium® M / Celeron® M (Onboard Mobile Intel® Celeron® 600 MHz with 0K L2 Cache CPU for EMB-9673 only)
FSB	400MHz
BIOS	Award 512 KB Flash BIOS
System Chipset	Intel® RG82855GME GMCH/FW82801DB ICH4 (Intel® RG82852GM GMCH/FW82801DB ICH4 for EMB-9673 only)
I/O Chip	Winbond W83627HF-AW
System Memory	One 184-pin DIMM socket supports up to 1 GB DDR 200/266/333 SDRAM
SSD	One CompactFlash Type I/II socket
Watchdog Timer	Reset: 1 sec.~255 min. (1 sec. or 1 min./step)
H/W Status Monitor	Monitoring system temperature, voltage, and cooling fan status. Auto throttling control when CPU overheats.
Expansion	One PCI slot, one Mini PCI slot
I/O	
MIO	4 x EIDE (Ultra DMA 100), 2 x FDD , 1 x LPT, 5 x RS-232, 1 x RS-232/422/485, 1x K/B, 1 x Mouse
IrDA	115k bps, IrDA 1.0 compliant
USB	6 x USB 2.0 ports
DI/O	16-bit General Purpose I/O for DI and DO

Display	
Chipset	Intel® RG82855GME GMCH integrated Extreme Graphics 2 controller (Intel® RG82852GM GMCH integrated Extreme Graphics controller for EMB-9673 only)
Display Memory	Intel® DVMT 2.0 supports up to 64 MB video memory
Resolution	CRT mode: 2048 x 1536 @ 16 bpp (75 Hz) LCD/Simultaneous mode: 2048 x 1536 @ 16 bpp (75 Hz)
VGA/LCD Interface	AGP 4x VGA/LCD interface
LVDS	Intel® RG82855GME supports dual-channel 24-bit LVDS panels (Intel® RG82852GM supports dual-channel 24-bit LVDS panels for EMB-9673 only)
DVI	Chrontel CH7009 DVI transmitter up to 135M pixels/ second
TV-Out	Chrontel CH7009 integrated TV encoder supports both NTSC/PAL Supports both S-video and composite video
Audio	
Chipset	Intel® FW82801DB ICH4
AC97 Codec	VIA VT1616 supports 5.1 CH Audio
Audio Interface	Mic in, Line in, CD Audio in, Line out, Rear out and Center/Subwoofer out
Ethernet	
Chipset	Intel® 82562ET and Realtek RTL8101L or optional Intel® 82551QM/82551ER
Ethernet Interface	IEEE 802.3u 100Base-Tx Fast Ethernet compatible
Remote Boot ROM	Optional built-in boot ROM in Flash BIOS
Gigabit	
Chipset	Intel® 82541PI (Optional)
Ethernet Interface	IEEE 802.3 1000Base-T Fast Ethernet compatible
Mechanical & Environmental	
Power Requirement	+ 5 V @ 1.12 A, +12 V @ 0.01 A, + 3.3 V @ 2.72 A (with Intel® Pentium® M 1.6 GHz & 1 GB DDR SDRAM)
Power Type	ATX
Operation Temperature	0~60® C (32~140® F)
Operating Humidity	0%~90% relative humidity, non-condensing
Size (L x W)	6.69" x 8.66" (170 mm x 220 mm)
Weight	0.88 lbs (0.4 Kg)

1.6 Architecture Overview

1.6.1 Block Diagram

The following block diagram shows the architecture and main components of EMB-9670/9673 series.



The following sections provide detail information about the functions provided onboard.

1.6.2 Intel RG82855GME and FW82801DB (for EMB-9670)

The Intel 855GM/855GME GMCH components provide the processor interface, DDR SDRAM interface, display interface, and Hub interface. The Intel 855GME also has an option for AGP external graphics port, in addition to integrated graphics support for added board flexibility options.

The Intel 855GM GMCH is in a 732-pin Micro-FCBGA package and contains the following functionality listed below:

- AGTL+ host bus supporting 32-bit host addressing with Enhanced Intel SpeedStep technology support
- Supports a single channel of DDR SDRAM memory
- System memory supports DDR200/266 MHz (SSTL_2) DDR SDRAM
- Integrated graphics capabilities: Display Core frequency at 133 MHz or 200 MHz
- Render Core frequency at 100 MHz ,133 MHz, and 200 MHz
- Provides supports four display ports: one progressive scan analog monitor, dual channel LVDS interface and two DVO port.

The Intel 855GME GMCH is in a 732-pin Micro-FCBGA package and contains all features listed above and the additional functionality list below:

- Display Core frequency at 133 MHz, 200 MHz, or 250 MHz
- Render Core frequency at 100 MHz ,133 MHz, 166 MHz, 200 MHz, or 250 MHz
- System memory supports 200/266/333- MHz (SSTL_2) DDR SDRAM.
- Enhanced Power Management Graphics features

The GMCH IGD provides a highly integrated graphics accelerator delivering high performance 2D, 3D, and video capabilities. With its interfaces to UMA using a DVMT configuration, an analog display, a LVDS port, and two digital display ports (e.g. flat panel), the GMCH can provide a complete graphics solution.

The GMCH also provides 2D hardware acceleration for block transfers of data (BLTs). The BLT engine provides the ability to copy a source block of data to a destination and perform raster operations (e.g., ROP1, ROP2, and ROP3) on the data using a pattern, and/or another destination. Performing these common tasks in hardware reduces CPU load, and thus improves performance. High bandwidth access to data is provided through the system memory interface. The GMCH uses Tiling architecture to increase system memory efficiency and thus maximize effective rendering bandwidth. The Intel 855GM/855GME GMCH improves 3D performance and quality with 3D Zone rendering technology. The Intel 855GME GMCH also supports Video Mixer rendering and Bi-Cubic filtering.

The Intel 855GM/855GME GMCH has four display ports, one analog and three digital. With these interfaces, the GMCH can provide support for a progressive scan analog monitor, a dedicated dual channel LVDS LCD panel, and two DVO devices. Each port can transmit data according to one or more protocols. The data that is sent out the display port is selected from one of the two possible sources, Pipe A or Pipe B.

The Intel 855GM/855GME GMCH have an integrated dual channel LFP Transmitter interface to support LVDS LCD panel resolutions up to UXGA The display pipe provides panel up-scaling to fit a smaller source image onto a specific native panel size, as well as provides panning and centering support. The LVDS port is only supported on Pipe B. The LVDS port can only be driven by Pipe B, either independently or simultaneously with the Analog Display port. Spread Spectrum Clocking is supported: center and down spread support of 0.5%, 1%, and 2.5% utilizing an external SSC clock.

The DVO B/C interface is compliant with the DVI Specification 1.0. When combined with a DVI compliant external device (e.g. TMDS Flat Panel Transmitter, TV-out encoder, etc.), the GMCH provides a high-speed interface to a digital or analog display (e.g. flat panel, TV monitor, etc.). The DVO ports are connected to an external display device. Examples of this are TV-out encoders, external DACs, LVDS transmitters, and TMDS transmitters. Each display port has control signals that may be used to control, configure and/or determine the capabilities of an external device. The GMCH provides two DVO ports that are each capable of driving a 165-MHz pixel clock at the DVO B or DVO C interface. When DVO B and DVO C are combined into a single DVO port, then an effective pixel rate of 330 MHz can be achieved. The DVO B/C ports can be driven by Pipe A or Pipe
B. If driven on Pipe B, then the LVDS port must be disabled.

The ICH4 is a highly integrated multifunctional I/O Controller Hub that provides the interface to the PCI Bus and integrates many of functions needed in today's PC platform. The GMCH and ICH4 communicate over a dedicated hub interface. The 82801DB ICH4 functions and capabilities include:

- PCI Rev. 2.2 compliant with support for 33MHz PCI operations
- Supports up to 6 Request/Grant pairs (PCI slots)
- Power management logic support
- Enhanced DMA controller, interrupt controller, and timer functions
- Integrated IDE controller; Ultra ATA/100/66/33
- USB host interface; 3 host controllers and supports 6 USB ports; includes a EHCI high-speed 2.0 USB controller

- Integrated LAN controller
- System Management Bus (SMBus) compatible with most IC devices; ICH4 has both bus master and slave capability
- AC ’97 2.3 compliant link for audio and telephony codecs; up to 6 channels
- Low Pin Count (LPC) interface
- FWH Interface (FWH Flash BIOS support)
- Alert on LAN* (AOL and AOL2)

1.6.3 Intel RG82852GM and FW82801DB (for EMB-9673)

The Intel 852GM GMCH component provides the processor interface, DDR SDRAM interface, display interface, and Hub Interface in an Intel 852GM chipset platform. The Intel 852GM GMCH is optimized for the Mobile Intel Pentium 4 Processor-M, Mobile Intel Celeron processor and Intel Celeron M processor. It supports a single channel of DDR SDRAM memory. Intel 852GM Chipset contains advanced power management logic. The Intel 852GM Chipset platform supports the fourth generation mobile I/O Controller Hub to provide the features required by a mobile platform.

The Intel 852GM GMCH is in a 732-pin Micro-FCBGA package and contains the following functionality:

- Supports single Intel processor configurations at 400-MHz or 3 GB/s
- 1.2-1.30-V AGTL+ host bus supporting 32-bit host bus addressing with Enhanced Intel SpeedStep® technology (Intel Celeron M processor and Intel Celeron Processor do not support Enhanced Intel SpeedStep Technology).
- System Memory supports 200/266-MHz (SSTL_2) DDR DRAM Up to 1 GB (with 256-Mb technology and two SO-DIMMs) of PC1600/2100 DDR SDRAM without ECC
- Integrated graphics capabilities, including 3D rendering acceleration and 2D hardware acceleration
- Integrated 350-MHz, 24-bit RAMDAC with pixel resolution up to 1600x1200 at 85-Hz and up to 1920x1440 @ 60 Hz
- One Dedicated Dual Channel LFP LVDS interface with frequency range of 25 MHz to 112 MHz (single channel/dual channel) for support up to SXGA+ (1400x1050 @ 60 Hz) panel resolutions with maximum pixel depth of 18-bpp
- Integrated PWM (Pulse Width Modulation) interface for LFP backlight inverter control for panel brightness
- One 165-MHz, 12-bit, DVO interface for TV-out encoder and DVI (LVDS transmitter and TMDS transmitter) support I^2C and DDC channels supported
- Dual Pipe Independent Display with Tri-view support through LFP, DVO, and CRT
- Deeper Sleep state support

- Distributed arbitration for highly concurrent operation
- Three USB host controllers provide high performance peripherals with 480 Mbps of bandwidth, while enabling support for up to six USB 2.0 ports. This results in a significant increase over previous integrated 1-4 port hubs at 12 Mbps
- The latest AC '97 implementation delivers 20-bit audio for enhanced sound quality and full surround sound capability. Integrated audio solutions continue to enjoy success as a very cost-effective, yet high-performance solution
- LAN Connect Interface (LCI) provides flexible network solutions such as 10/100 Mbps Ethernet and 10/100 Mbps Ethernet with LAN manageability
- Dual Ultra ATA/100 controllers, coupled with the Intel® Application Accelerator – a performance software package – support faster IDE transfers to storage devices
- Intel Application Accelerator software provides additional performance over native ATA drivers by improving I/O transfer rates and enabling faster O/S load time, resulting in accelerated boot times
- Communication and Network Riser (CNR) offers flexibility in system configuration with a baseline feature set that can be upgraded with an audio card, modem card, or network card

1.6.4 DRAM Interface (Intel RG855GME)

The 855GME GMCH system memory controller directly supports the following:

- One channel of PC1600/2100 DDR SDRAM memory
- One channel of PC1600/2100/2700 DDR SDRAM memory
- DDR SDRAM devices with densities of 128-Mb, 256-Mb, and 512-Mb technology
- Up to 1 GB (512-Mb technology) SDRAM

1.6.5 DRAM Interface (Intel RG852GM)

The 852GM GMCH system memory controller directly supports the following:

- One channel of PC1600/2100 DDR SDRAM memory
- DDR SDRAM devices with densities of 128-Mb, 256-Mb, and 512-Mb technology
- Variable page sizes of 2-kB, 4-kB, 8-kB, and 16-kB. Page size is individually selected for every row and a maximum of 16 pages may be opened simultaneously

1.6.6 Chrontel CH7009 TV/DVI Transmitter

The Chrontel CH7009 is a display controller device which accepts a digital graphics input signal, and encodes and transmits data through a DVI (DFP can also be supported) or TV output (analog composite, s-video or RGB). The device accepts data over one 12-bit wide variable voltage data port which supports five different data formats including RGB and YCrCb.

The DVI processor includes a low jitter PLL for generation of the high frequency serialized clock, and all circuitries are required to encode, serialize and transmit data. The CH7009 comes in versions able to drive a DVI display at a pixel rate of up to 165MHz, supporting UXGA resolution displays. No scaling of input data is performed on the data output to the DVI device.

1.6.7 PCI Interface

The ICH4 PCI interface provides a 33 MHz, Rev. 2.2 compliant implementation. All PCI signals are 5V tolerant, except PME#. The ICH2 integrates a PCI arbiter that supports up to six external PCI bus masters in addition to the internal ICH4 requests.

1.6.8 IDE Interface (Bus Master Capability and Synchronous DMA Mode)

The fast IDE interface supports up to four IDE devices providing an interface for IDE hard disks and ATAPI devices. Each IDE device can have independent timings. The IDE interface supports PIO IDE transfers up to 16 Mbytes/sec and Ultra ATA transfers up 100 Mbytes/sec. It does not consume any ISA DMA resources. The IDE interface integrates 16x32-bit buffers for optimal transfers.

The ICH4's IDE system contains two independent IDE signal channels. They can be electrically isolated independently. They can be configured to the standard primary and secondary channels (four devices). There are integrated series resistors on the data and control lines.

Access to these controllers is provided by two standard IDC 40-pin connectors.

1.6.9 USB 2.0

The ICH4 contains an Enhanced Host Controller Interface (EHCI) compliant host controller that supports USB high-speed signaling. High-speed USB 2.0 allows data transfers up to 480Mb/s which is 40 times faster than full-speed USB. The ICH4 also contains three Universal Host Controller Interface (UHCI) controllers that support USB full-speed and low-speed signaling.

The ICH4 supports 6 USB 2.0 ports. All six USB ports are high-speed, full-speed, and low-speed capable. ICH4's port-routing logic determines whether a USB port is controlled by one of the UHCI controllers or by the EHCI controller.

1.6.10 Ethernet

1.6.10.1 ICH4 LAN Controller

ICH4's integrated LAN Controller includes a 32-bit PCI controller that provides enhanced scatter-gather bus mastering capabilities and enables the LAN Controller to perform high-speed data transfers over the PCI bus. Its bus master capabilities enable the component to process high level commands and perform multiple operations, this lowers processor utilization by off-loading communication tasks from the processor. Two large transmit and receive FIFOs of 3 KB each help prevent data under runs and overruns while waiting for bus accesses. This enables the integrated LAN Controller to transmit data with minimum inter frame spacing (IFS).

The LAN Controller can operate in either full duplex or half duplex mode. In full duplex mode the LAN Controller adheres with the IEEE 802.3x Flow Control specification. Half duplex performance is enhanced by a proprietary collision reduction mechanism.

The integrated LAN controller also includes an interface to a serial (4-pin) EEPROM. The EEPROM provides power-on initialization for hardware and software and software configuration parameters.

From a software perspective, the integrated LAN controller appears to reside on the secondary side of the ICH4's virtual PCI to PCI Bridge. This is typically Bus 1, but may be assigned a different number, depending on system configuration.

The following summarizes the ICH4 LAN controller features:

- Compliance with Advanced Configuration and Power Interface and PCI Power Management Standard.
- Support for wake-up on interesting packets and link status change
- Support for remote power-up using Wake on LAN (WOL) technology
- Deep power-down no de support
- Support of Wired for management (WfM) Rev 2.0
- Backward compatible software with 82447, 82558 and 82559
- TCP/UDP checksum off load capabilities
- Support for intel's Adaptive Technology

1.6.10.2 Realtek RTL8101L Ethernet Controller

The Realtek RTL8101L is a highly integrated and cost-effective single-chip Fast Ethernet controller. Featuring an MC'97 interface, the device is able to provide a combo-solution for LAN and software modem applications. It is equipped with a PCI and Boot ROM share interface (Realtek patent pending) for both EPROM and Flash Memory to provide maximum network security and ease of management.

The RTL8101L offers an ACPI (Advanced Configuration Power Interface) management function to provide efficient power management for advanced operating systems with OSPM (Operating System Directed Power Management). A remote wake-up function is also provided by support to Magic Packet, Link Change, and Wake-up Frame to increase cost-efficiency in network maintenance and management. In addition, it supports analog Auto Power-down and provides an auxiliary power auto-detect function to further save power.

1.6.10.3 Intel 82551ER Ethernet Controller (Optional)

The Intel® 82551ER integrated 10BASE-T/100BASE-TX Ethernet Controller expands the family of Intel® 8255x controllers. As part of Intel's fourth generation of fully integrated Fast Ethernet MAC/PHY solutions, the 82551ER is optimized for low-cost, embedded applications. The 82551ER provides excellent performance with offloading of TCP, UDP and IP checksums. Its optimized 32-bit interface and efficient scatter-gather bus mastering capabilities enable the controller to perform high-speed data transfers over the PCI bus. These capabilities accelerate the processing of high-level commands and operations, lowering CPU utilization. The device's architecture enables efficient data flow from the bus interface unit to the 3KB transmit and receive FIFOs, providing the perfect balance between the wire and system bus. In addition, multiple priority queues augment Quality of Service (QoS) performance. The 82551ER is pin-compatible with the Intel® 82559ER Fast Ethernet controller, and it is layout compatible with Intel® 82540 Gigabit Ethernet controller. Intel-supported 82551ER drivers run on the standard Intel® 82551QM Fast Ethernet PCI/CardBus Controller, providing OEMs an upgrade path to the 82551QM for additional features and increased functionality.

1.6.10.4 Intel 82541PI Gigabit Ethernet Controller (Optional)

The Intel® 82541PI Gigabit Ethernet Controller provides optimized Gigabit networking for power-sensitive designs, such as mobile PC applications. This highly efficient controller, with enhanced power management, consumes less than 1.0W of power at Gigabit speeds. When no signal is detected on the wire, the controller reduces power consumption by switching to 100 or 10 and powering down the physical-layer circuitry (PHY). When a signal is detected, the controller automatically negotiates the connection to Gigabit, if available. To reduce the battery drain, the controller automatically switches the link to 100Mbps operation when on battery power.

The Intel 82541PI Gigabit Ethernet Controller enhances secure manageability and system health monitoring over the LAN with support for IPMI 1.5, ASF 2.0 and Advanced Pass Through. For IPMI designs, the on-board SMBus port can pass management traffic through the controller to a management device, such as a Baseboard Management Controller (BMC). Alternatively, ASF 2.0 provides manageability without the cost burden of external hardware via standardized interfaces. ASF 2.0 circuitry provides advanced system health and security alerting plus authenticated remote power control capabilities.

With built-in power management capabilities and enhanced manageability, the Intel 82541PI Gigabit Ethernet Controller can help extend battery life for mobile PC users, giving your designs a competitive edge for tomorrow's mobile PCs.

1.6.11 Winbond W83627HF

The Winbond W83627F/HF is made to fully comply with Microsoft PC98 and PC99 Hardware Design Guide. Moreover, W83627F/HF is made to meet the specification of PC98/PC99's requirement in the power management: ACPI and DPM (Device Power Management). Super I/O chip provides features as the following:

- Meet LPC Spec. 1.0
- Support LDRQ# (LPC DMA), SERIRQ (serial IRQ)
- Include all features of Winbond I/O W83977TF and W83977EF
- Integrate Hardware Monitor functions
- Compliant with Microsoft PC98/PC99 Hardware Design Guide.
- Support DPM (Device Power Management), ACPI
- Programmable configuration settings
- Single 24 or 48 MHz clock input

1.6.12 Fintek F81216D

The F81216D mainly provides 3 pure UART ports and one UART + IR port through LPC. Each UART includes 16-byte send/receive FIFO, a programmable baud rate generator, complete modem control capability and an interrupt system. The features are as followings:

- Support LPC interface
- Totally provides 4 UART ports (3 x Pure UART, 1 x UART + IR)
- 1 Watch dog timer with SDTOUT# signal
- 1 Frequency input 24/48 MHz
- Powered by 3Vcc
- 48-LQFP (7mm x 7mm)

1.6.13 Compact Flash Interface

A Compact Flash type II connector is connected to the secondary IDE controller. The Compact Flash storage card is IDE compatible. It is an ideal replacement for standard IDE hard drives. The solid-state design offers no seek errors even under extreme shock and vibration conditions. The Compact Flash storage card is extremely small and highly suitable for rugged environments, thus providing an excellent solution for mobile applications with space limitations. It is fully compatible with all consumer applications designed for data storage PC card, PDA, and Smart Cellular Phones, allowing simple use for the end user. The Compact Flash storage card is O/S independent, thus offering an optimal solution for embedded systems operating in non-standard computing environments. The Compact Flash storage card is IDE compatible and offers various capacities.

2. Hardware Configuration

2.1 Installation Procedure

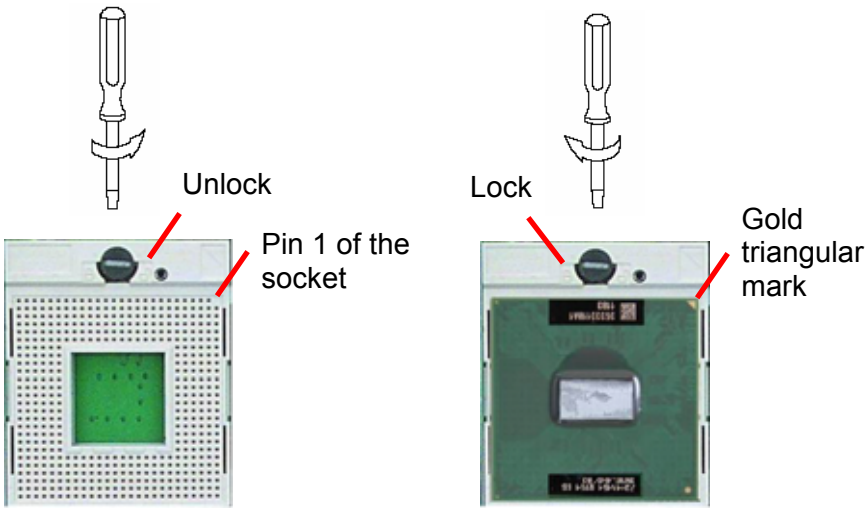
This chapter explains you the instructions of how to setup your system.

1. Turn off the power supply.
2. Insert the DIMM module (be careful with the orientation).
3. Insert all external cables for hard disk, floppy, keyboard, mouse, USB etc. except for flat panel. A CRT monitor must be connected in order to change CMOS settings to support flat panel.
4. Connect power supply to the board via the ATXPWR.
5. Turn on the power.
6. Enter the BIOS setup by pressing the delete key during boot up. Use the "LOAD BIOS DEFAULTS" feature. The ***Integrated Peripheral Setup*** and the ***Standard CMOS Setup*** Window must be entered and configured correctly to match the particular system configuration.
7. If TFT panel display is to be utilized, make sure the panel voltage is correctly set before connecting the display cable and turning on the power.

2.1.1 Processor Installation

2.1.1.1 Installing Pentium M CPU

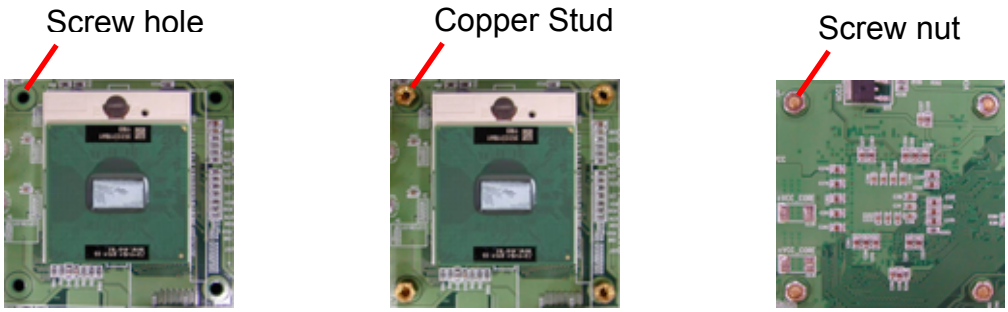
- The processor socket comes with a screw to secure the processor, please unlock the screw first.
- Position the CPU above the socket and the gold triangular mark on the CPU must align with pin 1 of the CPU socket. Then Insert the CPU gently seated in place.
- Turn the screw to the lock position.



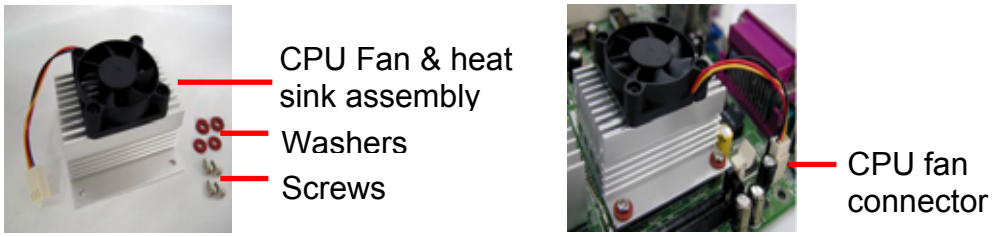
Note: Do not force the CPU into the socket. It may bend the pins and damage the CPU.

2.1.1.2 Installing the Fan and Heat Sink

- Insert the copper studs to the screw holes around the CPU socket from the top through the rear side of the board with screw nuts fastened.



