IEI Technology Corp.

MODEL:

ECW-281B-945GSE

IEI Intel® Atom™ Fanless Embedded System

RoHS Compliant, Dual GbE LAN, COM Ports, USB 2.0

User Manual

Rev. 1.01 17 March, 2009

RoHS Lead Free

Revision

Date	Version	Changes
17 March, 2009	1.01	Changed model name
10 February, 2009	1.00	Initial release

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Packing List

NOTE:

If any of the components listed in the checklist below are missing, please do not proceed with the installation. Contact the IEI reseller or vendor you purchased the ECW-281B-945GSE from or contact an IEI sales representative directly. To contact an IEI sales representative, please send an email to sales@iei.com.tw.

The items listed below should all be included in the ECW-281B-945GSE package.

- 1 x ECW-281B-945GSE embedded system
- 2 x Mounting brackets
- 1 x Screw set
- 1 x Thermal pad for HDD
- 1 x Mini jumper set
- 1 x QIG
- 1 x Driver and manual CD
- 1 x 2 dbi wireless antenna (for wireless models only)
- 1 x Power cord (optional for WD models)
- 1 x Power Adaptor (optional for WD models)

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1

Introduction

1.1 ECW-281B-945GSE Embedded System Overview

Figure 1-1: ECW-281B-945GSE Series Embedded System

There are four WAFER-945GSE Intel® Atom™ based embedded solutions in the ECW-281B-945GSE series. All fanless motherboards have been optimized for multimedia applications that require minimum installation space. The WAFER-945GSE motherboard supports a full range of functions for an AT/ATX-compatible industrial computer. ECW-281B-945GSE embedded subsystems are all capable of supporting one 2.5" SATA hard disk drive. The ECW-281B-945GSE-W models also have a built-in 802.11 b/g wireless module.

1.1.1 ECW-281B-945GSE Benefits

The ECW-281B-945GSE embedded system has the following benefits:

- Easy installation saves installation time
- Complete integration saves solution development time and cost
- Secure storage with one SATA hard drive supported
- Compact size saves space
- Powerful preinstalled Intel® Atom™ N270 CPU and motherboard ensures rigorous processing needs can be met

1.1.2 ECW-281B-945GSE Features

The ECW-281B-945GSE has the following features

- RoHS compliant design
- Fanless system
- Built-in DC-to-DC power converter
- 1.6 GHz Intel® Atom™ N270 CPU supported
- Dual GbE LAN for high speed network applications
- One SATA hard drive supported
- Wall mount and DIN mount supported.

1.2 ECW-281B-945GSE Model Variations

There are four models in the ECW-281B-945GSE embedded system series. The ECW-281B-945GSE series supports 12V DC input and the ECW-281BWD-945GSE series supports 9V~36V DC input. The four models are listed in **Table 1-1** below.

ECW-281B	CPU	Memory	Power	Wireless
-945GSE-R10/1GB	Intel® Atom™ N270	1 GB DDR	12V DC input (55 W adaptor)	No
-945GSE-W-R10/1GB	Intel® Atom™ N270	1 GB DDR	12V DC input (55 W adaptor)	Yes
ECW-281BWD	**CPU**	**Memory**	**Power**	**Wireless**
-945GSE-R10/1GB	Intel® Atom™ N270	1 GB DDR	9V~36V DC input	No
-945GSE-W-R10/1GB	Intel® Atom™ N270	1 GB DDR	9V~36V DC input	Yes

Table 1-1: Model Variations

1.3 Technical Specifications

The specifications for the Intel based embedded systems are listed below.

	ECW-281B-945GSE
CPU	Preinstalled 1.6 GHz Intel® Atom™ Processor N270 with a 533 MHz FSB
System Chipset	Intel® 945GSE + ICH7-M
System Memory	Preinstalled 1.0 GB DDR2 SDRAM SO-DIMM (system max. 2 GB)
Ethernet	Dual Realtek RTL8111CP GbE controllers Buit-in 802.11 b/g wireless module for the wireless models
Display	CRT integrated in Intel® 945GSE
USB	Four USB 2.0 ports
Serial Port	Five RS-232 One RS-232/422/485 (selectable)
Audio	One audio out
Storage	One 2.5” SATA hard drive supported One internal CF card slot
Chassis Construction	Aluminum Alloy
Power Supply	Internal DC-to-DC power converter, input voltage: 12V DC or 9V – 36V (WD series models) External power adapter, input voltage: 90V AC ~ 264V AC @ 47Hz ~ 63Hz, 55 W
Power Consumption	19 W
Operating Shock	Half-sine wave shock 3G; 11ms; 3 shocks per axis

Operating Vibration	MIL-STD-810F 514.5C-1 (HDD) MIL-STD-810F 514.5C-2 (CF)
Operating temperature	-10ºC ~ 50ºC with HDD -10ºC ~ 60ºC with CF card
Color	Black
Mounting	DIN mount VESA MIS-D 100 wall mount
Weight (Net/Gross)	2.1 kg/3.9 kg
Dimensions (D x W x H)	132 mm x 229 mm x 64 mm
EMC	FCC Class A, CE

Table 1-2: Technical Specifications

1.4 Power Module Specifications

1.4.1 Power Module Options

The ECW-281B-945GSE embedded system supports either a 12V DC input or a 9V~36V DC input. The input support depends on the power module installed in the system. The two power modules are listed in **Table 1-3**:

Embedded System	Power Module	DC Input
ECW-281B-945GSE Series	IDD-12250A	12V DC input
ECW-281BWD-945GSE Series	IDD-936260A	9V~36V DC input

Table 1-3: ECW-281B-945GSE Power Module Options

1.4.2 Power Module Specifications

The specifications for the IDD-12250A and IDD-936260A are shown in **Table 1-4**.

Model Name:	IDD-12250A	IDD-936260A
Input	12VDC	9VDC~36VDC
Output:		
12V	5A (pass thru.)	3A (Max.)
5V	10A (Max.)	10A (Max.)
5VSB	0.5A (Max.)	0.5A (Max.)
Max. Total Output:	50W+60W (12V pass thru.)	60W
Performance Characteristics:		
Noise & Ripple:	< 240mV	< 240mV
Line Regulation:	< 20mV	< 20mV

Load Regulation	<60mV	<60mV
Efficiency:	Up to 90%	Up to 90%
Dimensions:	40mm x 100mm	40mm x 100mm
Weight:	46g	58g
Operating Temperature:	-40°C~85°C	-40°C~85°C

Table 1-4: DC-to-DC Power Module Specifications

1.5 Power Adapter

The ECW-281B-945GSE series models are shipped with a 55 W power adapter.

Figure 1-2: Power Adapter

The specifications for the adapter are listed in **Table 1-5**:

Output	**Nominal**	12.0V
	Regulation	11.52V – 12.48V
	Ripple/Noise	120mV
	Min.	0A
	Max.	4.58A

Protection	**Short Circuit**	Output can be shorted without damage and auto-recovery	
	Over-Voltage	Upper Trip Limit:	15V+/-1.5V
Time	**Hold Up**	10ms	
Input	**Min.**	90V	
	Nominal	115V ~ 230V	
	Max.	264V	
	Frequency	47Hz ~ 63Hz	
	Inrush Current	80A Max. (cold start at 25ºC)	
	Steady Current	1.3Arms Max.	
	Efficiency	80% (typical)	
Environment	**Temperature**	Operating	0ºC ~ 40ºC
		Storage	-25ºC ~ 65ºC
	Relative Humidity	Operating (non-condensing)	0% ~ 95%
		Storage (non-condensing)	0% ~ 95%
	Vibration	Operating: 1G, 5Hz~500Hz, random vibration, 30mins/axis, 3 direction	
		Storage: 2G, 5Hz~500Hz, random vibration, 30mins/axis, 3 direction	
	Shock	Operating: 10G, 11ms, Half-sine wave	
		Storage: 20G, 11ms, Half-sine wave	
Reliability	**MTBF**	100,000 hours of continuous operation at 25ºC	
	Leakage Current	0.5mA max @264V	

Table 1-5: Power Adapter Specifications

Chapter

2

Mechanical Description

2.1 ECW-281B-945GSE Mechanical Overview

The ECW-281B-945GSE RoHS compliant, Intel® Atom™ fanless embedded system features industrial grade components that offer longer operating life, high shock/vibration resistance and endurance over a wide temperature range. The ECW-281B-945GSE combines these features in an aluminum enclosure designed for space critical applications that require low power consumption. Featuring two LAN, four USB, six serial communication ports, as well as audio, and VGA, the ECW-281B-945GSE offers system integrators and developers the best selection of robust and high performance computing system platforms. An internal bracket supports one 2.5" SATA hard drives.

2.2 Physical Dimensions

The physical dimensions of the ECW-281B-945GSE embedded systems are listed below.

2.2.1 ECW-281B-945GSE Dimensions

The dimensions of the ECW-281B-945GSE are listed below and shown in **Figure 2-1**.

- **Height**: 64.00 mm
- **Width**: 229.00 mm
- **Length**: 132.00 mm

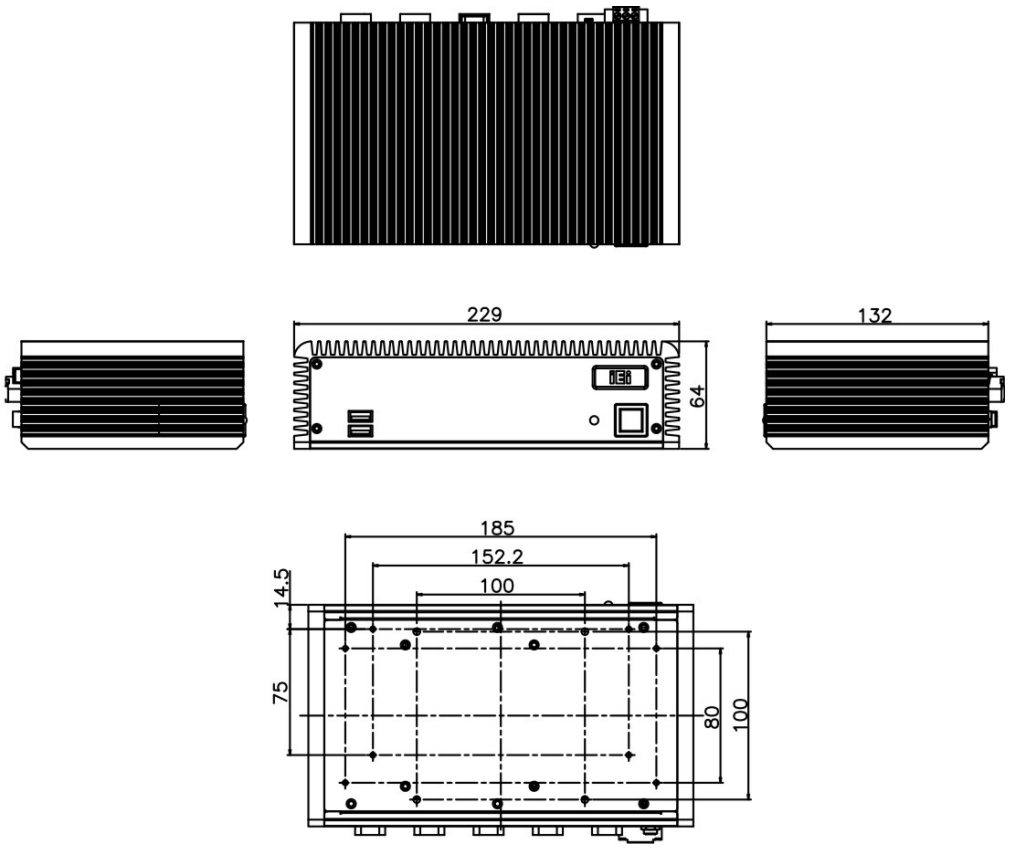


Figure 2-1: ECW-281B-945GSE Dimensions (mm)

2.2.2 Motherboard Dimensions

The WAFER series dimension are listed below and shown in **Figure 2-2**.

- **Length**: 145.00 mm
- **Width**: 102.00 mm

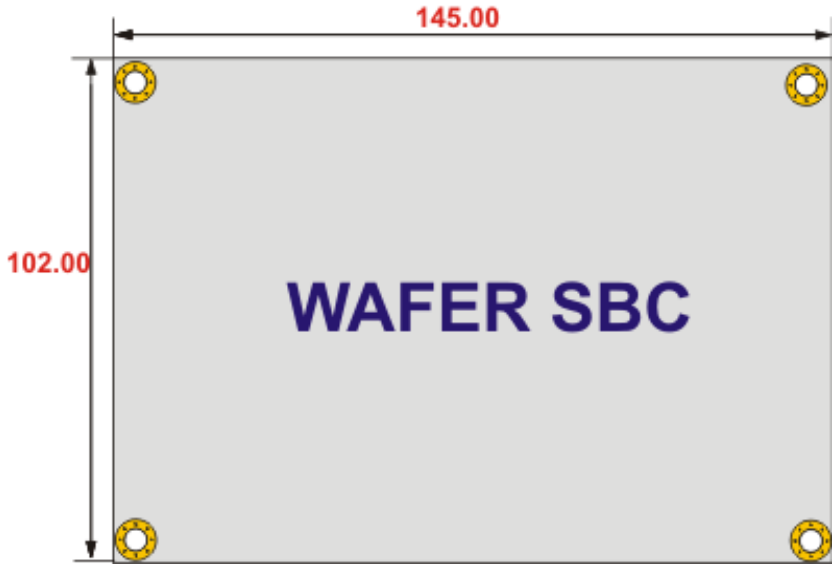


Figure 2-2: WAFER SBC Dimensions (mm)

2.2.3 Power Module Dimensions

The power module dimensions are listed below and shown in **Figure 2-3**.