- Match and place the CPU fan and heat sink assembly on the top of the CPU and copper studs. Tighten the screws into the copper studs through washers and the screw holes around the heat sink.
- Place the CPU Fan Connector.



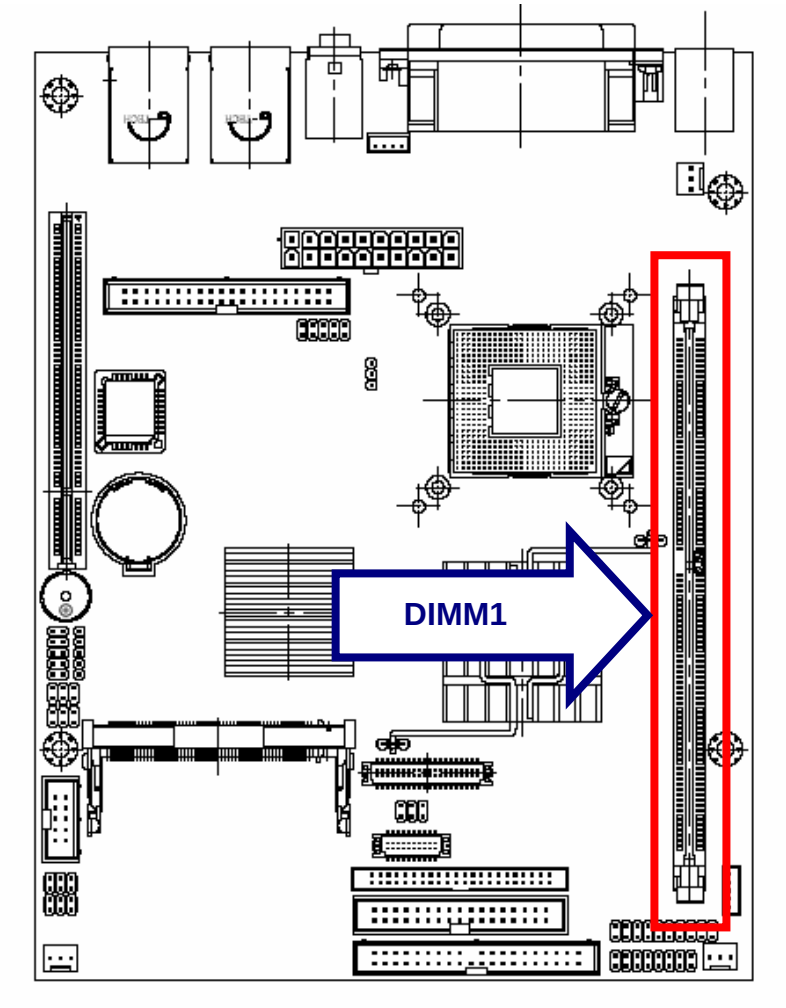
Note: Make sure the CPU fan and heat sink assembly and the CPU top surface are in total contact to avoid CPU overheating problem that would cause the system to hang or unstable

2.1.1.1 Removing CPU

- Disconnect the CPU fan connector.
- Remove the CPU fan and heat sink assembly first.
- Unfasten the copper studs from the board.
- Unlock the Pentium M processor.
- Carefully lift up the existing CPU to remove it from the socket.
- Follow the steps of installing a CPU to change to another one.

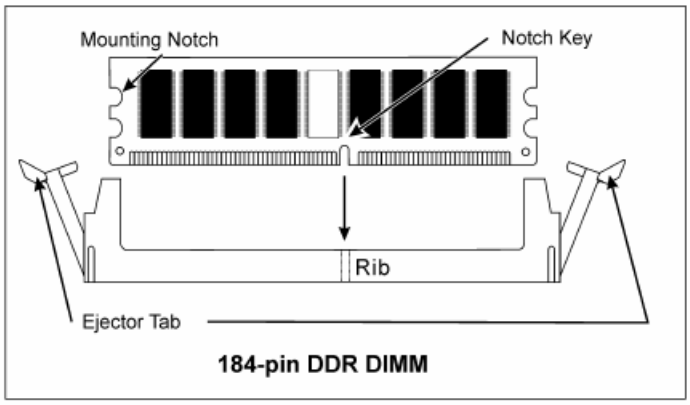
2.1.2 Main Memory

EMB-9670/9673 provides one 184-pin DIMM sockets to support DDR SDRAM. The total maximum memory size is 1GB.

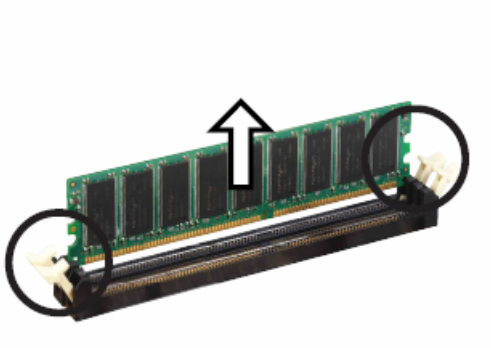


Make sure to unplug the power supply before adding or removing DIMMs or other system components. Failure to do so may cause severe damage to both the board and the components.

- Locate the DIMM slot on the board.
- Hold two edges of the DIMM module carefully. Keep away of touching its connectors.
- Align the notch key on the module with the rib on the slot.
- Firmly press the modules into the slot automatically snaps into the mounting notch. Do not force the DIMM module in with extra force as the DIMM module only fit in one direction.



- To remove the DIMM modules, push the two ejector tabs on the slot outward simultaneously, and then pull out the DIMM module.



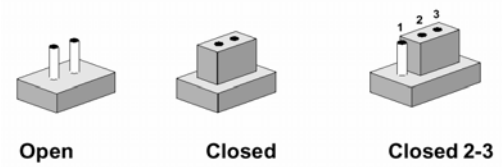
Note: (1) Please do not change any DDR SDRAM parameter in BIOS setup to increase your system's performance without acquiring technical information in advance.

(2) Static electricity can damage the electronic components of the computer or optional boards. Before starting these procedures, ensure that you are discharged of static electricity by touching a grounded metal object briefly.

2.2 Jumper and Connector List

You can configure your board to match the needs of your application by setting jumpers. A jumper is the simplest kind of electric switch.

It consists of two metal pins and a small metal 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, labeled 1, 2, and 3. In this case, you would connect either two pins.



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

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

Connectors on the board are linked to external devices such as hard disk drives, a keyboard, or floppy drives. In addition, the board has a number of jumpers that allow you to configure your system to suit your application.

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.

The following tables list the function of each of the board's jumpers and connectors.

Jumpers

Label	Function	Note
JBAT	Clear CMOS	3 x 1 header, pitch 2.54mm
JCPU1	Reserved	
JP1	COM2 RS-232/422/485 select	3 x 2 header, pitch 2.54mm
JP2	COM2 pin 9 signal select	3 x 2 header, pitch 2.54mm
JP3	COM2 RS-232/422/485 select	4 x 3 header, pitch 2.54mm
SW1	FSB select	DIP switch

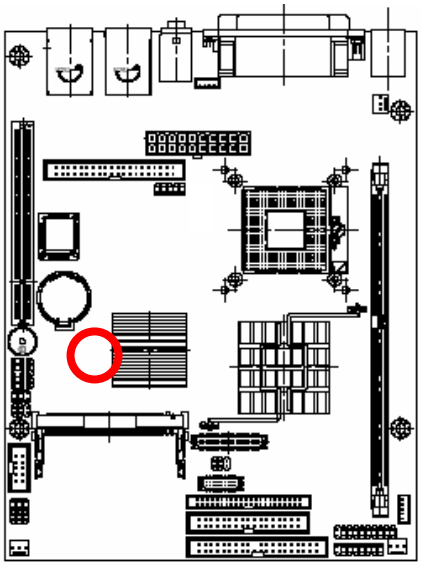
Connectors

Label	Function	Note
ATXPWR	ATX power connector	
CF	Compact Flash socket	
C_FAN1	CPU fan connector	3 x 1 wafer, pitch 2.54mm
CN1	RJ-45 Ethernet / USB 0 & 1 connector	
CN2	RJ-45 Ethernet / USB 2 & 3 connector	
CN3	Parallel port connector	D-sub 25-pin, female
	Serial port 1 connector	D-sub 9-pin, male
	VGA connector	D-sub 15-pin, female
CN4	Audio connector	Phone Jack X 3
DIMM	184-pin DDR SDRAM DIMM socket	
FLP	Floppy connector	17 x 2 header, pitch 2.54mm
IDE_1	Primary IDE connector	20 x 2 header, pitch 2.54mm
IDE_2	Secondary IDE connector	22 x 2 header, pitch 2.0mm
JBKL	LCD inverter connector	5 x 1 wafer, pitch 2.0mm
JCD	CD-ROM audio input connector	4 x 1 wafer, pitch 2.0mm
JCOM2	Serial port 2 connector	5 x 2 header, pitch 2.54mm
JCOM36	Serial port 3 / 4 / 5 / 6 connector	20 x 2 header, pitch 2.54mm
JDIO	DI/O connector	10 x 2 header, pitch 2.54mm
JFP	Front panel connector	8 x 2 header, pitch 2.54mm
JIR	IrDA connector	5 x 1 header, pitch 2.54mm
JLVDS	LVDS connector	HIROSE DF13-40DP-1.25V
JMISC	Miscellaneous setting connector	5 x 2 header, pitch 2.54mm
JTMDS	TMDS connector	HIROSE DF13-20DP-1.25V
JTV	TV out connector	3 x 2 header, pitch 2.54mm
JUSB	USB 4 / 5 connector	5 x 2 header, pitch 2.54mm
KB_MS1	PS/2 keyboard & mouse connector	6-pin Mini-DIN x 2
MPCI1	Mini PCI slot 1	
PCI1	PCI slot 1	
S_FAN1	System fan connector 1	3 x 1 wafer, pitch 2.54mm
S_FAN2	System fan connector 2	3 x 1 wafer, pitch 2.54mm
U23	Micro PGA 479 CPU socket	

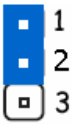
2.3 Setting Jumpers & Connectors

2.3.1 Clear CMOS (JBAT)

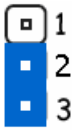
You can use JBAT to clear the CMOS data or password if necessary. To reset the CMOS data, set JBAT to 2-3 closed for just a few seconds, and then move the jumper back to 1-2 closed.



Normal*



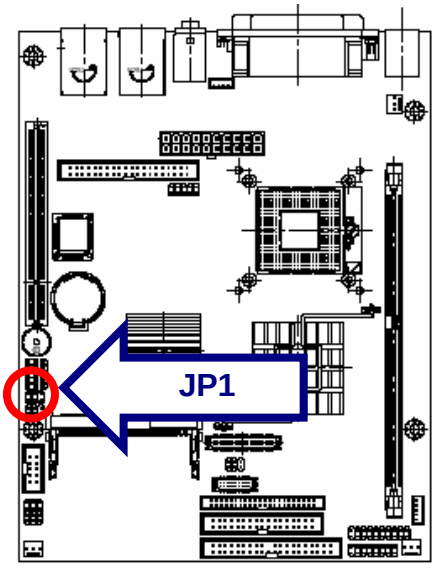
Clear CMOS



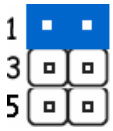
*** Default**

2.3.2 COM 2 RS-232/422/485 Select (JP1, JP3)

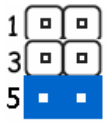
The EMB-9670/9673 COM2 serial port can be selected as RS-232, RS-422, or RS-485 by setting JP1 & JP3.



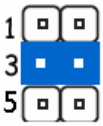
RS-232*



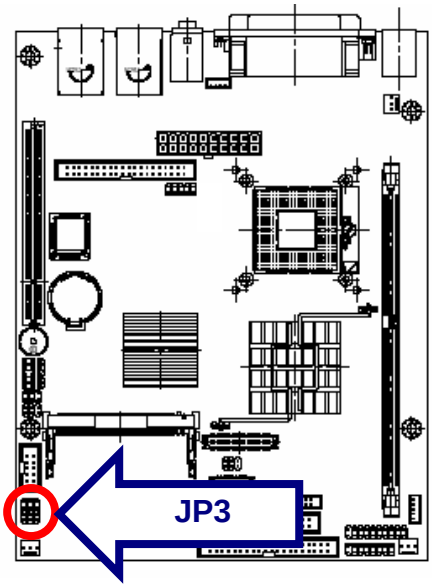
RS-485



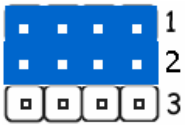
RS-422



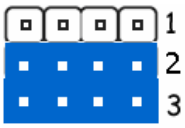
*** Default**



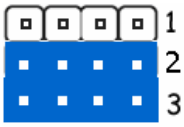
RS-232*



RS-485



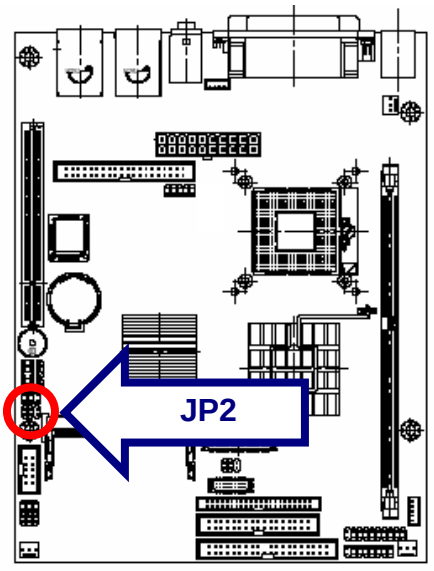
RS-422



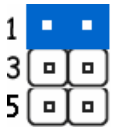
*** Default**

2.3.3 COM 2 Pin 9 Signal Select (JP2)

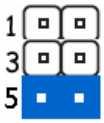
The EMB-9670/9673 COM2 Pin 9 Signal can be selected as +12V, +5V, or Ring by setting JP2.



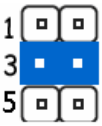
Ring*



+12V



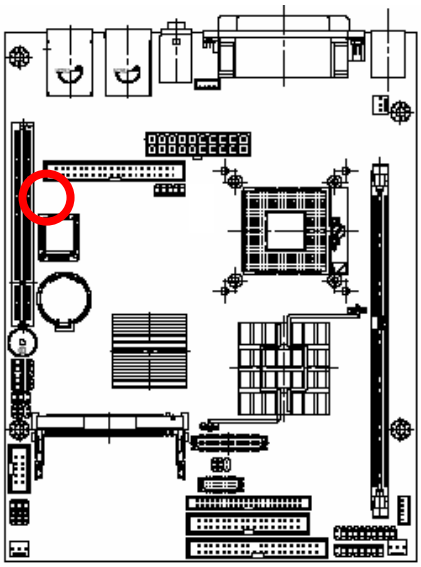
+5V



*** Default**

2.3.4 FSB Select (SW1)

Currently, SW1 is set with the below default for FSB selection.

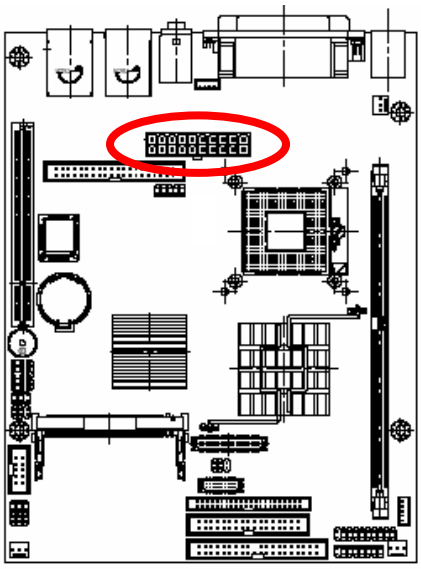


BIT1	BIT2	
ON	OFF	DEFAULT

Note: Please do not change the default setting otherwise it might damage the CPU.

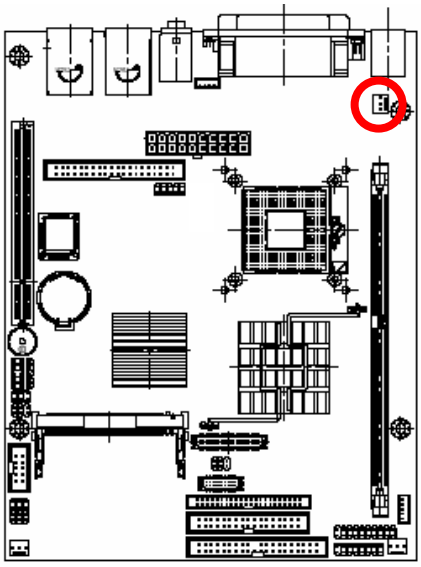
*** Default**

2.3.5 ATX Power Connector (ATXPWR)



Signal	PIN	PIN	Signal
+3.3V	11	1	+3.3V
-12V	12	2	+3.3V
GND	13	3	GND
PS_ON	14	4	+5V
GND	15	5	GND
GND	16	6	+5V
GND	17	7	GND
-5V	18	8	PWROK
+5V	19	9	AUX5V
+5V	20	10	+12V

2.3.6 CPU Fan Connector (C_FAN1)

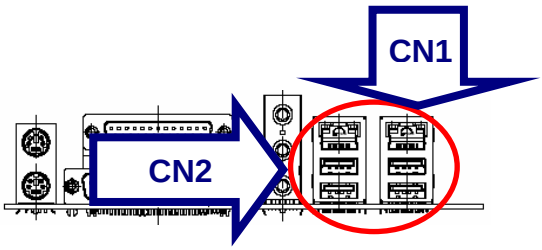


Signal	PIN
TAC	3
+12V	2
GND	1

2.3.7 Signal Description – CPU Fan Connector (C_FAN1)

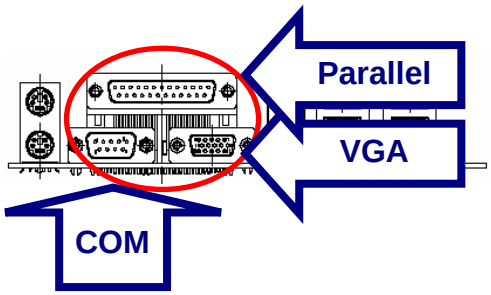
Signal	Signal Description
TAC	Fan speed monitor

2.3.8 RJ-45 Ethernet / USB 0 & 1, 2 & 3 Connectors (CN1, CN2)



Port	Description
RJ-45	Allows connection to a Local Area Network (LAN) through a network hub.
USB 2.0	For connecting USB port 0, 1 (CN1), 2, 3 (CN2)

2.3.9 Parallel Port Connector & Serial Port 1 Connector (CN3)



Port	Description
Parallel	Connects a parallel printer, a scanner, or other devices.
COM	For pointing devices or other serial devices

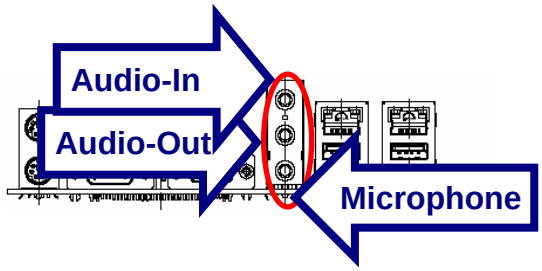
VGA

Signal	PIN			Signal
		6		GND
RED	1		11	NC
		7		GND
GREEN	2		12	DAT
		8		GND
BLUE	3		13	HSYNC
		9		VCC
NC	4		14	VSYNC
		10		GND
GND	5		15	DCK

2.3.10 Signal Description – VGA (CN3)

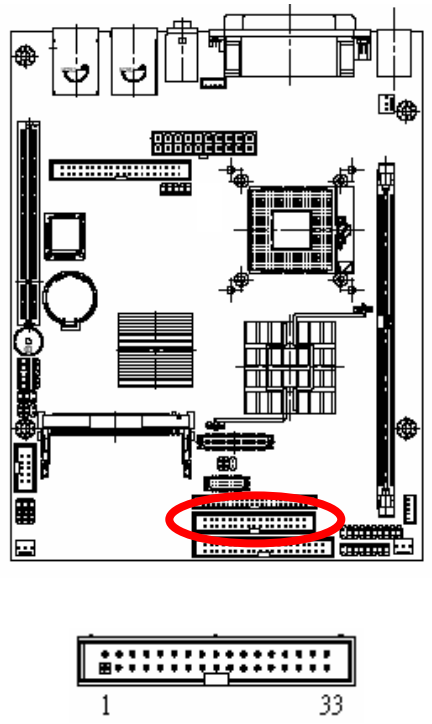
Signal	Signal Description
HSYNC	CRT horizontal synchronisation output.
VSYNC	CRT vertical synchronisation output.
DCK	Display Data Channel Clock. Used as clock signal to/from monitors with DDC interface.
DAT	Display Data Channel Data. Used as data signal to/from monitors with DDC interface.
RED	Analog output carrying the red colour signal to the CRT. For 75 Ω cable impedance.
GREEN	Analog output carrying the green colour signal to the CRT. For 75 Ω cable impedance.
BLUE	Analog output carrying the blue colour signal to the CRT. For 75 Ω cable impedance.

2.3.11 Audio Connector (CN4)



Port	Description
Audio-In	Connects a tape player or other audio sources.
Audio-Out	Connects a headphone or a speaker.
Microphone	Connects a microphone.

2.3.1 Floppy Connector (FLP)

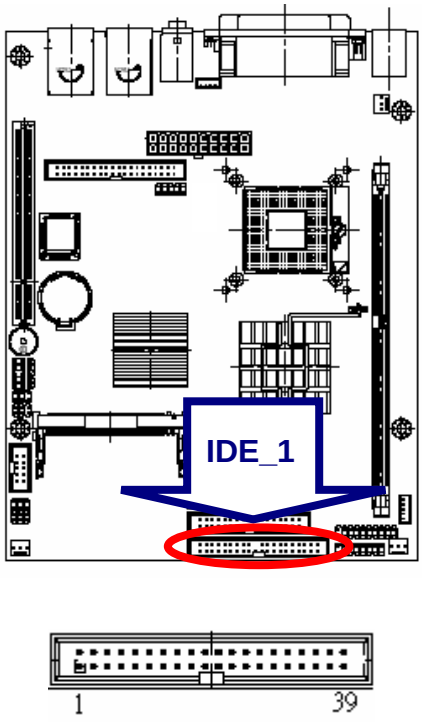


Signal	PIN	PIN	Signal
GND	1	2	REDWC
GND	3	4	NC
GND	5	6	NC
GND	7	8	INDEX
GND	9	10	MOTSA
GND	11	12	DRVSB
GND	13	14	DRVSA
GND	15	16	MOTEB
GND	17	18	DIR
GND	19	20	STEP
GND	21	22	WDATA
GND	23	24	WGATE
GND	25	26	TK00
GND	27	28	WPT
GND	29	30	RDATA
GND	31	32	SIDE1
GND	33	34	DSKCHG

2.3.2 Signal Description – Floppy Connector (FLP)

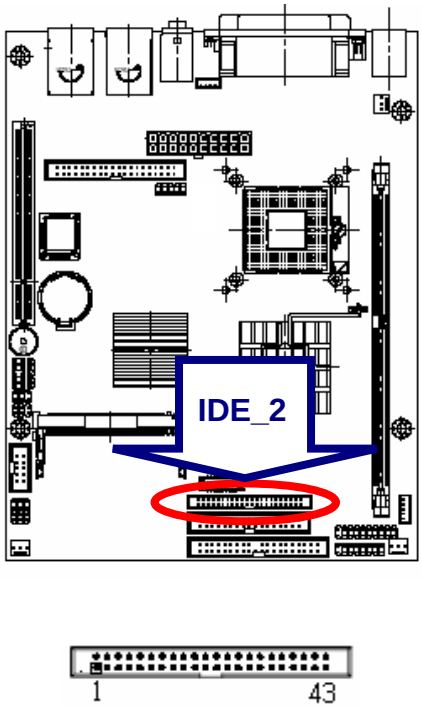
Signal	Signal Description
RDATA	The read data input signal from the FDD.
WDATA	Write data. This logic low open drain writes pre-compensation serial data to the selected FDD. An open drain output.
WGATE	Write enable. An open drain output.
MOATSA	Motor A On. When set to 0, this pin enables disk drive 0. This is an open drain output.
MOTEB	Motor B On. When set to 0, this pin enables disk drive 1. This is an open drain output.
DRVSA	Drive Select A. When set to 0, this pin enables disk drive A. This is an open drain output.
DRVSB	Drive Select B. When set to 0, this pin enables disk drive B. This is an open drain output.
SIDE1	This output signal selects side of the disk in the selected drive.
DIR	Direction of the head step motor. An open drain output Logic 1 = outward motion Logic 0 = inward motion
STEP	Step output pulses. This active low open drain output produces a pulse to move the head to another track.
REDWC	This output indicates whether a low drive density (250/300kbps at low level) or a high drive density (500/1000kbps at high level) has been selected.
TK00	Track 0. This Schmitt-triggered input from the disk drive is active low when the head is positioned over the outermost track.
INDEX	This Schmitt-triggered input from the disk drive is active low when the head is positioned over the beginning of a track marked by an index hole.
WPT	Write protected. This active low Schmitt input from the disk drive indicates that the diskette is write-protected.
DSKCHG	Diskette change. This signal is active low at power on and whenever the diskette is removed.