- **Length**: 100.00 mm
- **Width**: 40.00 mm

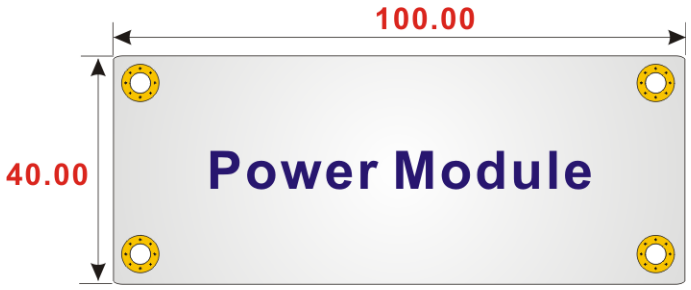


Figure 2-3: Power Module Dimensions (mm)

2.3 External Overview

2.3.1 Front Panel

The ECW-281B-945GSE front panel contains:

- 2 x USB port connectors
- 1 x HDD LED indicator
- 1 x Power button

An overview of the front panel is shown in **Figure 2-4** below.

Figure 2-4: ECW-281B-945GSE Front Panel

2.3.2 Rear Panel

The rear panel of the ECW-281B-945GSE provides access to the following external I/O connectors.

- 2 x USB port connectors
- 2 x RJ-45 Ethernet connector
- 1 x VGA connector
- 1 x RS-232/422/485 serial port
- 5 x RS-232 serial ports
- 1 x Speaker out
- 1 x 3-pin power terminal block
- 1 x 12V DC power jack
- 1 x Wireless antenna connector (for wireless models only)

An overview of the rear panel is shown in **Figure 2-5**.

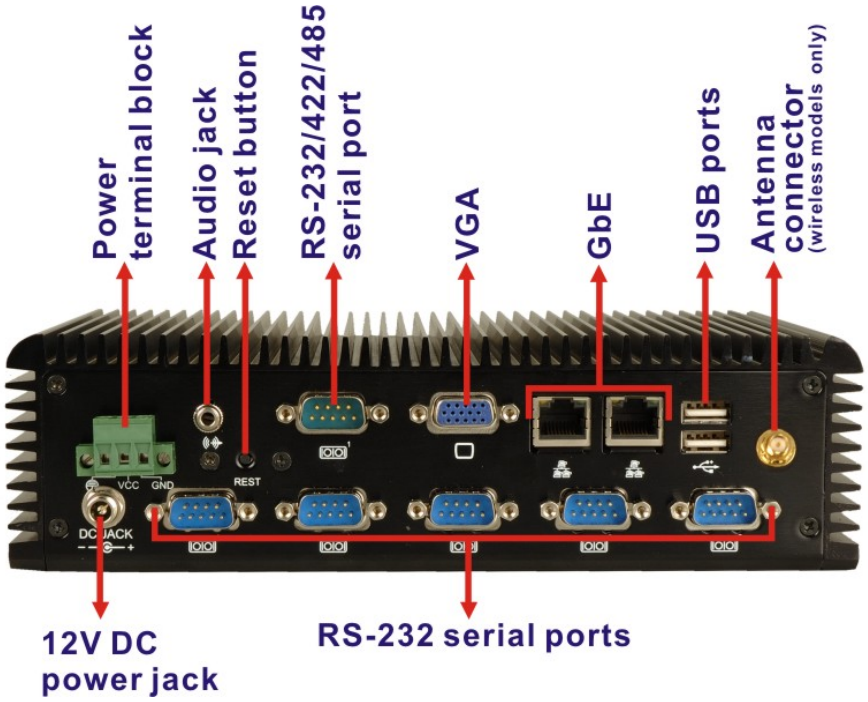


Figure 2-5: ECW-281B-945GSE Rear Panel

2.3.3 Bottom Surface

WARNING:

Never remove the bottom access panel from the chassis while power is still being fed into the system. Before removing the bottom access panel, make sure the system has been turned off and all power connectors unplugged.

The bottom surface of the ECW-281B-945GSE contains the retention screw holes for the VESA MIS-D 100 wall-mount kit, two-side mounting brackets and DIN mount bracket.

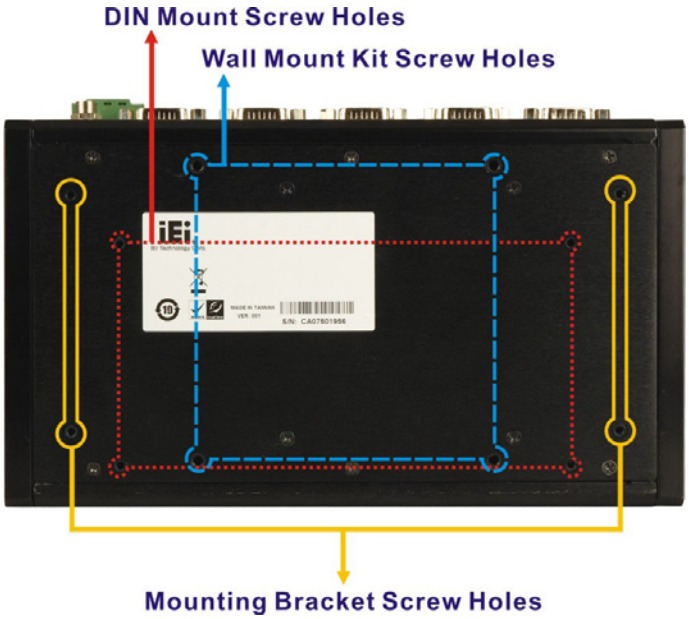


Figure 2-6: Bottom Surface

2.4 Internal Overview

The ECW-281B-945GSE internal components are listed below:

- 1 x IEI WAFER motherboard (preinstalled)
- 1 x IEI power module (preinstalled)
- 1 x SO-DIMM module (preinstalled)
- 1 x Hard drive bracket and SATA cable support one SATA hard disk

All the components are accessed by removing the bottom surface.

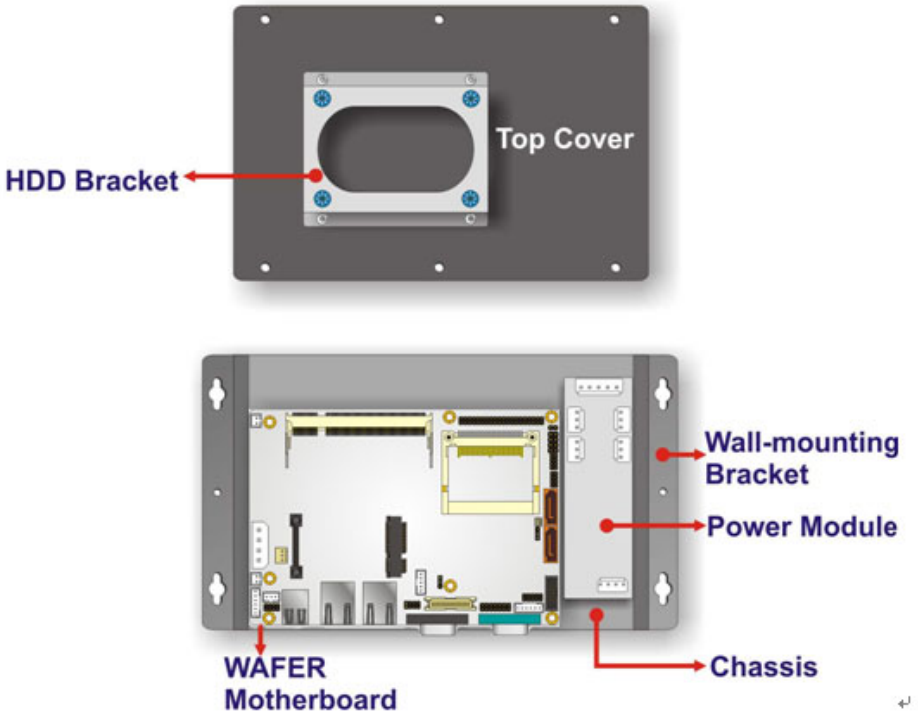


Figure 2-7: Internal Overview

Chapter

3

System Components

3.1 ECW-281B-945GSE Embedded System Motherboard

3.1.1 ECW-281B-945GSE Embedded System Motherboard

NOTE:

The jumpers and connectors shown in the section below are those jumpers and connectors that are relevant to the configuration and installation of the embedded system. For a complete list of jumpers and connectors on the WAFER-945GSE motherboard, please refer to the WAFER-945GSE user manual.

The ECW-281B-945GSE models have a WAFER-945GSE motherboard installed in the system. The following sections describe the relevant connectors and jumpers on the motherboard.

3.1.2 WAFER-945GSE Motherboard Overview

The locations of the WAFER-945GSE jumpers and connectors used on the ECW-281B-945GSE are shown in **Figure 3-1** below.

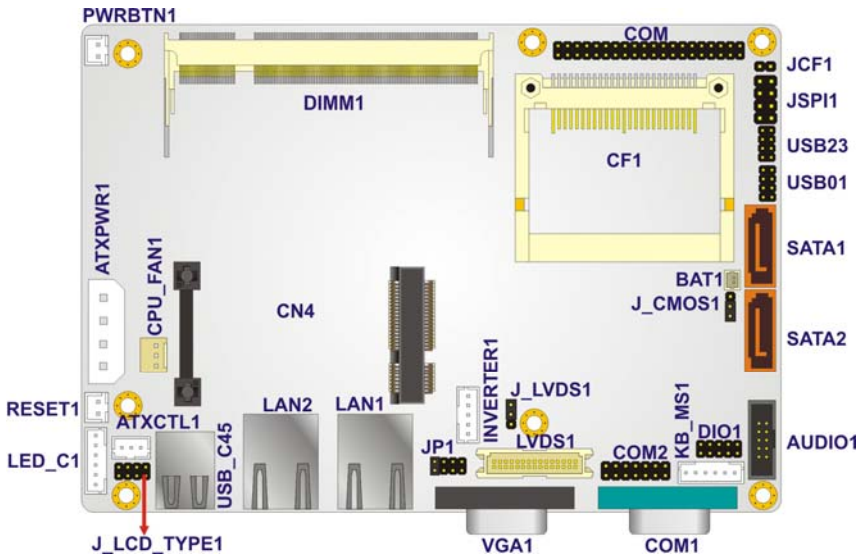


Figure 3-1: WAFER-945GSE Jumper and Connector Locations

3.1.3 CPU Support

NOTE:

The ECW-281B-945GSE series has a preinstalled Intel® Atom™ 1.6 GHz CPU on-board. If the CPU fails, the motherboard has to be replaced. Please contact the IEI reseller or vendor you purchased the ECW-281B-945GSE from or contact an IEI sales representative directly. To contact an IEI sales representative, please send an email to sales@iei.com.tw.

The ECW-281B-945GSE comes with an embedded 45 nm 1.60 GHz Intel® Atom™ processor N270. The processor supports a 533 MHz FSB and has a 1.6 GHz 512 KB L2 cache. The low power processor has a maximum power of 2.5 W.

3.2 Peripheral Interface Connectors

Section 3.2.1 lists all the peripheral interface connectors seen in **Section 3.1.2**.

3.2.1 Peripheral Interface Connectors

Table 3-1 shows a list of the peripheral interface connectors on the WAFER-945GSE that are used for the ECW-281B-945GSE. Detailed descriptions of these connectors can be found in **Section 3.3**.

Connector	Type	Label
Audio connector	10-pin header	AUDIO1
ATX enable connector	3-pin wafer	ATXCTL1
ATX power connector	4-pin ATX	ATXPWR1
CompactFlash® socket	50-pin CF socket	CF1
LED connector	6-pin header	LED_C1

PCIe Mini Card slot	PCIe Mini Slot	CN4
Power Button	2-pin wafer	PWRBTN1
Reset button connector	2-pin header	RESET1
Serial ATA (SATA) drive connectors	7-pin SATA	SATA1
RS-232 serial port connector (COM3 – COM6)	40-pin header	COM
RS-232/422/485 serial port connector	14-pin header	COM2
USB 2.0 connector	8-pin header	USB01

Table 3-1: Peripheral Interface Connectors

3.3 Internal Peripheral Connectors

Internal peripheral connectors are found on the motherboard and are only accessible when the motherboard is outside of the chassis. This section has complete descriptions of the internal, peripheral connectors on the WAFER-945GSE that are used for the ECW-281B-945GSE.

3.3.1 ATX Power Connector

CN Label: **ATXPWR1**

CN Type: 4-pin AT power connector (1x4)

CN Location: See **Figure 3-2**

CN Pinouts: See **Table 3-2**

The 4-pin ATX power connector is connected to a DC-DC power module.