2.3.3 Primary IDE Connector (IDE_1)



Signal	PIN	PIN	Signal
RESET#	1	2	GND
PDD7	3	4	PDD8
PDD6	5	6	PDD9
PDD5	7	8	PDD10
PDD4	9	10	PDD11
PDD3	11	12	PDD12
PDD2	13	14	PDD13
PDD1	15	16	PDD14
PDD0	17	18	PDD15
GND	19	20	NC
PDREQ	21	22	GND
PDIOW#	23	24	GND
PDIOR#	25	26	GND
PIORDY	27	28	GND
PDDACK#	29	30	GND
IRQ14	31	32	NC
PDA1	33	34	NC
PDA0	35	36	PDA2
PDCS1#	37	38	PDCS3#
IDEACTP#	39	40	GND

2.3.4 Secondary IDE Connector (IDE_2)



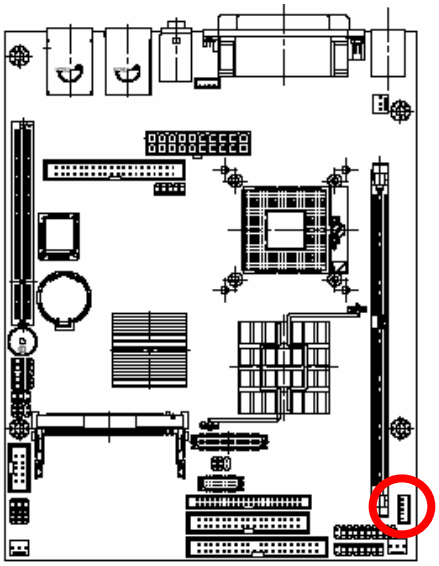
Signal	PIN	PIN	Signal
RESET#	1	2	GND
PDD7	3	4	PDD8
PDD6	5	6	PDD9
PDD5	7	8	PDD10
PDD4	9	10	PDD11
PDD3	11	12	PDD12
PDD2	13	14	PDD13
PDD1	15	16	PDD14
PDD0	17	18	PDD15
GND	19	20	NC
PDREQ	21	22	GND
PDIOW#	23	24	GND
PDIOR#	25	26	GND
PIORDY	27	28	GND
PDDACK#	29	30	GND
IRQ14	31	32	NC
PDA1	33	34	NC
PDA0	35	36	PDA2
PDCS1#	37	38	PDCS3#
IDEACTP#	39	40	GND
+5V	41	42	+5V
GND	43	44	NC

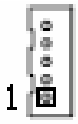
2.3.5 Signal Description –Primary / Secondary IDE Connector (IDE_1, IDE_2)

The IDE interface supports PIO modes 0 to 4 and Bus Master IDE. Data transfer rates up to 100 MB/Sec is possible.

Signal	Signal Description
DA [2:0]	IDE Address Bits. These address bits are used to access a register or data port in a device on the IDE bus.
DCS1#, DCS3#	IDE Chip Selects. The chip select signals are used to select the command block registers in an IDE device. DCS1# selects the primary hard disk.
D [15:0]	IDE Data Lines. D [15:0] transfers data to/from the IDE devices.
IOR#	IDE I/O Read. Signal is asserted on read accesses to the corresponding IDE port addresses.
IOW#	IDE I/O Write. Each signal is asserted on write accesses to corresponding the IDE port addresses.
IORDY	When deasserted, these signals extend the transfer cycle of any host register access when the device is not ready to respond to the data transfer request.
RESET#	IDE Reset. This signal resets all the devices that are attached to the IDE interface.
IRQ14	Interrupt line from hard disk. Connected directly to PC-AT bus.
DREQ	The DREQ is used to request a DMA transfer from the South Bridge. The direction of the transfers is determined by the IOR#/IOW# signals.
DACK#	DMA Acknowledge. The DACK# acknowledges the DREQ request to initiate DMA transfers.
DACT#	Signal from hard disk indicating hard disk activity. The signal level depends on the hard disk type, normally active low. The signal is routed directly to the LED1.

2.3.6 LCD Inverter Connector (JBKL)



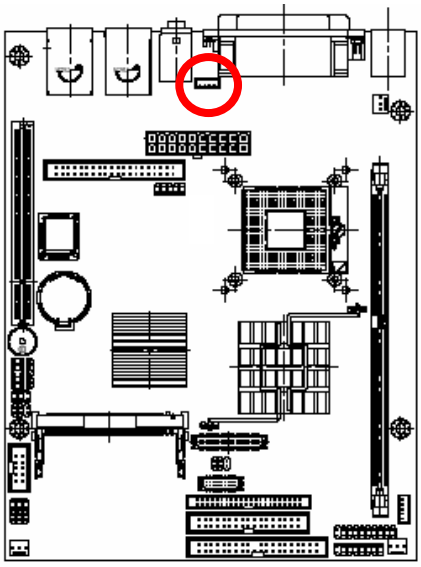


Signal	PIN
+5V	5
BL_ADJUST	4
BL_ON_OFF	3
GND	2
+12V	1

2.3.7 Signal Description – LCD Inverter Connector (JBKL)

Signal	Signal Description
BL_ADJUST	Bright adjust.
BL_ON_OFF	LCD backlight ON/OFF control signal.

2.3.8 CD-ROM Audio Input Connector (JCD)

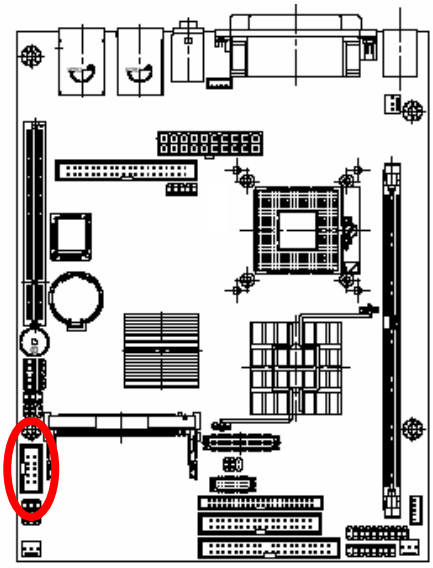


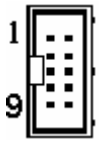
Signal	PIN
CD_R	4
CD_GND	3
CD_L	2
NC	1

2.3.9 Signal Description – LCD Panel Backlight Connector (JCD)

Signal	Signal Description
CD_R	Right CD-IN signal
CD_L	Left CD-IN signal

2.3.10 Serial Port 2 Connector in RS-232 Mode (JCOM2)



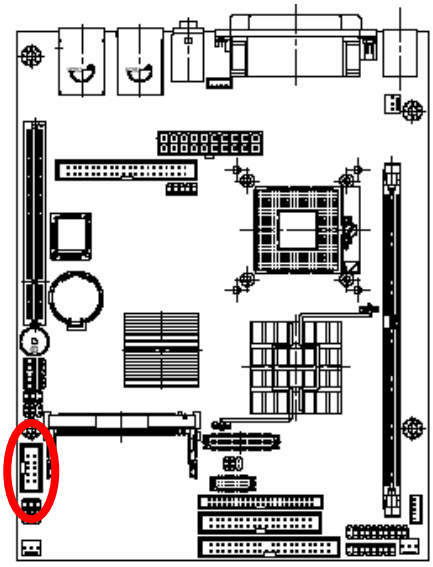


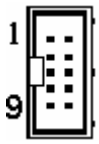
Signal	PIN	PIN	Signal
DCD	1	2	RxD
TxD	3	4	DTR
GND	5	6	DSR
RTS	7	8	CTS
RI/+5V/+12V	9	10	NC

2.3.11 Signal Description – Serial Port 2 Connector in RS-232 Mode (JCOM2)

Signal	Signal Description
TxD	Serial output. This signal sends serial data to the communication link. The signal is set to a marking state on hardware reset when the transmitter is empty or when loop mode operation is initiated.
RxD	Serial input. This signal receives serial data from the communication link.
DTR	Data Terminal Ready. This signal indicates to the modem or data set that the on-board UART is ready to establish a communication link.
DSR	Data Set Ready. This signal indicates that the modem or data set is ready to establish a communication link.
RTS	Request To Send. This signal indicates to the modem or data set that the on-board UART is ready to exchange data.
CTS	Clear To Send. This signal indicates that the modem or data set is ready to exchange data.
DCD	Data Carrier Detect. This signal indicates that the modem or data set has detected the data carrier.
RI	Ring Indicator. This signal indicates that the modem has received a telephone ringing signal.

2.3.12 Serial Port 2 Connector in RS-422 Mode (JCOM2)



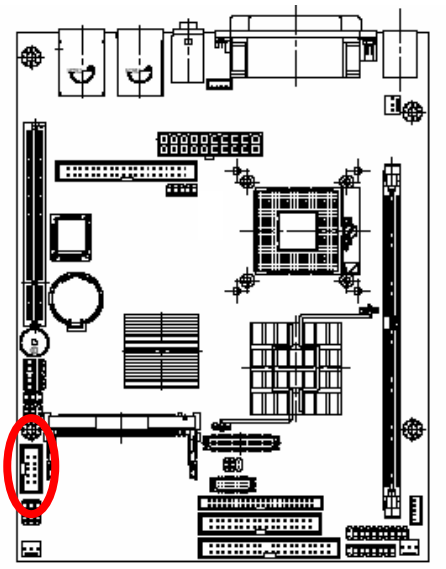


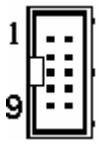
Signal	PIN	PIN	Signal
TxD-	1	2	RxD+
TxD+	3	4	RxD-
GND	5	6	NC
NC	7	8	NC
NC	9	10	NC

2.3.13 Signal Description – Serial Port 2 Connector in RS-422 Mode (JCOM2)

Signal	Signal Description
TxD+/-	Serial output. This differential signal pair sends serial data to the communication link. Data is transferred from Serial Port 2 Transmit Buffer Register to the communication link, if the RTS register of the Serial Port 2 is set to LOW.
RxD+/-	Serial input. This differential signal pair receives serial data from the communication link. Received data is available in Serial Port 2 Receiver Buffer Register.

2.3.14 Serial Port 2 Connector in RS-485 Mode (JCOM2)





Signal	PIN	PIN	Signal
DATA-	1	2	NC
DATA+	3	4	NC
GND	5	6	NC
NC	7	8	NC
NC	9	10	NC

2.3.15 Signal Description – Serial Port 2 Connector in RS-485 Mode (JCOM2)

Signal	Signal Description
DATA+/-	This differential signal pair sends and receives serial data to the communication link. The mode of this differential signal pair is controlled through the RTS register of Serial Port 2. Set the RTS register of the Serial Port 2 to LOW for transmitting, HIGH for receiving.

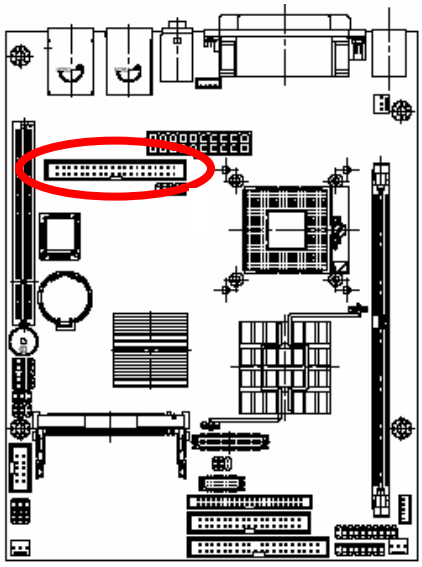
Do not select a mode different from the one used by the connected peripheral, as this may damage CPU board and/or peripheral.

The transmitter drivers in the port are short circuit protected by a thermal protection circuit. The circuit disables the drivers when the die temperature reaches 150 °C.

RS-422 mode is typically used in point to point communication. Data and control signal pairs should be terminated in the receiver end with a resistor matching the cable impedance (typical 100-120 Ω). The resistors could be placed in the connector housing.

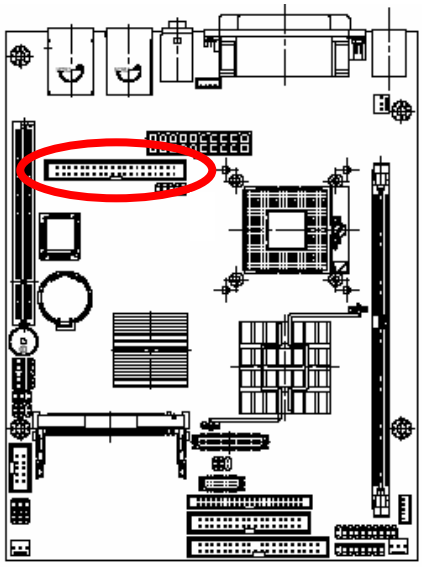
RS-485 mode is typically used in multi drop applications, where more than 2 units are communicating. The data and control signal pairs should be terminated in each end of the communication line with a resistor matching the cable impedance (typical 100-120 Ω). Stubs to substations should be avoided.

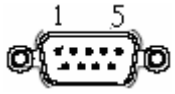
2.3.16 Serial Port 3 / 4 / 5 / 6 Connector (JCOM36)



Signal	PIN	PIN	Signal
DCDA	1	2	DSRA
RxDA	3	4	RTSA
TxDA	5	6	CTSA
DRTA	7	8	RIA
GND	9	10	NC
DCDB	11	12	DSRB
RxDB	13	14	RTSB
TxDB	15	16	CTSB
DRTB	17	18	RIB
GND	19	20	NC
DCDC	21	22	DSRC
RxDC	23	24	RTSC
TxDC	25	26	CTSC
DTRC	27	28	RIC
GND	29	30	NC
DCDD	31	32	DSRD
RxDD	33	34	RTSD
TxDD	35	36	CTSD
DRTD	37	38	RID
GND	39	40	NC

2.3.17 Serial Port 3 / 4 / 5 / 6 with External DB9 Connector (JCOM36)



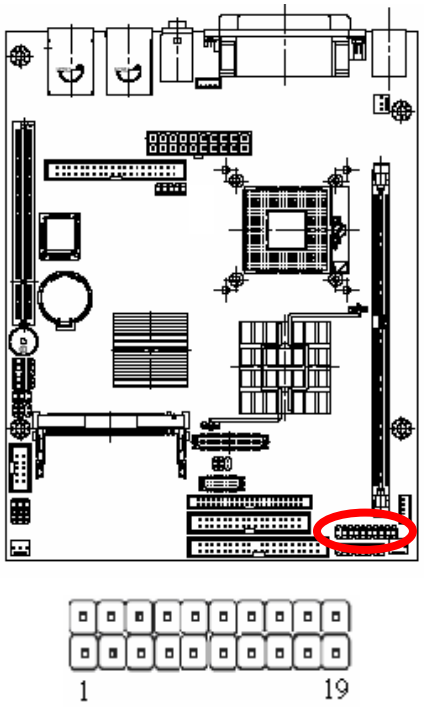


Signal	PIN	PIN	Signal
GND	5		
		9	RI
DTR	4		
		8	CTS
TxD	3		
		7	RTS
RxD	2		
		6	DSR
DCD	1		

2.3.18 Signal Description – Serial Port 3 / 4 / 5 / 6 with External DB9 Connector (JCOM36)

Signal	Signal Description
TxD	Serial output. This signal sends serial data to the communication link. The signal is set to a marking state on hardware reset when the transmitter is empty or when loop mode operation is initiated.
RxD	Serial input. This signal receives serial data from the communication link.
DTR	Data Terminal Ready. This signal indicates to the modem or data set that the on-board UART is ready to establish a communication link.
DSR	Data Set Ready. This signal indicates that the modem or data set is ready to establish a communication link.
RTS	Request To Send. This signal indicates to the modem or data set that the on-board UART is ready to exchange data.
CTS	Clear To Send. This signal indicates that the modem or data set is ready to exchange data.
DCD	Data Carrier Detect. This signal indicates that the modem or data set has detected the data carrier.
RI	Ring Indicator. This signal indicates that the modem has received a telephone ringing signal.

2.3.19 DI/O Connector (JDIO)

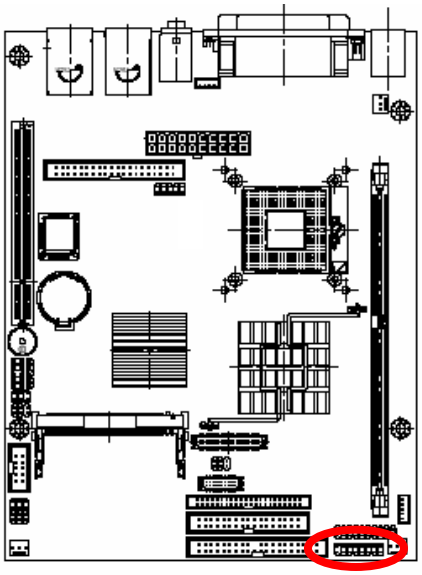


Signal	PIN	PIN	Signal
DO_1	1	2	DI_1
DO_2	3	4	DI_2
DO_3	5	6	DI_3
DO_4	7	8	DI_4
DO_5	9	10	DI_5
DO_6	11	12	DI_6
DO_7	13	14	DI_7
DO_8	15	16	DI_8
SMB_CLK	17	18	SMB_DATA
GND	19	20	+5V

2.3.20 Signal Description – DI/O (JDIO)

Signal	Signal Description
DI [7:0]	Digital Input Data Bit 7 to Bit 0
D0 [7:0]	Digital Output Data Bit 7 to Bit 0
SMB_CLK	Data input for I^2C input, 5V tolerant
SMB_DATA	Data input for I^2C serial input, 5V tolerant

2.3.21 Front Panel Connector (JFP)

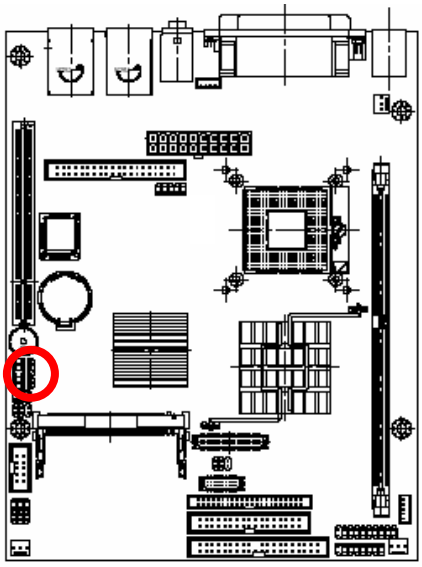


Signal	PIN	PIN	Signal
RESET	1	2	SYS_LED+
GND	3	4	SYS_LED-
HDD_LED+	5	6	PWR_LED+
HDD_LED-	7	8	PWR_LED-
VCCSB	9	10	VCCSB
PWR_BUT	11	12	SUS_LED
SUS_BUT	13	14	SPK+
GND	15	16	SPK-

2.3.22 Signal Description – Front Panel Connector (JFP)

PIN No.	Description
1, 3	Reset SW
2, 4	System LED
5, 7	HDD LED
6, 8	Power LED
9, 11	Power SW
10, 12	Suspend LED
13, 15	Suspend SW
14, 16	Speaker

2.3.23 IrDA Connector (JIR)

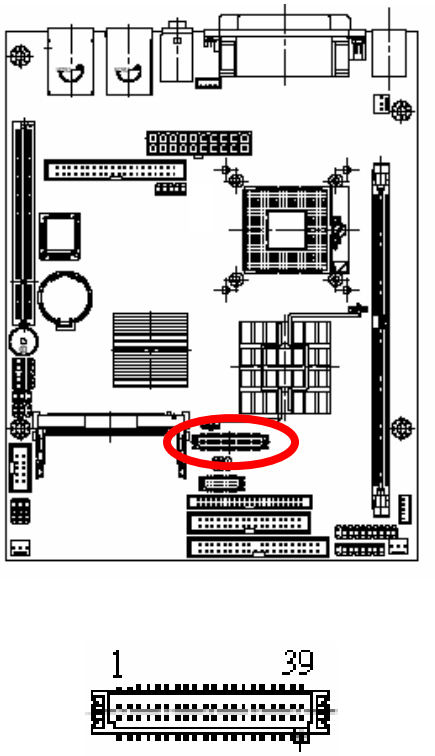


Signal	PIN
IRTX	5
GND	4
IRRX	3
NC	2
+5V	1

2.3.24 Signal Description – IrDA Connector (JIR)

Signal	Signal Description
IRRX	Infrared Receiver input
IRTX	Infrared Transmitter output

2.3.25 LVDS Connector (JLVDS)

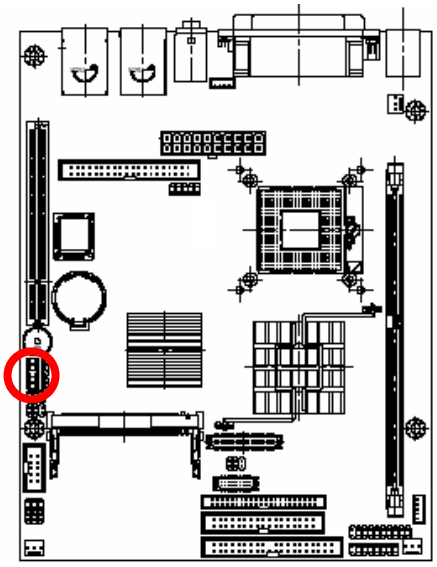


Signal	PIN	PIN	Signal
+5V	2	1	+3.3V
+5V	4	3	+3.3V
SPDATA	6	5	SPCLK
GND	8	7	GND
YA0P	10	9	YA1P
YA0M	12	11	YA1M
GND	14	13	GND
YA2P	16	15	YA3P
YA2M	18	17	YA3M
GND	20	19	GND
YB0P	22	21	YB1P
YB0M	24	23	YB1M
GND	26	25	GND
YB2P	28	27	YB3P
YB2M	30	29	YB3M
GND	32	31	GNDG
CLK1P	34	33	CLK2P
CLK1M	36	35	CLK2M
GND	38	37	GND
Reserved	40	39	Reserved

2.3.26 Signal Description – LVDS Connector (JLVDS)

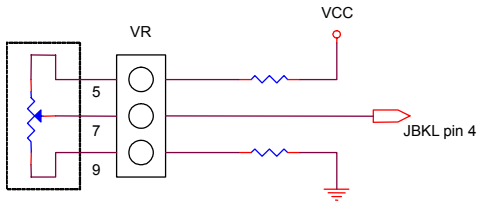
Signal	Type	Signal Description
SPDATA	I/O CMOS	**Panel DDC Data:** This signal is used as the DDC data signal between the LFP and the GMCH.
SPCLK	I/O CMOS	**Panel DDC Clock:** This signal is used as the DDC clock signal between the LFP and the GMCH.
YA[0:3]P	O LVDS	**Channel A differential data pair 3:0 output (true):** 245-800 MHz.
YA[0:3]M	O LVDS	**Channel A differential data pair 3:0 output (compliment):** 245--800 MHz
YB[0:3]P	O LVDS	**Channel B differential data pair 3:0 output (true):** 245-800 MHz.
YB[0:3]M	O LVDS	**Channel B differential data pair 3:0 output (compliment):** 245- 800 MHz.
CLK1P	O LVDS	**Channel A differential clock pair output (true):** 245-800 MHz
CLK1M	O LVDS	**Channel A differential clock pair output (compliment):** 245- 800 MHz.
CLK2P	O LVDS	**Channel B differential clock pair output (true):** 245-800 MHz
CLK2M	O LVDS	**Channel B differential clock pair output (compliment):** 245- 800 MHz.

2.3.27 Miscellaneous Setting Connector (JMISC)

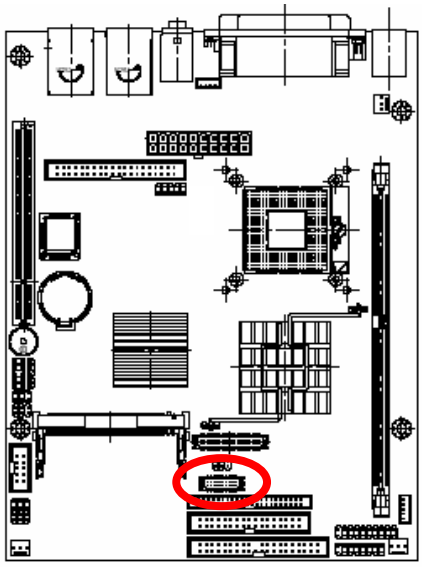


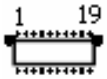
Signal	PIN	PIN	Signal
CASEOPEN#	1	2	VTIN3
GND	3	4	THRMDN
+5V	5	6	+5V
BRIGHT	7	8	#MASTER
GND	9	10	GND

2.3.28 Signal Description – Miscellaneous Setting Connector (JMISC)

PIN No.	Description
1, 3	Case open detection
5, 7, 9	LCD brightness setting  **Variation Resistor** (Recommended: 4.7KΩ, >1/16W)
2, 4	Thermal detection
6, 8, 10	CF Master/Slave setting 8-10 short (default: Master)

2.3.29 TMDS Connector (JTMDS)



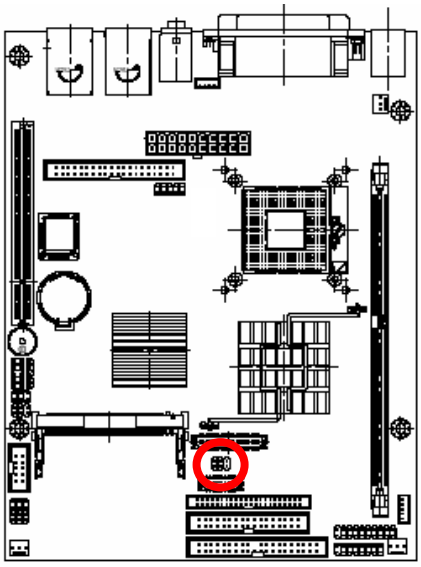


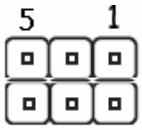
Signal	PIN	PIN	Signal
+5V	2	1	TDC0#
GND	4	3	TDC0
NC	6	5	NC
NC	8	7	NC
HPDET	10	9	TDC1#
TMDSDATA	12	11	TDC1
TMDSDCLK	14	13	NC
GND	16	15	NC
TLC#	18	17	TDC2#
TLC	20	19	TDC

2.3.30 Signal Description – TMDS Connector (JTMDS)

Signal	Type	Signal Description
TDC0, TDC0#	O	**DVI Data Channel 0 Outputs:** These pins provide the DVI differential outputs for data channel 0 (blue).
TDC1, TDC1#	O	**DVI Data Channel 1 Outputs:** These pins provide the DVI differential outputs for data channel 1 (green).
TDC2, TDC2#	O	**DVI Data Channel 2 Outputs:** These pins provide the DVI differential outputs for data channel 2 (red).
HPDET	I	**Hot Plug Detect (internal pull-down):** This input pin determines whether the DVI is connected to a DVI monitor. When terminated, the monitor is required to apply a voltage greater than 2.4 volts. Changes on the status of this pin will be relayed to the graphics controller via the P-OUT/TLDET* or GPIO (1)/TLDET* pin pulling low.
TMDSDATA	I/O	**DVO I2C Data:** This signal is used as the I2C_DATA for a digital display (i.e. TV-Out Encoder, TMDS transmitter). This signal is tri-stated during a hard reset.
TMDSDCLK	I/O	**DVI DDC Clock:** This signal is used as the DDC clock for a digital display connector (i.e. primary digital monitor). This signal is tri-stated during a hard reset.
TLC, TLC#	O	**DVI Clock Outputs:** These pins provide the differential clock outputs for the DVI interface corresponding to data on TDC (0:2) outputs.