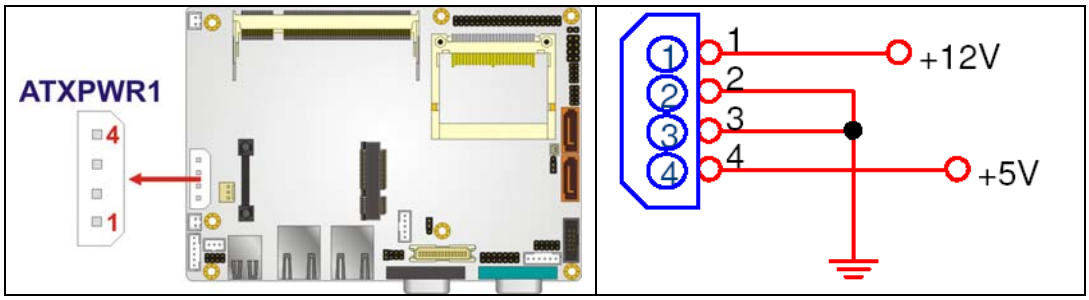


Figure 3-2: ATX Power Connector Location

PIN NO.	DESCRIPTION
1	+12V
2	GND
3	GND
4	+5V

Table 3-2: ATX Power Connector Pinouts

3.3.2 ATX Power Supply Enable Connector

CN Label: **ATXCTL1**

CN Type: 3-pin wafer (1x3)

CN Location: See **Figure 3-3**

CN Pinouts: See **Table 3-3**

The ATX power supply enable connector is connected to the ATX mode connector on the power module to enable the ECW-281B-945GSE to be connected to an ATX power supply.

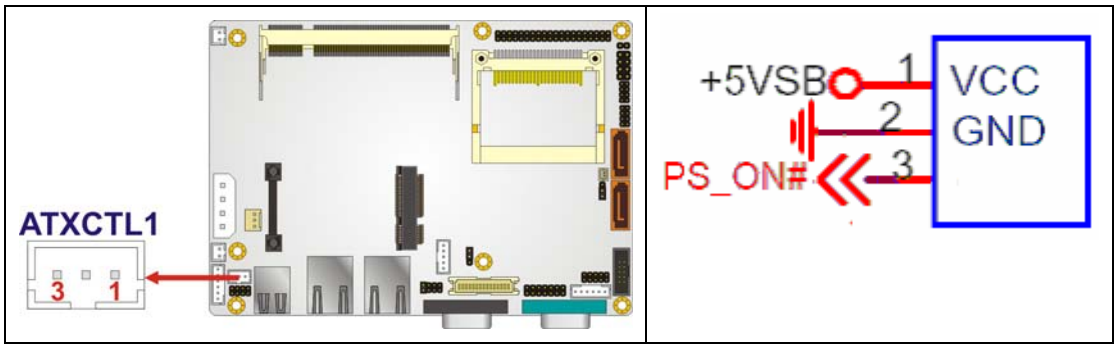


Figure 3-3: ATX Power Supply Enable Connector Location

PIN NO.	DESCRIPTION
1	+5V Standby
2	GND
3	PS-ON

Table 3-3: ATX Power Supply Enable Connector Pinouts

3.3.3 Audio Connector (10-pin)

CN Label: **AUDIO1**

CN Type: 10-pin header

CN Location: See **Figure 3-4**

CN Pinouts: See **Table 3-4**

The 10-pin audio connector is interfaced to an audio line-out connector and provides output of audio signals from the system.

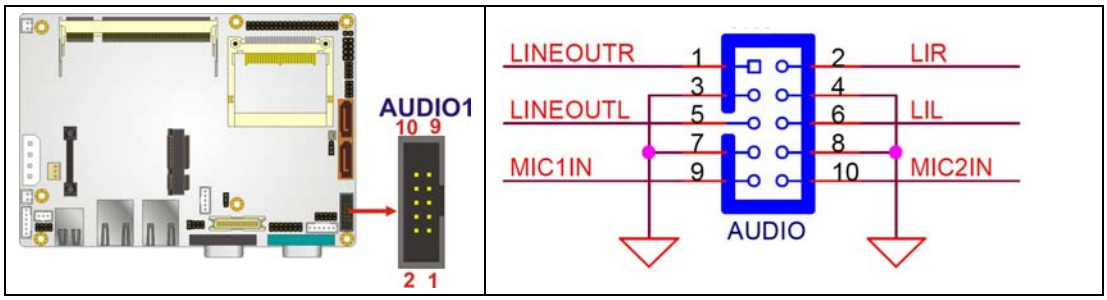


Figure 3-4: Audio Connector Pinouts (10-pin)

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	Line out R	2	Line in R
3	GND	4	GND
5	Line out L	6	Line in L
7	GND	8	GND
9	MIC in	10	Mic in

Table 3-4: Audio Connector Pinouts (10-pin)

3.3.4 CompactFlash® Socket

CN Label: **CF1**

CN Type: 50-pin header (2x25)

CN Location: See **Figure 3-5**

CN Pinouts: See **Table 3-5**

A CF Type I or Type II memory card is inserted to the CF socket on the solder side of the ECW-281B-945GSE.

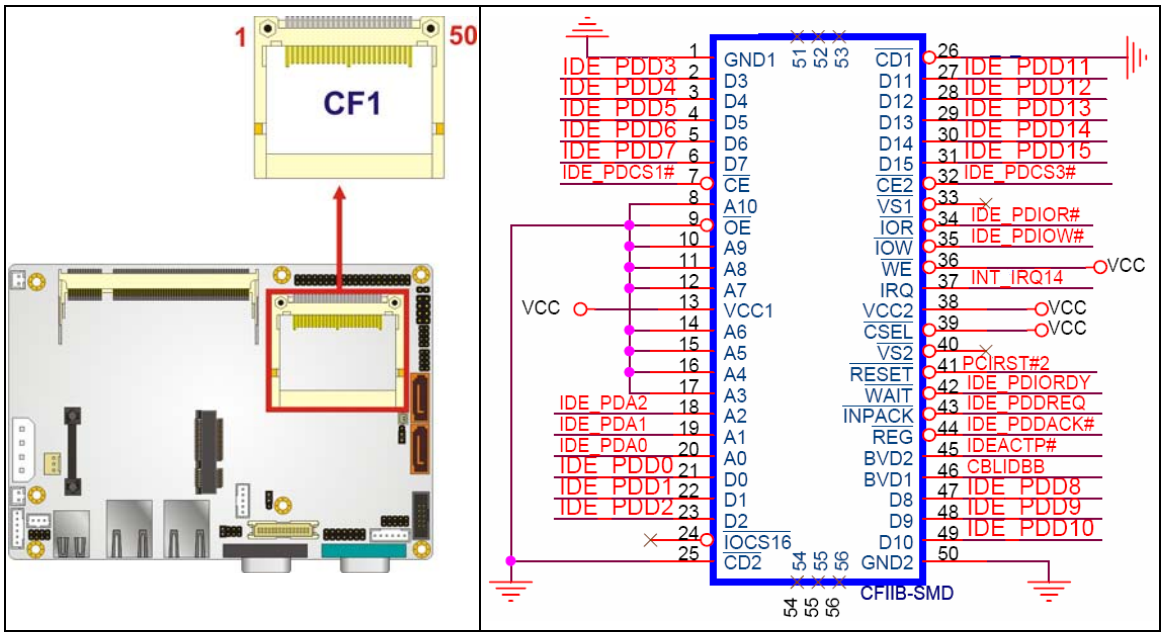


Figure 3-5: CF Card Socket Location

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	GROUND	26	VCC-IN CHECK1
2	DATA 3	27	DATA 11
3	DATA 4	28	DATA 12
4	DATA 5	29	DATA 13
5	DATA 6	30	DATA 14
6	DATA 7	31	DATA 15
7	HDC_CS0#	32	HDC_CS1
8	GROUND	33	N/C
9	GROUND	34	IOR#
10	GROUND	35	IOW#
11	GROUND	36	VCC_COM
12	GROUND	37	IRQ14
13	VCC_COM	38	VCC_COM
14	GROUND	39	CSEL
15	GROUND	40	N/C
16	GROUND	41	HDD_RESET

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
17	GROUND	42	IORDY
18	SA2	43	SDREQ
19	SA1	44	SDACK#
20	SA0	45	HDD_ACTIVE#
21	DATA 0	46	66DET
22	DATA 1	47	DATA 8
23	DATA 2	48	DATA 9
24	N/C	49	DATA 10
25	VCC-IN CHECK2	50	GROUND

Table 3-5: CF Card Socket Pinouts

3.3.5 LED Connector

CN Label: **LED_C1**

CN Type: 6-pin wafer (1x6)

CN Location: See **Figure 3-6**

CN Pinouts: See **Table 3-6**

The LED connector connects to an HDD indicator LED and a power LED on the system chassis to inform the user about HDD activity and the power on/off status of the system.

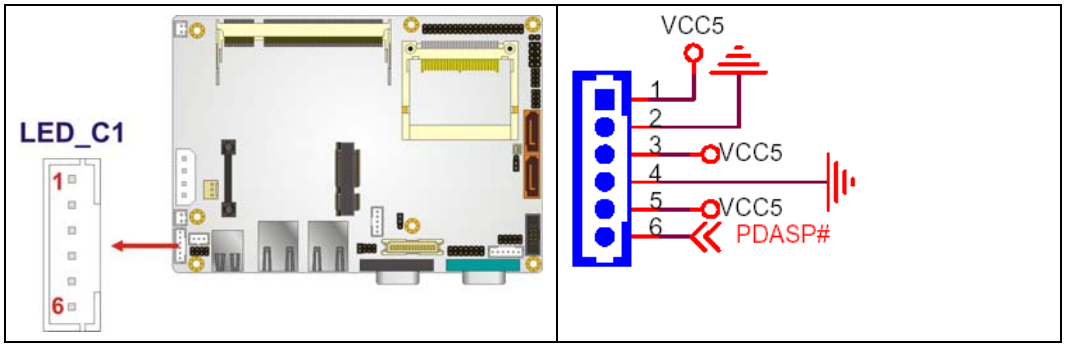


Figure 3-6: LED Connector Locations

PIN NO.	DESCRIPTION
1	+5V
2	GND
3	Power LED+
4	Power LED-
5	HDD LED+
6	HDD LED-

Table 3-6: LED Connector Pinouts

3.3.6 PCIe Mini Card Slot

CN Label: **CN4**

CN Type: 52-pin Mini PCIe Card Slot

CN Location: See **Figure 3-7**

CN Pinouts: See **Table 3-7**

The PCIe mini card slot enables a PCIe mini card expansion module to be connected to the board. Cards supported include among others wireless LAN (WLAN) cards.

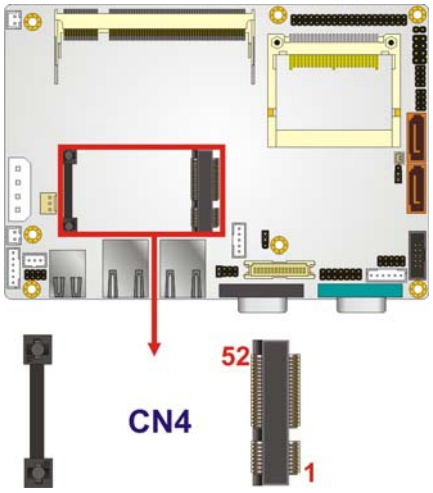


Figure 3-7: PCIe Mini Card Slot Location

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	PCIE_WAKE#	2	VCC3
3	N/C	4	GND
5	N/C	6	1.5V
7	CLKREQ#	8	LFRAME#
9	GND	10	LAD3
11	CLK-	12	LAD2
13	CLK+	14	LAD1
15	GND	16	LAD0
17	PCIRST#	18	GND
19	LPC	20	VCC3
21	GND	22	PCIRST#
23	PERN2	24	3VDual
25	PERP2	26	GND
27	GND	28	1.5V
29	GND	30	SMBCLK
31	PETN2	32	SMBDATA
33	PETP2	34	GND
35	GND	36	USBD-
37	N/C	38	USBD+
39	N/C	40	GND
41	N/C	42	N/C
43	N/C	44	RF_LINK#
45	N/C	46	BLUELED#
47	N/C	48	1.5V
49	N/C	50	GND
51	N/C	52	VCC3

Table 3-7: PCIe Mini Card Slot Pinouts

3.3.7 Power Button Connector

CN Label: **PWRBTN1**

CN Type: 2-pin wafer (1x2)

CN Location: See **Figure 3-8**

CN Pinouts: See **Table 3-8**

The power button connector is connected to a power switch on the system chassis to enable users to turn the system on and off.

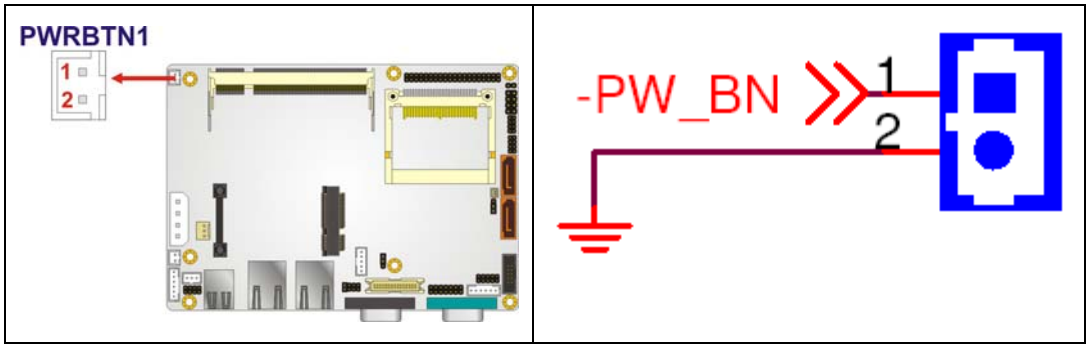


Figure 3-8: Power Button Connector Location

PIN NO.	DESCRIPTION
1	Power Switch
2	GND

Table 3-8: Power Button Connector Pinouts

3.3.8 Reset Button Connector

CN Label: **RESET1**

CN Type: 2-pin wafer (1x2)

CN Location: See **Figure 3-9**

CN Pinouts: See **Table 3-9**

The reset button connector is connected to a reset switch on the system chassis to enable users to reboot the system when the system is turned on.

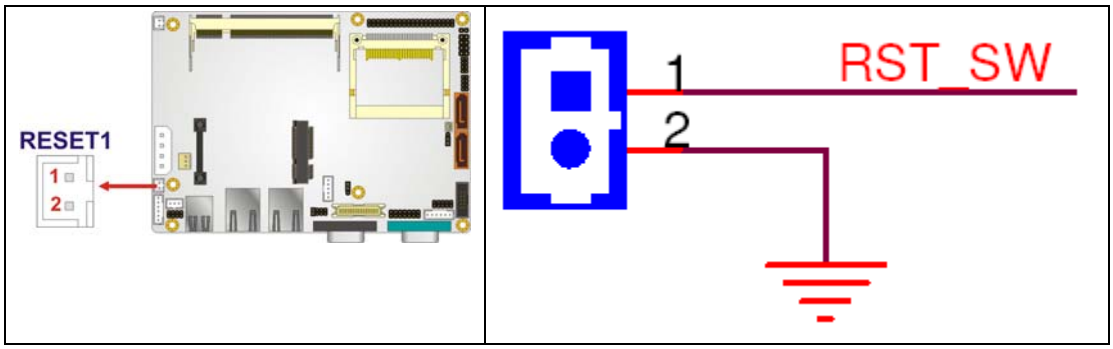


Figure 3-9: Reset Button Connector Locations

PIN NO.	DESCRIPTION
1	Reset Switch
2	GND

Table 3-9: Reset Button Connector Pinouts

3.3.9 SATA Drive Connectors

CN Label: **SATA1**, **SATA2**

CN Type: 7-pin SATA drive connectors

CN Location: See **Figure 3-10**

CN Pinouts: See **Table 3-10**

The SATA drive connectors are each connected to a first generation SATA drive. First generation SATA drives transfer data at speeds as high as 150Mb/s. The SATA drives can be configured in a RAID configuration.

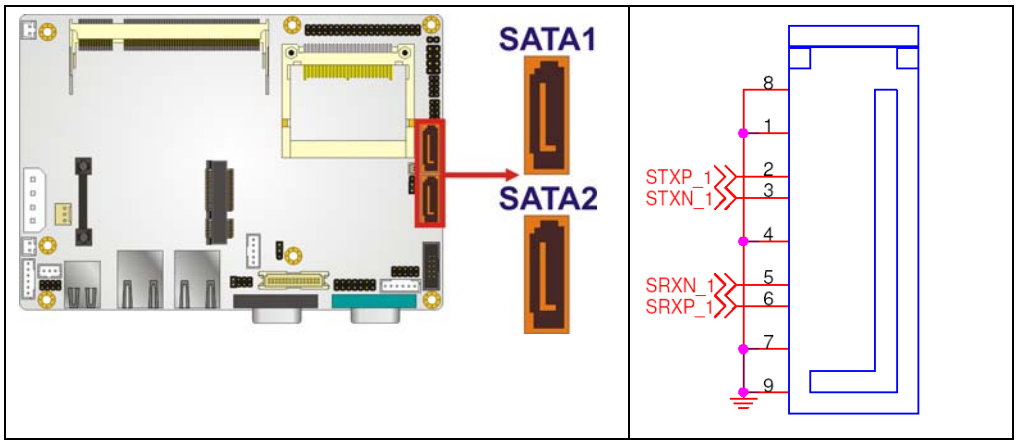


Figure 3-10: SATA Drive Connector Locations

PIN NO.	DESCRIPTION
1	GND
2	TX+
3	TX-
4	GND
5	RX-
6	RX+
7	GND

Table 3-10: SATA Drive Connector Pinouts

3.3.10 Serial Port Connector (COM3, COM4, COM5 and COM6)

CN Label: **COM**

CN Type: 40-pin header (2x20)

CN Location: See **Figure 3-11**

CN Pinouts: See **Table 3-11**

The 40-pin serial port connector contains the following four serial ports: COM3, COM4, COM5 and COM6. All these serial ports are RS-232 serial communications channels. The serial port locations are specified below.

- COM3 is located on pin 1 to pin 10
- COM4 is located on pin 11 to pin 20
- COM5 is located on pin 21 to pin 30
- COM6 is located on pin 31 to pin 40

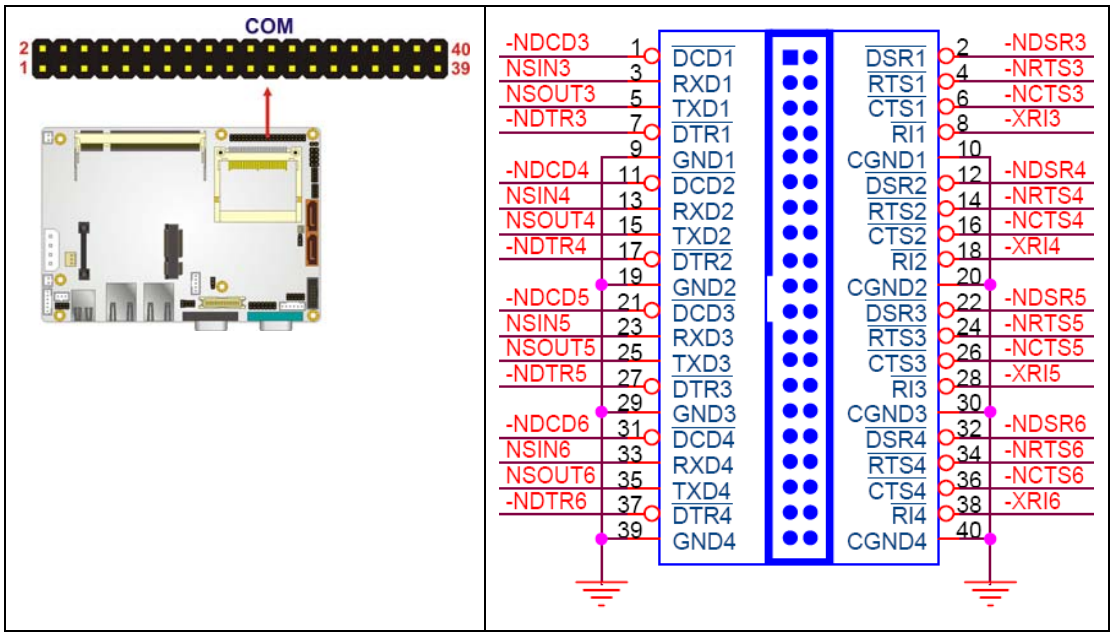


Figure 3-11: COM3 to COM6 Connector Pinout Locations

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	DATA CARRIER DETECT (DCD3)	2	DATA SET READY (DSR3)
3	RECEIVE DATA (RXD3)	4	REQUEST TO SEND (RTS3)
5	TRANSMIT DATA (TXD3)	6	CLEAR TO SEND (CTS3)
7	DATA TERMINAL READY (DTR3)	8	RING INDICATOR (RI3)
9	GND	10	GND
11	DATA CARRIER DETECT (DCD4)	12	DATA SET READY (DSR4)
13	RECEIVE DATA (RXD4)	14	REQUEST TO SEND (RTS4)
15	TRANSMIT DATA (TXD4)	16	CLEAR TO SEND (CTS4)
17	DATA TERMINAL READY (DTR4)	18	RING INDICATOR (RI4)
19	GND	20	GND
21	DATA CARRIER DETECT (DCD5)	22	DATA SET READY (DSR5)
23	RECEIVE DATA (RXD5)	24	REQUEST TO SEND (RTS5)

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
25	TRANSMIT DATA (TXD5)	26	CLEAR TO SEND (CTS5)
27	DATA TERMINAL READY (DTR5)	28	RING INDICATOR (RI5)
29	GND	30	GND
31	DATA CARRIER DETECT (DCD6	32	DATA SET READY (DSR6)
33	RECEIVE DATA (RXD6)	34	REQUEST TO SEND (RTS6)
35	TRANSMIT DATA (TXD6	36	CLEAR TO SEND (CTS6)
37	DATA TERMINAL READY (DTR6	38	RING INDICATOR (RI6)
39	GND	40	GND

Table 3-11: COM3 to COM6 Connector Pinouts

3.3.11 Serial Port Connector (COM 2)(RS-232, RS-422 or RS-485)

CN Label: **COM2**

CN Type: 14-pin header (2x7)

CN Location: See **Figure 3-12**

CN Pinouts: See **Table 3-12**

The 14-pin serial port connector connects to the COM2 serial communications channels. COM2 is a multi function channel. In default mode COM2 is an RS-232 serial communication channel but, with the COM2 function select jumper, can be configured as either an RS-422 or RS-485 serial communications channel.

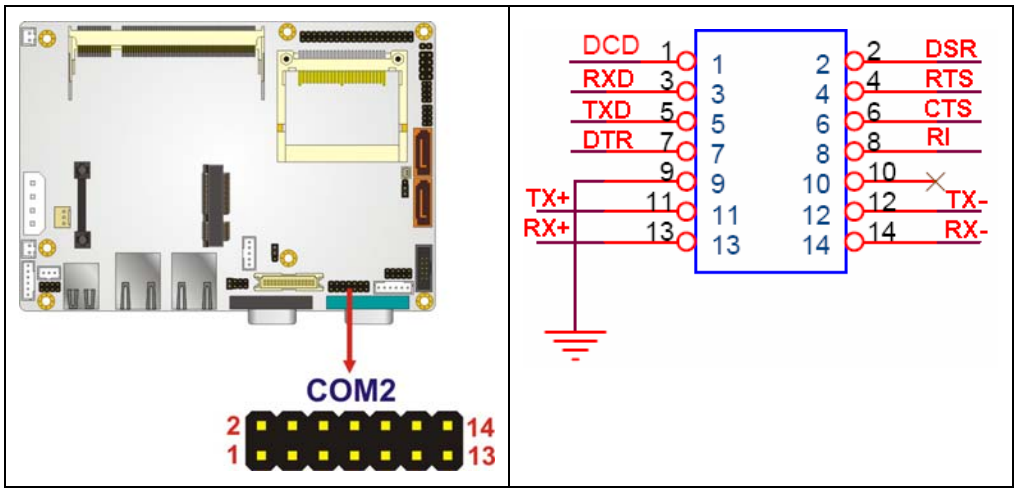


Figure 3-12: RS-232/422/485 Serial Port Connector Location

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	NDCD	2	NDSR2
3	NRX	4	NRTS2
5	NTX	6	NCTS2
7	NDTR	8	NRI2
9	GND	10	GND
11	TXD485+	12	TXD485-
13	RXD485+	14	RXD485-

Table 3-12: RS-232/RS-485 Serial Port Connector Pinouts

3.3.12 USB Connectors (Internal)

CN Label: **USB01** and **USB23**

CN Type: 8-pin header (2x4)

CN Location: See **Figure 3-13**

CN Pinouts: See **Table 3-13**

The 2x4 USB pin connectors each provide connectivity to two USB 1.1 or two USB 2.0 ports. Each USB connector can support two USB devices. Additional external USB ports are found on the rear panel. The USB ports are used for I/O bus expansion.