2.3.31 TV Out Connector (JTV)



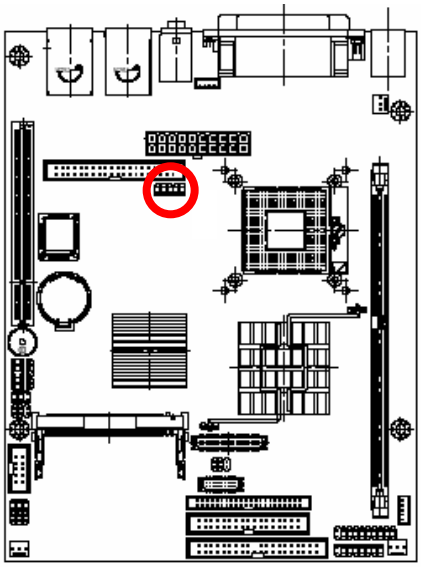


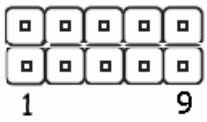
Signal	PIN	PIN	Signal
GND	6	5	GND
TVCFCC2	4	3	TVYFCC2
GND	2	1	TVCVB

2.3.32 Signal Description – TV Out Connector (JTV)

Signal	Signal Description
TVYFCC2	Luminance output
TVCFCC2	Chrominance output
TVCVB	Composite video output

2.3.33 USB 4 / 5 Connector (JUSB)



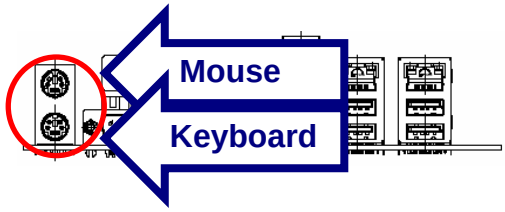


Signal	PIN	PIN	Signal
USB_VCC	1	2	GND
D4-	3	4	GND
D4+	5	6	D5+
GND	7	8	D5-
GND	9	10	USB_VCC

2.3.34 Signal Description – USB 4 / 5 Connector (JUSB)

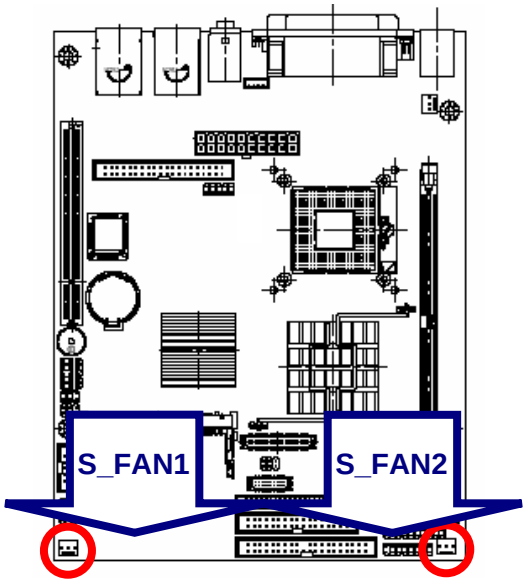
Signal	Signal Description
D5+/-	Differential bi-directional data signal for USB channel 5. Clock is transmitted along with the data using NRZI encoding. The signalling bit rate is up to 12 Mbs.
D4+/-	Differential bi-directional data signal for USB channel 4. Clock is transmitted along with the data using NRZI encoding. The signalling bit rate is up to 12 Mbs.
USB_VCC	5 V DC supply for external devices. Maximum load according to USB standard.

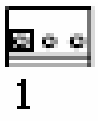
2.3.35 PS/2 Keyboard & Mouse Connector (KB_MS1)



Port	Description
Mouse	PS/2 Mouse connector
Keyboard	PS/2 Keyboard connector

2.3.36 System Fan Connector 1 / 2 (S_FAN1, S_FAN2)





Signal	PIN
GND	1
+12V	2
TAC	3

2.3.37 Signal Description – System Fan Connector 1 / 2 (S_FAN1, S_FAN2)

Signal	Signal Description
TAC	Fan speed monitor

3. BIOS Setup

3.1 Starting Setup

The AwardBIOS™ is immediately activated when you first power on the computer. The BIOS reads the system information contained in the CMOS and begins the process of checking out the system and configuring it. When it finishes, the BIOS will seek an operating system on one of the disks and then launch and turn control over to the operating system.

While the BIOS is in control, the Setup program can be activated in one of two ways:

By pressing <Del> immediately after switching the system on, or

By pressing the <Del> key when the following message appears briefly at the bottom of the screen during the POST (Power On Self Test).

Press DEL to enter SETUP

If the message disappears before you respond and you still wish to enter Setup, restart the system to try again by turning it OFF then ON or pressing the "RESET" button on the system case. You may also restart by simultaneously pressing <Ctrl>, <Alt>, and <Delete> keys. If you do not press the keys at the correct time and the system does not boot, an error message will be displayed and you will again be asked to.

Press F1 to Continue, DEL to enter SETUP

3.2 Using Setup

In general, you use the arrow keys to highlight items, press <Enter> to select, use the PageUp and PageDown keys to change entries, press <F1> for help and press <Esc> to quit. The following table provides more detail about how to navigate in the Setup program using the keyboard.

Button	Description
↑	Move to previous item
↓	Move to next item
←	Move to the item in the left hand
→	Move to the item in the right hand
Esc key	Main Menu -- Quit and not save changes into CMOS Status Page Setup Menu and Option Page Setup Menu -- Exit current page and return to Main Menu
PgUp key	Increase the numeric value or make changes
PgDn key	Decrease the numeric value or make changes
+ key	Increase the numeric value or make changes
- key	Decrease the numeric value or make changes
F1 key	General help, only for Status Page Setup Menu and Option Page Setup Menu
(Shift) F2 key	Change color from total 16 colors. F2 to select color forward, (Shift) F2 to select color backward
F3 key	Calendar, only for Status Page Setup Menu
F4 key	Reserved
F5 key	Restore the previous CMOS value from CMOS, only for Option Page Setup Menu
F6 key	Load the default CMOS value from BIOS default table, only for Option Page Setup Menu
F7 key	Load the default
F8 key	Reserved
F9 key	Reserved
F10 key	Save all the CMOS changes, only for Main Menu

- **Navigating Through The Menu Bar**

  Use the left and right arrow keys to choose the menu you want to be in.

Note: Some of the navigation keys differ from one screen to another.

- **To Display a Sub Menu**
  Use the arrow keys to move the cursor to the sub menu you want. Then press <Enter>. A "➢" pointer marks all sub menus.

3.3 Getting Help

Press F1 to pop up a small help window that describes the appropriate keys to use and the possible selections for the highlighted item. To exit the Help Window press <Esc> or the F1 key again.

3.4 In Case of Problems

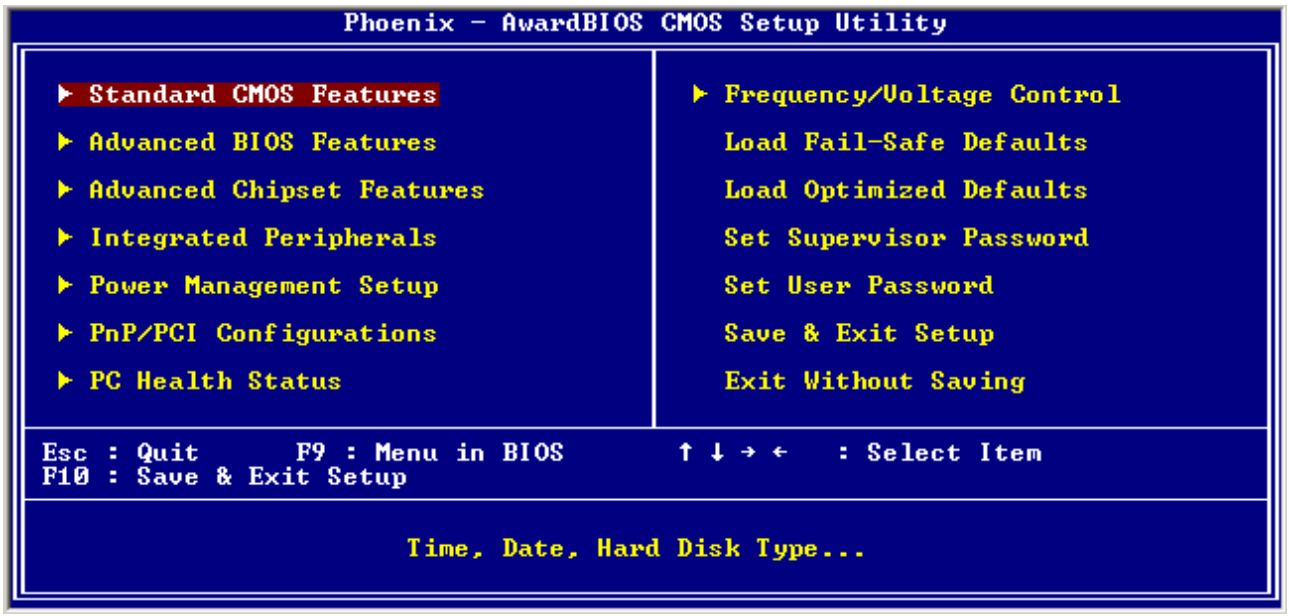
If, after making and saving system changes with Setup, you discover that your computer no longer is able to boot, the AwardBIOS™ supports an override to the CMOS settings which resets your system to its defaults.

The best advice is to only alter settings which you thoroughly understand. To this end, we strongly recommend that you avoid making any changes to the chipset defaults. These defaults have been carefully chosen by both Award and your systems manufacturer to provide the absolute maximum performance and reliability. Even a seemingly small change to the chipset setup has the potential for causing you to use the override.

3.5 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 and enter the sub-menu.

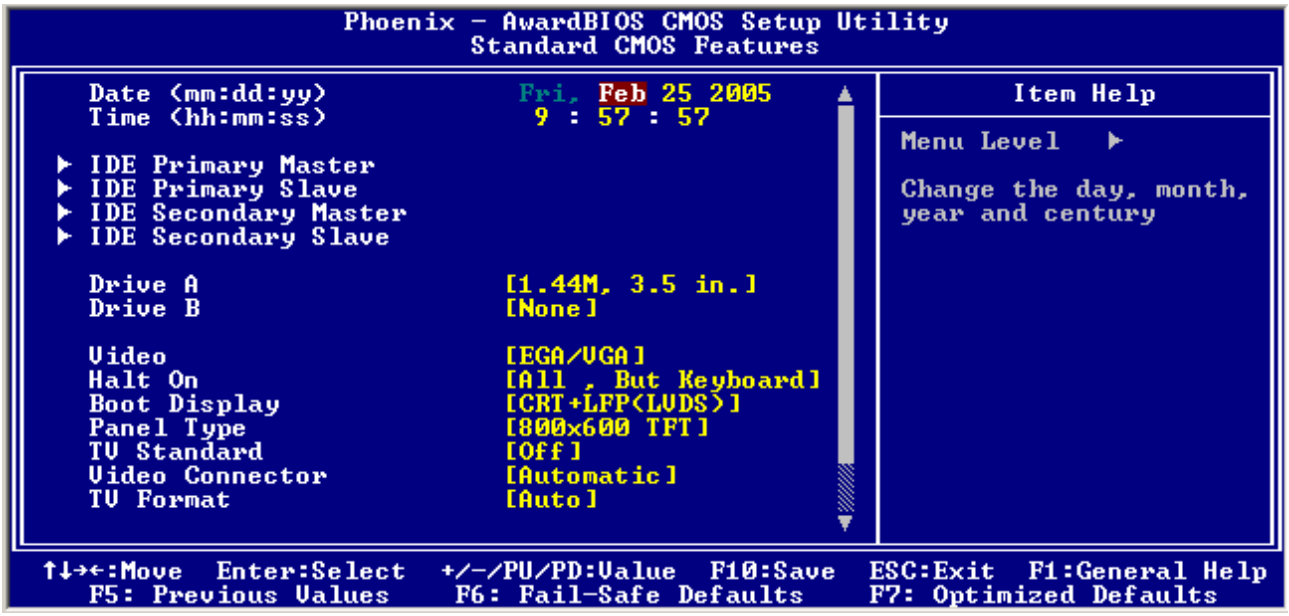
Note that a brief description of each highlighted selection appears at the bottom of the screen.



Note: The BIOS setup screens shown in this chapter are for reference purposes only, and may not exactly match what you see on your screen.
Visit the Evalue website (www.evalue-tech.com) to download the latest product and BIOS information.

3.5.1 Standard CMOS Features

The items in Standard CMOS Setup Menu are divided into few categories. Each category includes no, one or more than one setup items. Use the arrow keys to highlight the item and then use the <PgUp> or <PgDn> keys to select the value you want in each item.



3.5.1.1 Main Menu Selection

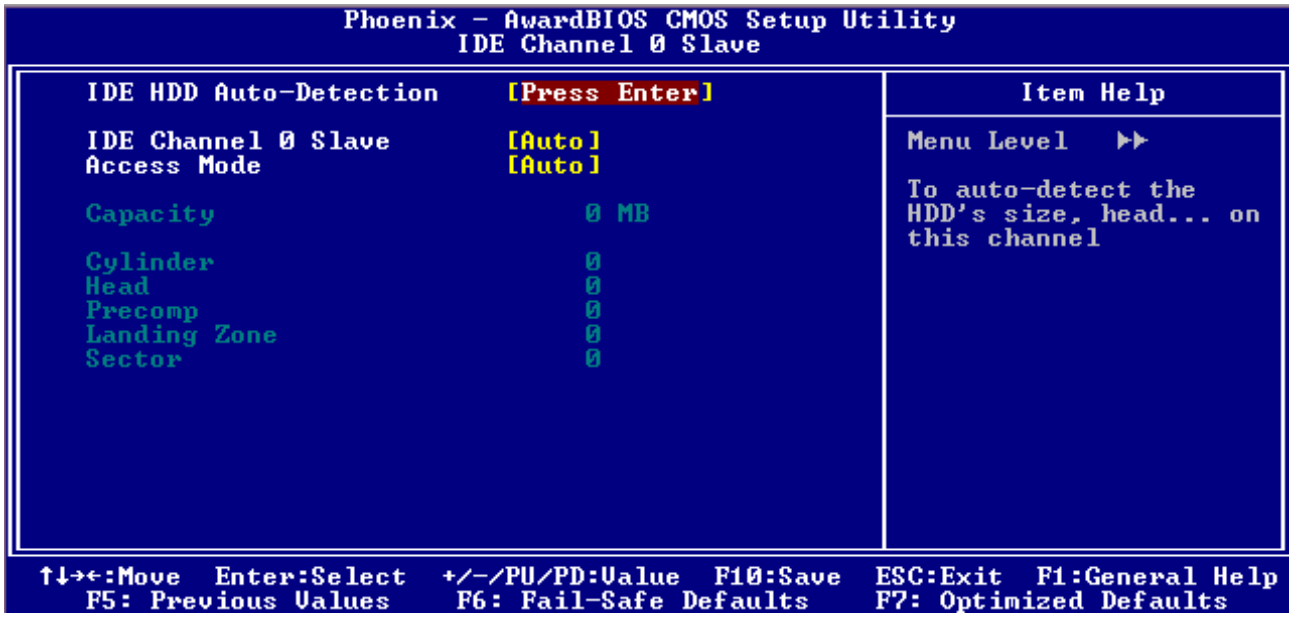
This table shows the selections that you can make on the Main Menu.

Item	Options	Description
Date	MM DD YYYY	Set the system date. Note that the 'Day' automatically changes when you set the date
Time	HH : MM : SS	Set the system time
IDE Channel 0 Master IDE Channel 0 Slave IDE Channel 1 Master IDE Channel 1 Slave	Options are in its sub menu	Press <Enter> to enter the sub menu of detailed options
Drive A Drive B	None 360K, 5.25 in 1.2M, 5.25 in 720K, 3.5 in 1.44M, 3.5 in 2.88M, 3.5 in	Select the type of floppy disk drive installed in your system
Video	EGA/VGA CGA 40 CGA 80 MONO	Select the default video device
Halt On	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

Item	Options	Description
Boot Display	CRT LFP (LVDS) CRT+LFP(LVDS) EFP(PANEL-LINK) TV CRT+EFP	Select Display Device that the screen will be shown
Panel Type	640x480 TFT 800x600 TFT 1024x768 TFT 1280x1024 TFT	Select Panel Resolution that will be displayed depending on the LCD Panel (LFP)
TV Standard	Off NTSC PAL SECAM	Select the output mode of TV Standard
Video Connector	Automatic Composite Component Both	Select the type of Video display connector
TV Format	Auto NTSC_M NTSC_M_J NTSC_433 NTSC_N PAL_B PAL_G PAL_D PAL_H PAL_I PAL_M PAL_N PAL_60 SECAM_L SECAM_L1 SECAM_B SECAM_D SECAM_G SECAM_H SECAM_K SECAM_K1	This item allows you to select different TV signal format when the TV Standard item is not off.

3.5.1.2 IDE Adapter Setup

The IDE adapters control the hard disk drive. Use a separate sub menu to configure each hard disk drive. The below Figure will shows the IDE primary master sub menu.

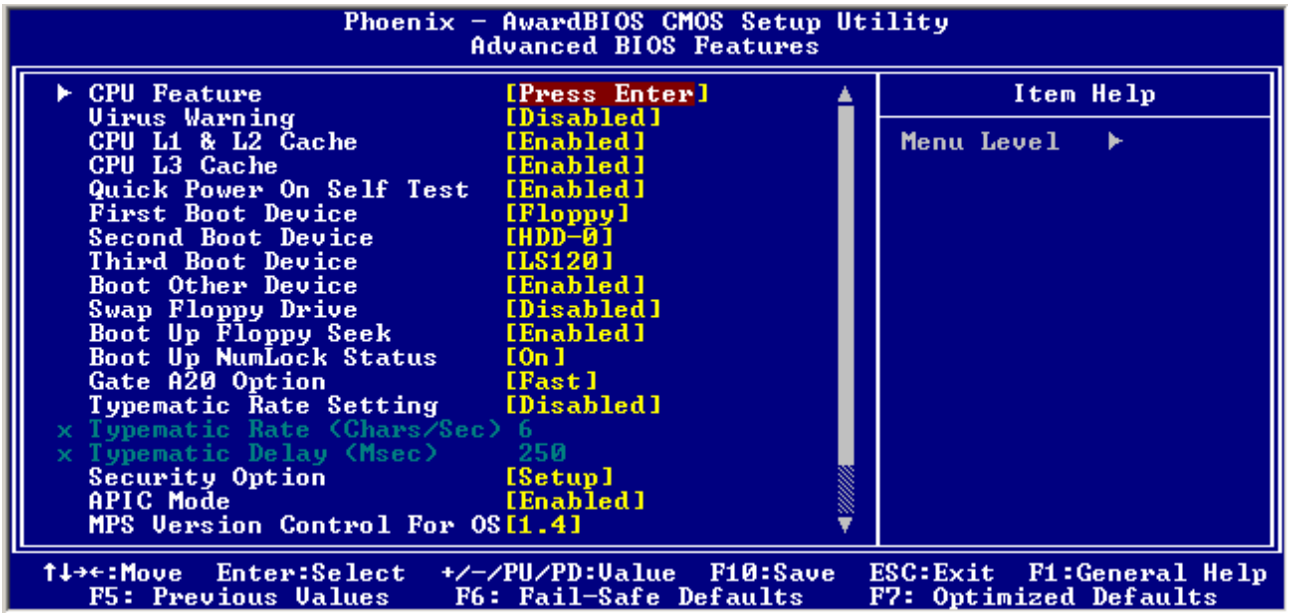


Use the following table to configure the hard disk.

Item	Options	Description
IDE HDD Auto-detection	Press Enter	Press Enter to auto-detect the HDD on this channel. If detection is successful, it fills the remaining fields on this menu.
IDE Channel 0 Master IDE Channel 0 Slave, IDE Channel 1 Master, IDE Channel 1 Slave	None Auto 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	Normal LBA Large Auto	Choose the access mode for this hard disk
Capacity	Auto Display your disk drive size	Disk drive capacity (Approximated). Note that this size is usually slightly greater than the size of a formatted disk given by a disk checking program.
The following options are selectable only if the 'IDE Channel …' item is set to 'Manual'		
Cylinder	Min = 0 Max = 65535	Set the number of cylinders for this hard disk.
Head	Min = 0 Max = 255	Set the number of read/write heads
Precomp	Min = 0 Max = 65535	**** **Warning**: Setting a value of 65535 means no hard disk
Landing zone	Min = 0 Max = 65535	****
Sector	Min = 0 Max = 255	Number of sectors per track

3.5.2 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.



3.5.2.1 Virus Warning

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

Item	Description
Enabled	Activates automatically when the system boots up causing 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.

3.5.2.2 CPU L1 & L2 Cache

This item allows you to speed up memory access. However, it depends on CPU design.

Item	Description
Enabled	Enable cache
Disabled	Disable cache

3.5.2.3 Quick Power On Self Test

This category speeds up Power On Self Test (POST) after you power up the computer. If it is set to Enable, BIOS will shorten or skip some check items during POST.

Item	Description
Enabled	Enable quick POST
Disabled	Normal POST

3.5.2.4 First/Second/Third/Other Boot Device

The BIOS attempts to load the operating system from the devices in the sequence selected in these items.

Item	Description
Floppy	Floppy Device
LS120	LS120 Device
HDD-0	First Hard Disk Device
SCSI	SCSI Device
CDROM	CDROM Device
HDD-1	Secondary Hard Disk Device
HDD-2	Third Hard Disk Device
HDD-3	Fourth Hard Disk Device
ZIP100	ZIP-100 Device
USB-FDD	USB Floppy Device
USB-ZIP	USB ZIP Device
USB-CDROM	USB CDROM Device
USB-HDD	USB Hard Disk Device
LAN	Network Device
Disabled	Disabled any boot device

3.5.2.5 Book Up Floppy Seek

Seeks disk drives during boot up. Disabling seeds boot up.

Item	Description
Enabled	Enable Floppy Seek
Disabled	Disable Floppy Seek

3.5.2.6 Boot Up NumLock Status

Select power on state for NumLock.

Item	Description
Enabled	Enable NumLock
Disabled	Disable NumLock

3.5.2.7 Gate A20 Option

Select if chipset or keyboard controller should control Gate A20.

Item	Description
Normal	A pin in the keyboard controller controls GateA20
Fast	Lets chipset control GateA20

3.5.2.8 Typematic Rate Setting

Key strokes repeat at a rate determined by the keyboard controller. When enabled, the typematic rate and typematic delay can be selected.

The choice: Enabled/Disabled.

3.5.2.9 Security Option

Select whether the password is required every time the system boots or only when you enter setup.

Item	Description
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 Main Menu and then you will be asked to enter password. Do not type anything and just press <Enter>, it will disable security. Once the security is disabled, the system will boot and you can enter Setup freely.

3.5.2.10 APIC Mode

The BIOS supports versions 1.4 of the Intel multiprocessor specification. When enabled, the MPS Version 1.4 Control for OS can be activated.

The choice: Enabled/Disabled.

3.5.2.11 MPS Version Control For OS

This feature is to indicate the version of Multi-Processor Specification (MPS) that is using.

The choice: 1.1, 1.4

3.5.2.12 OS Select for DRAM > 64MB

Select the operating system that is running with greater than 64MB of RAM on the system.

The choice: Non-OS2, OS2.

3.5.2.13 Report No FDD For WIN 95

The original Windows95 requires the presence of a floppy. Unless the BIOS tells it to disregard the absence of the drive, it will generate an error message. For other operating systems as Win98 etc this field is without relevance.