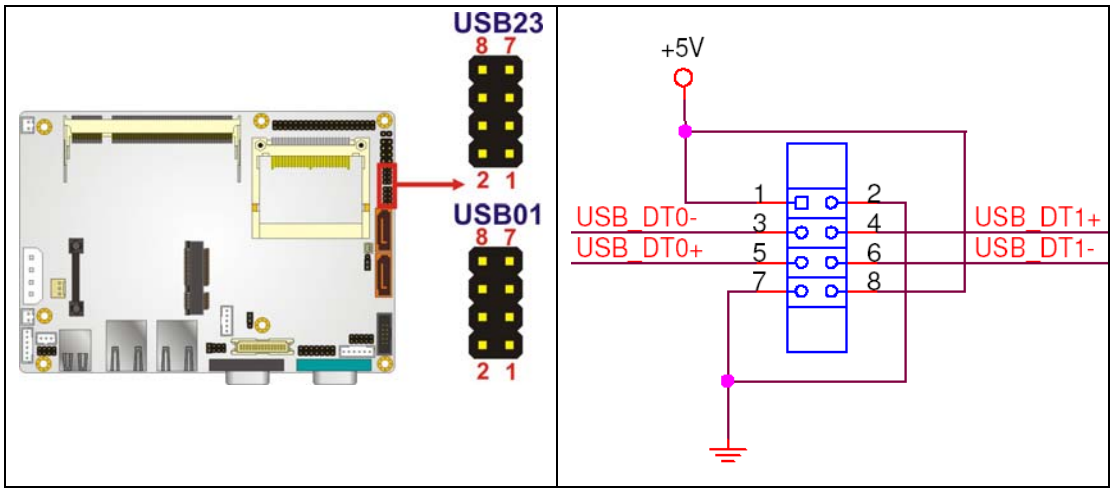


Figure 3-13: USB Connector Pinout Locations

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	VCC	2	GND
3	DATA-	4	DATA+
5	DATA+	6	DATA-
7	GND	8	VCC

Table 3-13: USB Port Connector Pinouts

3.4 External Peripheral Interface Connector Panel

Figure 3-14 shows the ECW-281B-945GSE external peripheral interface connector (EPIC) panel. The ECW-281B-945GSE EPIC panel consists of the following:

- 2 x RJ-45 LAN connectors
- 1 x Serial port connectors
- 2 x USB connectors
- 1 x VGA connector

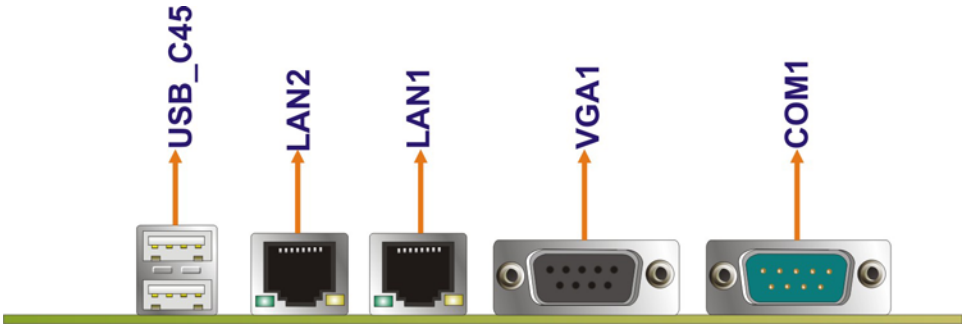


Figure 3-14: ECW-281B-945GSE External Peripheral Interface Connector

3.4.1 LAN Connectors

CN Label: **LAN1** and **LAN2**

CN Type: RJ-45

CN Location: See **Figure 3-14**

CN Pinouts: See **Table 3-14**

The ECW-281B-945GSE is equipped with two built-in RJ-45 Ethernet controllers. The controllers can connect to the LAN through two RJ-45 LAN connectors. There are two LEDs on the connector indicating the status of LAN. The pin assignments are listed in the following table:

PIN	DESCRIPTION	PIN	DESCRIPTION
1	MDIA3-	5	MDIA1+
2	MDIA3+	6	MDIA2+
3	MDIA2-	7	MDIA0-
4	MDIA1-	8	MDIA0+

Table 3-14: LAN Pinouts

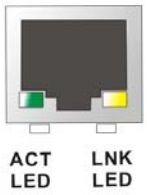


Figure 3-15: RJ-45 Ethernet Connector

The RJ-45 Ethernet connector has two status LEDs, one green and one yellow. The green LED indicates activity on the port and the yellow LED indicates the port is linked. See **Table 3-15**.

STATUS	DESCRIPTION	STATUS	DESCRIPTION
GREEN	Activity	YELLOW	Linked

Table 3-15: RJ-45 Ethernet Connector LEDs

3.4.2 Serial Port Connector (COM1)

CN Label: **COM1**

CN Type: DB-9 connectors

CN Location: See **Figure 3-14**

CN Pinouts: See **Table 3-16** and **Figure 3-16**

The 9-pin DB-9 serial port connectors are connected to RS-232 serial communications devices.

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	DCD	6	DSR
2	RX	7	RTS
3	TX	8	CTS
4	DTR	9	RI
5	GND		

Table 3-16: RS-232 Serial Port (COM 1) Pinouts

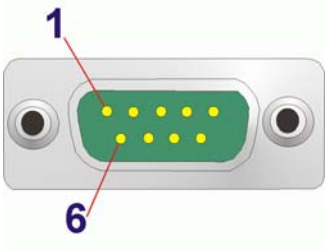


Figure 3-16: COM1 Pinout Locations

3.4.3 USB Connectors

CN Label: **USB**

CN Type: Dual USB port

CN Location: See **Figure 3-14**

CN Pinouts: See **Table 3-17**

The ECW-281B-945GSE has two external USB 2.0 ports. The ports connect to both USB 2.0 and USB 1.1 devices.

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	VCC	5	VCC
2	DATA-	6	DATA-
3	DATA+	7	DATA+
4	GND	8	GND

Table 3-17: USB Port Pinouts

3.4.4 VGA Connector

CN Label: **VGA1**

CN Type: 15-pin Female

CN Location: See **Figure 3-14**

CN Pinouts: See **Figure 3-17** and **Table 3-18**

The ECW-281B-945GSE has a single 15-pin female connector for connectivity to standard display devices.

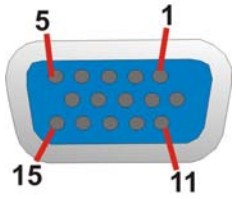


Figure 3-17: VGA Connector

PIN	DESCRIPTION	PIN	DESCRIPTION
1	RED	2	GREEN
3	BLUE	4	NC
5	GND	6	CRT_PLUG-
7	GND	8	GND
9	VCC	10	GND
11	NC	12	DDC DAT
13	HSYNC	14	VSYNC
15	DDCCLK		

Table 3-18: VGA Connector Pinouts

3.5 WAFER-945GSE Motherboard On-board Jumpers

NOTE:

A jumper is a metal bridge used to close an electrical circuit. It consists of two or three metal pins and a small metal clip (often protected by a plastic cover) that slides over the pins to connect them. To CLOSE/SHORT a jumper means connecting the pins of the jumper with the plastic clip and to OPEN a jumper means removing the plastic clip from a jumper.

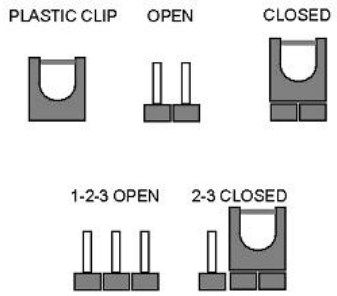


Figure 3-18: Jumpers

The WAFER-945GSE motherboard has several onboard jumpers (**Table 3-19**).

Description	Label	Type
CF Card Setting	JCF1	2-pin header
Clear CMOS	J_CMOS1	3-pin header
COM2 Mode Setting	JP1	6-pin header

Table 3-19: Jumpers

3.5.1 CF Card Setup

Jumper Label: **JCF1**

Jumper Type: 2-pin header

Jumper Settings: See **Table 3-20**

Jumper Location: See **Figure 3-19**

The CF Card Setup jumper sets the CF Type I card or CF Type II cards as either the slave device or the master device. CF Card Setup jumper settings are shown in Table 3-20.

CF Card Setup	Description	
OFF	Slave	Default
Short 1-2	Master	

Table 3-20: CF Card Setup Jumper Settings

The CF Card Setup jumper location is shown in Figure 3-19.

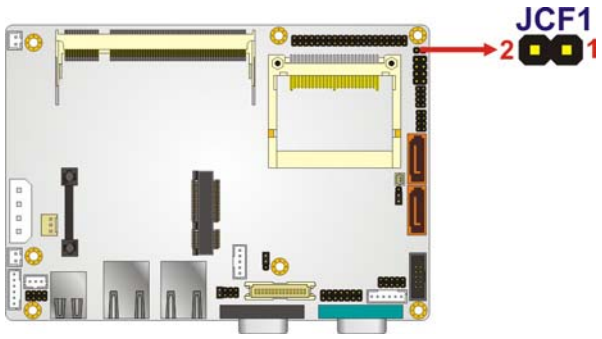


Figure 3-19: CF Card Setup Jumper Location

3.5.2 Clear CMOS Jumper

Jumper Label: **J_CMOS1**

Jumper Type: 3-pin header

Jumper Settings: See **Table 3-21**

Jumper Location: See **Figure 3-20**

If the ECW-281B-945GSE fails to boot due to improper BIOS settings, the clear CMOS jumper clears the CMOS data and resets the system BIOS information. To do this, use the jumper cap to close pins 2 and 3 for a few seconds then reinstall the jumper clip back to pins 1 and 2.

If the "CMOS Settings Wrong" message is displayed during the boot up process, the fault may be corrected by pressing the F1 to enter the CMOS Setup menu. Do one of the following:

- Enter the correct CMOS setting
- Load Optimal Defaults
- Load Failsafe Defaults.

After having done one of the above, save the changes and exit the CMOS Setup menu.

The clear CMOS jumper settings are shown in **Table 3-21**.

AT Power Select	Description	
Short 1 - 2	Keep CMOS Setup	Default
Short 2 - 3	Clear CMOS Setup	

Table 3-21: Clear CMOS Jumper Settings

The location of the clear CMOS jumper is shown in **Figure 3-20** below.

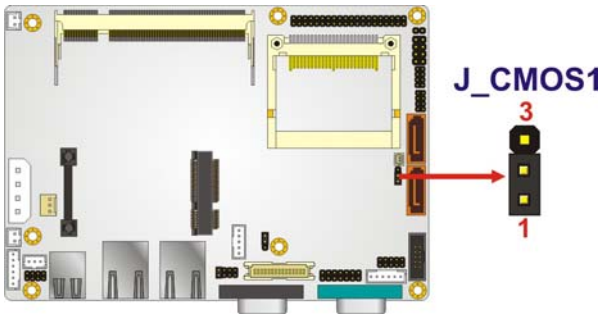


Figure 3-20: Clear CMOS Jumper

3.5.3 COM 2 Function Select Jumper

Jumper Label:	**JP1**
Jumper Type:	8-pin header
Jumper Settings:	See **Table 3-22**
Jumper Location:	See **Figure 3-21**

The COM 2 Function Select jumper sets the communication protocol used by the second serial communications port (COM 2) as RS-232, RS-422 or RS-485. The COM 2 Function Select settings are shown in **Table 3-22**.

COM 2 Function Select	Description	
Short 1-2	RS-232	Default
Short 3-4	RS-422	
Short 5-6	RS-485	
Short 5-6 Short 7-8	RS-485 with RTS control	

Table 3-22: COM 2 Function Select Jumper Settings

The COM 2 Function Select jumper location is shown in **Figure 3-21**.

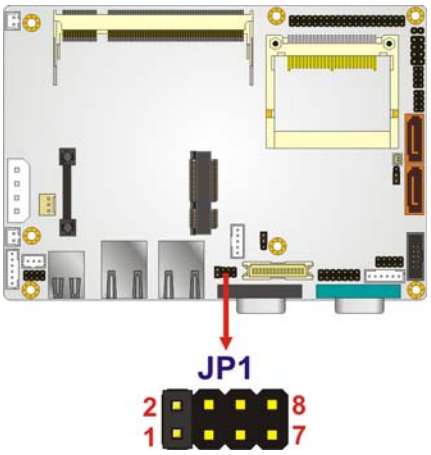


Figure 3-21: COM 2 Function Select Jumper Location

3.6 Connector Mappings

This section describes how the connectors on the motherboard and power module are connected to different components within the system. When performing maintenance operations on the system it is imperative that the correct connections are made.

3.6.1 Power Connector

The connector mapping for the power module output power connector and the motherboard input power connector are shown in **Table 3-23**.

WAFER-945GSE	Power Module
ATXPWR1: Power	CN4: Output Power
Pin 1	Pin 4
Pin 2	Pin 3
Pin 3	Pin 2
Pin 4	Pin 1

Table 3-23: Motherboard Power Connector Mapping

3.6.2 ATX Mode Connector

The connector mapping for the ATX mode connector on the motherboard and power module are shown in **Table 3-24**.

WAFER-945GSE	Power Module
ATXCTL1: PS-ON	CN7: ATX Mode
Pin 1	Pin 1
Pin 2	Pin 2
Pin 3	Pin 3

Table 3-24: Motherboard Power Connector Mapping

Chapter

4

Installation

4.1 Anti-static Precautions

WARNING:

If the following anti-static precautions are not followed, a user may be injured and the system irreparably damaged.

Electrostatic discharge (ESD) can cause serious damage to electronic components, including the WAFER series motherboard and the power module. (Dry climates are especially susceptible to ESD.) It is therefore critical that whenever the ECW-281B-945GSE is opened and any electrical component handled, the following anti-static precautions are strictly adhered to.

- ***Wear an anti-static wristband***: - Wearing a simple anti-static wristband can help to prevent ESD from damaging the board.
- ***Self-grounding***:- Before handling the board, touch any grounded conducting material. During the time the board is handled, frequently touch any conducting materials that are connected to the ground.

4.2 Installation Procedure

4.2.1 Installation Procedure Overview

To properly install the ECW-281B-945GSE, the following steps must be followed. Detailed descriptions of these instructions are listed in the sections that follow.

Step 1: Unpacking

Step 2: Configure the jumper settings

Step 3: Install the SATA hard disk drive (HDD)

Step 4: Mount the ECW-281B-945GSE

Step 5: Connect the front panel peripheral connectors

Step 6: Power the system up

4.2.2 Unpacking

After the ECW-281B-945GSE is received make sure the following components are included in the package. If any of these components are missing, please contact the ECW-281B-945GSE reseller or vendor where it was purchased or contact an IEI sales representative immediately.

Quantity	Item	Image
1	ECW-281B-945GSE embedded system	
1	Power cord (optional for WD models)	
1	Power Adaptor (optional for WD models)	
2	Mounting brackets	
1	Screw set	
1	Thermal pad for HDD	
1	Quick installation guide	

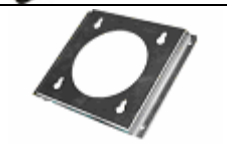
1	Driver and manual CD	
1	Wireless antenna (wireless model only)	
1	VESA MIS-D 100 wall mount kit (optional)	
1	DIN mount kit (optional)	

Table 4-1: Package List Contents

4.2.3 Bottom Surface Removal

Before the jumper settings can be configured and the hard disk drive can be installed, the bottom surface must be removed. To remove the bottom surface, please follow the steps below:

Step 1: Remove the bottom surface retention screws. The bottom surface is secured to the chassis with six retention screws (**Figure 4-1**). All six screws must be removed.

Figure 4-1: Bottom Surface Retention Screws

Step 2: Gently remove the bottom surface from the ECW-281B-945GSE.

4.2.4 Configure the Jumper Settings

To configure the jumper settings, please follow the steps below.

Step 1: Remove the bottom surface. See **Section 4.2.3**.

Step 2: Locate the jumper settings on the embedded motherboard. See **Chapter 3**.

Step 3: Make the jumper settings in accordance with the settings described and defined in **Chapter 3**.

4.2.5 Hard Drive Installation

One 2.5” SATA hard drive supported. The SATA drive is installed into a hard drive bracket attached on the inside of the bottom panel (**Figure 4-2**).

Figure 4-2: Hard Drive Bracket

To install the hard drive into the system, please follow the steps below.

Step 1: Remove the bottom surface See **Section 4.2.3**.

Step 2: Remove the hard drive bracket from the bottom surface by removing the four retention screws that secure the bracket to the bottom surface. (**Figure 4-3**)

Figure 4-3:HDD Bracket Retention Screws

Step 3: Place the HDD into the bracket.

Step 4: Align the retention screw holes in the HDD with those in the bottom of the bracket.

Step 5: Secure the HDD with the bracket by inserting four retention screws into the bottom of the bracket (**Figure 4-4**).

Figure 4-4: HDD Retention Screws

Step 6: Locate the breather hole of the HDD. Cut off the corresponding area of the breather hole from the thermal pad.

Step 7: Adhere the thermal pad to the HDD. Make sure there is no obstacle covering the breather hole (**Figure 4-5**).

CAUTION:

Make sure the breather hole of the HDD is not covered. Covering the breather hole may cause damage to the HDD.

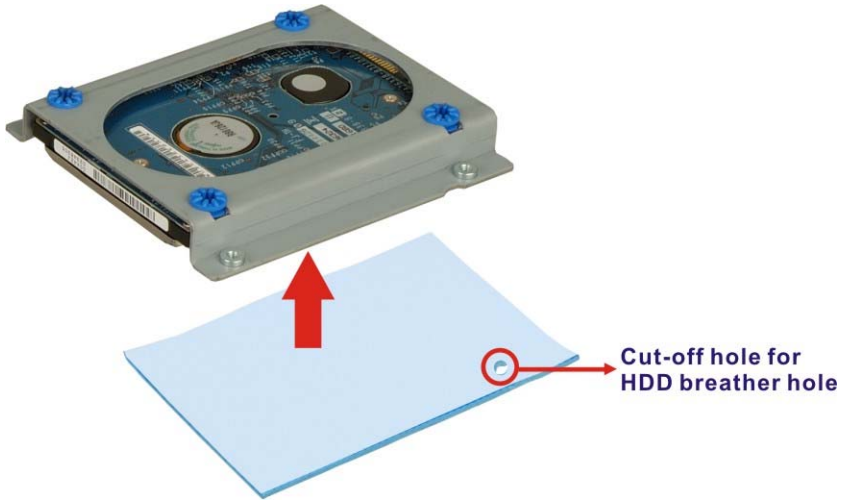


Figure 4-5: HDD Thermal Pad

Step 8: Replace the HDD bracket onto the bottom surface by aligning the four retention screw holes in the HDD bracket with those in the back of the bottom surface.

Step 9: Reinsert the four previously removed retention screws.

Step 10: Connect the SATA cable connector in the ECW-281B-945GSE to the HDD.

Step 11: Replace the bottom surface to the bottom panel by reinserting the six previously removed retention screws.

4.2.6 Mounting the System with Mounting Brackets

To mount the embedded system onto a wall or some other surface using the two mounting brackets, please follow the steps below.

Step 1: Turn the embedded system over.

Step 2: Align the two retention screw holes in each bracket with the corresponding retention screw holes on the sides of the bottom surface.

Step 3: Secure the brackets to the system by inserting two retention screws into each bracket.

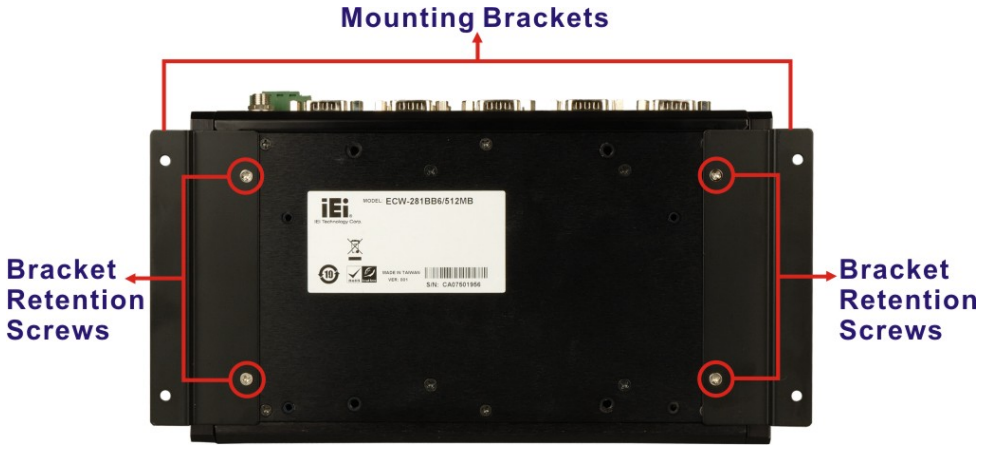


Figure 4-6: Mounting Bracket Retention Screws

Step 4: Drill holes in the intended installation surface.

Step 5: Align the mounting holes in the sides of the mounting brackets with the predrilled holes in the mounting surface.

Step 6: Insert four retention screws, two in each bracket, to secure the system to the wall.

4.2.7 Mounting the System with Wall Mount Kit

To mount the embedded system onto a wall using the VESA MIS-D 100 wall mount kit, please follow the steps below.

Step 1: Select the location on the wall for the wall-mounting bracket.

Step 2: Carefully mark the locations of the four bracket screw holes on the wall.

Step 3: Drill four pilot holes at the marked locations on the wall for the bracket retention screws.

Step 4: Align the wall-mounting bracket screw holes with the pilot holes.

Step 5: Secure the mounting-bracket to the wall by inserting the retention screws into the four pilot holes and tightening them (**Figure 4-7**).

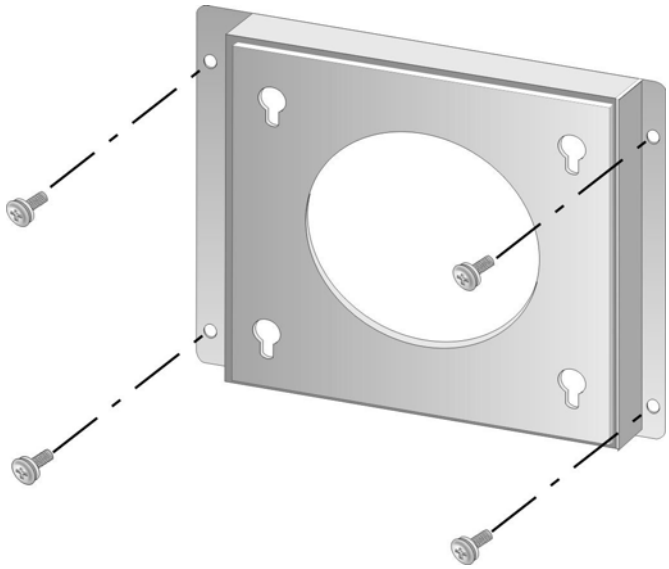


Figure 4-7: Wall-mounting Bracket

Step 6: Insert the four monitor mounting screws provided in the wall mounting kit into the four screw holes on the bottom panel of the system and tighten until the screw shank is secured against the bottom panel (**Figure 4-8**).

Step 1: Align the mounting screws on the ECW-281B-945GSE bottom panel with the mounting holes on the bracket.

Step 2: Carefully insert the screws through the holes and gently pull the monitor downwards until the ECW-281B-945GSE rests securely in the slotted holes (**Figure 4-8**). Ensure that all four of the mounting screws fit snuggly into their respective slotted holes.

NOTE:

In the diagram below the bracket is already installed on the wall.

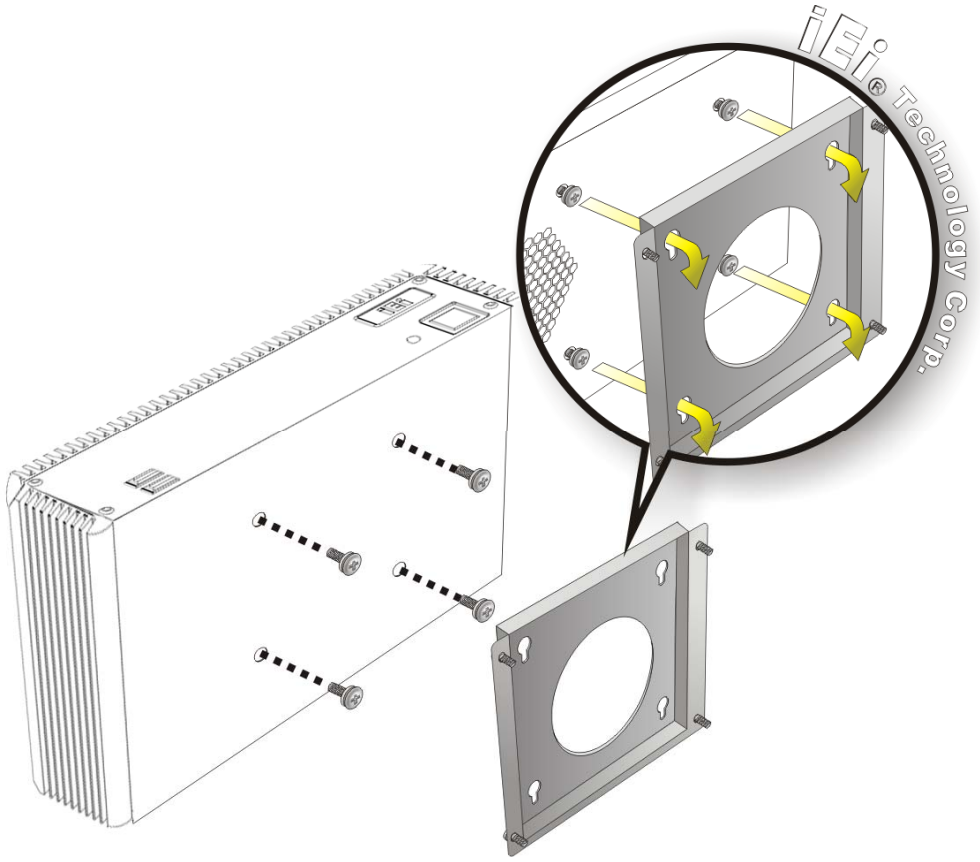


Figure 4-8: Mount the Embedded System

4.2.8 DIN Mounting

To mount the ECW-281B-945GSE embedded system onto a DIN rail, please follow the steps below.

Step 3: Attach the DIN rail mounting bracket to the bottom panel of the embedded system. Secure the bracket to the embedded system with the supplied retention screws (**Figure 4-9**).

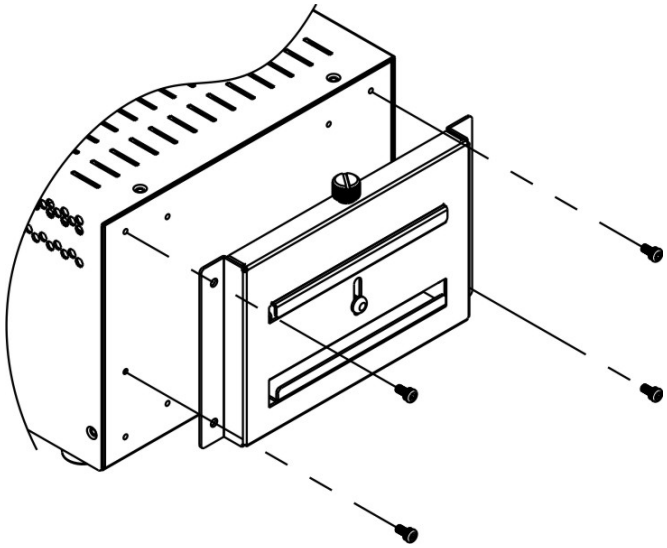


Figure 4-9: DIN Rail Mounting Bracket

Step 4: Make sure the inserted screw in the center of the bracket is at the lowest position of the elongated hole (**Figure 4-10**).