Item	Description
No	Don't generate error message
Yes	Generate error message

3.5.2.14 Small Logo (EPA) Show

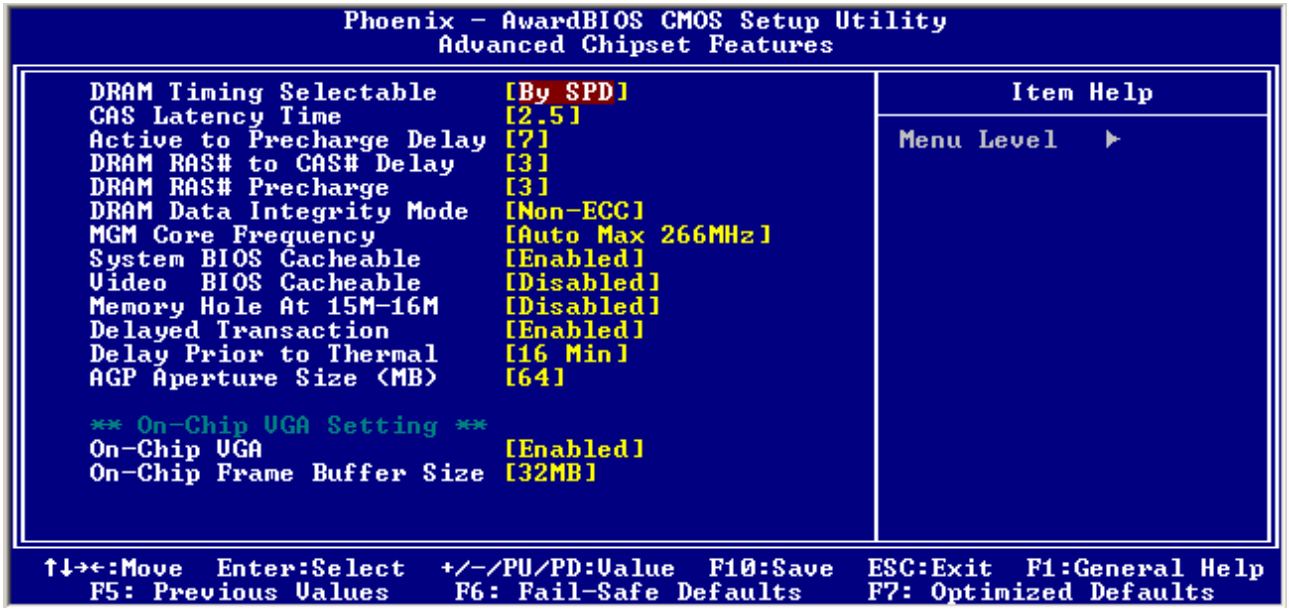
This item allows you enabled/disabled the small EPA logo show on screen at the POST step.

Item	Description
Enabled	EPA Logo show is enabled
Disabled	EPA Logo show is disabled

3.5.3 Advanced Chipset Features

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

The first chipset settings deal with CPU access to dynamic random access memory (DRAM). The default timings have been carefully chosen and should only be altered if data is being lost. Such a scenario might well occur if your system had mixed speed DRAM chips installed so that greater delays may be required to preserve the integrity of the data held in the slower memory chips.



3.5.3.1 DRAM Timing Selectable

This item allows you to select the DRAM timing value by SPD data or Manual by yourself. The choice: Manual, By SPD.

3.5.3.2 CAS Latency Time

This item controls the time delay (in clock cycles - CLKs) that passes before the SDRAM starts to carry out a read command after receiving it. This also determines the number of CLKs for the completion of the first part of a burst transfer. In other words, the lower the latency, the faster the transaction.

The Choices: 1.5, 2, 2.5, 3.

3.5.3.3 Active to Precharge Delay

This item is the minimum delay time between Active and Precharge.

The Choices: 5, 6, 7.

3.5.3.4 DRAM RAS# to CAS# Delay

This option allows you to insert a delay between the RAS (Row Address Strobe) and CAS (Column Address Strobe) signals. This delay occurs when the SDRAM is written to, read from or refreshed. Naturally, reducing the delay improves the performance of the SDRAM while increasing it reduces performance.

The Choices: 2, 3.

3.5.3.5 DRAM RAS# Precharge

This option sets the number of cycles required for the RAS to accumulate its charge before the SDRAM refreshes. Reducing the precharge time to **2** improves SDRAM performance but if the precharge time of **2** is insufficient for the installed SDRAM, the SDRAM may not be refreshed properly and it may fail to retain data

So, for better SDRAM performance, set the **SDRAM RAS Precharge Time** to **2** but increase it to **3** if you face system stability issues after reducing the precharge time.

The Choices: 2, 3.

3.5.3.6 DRAM Data Integrity Mode

Select ECC if your memory module supports it. The memory controller will detect and correct single-bit soft memory errors. The memory controller will also be able to detect double-bit errors though it will not be able to correct them. This provides increased data integrity and system stability.

The choices: ECC, Non ECC.

3.5.3.7 MGM Core Frequency

This field sets the frequency of the DRAM memory installed.

The choices: Auto Max 266MHz, 400/266/133/200 MHz, 400/200/100/200 MHz, 400/200/100/133 MHz, 400/266/133/267 MHz, 533/266/133/200 MHz, 533/266/133/266 MHz, 533/333/166/266 MHz, 400/333/166/250 MHz, Auto Max 400/333 MHz, Auto Max 533/333.

3.5.3.8 System BIOS Cacheable

This feature is only valid when the system BIOS is shadowed. It enables or disables the caching of the system BIOS ROM at **F0000h-FFFFFh** via the L2 cache. This greatly speeds up accesses to the system BIOS. However, this does **not** translate into better system performance because the OS does not need to access the system BIOS much.

The Choice: Disabled, Enabled.

3.5.3.9 Video BIOS Cacheable

This feature is only valid when the video BIOS is shadowed. It enables or disables the caching of the video BIOS ROM at **C0000h-C7FFFh** via the L2 cache. This greatly speeds up accesses to the video BIOS. However, this does **not** translate into better system performance because the OS bypasses the BIOS using the graphics driver to access the video card's hardware directly.

The Choice: Enabled, Disabled.

3.5.3.10 Memory Hole At 15M-16M

Enabling this feature reserves 15MB to 16MB memory address space to ISA expansion cards that specifically require this setting. This makes the memory from 15MB and up unavailable to the system. Expansion cards can only access memory up to 16MB.

The choice: Enable, Disable.

3.5.3.11 Delayed Transaction

This feature is used to meet the latency of PCI cycles to and from the ISA bus. The ISA bus is much, much slower than the PCI bus. Thus, PCI cycles to and from the ISA bus take a longer time to complete and this slows the PCI bus down.

However, enabling **Delayed Transaction** enables the chipset's embedded 32-bit posted write buffer to support delayed transaction cycles. This means that transactions to and from the ISA bus are buffered and the PCI bus can be freed to perform other transactions while the ISA transaction is underway.

This option should be **enabled** for better performance and to meet PCI 2.1 specifications. Disable it only if your PCI cards cannot work properly or if you are using an ISA card that is not PCI 2.1 compliant.

The Choice: Enabled, Disabled.

3.5.3.12 Delay Prior to Thermal

When you system temperature higher, you can set the DRAM access time slowdown between on 4 min – 32 min delay.

The choice: 4 Min, 8 Min, 16 Min, and 32 Min.

3.5.3.13 AGP Aperture Size

Select the size of Accelerated Graphics Port (AGP) aperture. The aperture is a portion of the PCI memory address range dedicated for graphics memory address space. Host cycles that hit the aperture range are forwarded to the AGP without any translation.

The Choice: 4MB,8MB,16MB.32MB, 64MB,128MB,256MB.

3.5.3.14 On-Chip VGA

This item is enabled as the onboard VGA is used.

The Choices: Enabled, Disabled.

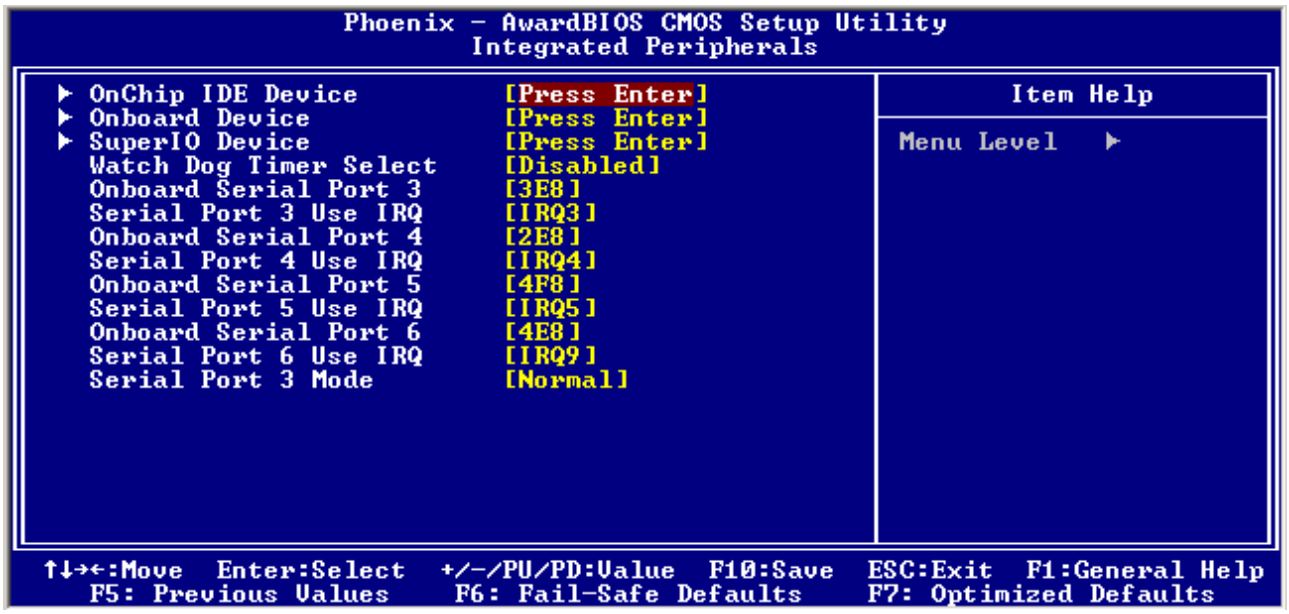
3.5.3.15 On-Chip Frame Buffer Size

This item is to select the amount of system memory that will be utilized as internal graphics device memory.

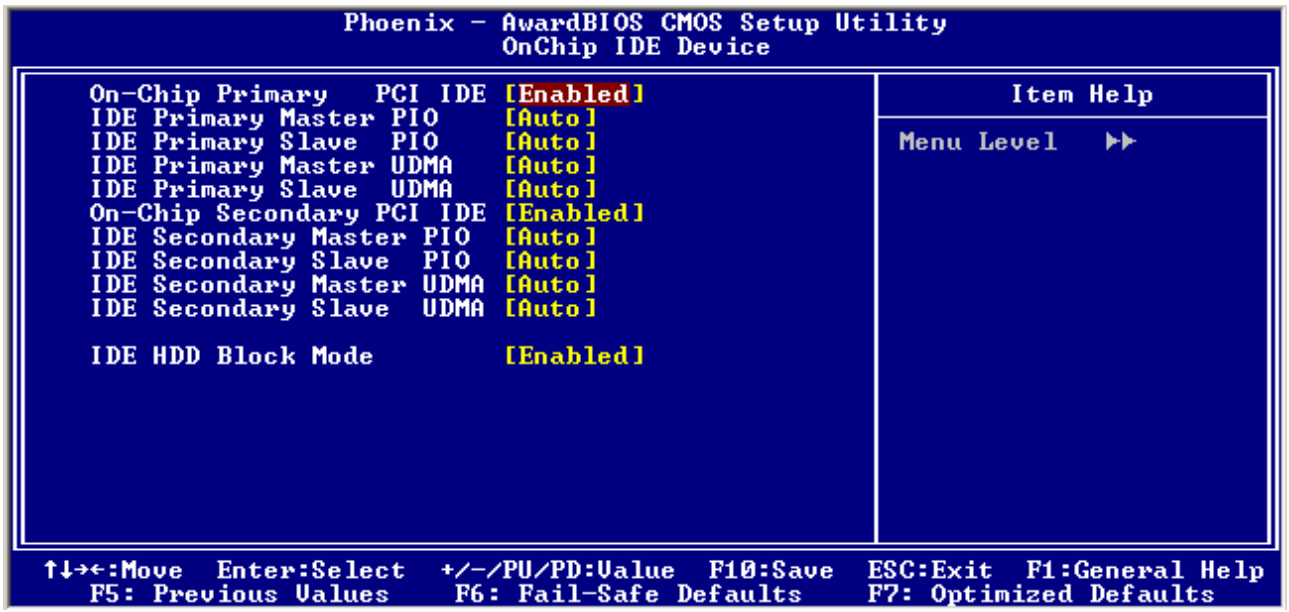
The choices: 1MB, 4MB, 8MB, 16MB, 32MB.

3.5.4 Integrated Peripherals

Use this menu to specify your settings for integrated peripherals.



3.5.4.1 OnChip IDE Device



3.5.4.1.1 On-Chip Primary PCI IDE

The chipset contains a PCI IDE interface with support for two IDE channels. Select Enabled to activate the primary IDE interface. Select Disabled to deactivate this interface.

The choice: Enabled, Disabled.

3.5.4.1.2 On-Chip Secondary PCI IDE

The chipset contains a PCI IDE interface with support for two IDE channels. Select Enabled to activate the secondary IDE interface. Select Disabled to deactivate this interface.

The choice: Enabled, Disabled.

3.5.4.1.3 Primary/Secondary Master/Slave PIO

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

The choice: Auto, Mode 0, Mode 1, Mode 2, Mode 3, or Mode 4.

3.5.4.1.4 Primary/Secondary Master/Slave UDMA

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

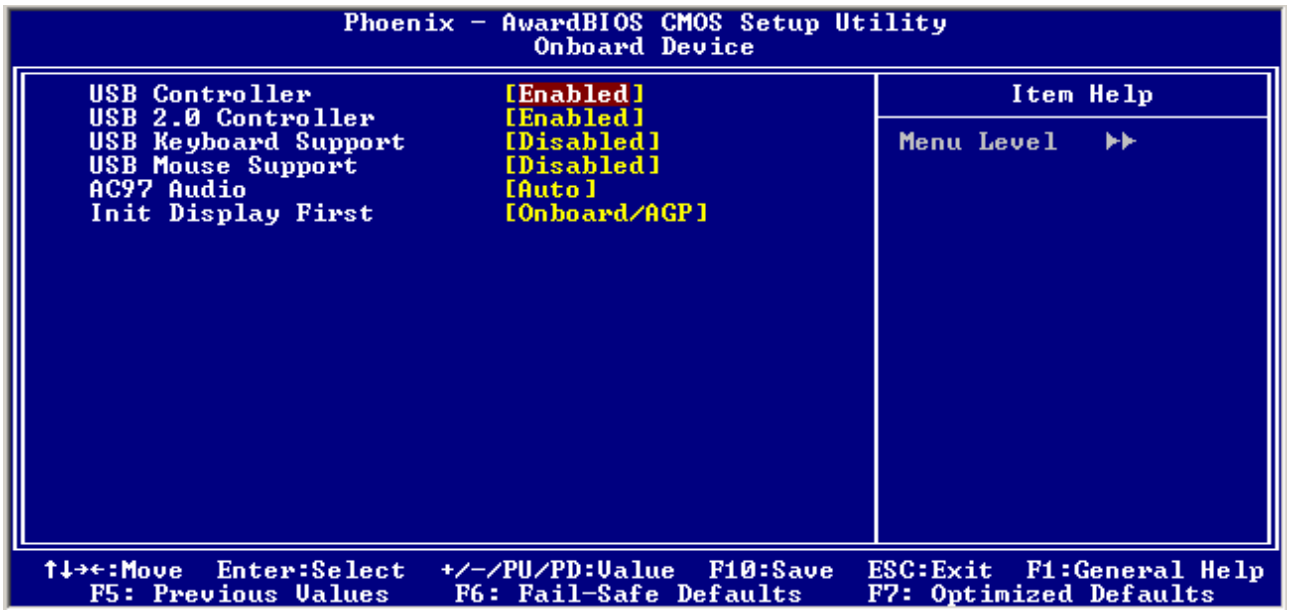
The Choice: Auto, Disabled.

3.5.4.1.5 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.

The Choice: Enabled, Disabled.

3.5.4.2 Onboard Device



3.5.4.2.1 USB / USB 2.0 Controller

This item allows you to set the USB / USB 2.0 Controller to Enabled/Disabled.

The choice: Enabled, Disabled

3.5.4.2.2 USB Keyboard / Mouse Support

This item allows you to set the system's USB keyboard/mouse to Enabled/Disabled.

The choice: Enabled, Disabled

3.5.4.2.3 AC97 Audio

This item allows you to decide to enable/disable the 815 chipset family to support AC97 Audio.

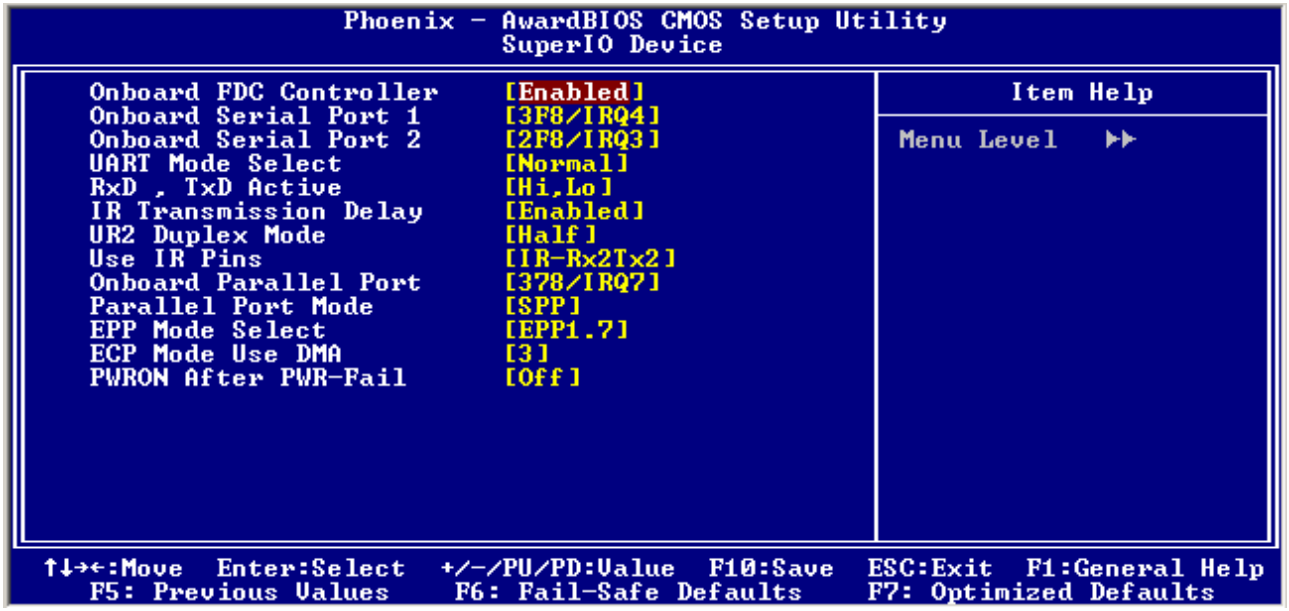
The choice: Enabled, Disabled

3.5.4.2.4 Init Display First

This item allows you to decide to active whether PCI Slot or AGP first.

The choice: PCI Slot, AGP/Onboard.

3.5.4.3 Super IO Device



3.5.4.3.1 Onboard FDC Controller

Select Enabled if your system has a floppy disk controller (FDC) installed on the system board and you wish to use it. If you install and-in FDC or the system has no floppy drive, select Disabled in this field.

The Choice: Enabled, Disabled.

3.5.4.3.2 Onboard Serial Port 1 / 2

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

The Choice: Enabled, Disabled.

3.5.4.3.3 UART Mode Select

Select UART 2 mode as standard serial port or IR port.

The Choice: Enabled, Disabled.

3.5.4.3.4 RxD , TxD Active

This item allows you to determine the active of RxD, TxD level.

The Choice: Hi,Hi , Hi,Lo , Lo,Hi , Lo,Lo

3.5.4.3.5 IR Transmission Delay

This item allows you to enable/disable the IR Transmission Delay.

The Choice: Enabled, Disabled.

3.5.4.3.6 UR2 Duplex Mode.

Select the value required by the IR device connected to the IR port. Full-duplex mode permits simultaneous two-direction transmission. Half-duplex mode permits transmission in one direction only at a time.

The choice: Half, Full.

3.5.4.3.7 Use IR Pins

This item allows you to determine the pin definition.

The Choice: RxD2,TxD2, IR-Rx2Tx2.

3.5.4.3.8 Onboard Parallel Port

Select a logical LPT port name and matching address for the physical parallel (printer) port.

The choice: 378H/IRQ7, 278H/IRQ5, 3BCH/IRQ7, Disabled.

3.5.4.3.9 Parallel Port Mode

Select an operating mode for the parallel port. Select Compatible or Extended unless you are certain both your hardware and software support EPP or ECP mode.

The choice: SPP, EPP, ECP, ECP+EPP, Normal.

3.5.4.3.10 EPP Mode Select

Select EPP port type 1.7 or 1.9.

The choice: EPP1.7, EPP1.9.

3.5.4.3.11 ECP Mode Use DMA

Select a DMA channel for the port.

The choice: 3, 1.

3.5.4.3.12 PWRON After POW-Fail

When ATX power supply is used, this item is to set whether the system should reboot after a power failure.

The choices: Off, On, Former-Sts.

3.5.4.4 Watch Dog Timer Select

This option will determine watch dog timer.

The choices: Disabled,10 ,20 ,30 ,40 Sec,1,2,4 Min.

3.5.4.5 Onboard Serial Port 3 / 4

Select an IO address for the third and serial ports.

The choices: 3F8, 2F8, 3E8, 2E8, Disabled.

3.5.4.6 Onboard Serial Port 5 / 6

Select an IO address for the fifth and sixth serial ports.

The choices: 4E8, 4F8, Disabled.

3.5.4.7 Serial Port 3 / 4 / 5 / 6 Use IRQ

Select an IRQ for the third, forth, fifth and sixth serial ports.

The choices: IRQ3, IRQ4, IRQ5, IRQ9, IRQ10, IRQ11.

The choices: Normal, IRDA.

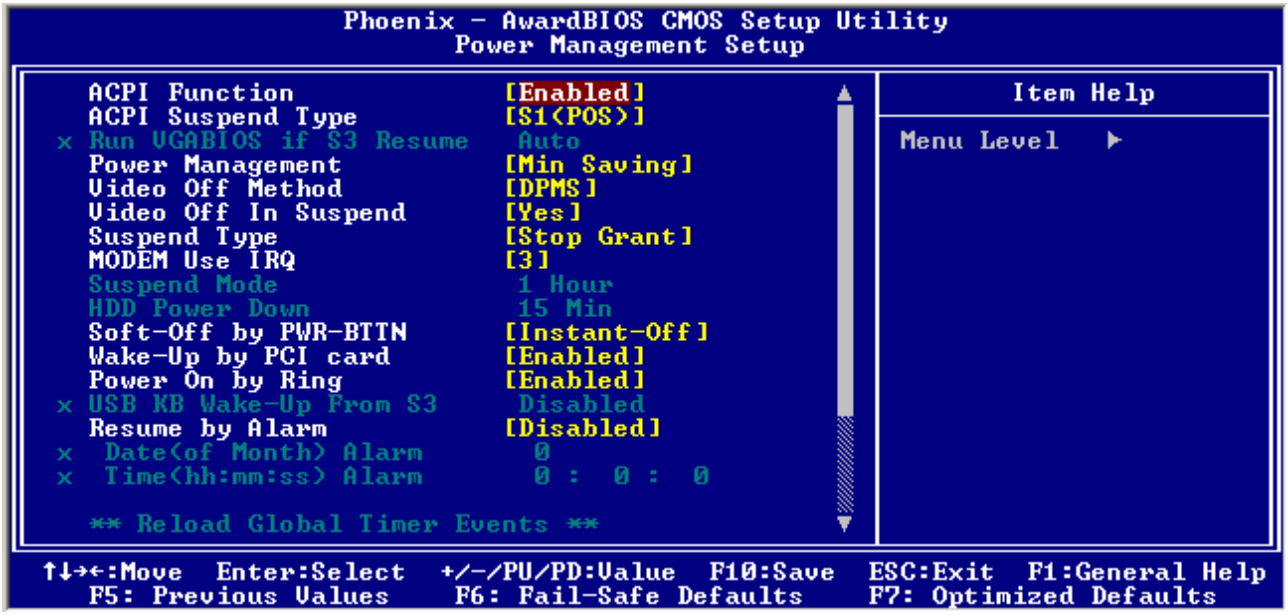
3.5.4.8 Serial Port 3 Mode

Select Serial Port 3 mode as standard serial port or IR port.

The choices: Normal, IrDA.

3.5.5 Power Management Setup

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



3.5.5.1 ACPI Function

This item allows you to enable/disable the ACPI function.

The choice: Enable, Disable.

3.5.5.2 ACPI Suspend Type

This item will set which ACPI suspend type will be used.

The choice: S1(POS), S3(STR).S1&S3.

3.5.5.3 Power Management

There are three selections for Power Management, and each of them have fixed mode settings.

Item	Description
Min. Power Saving	Minimum power management, HDD Power Down = 15 Min,
Max. Power Saving	Maximum power management, HDD Power Down =1 Min,
User Defined	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.

3.5.5.4 Video Off Method

This determines the manner in which the monitor is blanked.

The choice: Blank Screen, SYNC+Blank, DPMS.

3.5.5.5 Video Off In Suspend

Screen off when system is in Suspend mode.

The choice: No, Yes.

3.5.5.6 Suspend Type

Select the suspend type.

The choice: Stop Grant, Pwron suspend.

3.5.5.7 MODEM Use IRQ

This determines the IRQ in which the MODEM can use.

The choice: 3, 4, 5, 7, 9, 10, 11, or NA.

3.5.5.8 Soft-Off by PWR-BTTN

Pressing the power button for more than 4 seconds forces the system to enter the Soft-Off state when the system has “hung”.(Only could working on ATX Power supply)

The choice: Delay 4 Sec, Instant-Off.

3.5.5.9 Wake-Up by PCI card

This will enable the system to wake up through PCI Card peripheral.

The choice: Enable, Disabled.

3.5.5.10 Power On by Ring

This determines whether the system boot up if there’s an incoming call from the Modem.

The choice: Enable, Disabled.