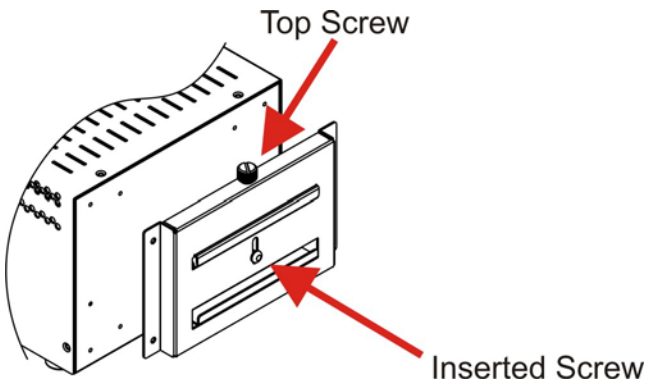


Figure 4-10: Screw Locations

Step 5: Place the DIN rail flush against the back of the mounting bracket making sure the edges of the rail are between the upper and lower clamps (**Figure 4-11**).

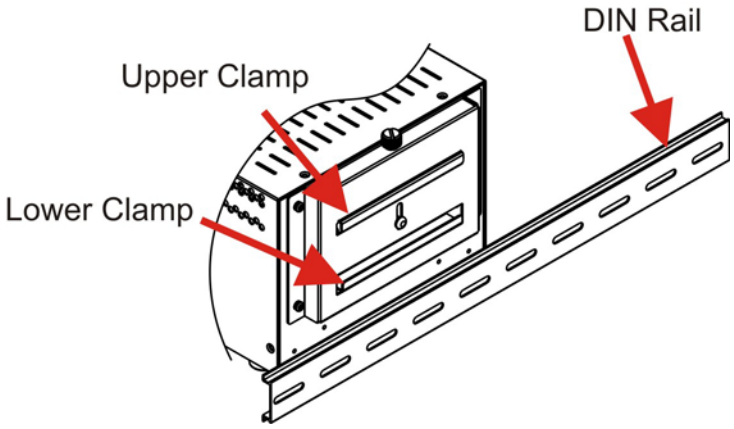


Figure 4-11: Mounting the DIN RAIL

Step 6: Secure the DIN rail to the mounting bracket by turning the top screw clockwise. This draws the lower clamp up and secures the embedded system to the DIN rail (**Figure 4-12**).

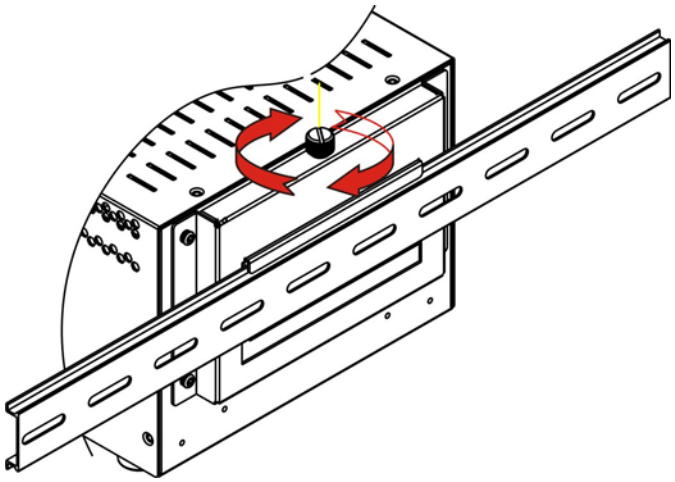


Figure 4-12: Secure the Assembly to the DIN Rail

4.2.9 Wireless Antenna Installation (Wireless Models Only)

To install an antenna to the wireless ECW-281B-945GSE series for efficient wireless network transmission, follow the steps below.

Step 1: Locate the antenna connector on the rear panel of the embedded system (refer to **Figure 2-5**).

Step 2: Install the antenna to the antenna connector (**Figure 4-13**).

Figure 4-13: Wireless Antenna Installation

4.2.10 Cable Connections

Once the system has been mounted on the wall, the following connectors can be connected to the system.

- VGA cable connector
- Serial port connectors
- RJ-45 connectors
- USB devices can be connected to the system.

The cable connection locations are shown in **Figure 2-5**.

4.3 Power-On Procedure

4.3.1 Installation Checklist

WARNING:

Make sure a power supply with the correct input voltage is being fed into the system. Incorrect voltages applied to the system may cause damage to the internal electronic components and may also cause injury to the user.

To power on the embedded system please make sure of the following:

- The bottom surface panel is installed
- All peripheral devices (VGA monitor, serial communications devices etc.) are connected
- The power cables are plugged in
- The system is securely mounted

4.3.2 Terminal Block Pinouts

The terminal block pinouts are shown in **Figure 4-14**.

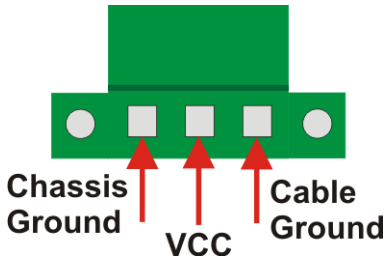


Figure 4-14: Terminal Block Pinouts

The chassis ground is connected to the ECW chassis internally. The cable ground is connected to the ground pin on the input power connector of the power module.

4.3.3 Power-on Procedure

To power-on the ECW-281B-945GSE please follow the steps below:

Step 1: Push the power button.

Step 2: Once turned on, the power button should turns to blue. See **Figure 4-15**.

Figure 4-15: Power Button

Chapter

6

BIOS Screens

5.1 Introduction

A licensed copy of AMI BIOS is preprogrammed into the ROM BIOS. The BIOS setup program allows users to modify the basic system configuration. This chapter describes how to access the BIOS setup program and the configuration options that may be changed.

5.1.1 Starting Setup

The AMI BIOS is activated when the computer is turned on. The setup program can be activated in one of two ways.

1. Press the **DELETE** key as soon as the system is turned on or
2. Press the **DELETE** key when the "**Press Del to enter SETUP**" message appears on the screen.

If the message disappears before the **DELETE** key is pressed, restart the computer and try again.

5.1.2 Using Setup

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. Navigation keys are shown in.

Key	Function
Up arrow	Move to previous item
Down arrow	Move to next item
Left arrow	Move to the item on the left hand side
Right arrow	Move to the item on the right hand side
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
Page Up key	Increase the numeric value or make changes
Page Dn key	Decrease the numeric value or make changes

F1 key	General help, only for Status Page Setup Menu and Option Page Setup Menu
F2 /F3 key	Change color from total 16 colors. F2 to select color forward.
F10 key	Save all the CMOS changes, only for Main Menu

Table 5-1: BIOS Navigation Keys

5.1.3 Getting Help

When **F1** is pressed a small help window describing the appropriate keys to use and the possible selections for the highlighted item appears. To exit the Help Window press **Esc** or the **F1** key again.

5.1.4 Unable to Reboot After Configuration Changes

If the computer cannot boot after changes to the system configuration is made, CMOS defaults. Use the jumper described in **Chapter 5**.

5.1.5 BIOS Menu Bar

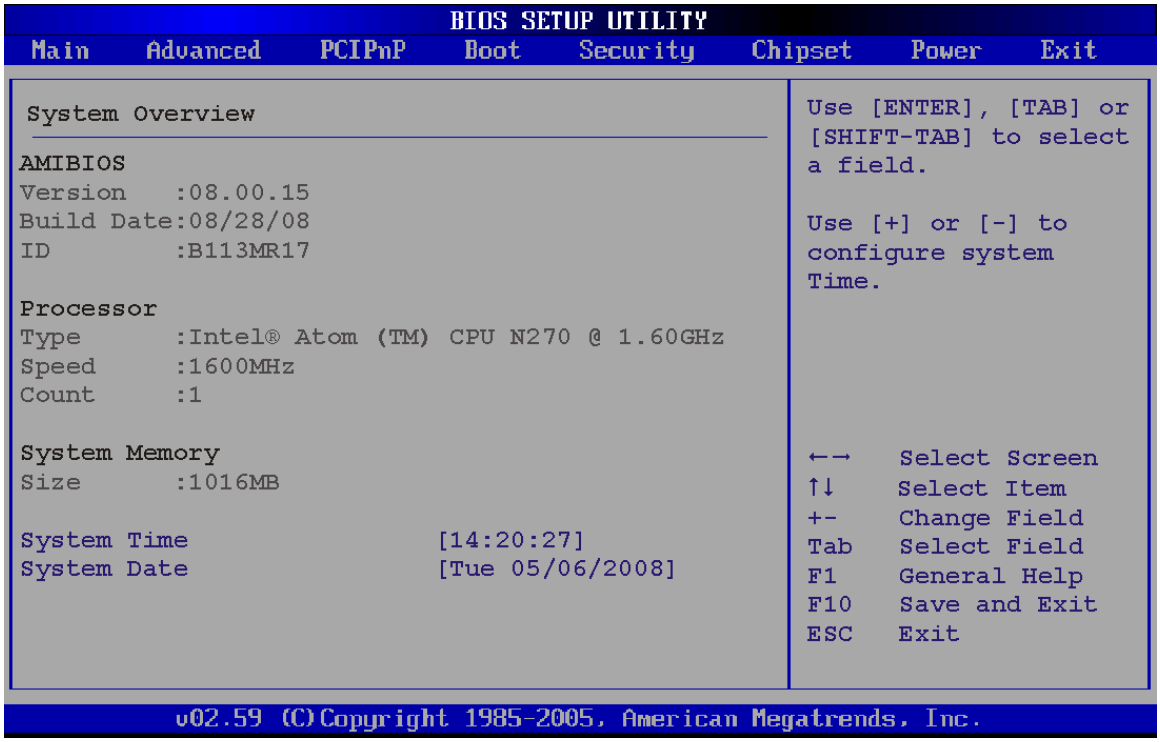
The **menu bar** on top of the BIOS screen has the following main items:

- **Main** Changes the basic system configuration.
- **Advanced** Changes the advanced system settings.
- **PCIPnP** Changes the advanced PCI/PnP Settings
- **Boot** Changes the system boot configuration.
- **Security** Sets User and Supervisor Passwords.
- **Chipset** Changes the chipset settings.
- **Power** Changes power management settings.
- **Exit** Selects exit options and loads default settings

The following sections completely describe the configuration options found in the menu items at the top of the BIOS screen and listed above.

5.2 Main

The **Main** BIOS menu (**BIOS Menu 1**) appears when the **BIOS Setup** program is entered. The **Main** menu gives an overview of the basic system information.



BIOS Menu 1: Main

➔ System Overview

The **System Overview** lists a brief summary of different system components. The fields in **System Overview** cannot be changed. The items shown in the system overview include:

- **AMI BIOS**: Displays auto-detected BIOS information
  - Version: Current BIOS version
  - Build Date: Date the current BIOS version was made
  - ID: Installed BIOS ID
- **Processor**: Displays auto-detected CPU specifications
  - Type: Names the currently installed processor
  - Speed: Lists the processor speed

- Count: The number of CPUs on the motherboard

- **System Memory**: Displays the auto-detected system memory.
  - Size: Lists memory size

The System Overview field also has two user configurable fields:

➔ **System Time [xx:xx:xx]**

Use the **System Time** option to set the system time. Manually enter the hours, minutes and seconds.

➔ **System Date [xx/xx/xx]**

Use the **System Date** option to set the system date. Manually enter the day, month and year.

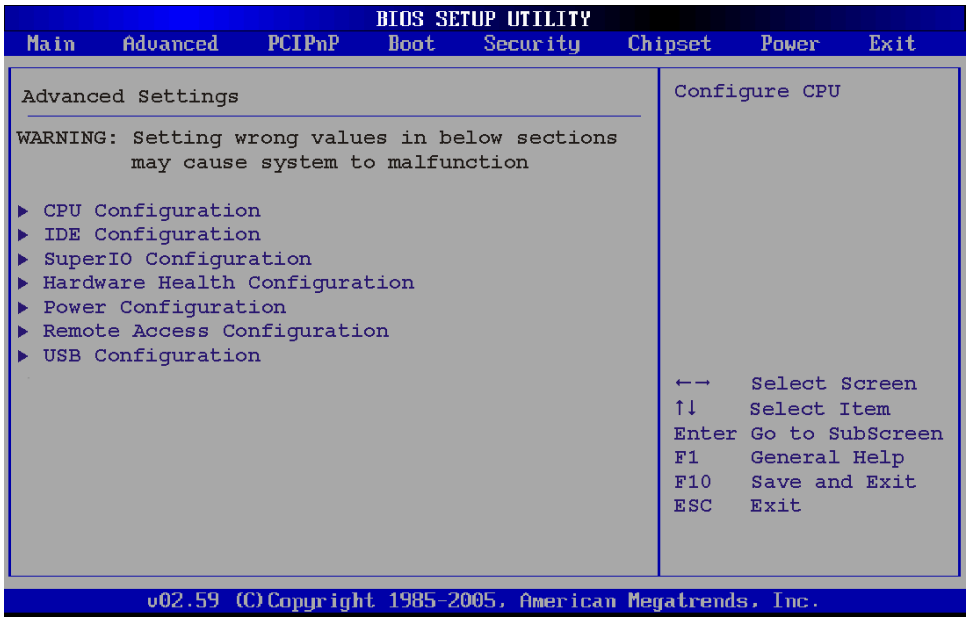
5.3 Advanced

Use the **Advanced** menu (**BIOS Menu 2**) to configure the CPU and peripheral devices through the following sub-menus:

WARNING:

Setting the wrong values in the sections below may cause the system to malfunction. Make sure that the settings made are compatible with the hardware.