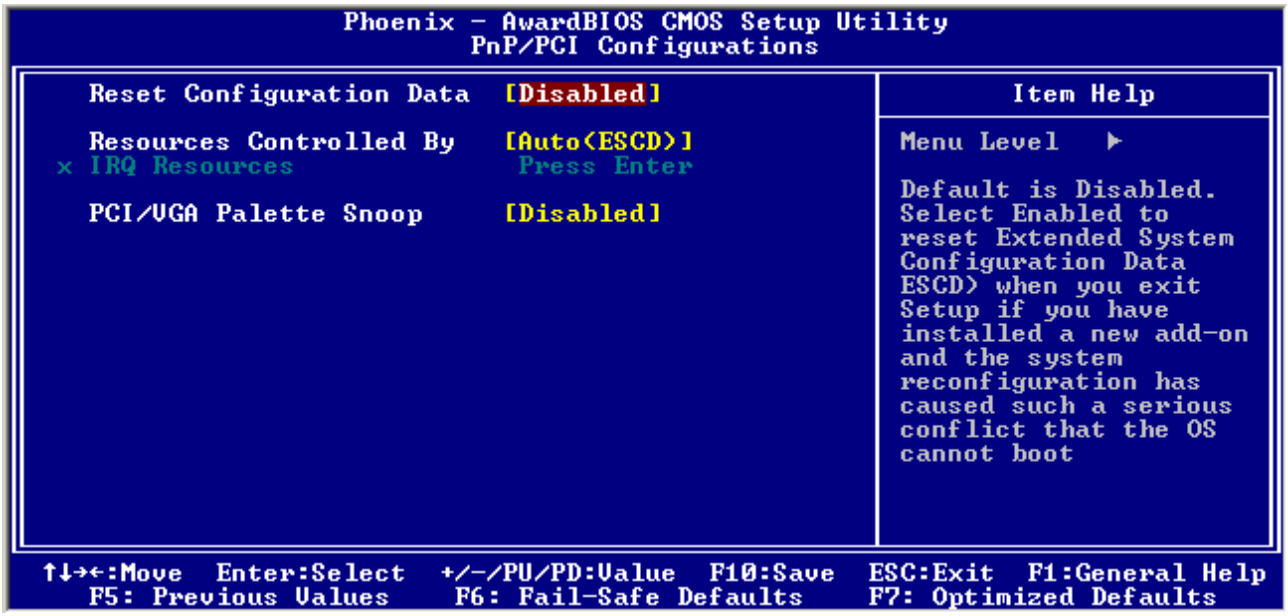
3.5.5.11 Resume by Alarm

This function is for setting date and time for your computer to boot up.

Reload Global Timer Events

3.5.6 PnP / PCI Configuration

This section describes configuring the PCI bus system. PCI, or **P**ersonal **C**omputer **I**nterconnect, is a system which allows I/O devices to operate at speeds nearing the speed the CPU itself uses when communicating with its own special components. This section covers some very technical items and it is strongly recommended that only experienced users should make any changes to the default settings.



3.5.6.1 Reset Configuration Data

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

The choice: Enabled, Disabled.

3.5.6.2 Resources Controlled By

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

The choice: Auto, Manual.

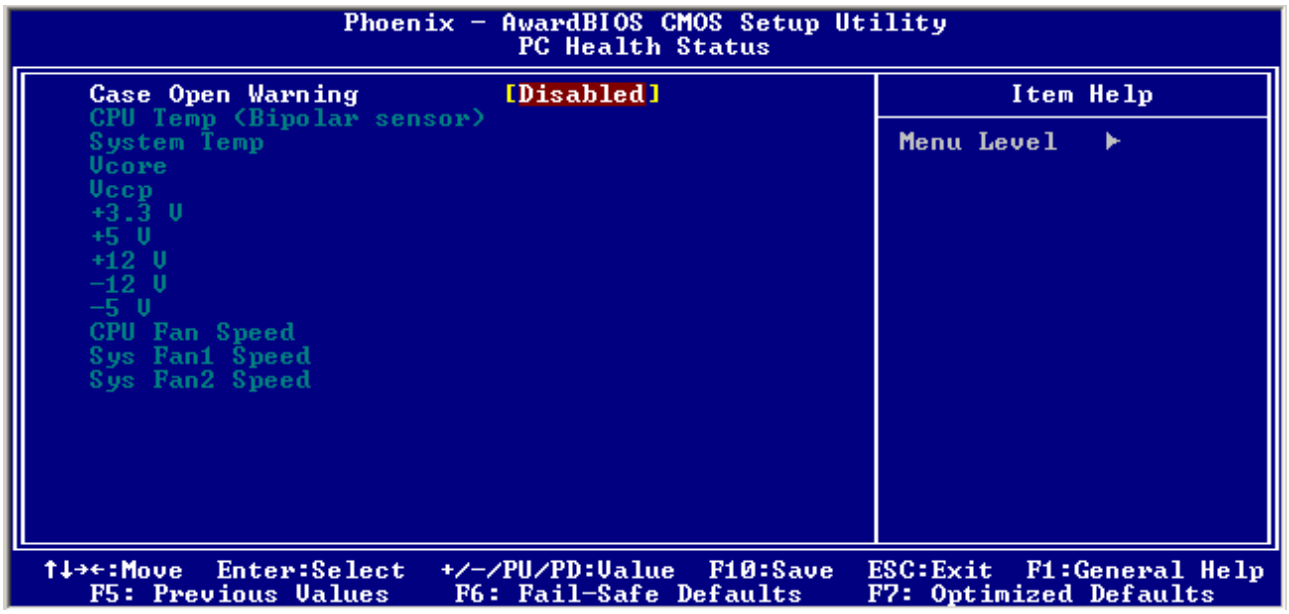
3.5.6.3 PCI / VGA Palette Snoop

Leave this field at Disabled.

The choice: Enabled, Disabled.

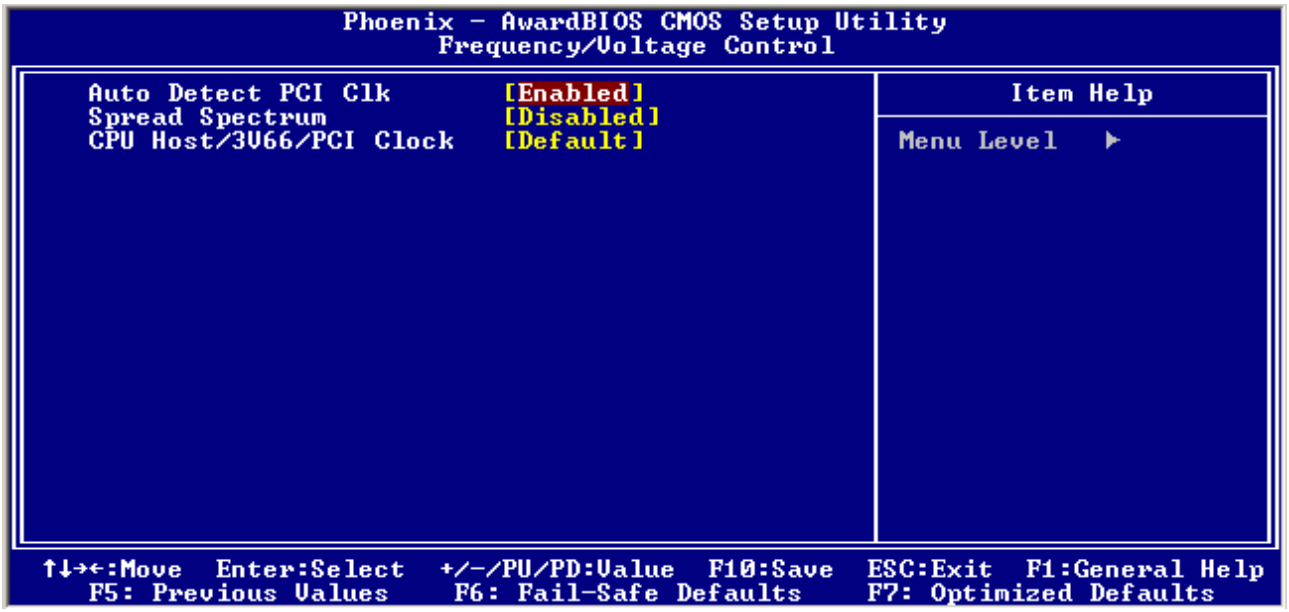
3.5.7 PC Health Status

This section shows the status of your CPU, Fan & System.



3.5.8 Frequency / Voltage Control

This menu specifies your setting for frequency/voltage control.



3.5.8.1 Auto Detect PCI Clk

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

The choice: Enable, Disable.

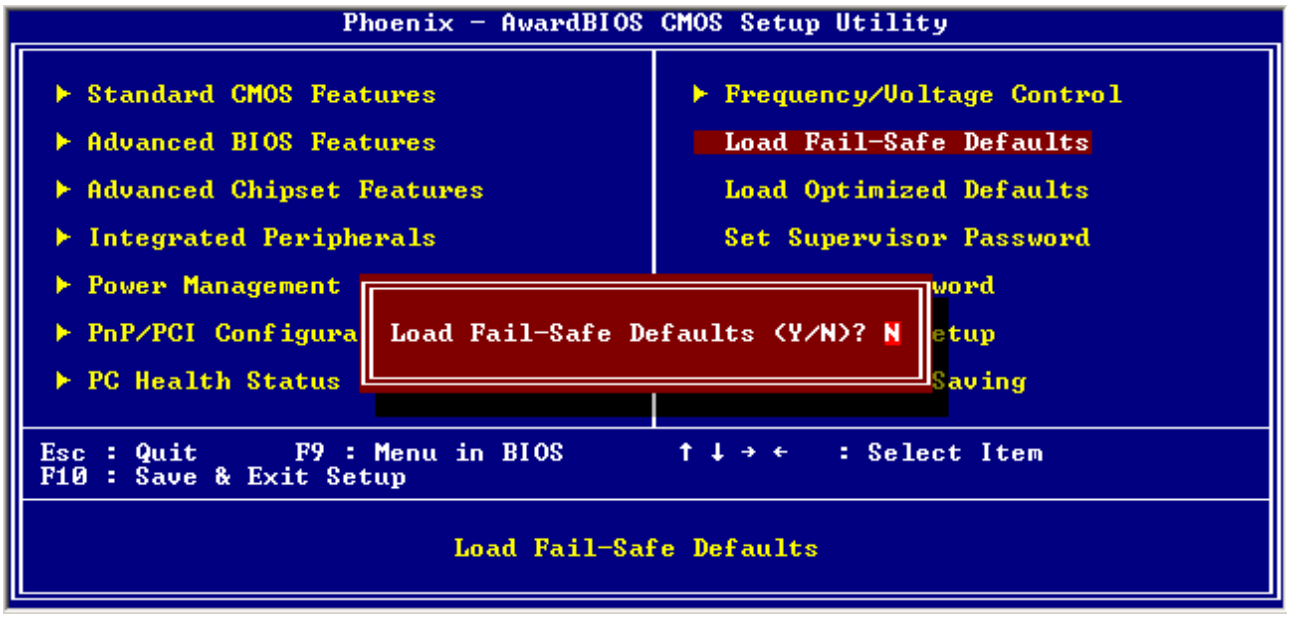
3.5.8.2 Spread Spectrum / CPU Host/3V66/PCI Clock

These options allow you to set Spread Spectrum and CPU Host/3V66/PCI clock into various types of frequencies.

3.5.9 Load Fail-Safe Defaults

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

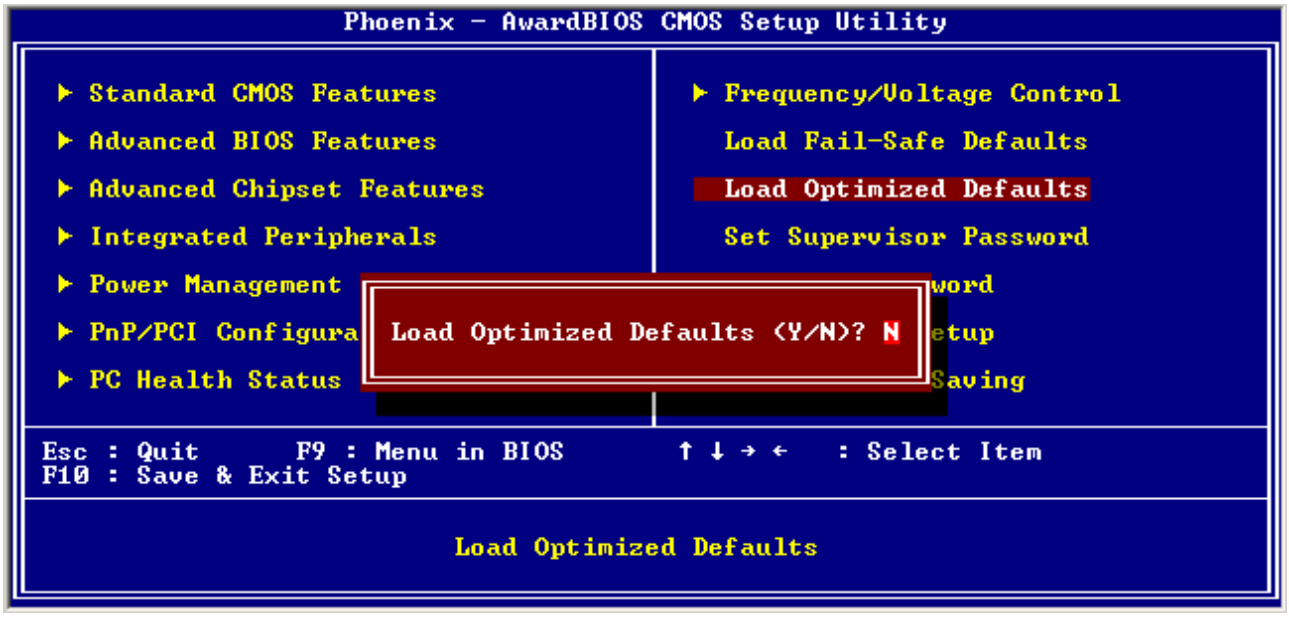
Press <Y> to load the BIOS default values for the most stable, minimal-performance system operations.



3.5.10 Load Optimized Defaults

Use this menu to load the BIOS default values that are factory settings for optimal performance 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.

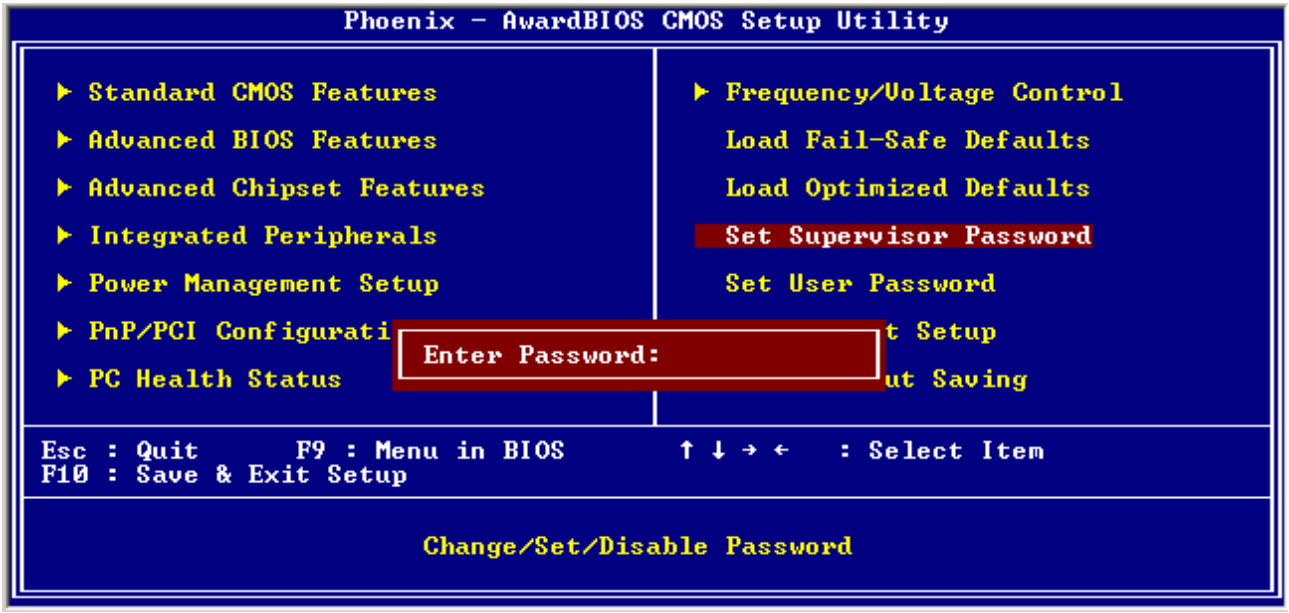
Press <Y> to load the default values setting for optimal performance system operations.



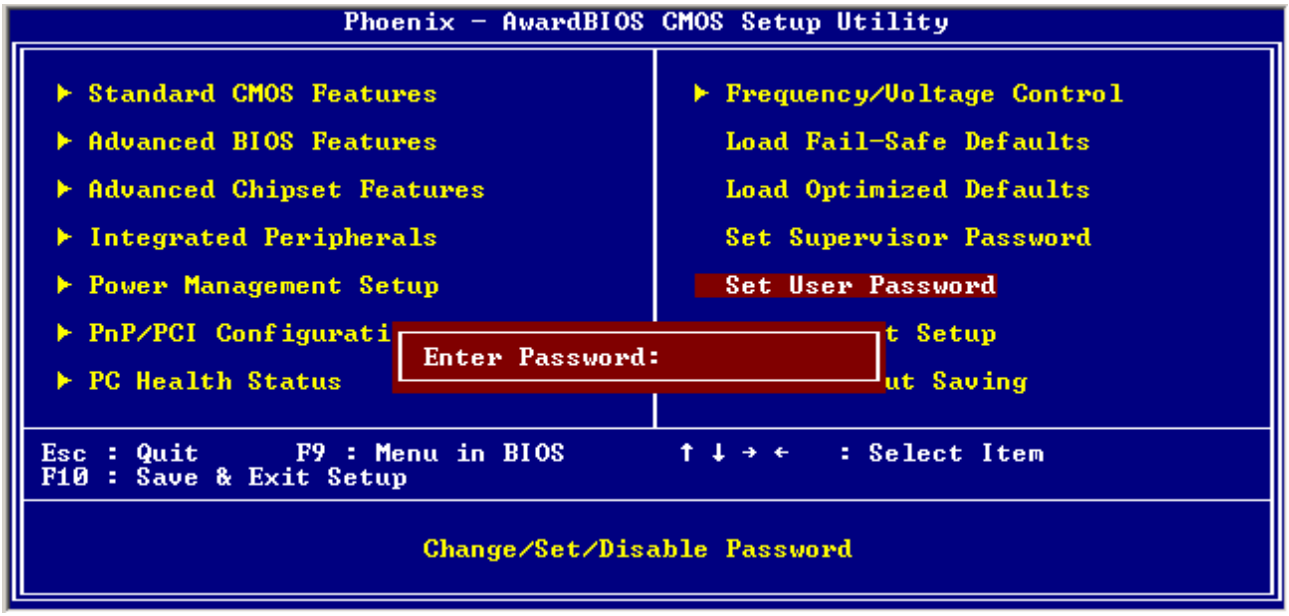
3.5.11 Set Supervisor / User Password

You can set either supervisor or user password, or both of them.

Supervisor Password: able to enter/change the options of setup menus.



User Password: able to enter but no right to change the options of setup menus.



Type the password, up to eight characters in length, and press <Enter>. The password typed now 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 selection and not enter a password. To disable a password, just press <Enter> when you are prompted to enter the password. A message will confirm the password will be disabled. Once the password is disabled, the system will boot and you can enter Setup freely.

PASSWORD DISABLED.

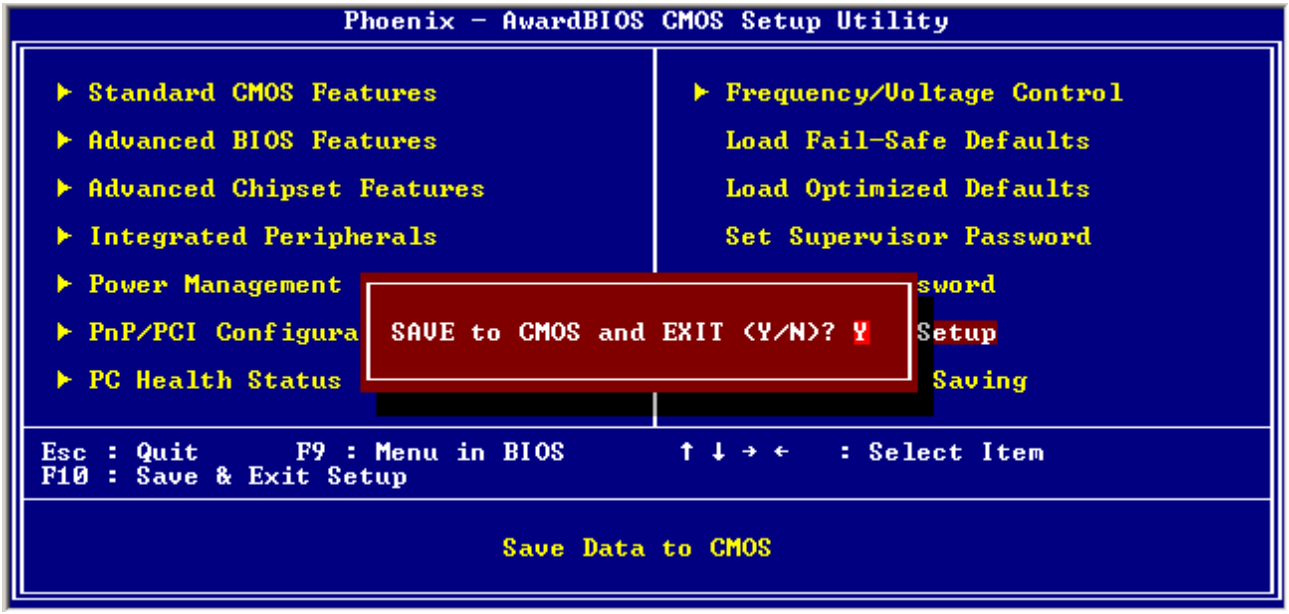
When a password has been enabled, you will be prompted to enter it every time you try to enter Setup. This prevents an unauthorized person from changing any part of your system configuration. Additionally, when a password is enabled, you can also require the BIOS to request a password every time your system is rebooted. This would prevent unauthorized use of your computer. You determine when the password is required within the BIOS Features Setup Menu and its Security option (see Section 3). If the Security option is set to "System", the password will be required both at boot and at entry to Setup. If set to "Setup", prompting only occurs when trying to enter Setup

3.5.12 Save & Exit Setup

Save CMOS value changes to CMOS and exit setup.

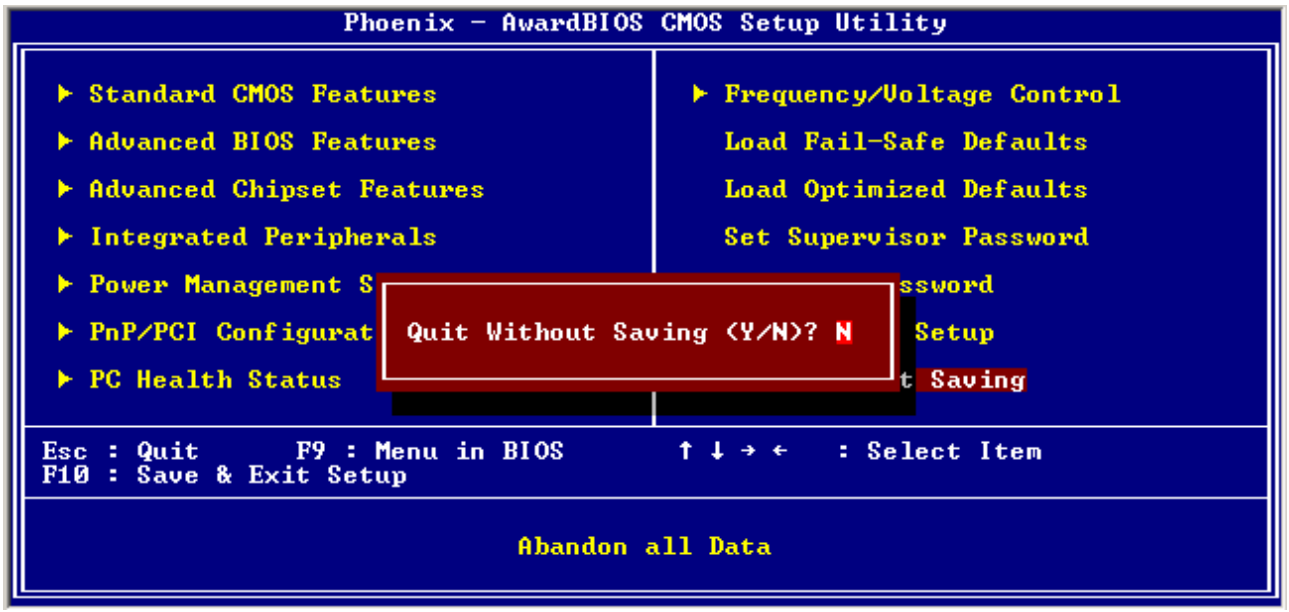
Enter <Y> to store the selection made in the menus in CMOS, a special section in memory that stays on after turning the system off. The BIOS configures the system according to the Setup selection stored in CMOS when boot the computer next time.

The system is restarted after saving the values.



3.5.13 Exit Without Save

Abandon all CMOS value changes and exit setup, and the system is restarted after exiting.



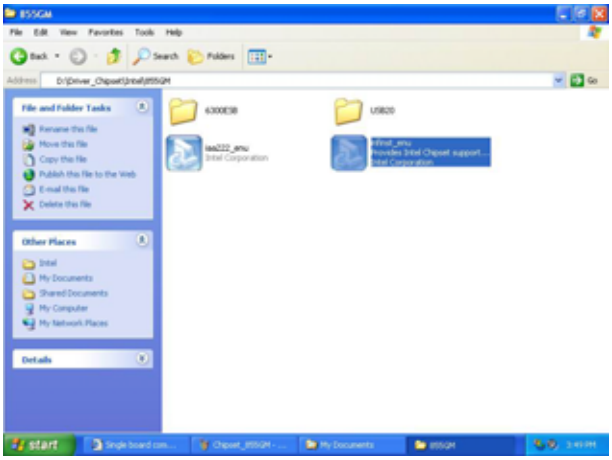
4. Drivers Installation

Note: Installation procedures and screen shots in this section are for your reference and may not be exactly the same as shown on your screen.

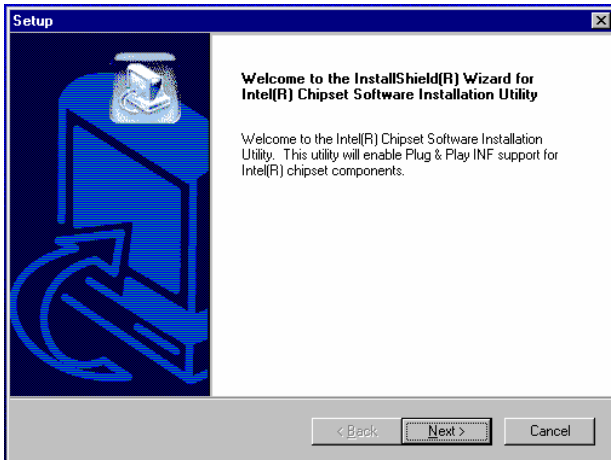
4.1 Install Chipset Driver (For Intel RG82855GME)

Insert the Supporting CD-ROM to CD-ROM drive, and it should show the index page of Evalue's products automatically. If not, locate Index.htm and choose the product from the menu left, or link to **\Driver_Chipset\Intel\ 855GM**.

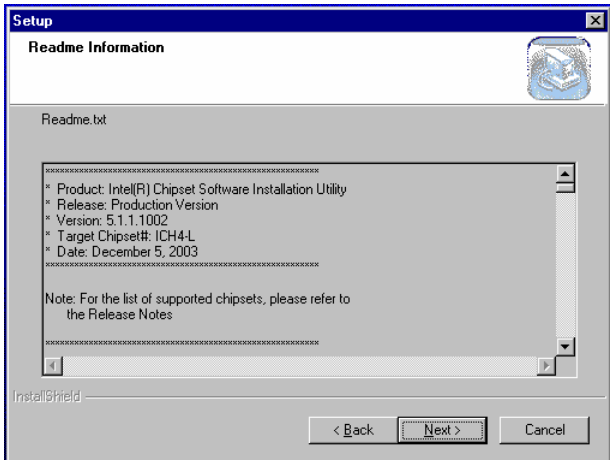
Note: The installation procedures and screen shots in this section are based on Windows XP operation system.



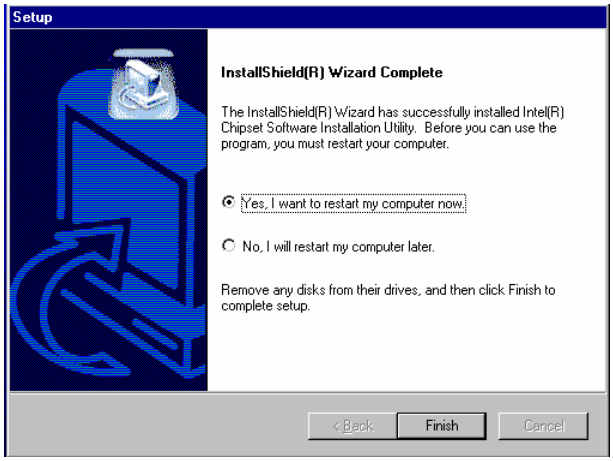
Step1. Locate 「\Driver_Chipset\Intel\ 855GM\ infinst_enu.exe」.



Step 2. Click **Next**.



Step 3. Click **Next**.

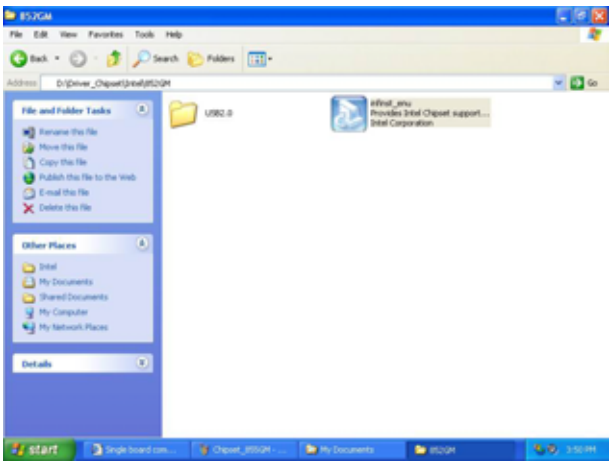


Step 4. Click **Finish** to complete setup.

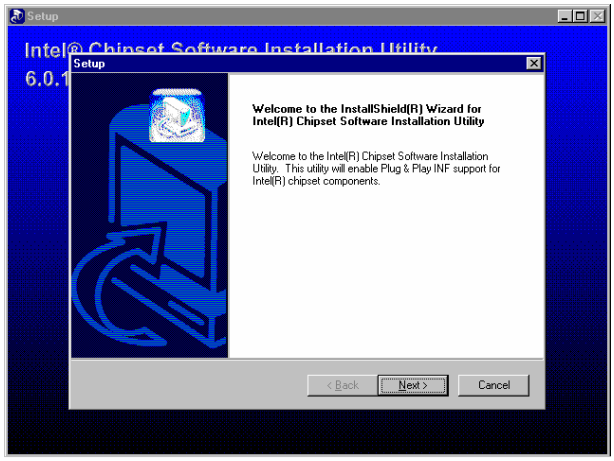
4.2 Install Chipset Driver (For Intel RG82852GM)

Insert the Supporting CD-ROM to CD-ROM drive, and it should show the index page of Evalue's products automatically. If not, locate Index.htm and choose the product from the menu left, or link to **\Driver_Chipset\Intel\852GM**.

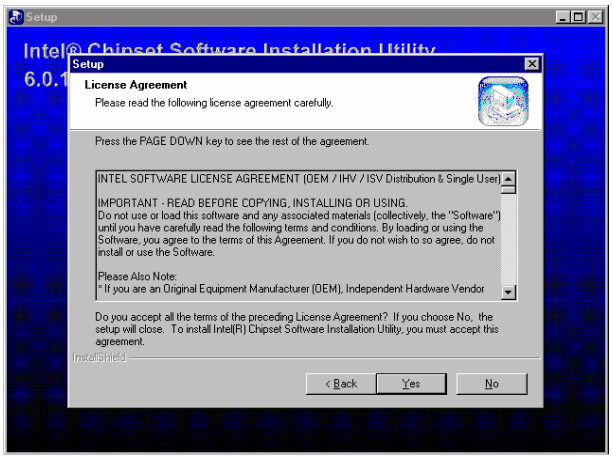
Note: The installation procedures and screen shots in this section are based on Windows XP operation system.



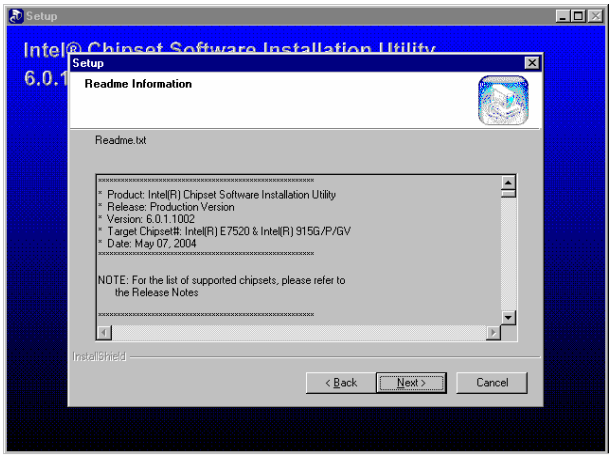
Step1. Locate 「\Driver_Chipset\Intel\852GM\infinst_enu.exe」.



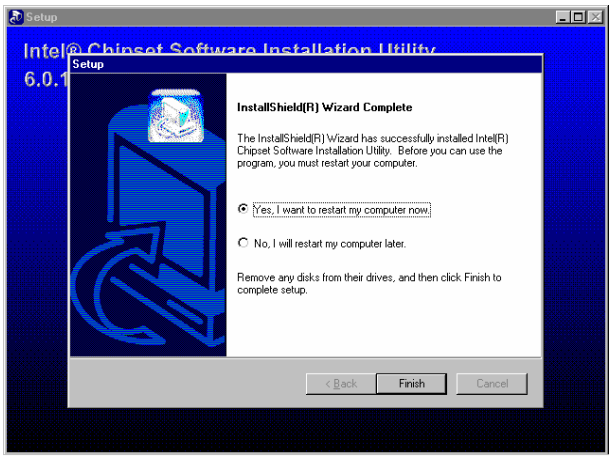
Step 2. Click **Next**.



Step 3. Click **Next**.



Step 4. Click **Next** to complete setup.

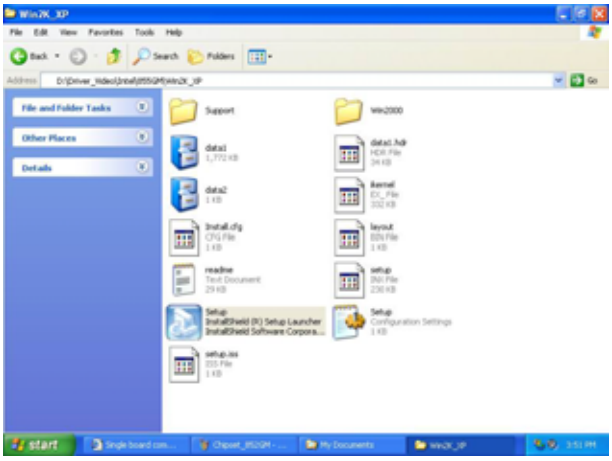


Step 4. Click **Finish** to complete setup.

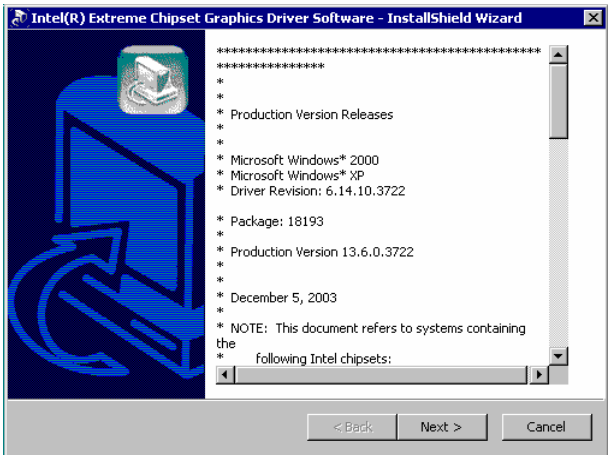
4.3 Install Display Driver (For Intel RG82855GME)

Insert the Supporting CD-ROM to CD-ROM drive, and it should show the index page of Evalue's products automatically. If not, locate Index.htm and choose the product from the menu left, or link to **\Driver_Video\Intel\855GM**.

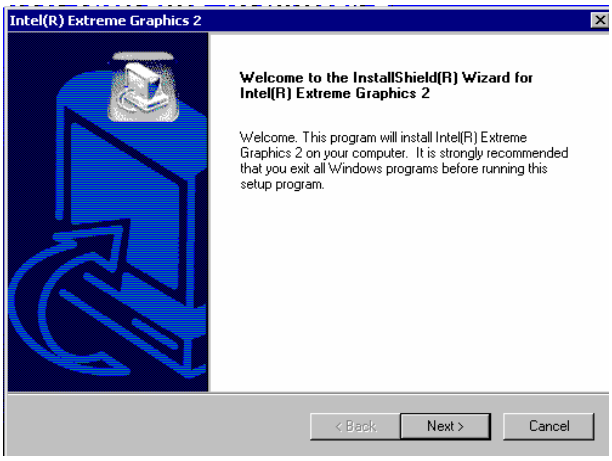
Note: The installation procedures and screen shots in this section are based on Windows XP operation system.



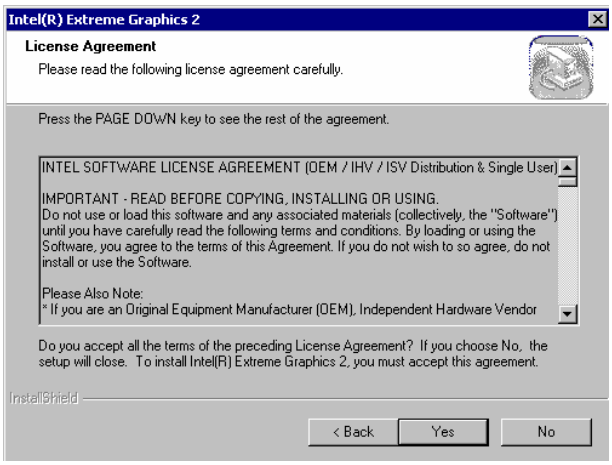
Step 1. Locate 「Driver_Video\Intel\855GM\Win2K_XP\setup.exe」.



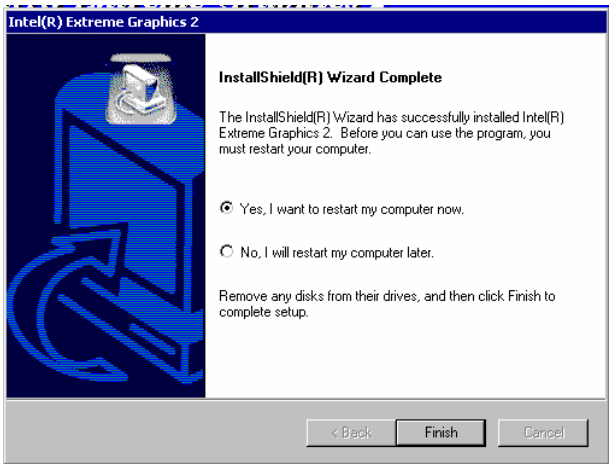
Step 2. Click **Next**.



Step 3. Click **Next**.



Step 4. Click **Yes**.

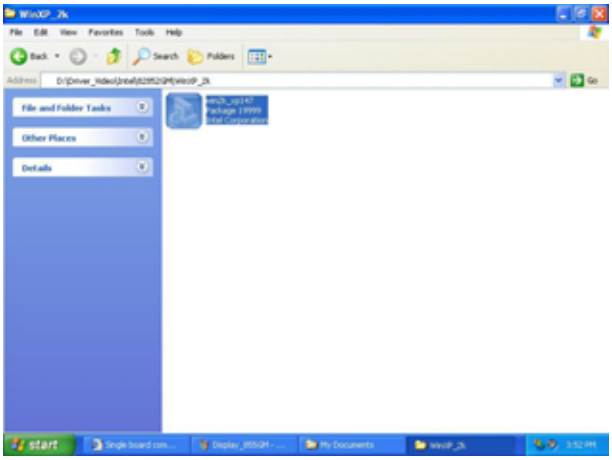


Step 5. Click **Finish** to complete setup.

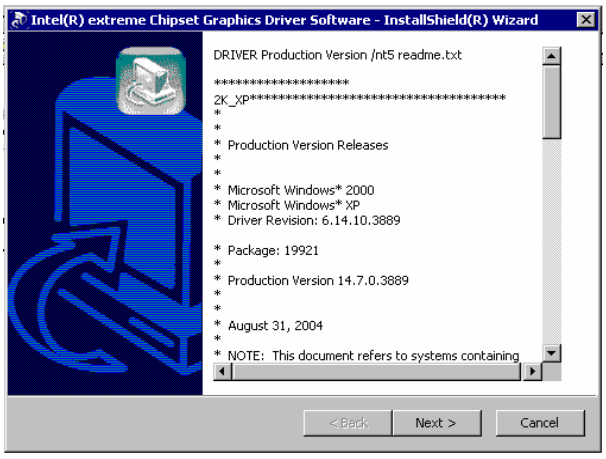
4.4 Install Display Driver (For Intel RG82852GM)

Insert the Supporting CD-ROM to CD-ROM drive, and it should show the index page of Evalue's products automatically. If not, locate Index.htm and choose the product from the menu left, or link to **\Driver_Video\Intel\82852GM\ WinXP_2k**.

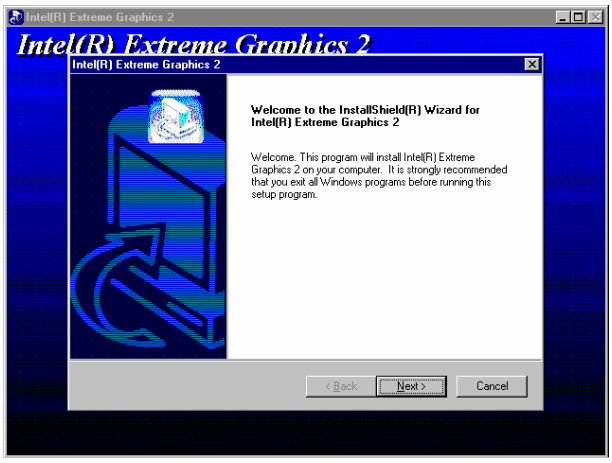
Note: The installation procedures and screen shots in this section are based on Windows XP operation system.



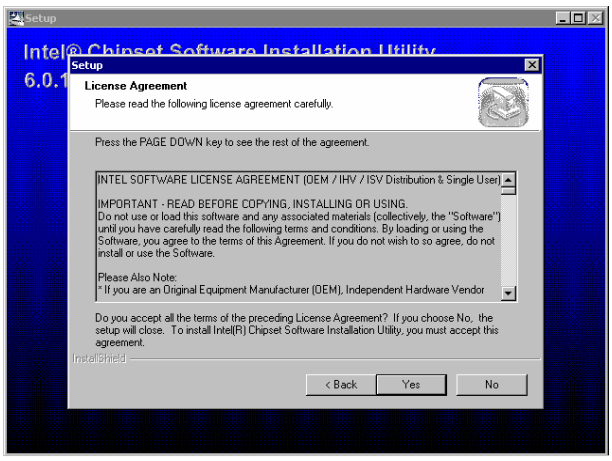
Step 1. Locate 「Driver_Video\Intel\ 82852GM\WinXP_2k\win2k_xp147.exe」.



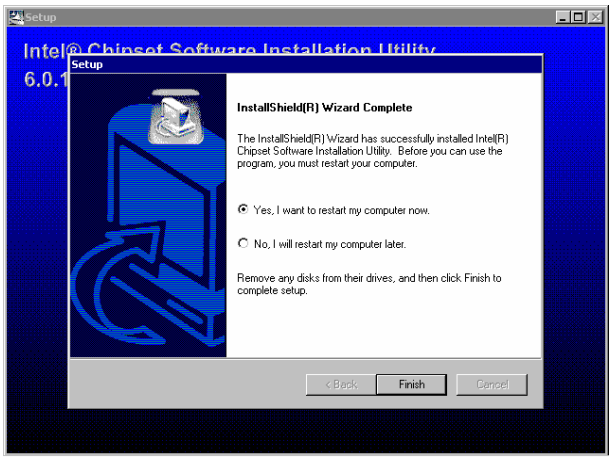
Step 2. Click **Next**.



Step 3. Click **Next**.



Step 4. Click **Yes**.

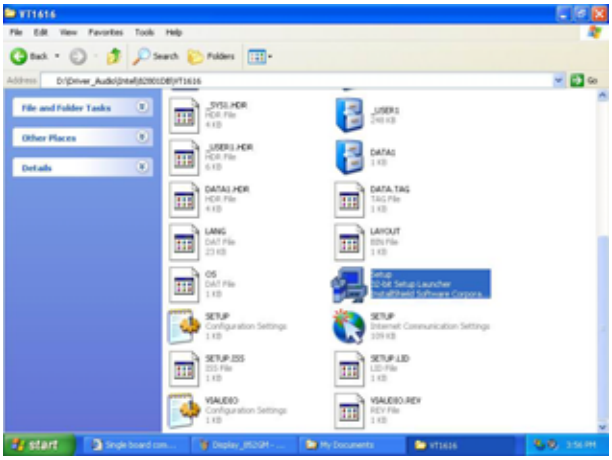


Step 5. Click **Finish** to complete setup.

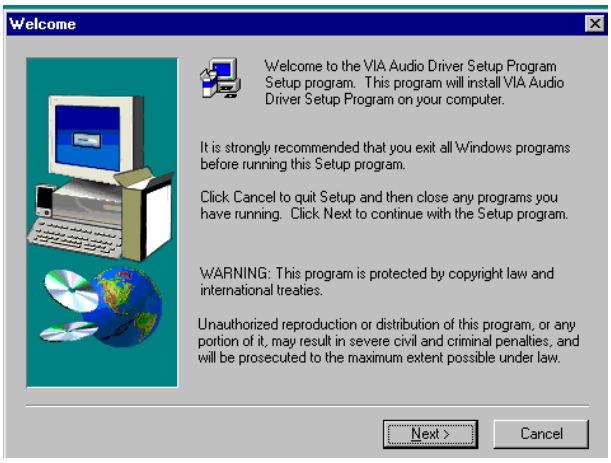
4.5 Install Audio Driver (For Intel FW82801DB)

Insert the Supporting CD-ROM to CD-ROM drive, and it should show the index page of Evalue's products automatically. If not, locate Index.htm and choose the product from the menu left, or link to **\Driver_Audio\Intel\ 82801DB\ VT1616**.

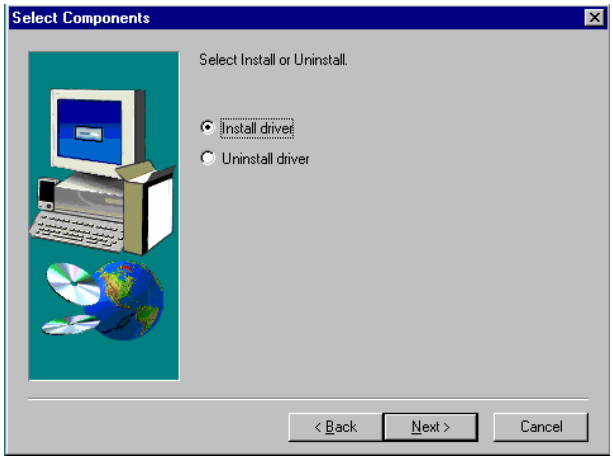
Note: The installation procedures and screen shots in this section are based on Windows XP operation system.



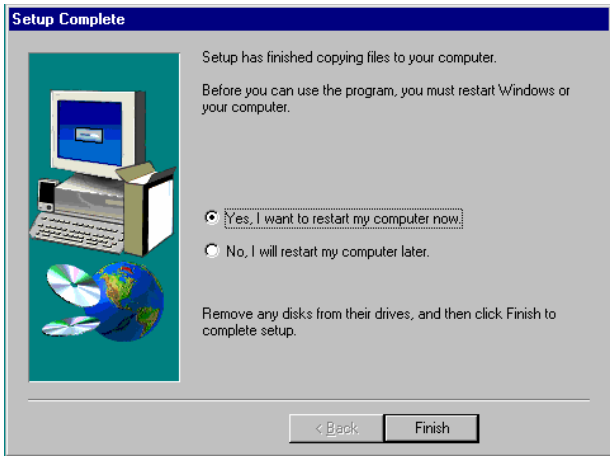
Step 1. Locate 「\Driver_Audio\Intel\ 82801DB\VT1616\setup.exe」.



Step 2. Click **Next**.



Step 3. Select **Install driver** and click **Next**.

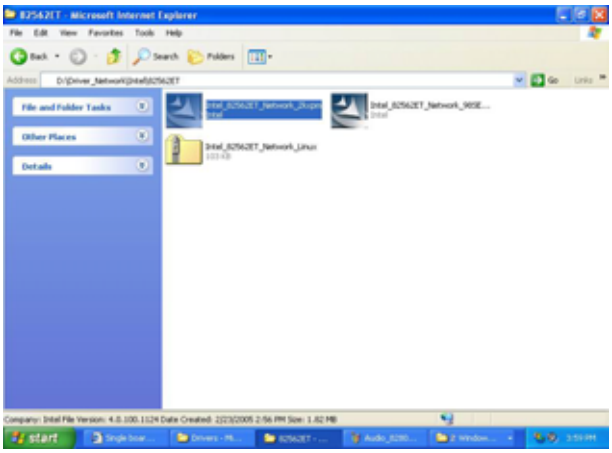


Step 4. Click **Finish** to complete the setup and restart the computer.

4.6 Install Ethernet Driver (For Intel 82562ET)

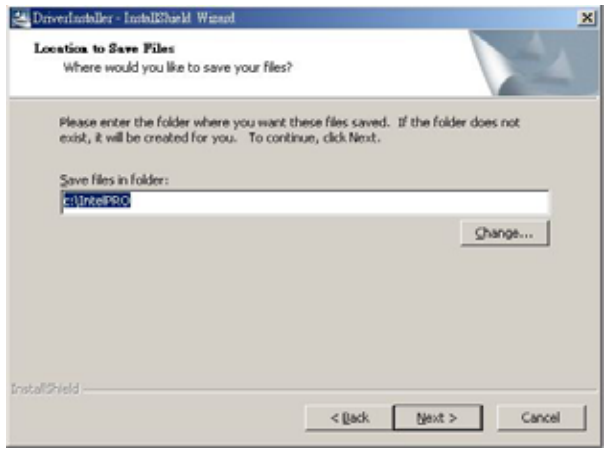
Insert the Supporting CD-ROM to CD-ROM drive, and it should show the index page of Evalue's products automatically. If not, locate Index.htm and choose the product from the menu left, or link to **\Driver_Network\Intel\82562ET**.

Note: The installation procedures and screen shots in this section are based on Windows XP operation system.



Step 1. Locate 「\Driver_Network\Intel\ 82562ET\ Intel_82562ET_Network_ 2kxpm.exe」.

Step 2. Click **Next**.



Step 3. Clarify the file direction to **Next**.

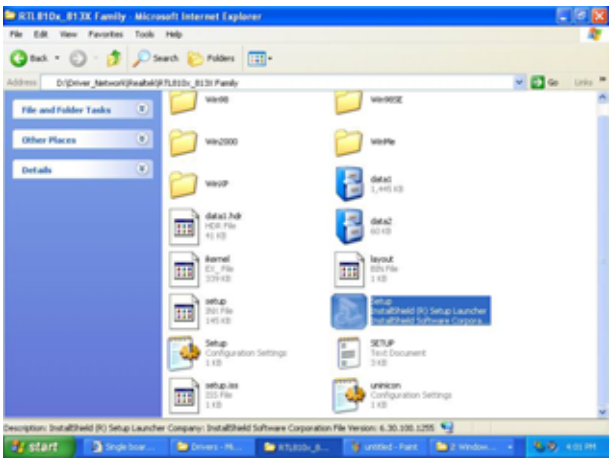
Step 4. Click **Install Base Driver** to run the setup.

Step 5. Driver will complete the setup automatically.

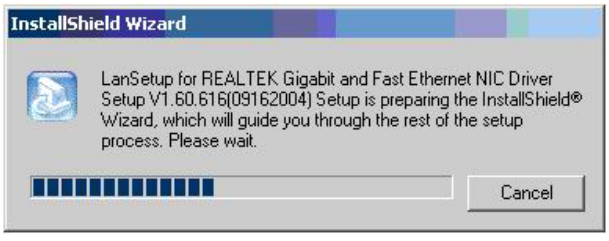
4.7 Install Ethernet Driver (For Realtek RTL810x, RTL813x Family)

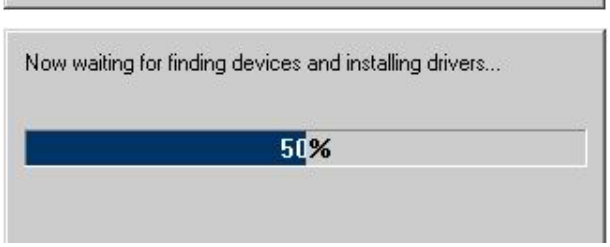
Insert the Supporting CD-ROM to CD-ROM drive, and it should show the index page of Evalue's products automatically. If not, locate Index.htm and choose the product from the menu left, or link to **\Driver_Network\Realtek\ RTL810x_813X Family**.

Note: The installation procedures and screen shots in this section are based on Windows XP operation system.

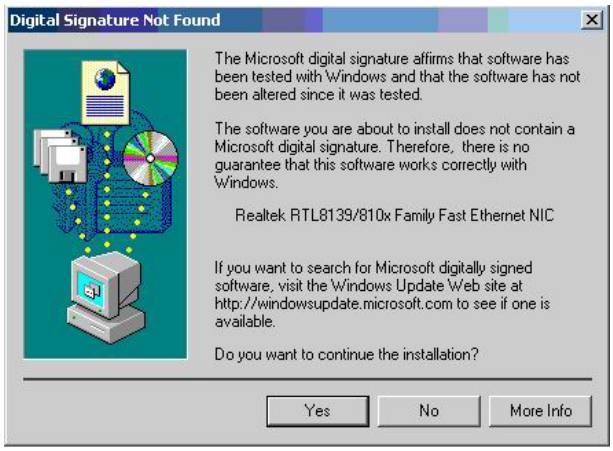


Step 1. Locate 「\Driver_Network\Realtek\ RTL810x_813X Family\Setup.exe」.

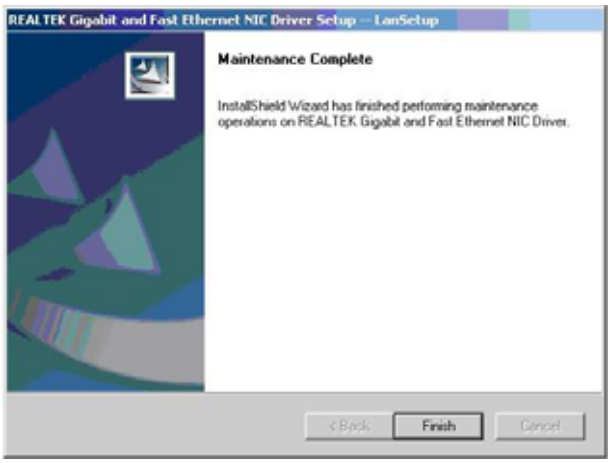




Step 2. Setup executing.

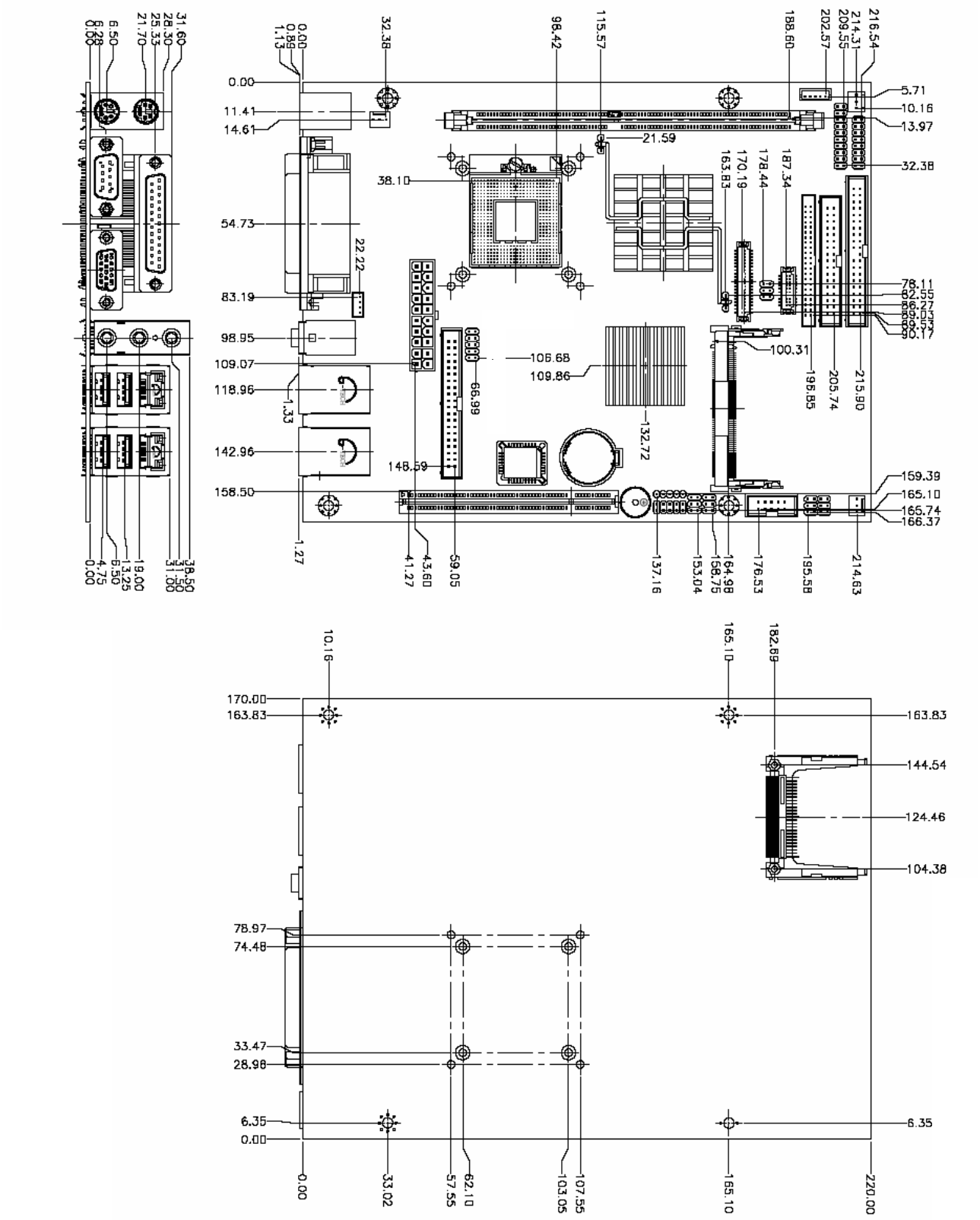


Step 3. Click **Yes** to continue the installation.



Step 4. Click **Finish** to complete the setup.

5. Measurement Drawing


0.00
11.41
14.61
54.73
83.19
98.95
109.07
118.96
142.96
158.50
38.10
98.42
115.57
188.60
202.57
209.55
214.31
216.54
5.71
10.16
13.97
21.59
32.38
163.83
170.19
178.44
187.34
78.11
100.31
105.68
109.86
132.72
148.59
159.39
165.10
165.74
166.37
195.85
205.74
215.90
195.58
214.63
22.22
66.99
1.33
1.27
41.27
43.60
59.05
137.16
153.04
164.98
176.53
10.16
170.00
163.83
165.10
182.69
144.54
124.46
104.38
78.97
74.48
33.47
28.98
6.35
0.00
33.02
57.55
62.10
103.05
107.55
165.10
220.00

Appendix A: BIOS Revisions

BIOS Rev.

New Features

Bugs/Problems Solved

Known Problems

Appendix B: AWARD BIOS POST Messages

Overview

During the Power On Self-Test (POST), if the BIOS detects an error requiring you to do something to fix, it will either sound a beep code or display a message.
If a message is displayed, it will be accompanied by:
PRESS F1 TO CONTINUE, CTRL-ALT-ESC OR DEL TO ENTER SETUP

Post Beep

Currently there are two kinds of beep codes in BIOS. This code indicates that a video error has occurred and the BIOS cannot initialize the video screen to display any additional information. This beep code consists of a single long beep followed by two short beeps. The other code indicates that your DRAM error has occurred. This beep code consists of a single long beep repeatedly.

Error Messages

One or more of the following messages may be displayed if the BIOS detects an error during the POST. This list includes messages for both the ISA and the EISA BIOS.

1. CMOS BATTERY HAS FAILED

CMOS battery is no longer functional. It should be replaced.

2. CMOS CHECKSUM ERROR

Checksum of CMOS is incorrect. This can indicate that CMOS has become corrupt. This error may have been caused by a weak battery. Check the battery and replace if necessary.

3. DISK BOOT FAILURE, INSERT SYSTEM DISK AND PRESS ENTER

No boot device was found. This could mean that either a boot drive was not detected or the drive does not contain proper system boot files. Insert a system disk into Drive A: and press <Enter>. If you assumed the system would boot from the hard drive, make sure the controller is inserted correctly and all cables are properly attached. Also be sure the disk is formatted as a boot device. Then reboot the system.

4. DISKETTE DRIVES OR TYPES MISMATCH ERROR - RUN SETUP

Type of diskette drive installed in the system is different from the CMOS definition. Run Setup to reconfigure the drive type correctly.

5. DISPLAY SWITCH IS SET INCORRECTLY

Display switch on the motherboard can be set to either monochrome or color. This indicates the switch is set to a different setting than indicated in Setup. Determine which setting is correct, and then either turn off the system and change the jumper, or enter Setup and change the VIDEO selection.

6. DISPLAY TYPE HAS CHANGED SINCE LAST BOOT

Since last powering off the system, the display adapter has been changed. You must configure the system for the new display type.

7. EISA Configuration Checksum Error
PLEASE RUN EISA CONFIGURATION UTILITY

The EISA non-volatile RAM checksum is incorrect or cannot correctly read the EISA slot. This can indicate either the EISA non-volatile memory has become corrupt or the slot has been configured incorrectly. Also be sure the card is installed firmly in the slot.

8. EISA Configuration Is Not Complete
PLEASE RUN EISA CONFIGURATION UTILITY

The slot configuration information stored in the EISA non-volatile memory is incomplete.

Note: When either of these errors appears, the system will boot in ISA mode, which allows you to run the EISA Configuration Utility.

9. ERROR ENCOUNTERED INITIALIZING HARD DRIVE

Hard drive cannot be initialized. Be sure the adapter is installed correctly and all cables are correctly and firmly attached. Also be sure the correct hard drive type is selected in Setup.

10. ERROR INITIALIZING HARD DISK CONTROLLER

Cannot initialize controller. Make sure the cord is correctly and firmly installed in the bus. Be sure the correct hard drive type is selected in Setup. Also check to see if any jumper needs to be set correctly on the hard drive.

11. FLOPPY DISK CNTRLR ERROR OR NO CNTRLR PRESENT

Cannot find or initialize the floppy drive controller. Make sure the controller is installed correctly and firmly. If there are no floppy drives installed, be sure the Diskette Drive selection in Setup is set to NONE.

12. Invalid EISA Configuration
PLEASE RUN EISA CONFIGURATION UTILITY

The non-volatile memory containing EISA configuration information was programmed incorrectly or has become corrupt. Re-run EISA configuration utility to correctly program the memory.

Note: When either of these errors appears, the system will boot in ISA mode, which allows you to run the EISA Configuration Utility.

13. KEYBOARD ERROR OR NO KEYBOARD PRESENT

Cannot initialize the keyboard. Make sure the keyboard is attached correctly and no keys are being pressed during the boot.

If you are purposely configuring the system without a keyboard, set the error halt condition in Setup to HALT ON ALL, BUT KEYBOARD. This will cause the BIOS to ignore the missing keyboard and continue the boot.

14. Memory Address Error at ...

Indicates a memory address error at a specific location. You can use this location along with the memory map for your system to find and replace the bad memory chips.

15. Memory parity Error at ...

Indicates a memory parity error at a specific location. You can use this location along with the memory map for your system to find and replace the bad memory chips.

16. MEMORY SIZE HAS CHANGED SINCE LAST BOOT

Memory has been added or removed since the last boot. In EISA mode use Configuration Utility to reconfigure the memory configuration. In ISA mode enter Setup and enter the new memory size in the memory fields.

17. Memory Verify Error at ...

Indicates an error verifying a value already written to memory. Use the location along with your system's memory map to locate the bad chip.

18. OFFENDING ADDRESS NOT FOUND

This message is used in conjunction with the I/O CHANNEL CHECK and RAM PARITY ERROR messages when the segment that has caused the problem cannot be isolated.

19. OFFENDING SEGMENT:

This message is used in conjunction with the I/O CHANNEL CHECK and RAM PARITY ERROR messages when the segment that has caused the problem has been isolated.

20. PRESS A KEY TO REBOOT

This will be displayed at the bottom screen when an error occurs that requires you to reboot. Press any key and the system will reboot.

21. PRESS F1 TO DISABLE NMI, F2 TO REBOOT

When BIOS detects a Non-maskable Interrupt condition during boot, this will allow you to disable the NMI and continue to boot, or you can reboot the system with the NMI enabled.

22. RAM PARITY ERROR - CHECKING FOR SEGMENT ...

Indicates a parity error in Random Access Memory.

23. Should Be Empty But EISA Board Found
PLEASE RUN EISA CONFIGURATION UTILITY

A valid board ID was found in a slot that was configured as having no board ID.

Note: When either of these errors appears, the system will boot in ISA mode, which allows you to run the EISA Configuration Utility.

24. Should Have EISA Board But Not Found
PLEASE RUN EISA CONFIGURATION UTILITY

The board installed is not responding to the ID request, or no board ID has been found in the indicated slot.

Note: When either of these errors appears, the system will boot in ISA mode, which allows you to run the EISA Configuration Utility.

25. Slot Not Empty

Indicates that a slot designated as empty by the EISA Configuration Utility actually contains a board.

Note: When either of these errors appears, the system will boot in ISA mode, which allows you to run the EISA Configuration Utility.

26. SYSTEM HALTED, (CTRL-ALT-DEL) TO REBOOT ...

Indicates the present boot attempt has been aborted and the system must be rebooted. Press and hold down the CTRL and ALT keys and press DEL.

27. Wrong Board In Slot
PLEASE RUN EISA CONFIGURATION UTILITY

The board ID does not match the ID stored in the EISA non-volatile memory.

Note: When either of these errors appears, the system will boot in ISA mode, which allows you to run the EISA Configuration Utility.

28. FLOPPY DISK(S) fail (80) → Unable to reset floppy subsystem.
29. FLOPPY DISK(S) fail (40) → Floppy Type dismatch.
30. Hard Disk(s) fail (80) → HDD reset failed.
31. Hard Disk(s) fail (40) → HDD controller diagnostics failed.
32. Hard Disk(s) fail (20) → HDD initialization error.
33. Hard Disk(s) fail (10) → Unable to recalibrate fixed disk.
34. Hard Disk(s) fail (08) → Sector Verify failed.
35. Keyboard is locked out - Unlock the key.

BIOS detect the keyboard is locked. P17 of keyboard controller is pulled low.

36. Keyboard error or no keyboard present.

Cannot initialize the keyboard. Make sure the keyboard is attached correctly and no keys are being pressed during the boot.

37. Manufacturing POST loop.

System will repeat POST procedure infinitely while the P15 of keyboard controller is pull low. This is also used for M/B burn in test.

38. BIOS ROM checksum error - System halted.

The checksum of ROM address F0000H-FFFFFH is bad.

39. Memory test fail.

BIOS reports the memory test fail if the onboard memory is tested error.

40. POST Codes

POST (hex)	Description
CFh	Test CMOS R/W functionality.
C0h	Early chipset initialization: -Disable shadow RAM -Disable L2 cache (socket 7 or below) -Program basic chipset registers
C1h	Detect memory -Auto-detection of DRAM size, type and ECC. -Auto-detection of L2 cache (socket 7 or below)
C3h	Expand compressed BIOS code to DRAM
C5h	Call chipset hook to copy BIOS back to E000 & F000 shadow RAM.
0h1	Expand the Xgroup codes locating in physical address 1000:0
02h	Reserved
03h	Initial Superio_Early_Init switch.
04h	Reserved
05h	1. Blank out screen 2. Clear CMOS error flag
06h	Reserved
07h	1. Clear 8042 interface 2. Initialize 8042 self-test
08h	1. Test special keyboard controller for Winbond 977 series Super I/O chips. 2. Enable keyboard interface.
09h	Reserved
0Ah	1. Disable PS/2 mouse interface (optional). 2. Auto detect ports for keyboard & mouse followed by a port & interface swap (optional). 3. Reset keyboard for Winbond 977 series Super I/O chips.
0Bh	Reserved
0Ch	Reserved
0Dh	Reserved
0Eh	Test F000h segment shadow to see whether it is R/W-able or not. If test fails, keep beeping the speaker.
0Fh	Reserved
10h	Auto detect flash type to load appropriate flash R/W codes into the run time area in F000 for ESCD & DMI support.
11h	Reserved
12h	Use walking 1's algorithm to check out interface in CMOS circuitry. Also set real-time clock power status, and then check for override.
13h	Reserved
14h	Program chipset default values into chipset. Chipset default values are MODBINable by OEM customers.

POST (hex)	Description
15h	Reserved
16h	Initial Early_Init_Onboard_Generator switch.
17h	Reserved
18h	Detect CPU information including brand, SMI type (Cyrix or Intel) and CPU level (586 or 686).
19h	Reserved
1Ah	Reserved
1Bh	Initial interrupts vector table. If no special specified, all H/W interrupts are directed to SPURIOUS_INT_HDLR & S/W interrupts to SPURIOUS_soft_HDLR.
1Ch	Reserved
1Dh	Initial EARLY_PM_INIT switch.
1Eh	Reserved
1Fh	Load keyboard matrix (notebook platform)
20h	Reserved
21h	HPM initialization (notebook platform)
22h	Reserved
23h	1. Check validity of RTC value: e.g. a value of 5Ah is an invalid value for RTC minute. 2. Load CMOS settings into BIOS stack. If CMOS checksum fails, use default value instead. 3. Prepare BIOS resource map for PCI & PnP use. If ESCD is valid, take into consideration of the ESCD's legacy information. 4. Onboard clock generator initialization. Disable respective clock resource to empty PCI & DIMM slots. 5. Early PCI initialization: -Enumerate PCI bus number -Assign memory & I/O resource -Search for a valid VGA device & VGA BIOS, and put it into C000:0.
24h	Reserved
25h	Reserved
26h	Reserved
27h	Initialize INT 09 buffer
28h	Reserved
29h	1. Program CPU internal MTRR (P6 & PII) for 0-640K memory address. 2. Initialize the APIC for Pentium class CPU. 3. Program early chipset according to CMOS setup. Example: onboard IDE controller. 4. Measure CPU speed. 5. Invoke video BIOS.
2Ah	Reserved
2Bh	Reserved
2Ch	Reserved

POST (hex)	Description
2Dh	1. Initialize multi-language 1. Put information on screen display, including Award title, CPU type, CPU speed ….
2Eh	Reserved
2Fh	Reserved
30h	Reserved
31h	Reserved
32h	Reserved
33h	Reset keyboard except Winbond 977 series Super I/O chips.
34h	Reserved
35h	Reserved
36h	Reserved
37h	Reserved
38h	Reserved
39h	Reserved
3Ah	Reserved
3Bh	Reserved
3Ch	Test 8254
3Dh	Reserved
3Eh	Test 8259 interrupt mask bits for channel 1.
3Fh	Reserved
40h	Test 8259 interrupt mask bits for channel 2.
41h	Reserved
42h	Reserved
43h	Test 8259 functionality.
44h	Reserved
45h	Reserved
46h	Reserved
47h	Initialize EISA slot
48h	Reserved
49h	1. Calculate total memory by testing the last double word of each 64K page. 2. Program writes allocation for AMD K5 CPU.
4Ah	Reserved
4Bh	Reserved
4Ch	Reserved
4Dh	Reserved
4Eh	1. Program MTRR of M1 CPU 2. Initialize L2 cache for P6 class CPU & program CPU with proper cacheable range. 3. Initialize the APIC for P6 class CPU. 4. On MP platform, adjust the cacheable range to smaller one in case the cacheable ranges between each CPU are not identical.
4Fh	Reserved
50h	Initialize USB

POST (hex)	Description
51h	Reserved
52h	Test all memory (clear all extended memory to 0)
53h	Reserved
54h	Reserved
55h	Display number of processors (multi-processor platform)
56h	Reserved
57h	1. Display PnP logo 2. Early ISA PnP initialization -Assign CSN to every ISA PnP device.
58h	Reserved
59h	Initialize the combined Trend Anti-Virus code.
5Ah	Reserved
5Bh	(Optional Feature) Show message for entering AWDFLASH.EXE from FDD (optional)
5Ch	Reserved
5Dh	1. Initialize Init_Onboard_Super_IO switch. 2. Initialize Init_Onbaord_AUDIO switch.
5Eh	Reserved
5Fh	Reserved
60h	Okay to enter Setup utility; i.e. not until this POST stage can users enter the CMOS setup utility.
61h	Reserved
62h	Reserved
63h	Reserved
64h	Reserved
65h	Initialize PS/2 Mouse
66h	Reserved
67h	Prepare memory size information for function call: INT 15h ax=E820h
68h	Reserved
69h	Turn on L2 cache
6Ah	Reserved
6Bh	Program chipset registers according to items described in Setup & Auto-configuration table.
6Ch	Reserved
6Dh	1. Assign resources to all ISA PnP devices. 2. Auto assign ports to onboard COM ports if the corresponding item in Setup is set to "AUTO".
6Eh	Reserved
6Fh	1. Initialize floppy controller 2. Set up floppy related fields in 40:hardware.
70h	Reserved
71h	Reserved
72h	Reserved

POST (hex)	Description
73h	(Optional Feature) Enter AWDFLASH.EXE if : -AWDFLASH is found in floppy drive. -ALT+F2 is pressed
74h	Reserved
75h	Detect & install all IDE devices: HDD, LS120, ZIP, CDROM…..
76h	Reserved
77h	Detect serial ports & parallel ports.
78h	Reserved
79h	Reserved
7Ah	Detect & install co-processor
7Bh	Reserved
7Ch	Reserved
7Dh	Reserved
7Eh	Reserved
7Fh	1. Switch back to text mode if full screen logo is supported. -If errors occur, report errors & wait for keys -If no errors occur or F1 key is pressed to continue: ◆Clear EPA or customization logo.
80h	Reserved
81h	Reserved
82h	1. Call chipset power management hook. 2. Recover the text fond used by EPA logo (not for full screen logo) 3. If password is set, ask for password.
83h	Save all data in stack back to CMOS
84h	Initialize ISA PnP boot devices
85h	1. USB final Initialization 2. NET PC: Build SYSID structure 3. Switch screen back to text mode 4. Set up ACPI table at top of memory. 5. Invoke ISA adapter ROMs 6. Assign IRQs to PCI devices 7. Initialize APM 8. Clear noise of IRQs.
86h	Reserved
87h	Reserved
88h	Reserved
89h	Reserved
90h	Reserved
91h	Reserved
92h	Reserved
93h	Read HDD boot sector information for Trend Anti-Virus code

POST (hex)	Description
94h	1. Enable L2 cache 1. Program boot up speed 2. Chipset final initialization. 3. Power management final initialization 4. Clear screen & display summary table 5. Program K6 write allocation 6. Program P6 class write combining
95h	1. Program daylight saving 1. Update keyboard LED & typematic rate
96h	1. Build MP table 2. Build & update ESCD 3. Set CMOS century to 20h or 19h 4. Load CMOS time into DOS timer tick 5. Build MSIRQ routing table.
FFh	Boot attempt (INT 19h)