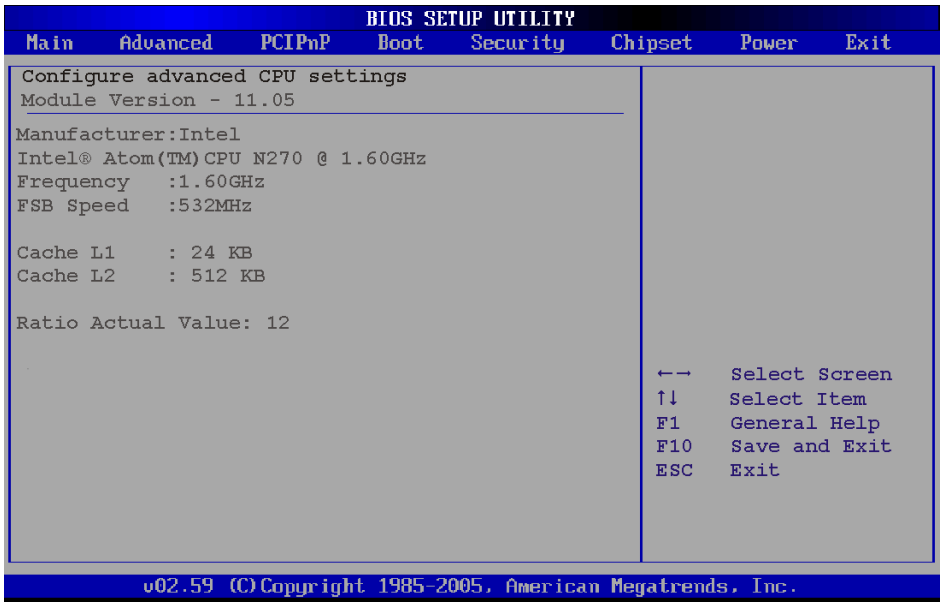
- CPU Configuration (see **Section 5.3.1**)
- IDE Configuration (see **Section 5.3.2**)
- SuperIO Configuration (see **Section 5.3.3**)
- Hardware Health Configuration (see **Section 5.3.4**)
- Power Configuration (see **Section 5.3.5**)
- Remote Access Configuration (see **Section 5.3.6**)
- USB Configuration (see **Section 5.3.7**)



BIOS Menu 2: Advanced

5.3.1 CPU Configuration

Use the **CPU Configuration** menu (**BIOS Menu 3**) to view detailed CPU specifications and configure the CPU.



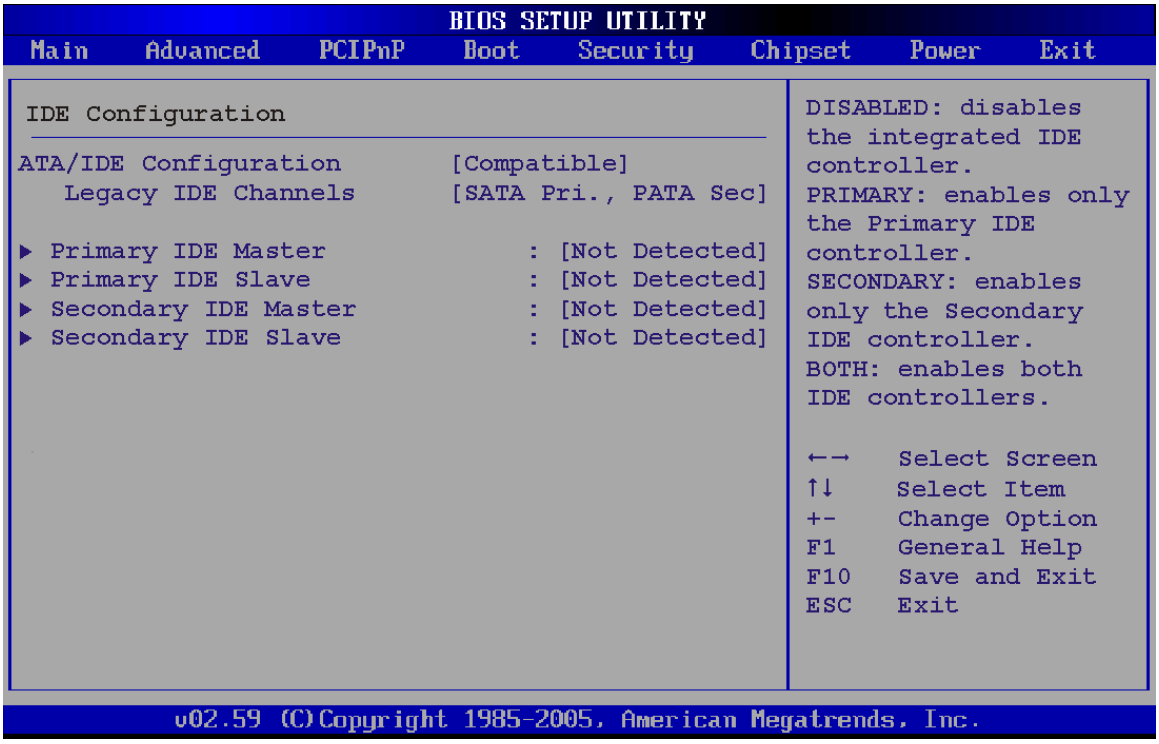
BIOS Menu 3: CPU Configuration

The CPU Configuration menu (BIOS Menu 3) lists the following CPU details:

- **Manufacturer**: Lists the name of the CPU manufacturer
- **Brand String**: Lists the brand name of the CPU being used
- **Frequency:** Lists the CPU processing speed
- **FSB Speed**: Lists the FSB speed
- **Cache L1**: Lists the CPU L1 cache size
- **Cache L2**: Lists the CPU L2 cache size

5.3.2 IDE Configuration

Use the **IDE Configuration** menu (**BIOS Menu 4**) to change and/or set the configuration of the IDE devices installed in the system.



BIOS Menu 4: IDE Configuration

➔ **ATA/IDE Configurations [Compatible]**

Use the **ATA/IDE Configurations** option to configure the ATA/IDE controller.

➔ **Disabled** Disables the on-board ATA/IDE controller.

➔ **Compatible** Configures the on-board ATA/IDE controller to be in compatible mode. In this mode, a SATA channel will replace one of the IDE channels. This mode supports up to 4 storage devices.

➔ **Enhanced** **DEFAULT** Configures the on-board ATA/IDE controller to be in Enhanced mode. In this mode, IDE channels and SATA channels are separated. This mode supports up to 6 storage devices. Some legacy OS do not support this mode.

➔ **Legacy IDE Channels [PATA Pri, SATA Sec]**

➔ **SATA Only** Only the SATA drives are enabled.

➔ **SATA Pri, PATA Sec** **DEFAULT** The IDE drives are enabled on the Primary IDE channel. The SATA drives are enabled on the Secondary IDE channel.

➔ **PATA Only** The IDE drives are enabled on the primary and secondary IDE channels. SATA drives are disabled.

➔ **IDE Master and IDE Slave**

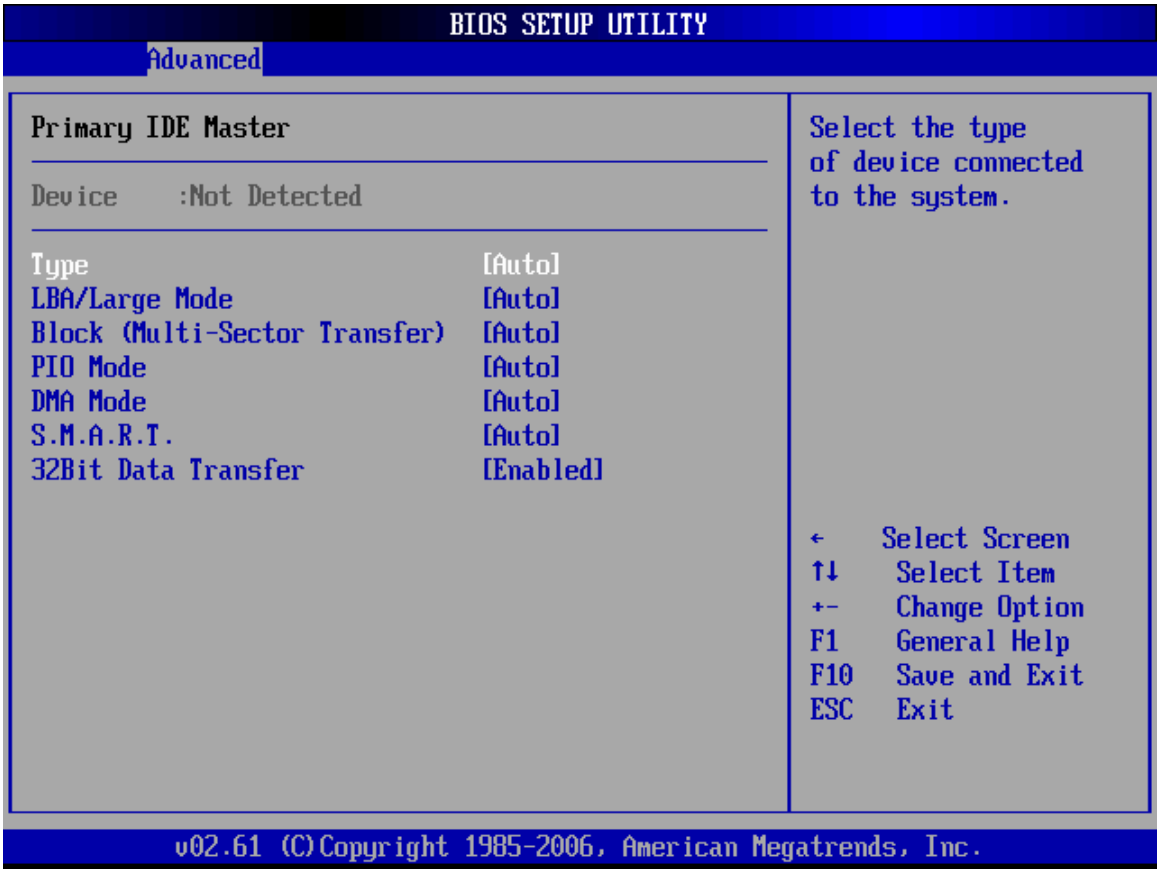
When entering setup, BIOS auto detects the presence of IDE devices. BIOS displays the status of the auto detected IDE devices. The following IDE devices are detected and are shown in the **IDE Configuration** menu:

- Primary IDE Master
- Primary IDE Slave
- Secondary IDE Master
- Secondary IDE Slave

The **IDE Configuration** menu (**BIOS Menu 4**) allows changes to the configurations for the IDE devices installed in the system. If an IDE device is detected, and one of the above listed four BIOS configuration options are selected, the IDE configuration options shown in **Section 5.3.2.1** appear.

5.3.2.1 IDE Master, IDE Slave

Use the **IDE Master** and **IDE Slave** configuration menu to view both primary and secondary IDE device details and configure the IDE devices connected to the system.



BIOS Menu 5: IDE Master and IDE Slave Configuration

➔ **Auto-Detected Drive Parameters**

The "grayed-out" items in the left frame are IDE disk drive parameters automatically detected from the firmware of the selected IDE disk drive. The drive parameters are listed as follows:

- **Device**: Lists the device type (e.g. hard disk, CD-ROM etc.)
- **Type**: Indicates the type of devices a user can manually select
- **Vendor**: Lists the device manufacturer
- **Size**: List the storage capacity of the device.
- **LBA Mode**: Indicates whether the LBA (Logical Block Addressing) is a method of addressing data on a disk drive is supported or not.
- **Block Mode**: Block mode boosts IDE drive performance by increasing the amount of data transferred. Only 512 bytes of data can be transferred per interrupt if block mode is not used. Block mode allows transfers of up to 64 KB per interrupt.
- **PIO Mode**: Indicates the PIO mode of the installed device.
- **Async DMA**: Indicates the highest Asynchronous DMA Mode that is supported.
- **Ultra DMA**: Indicates the highest Synchronous DMA Mode that is supported.
- **S.M.A.R.T.**: Indicates whether or not the Self-Monitoring Analysis and Reporting Technology protocol is supported.
- **32Bit Data Transfer**: Enables 32-bit data transfer.

➔ **Type [Auto]**

Use the **Type** BIOS option select the type of device the AMIBIOS attempts to boot from after the Power-On Self-Test (POST) is complete.

➔ **Not Installed** BIOS is prevented from searching for an IDE disk drive on the specified channel.

➔ **Auto** **DEFAULT** The BIOS auto detects the IDE disk drive type attached to the specified channel. This setting should be used if an IDE hard disk drive is attached to the

specified channel.

➔ **CD/DVD** The CD/DVD option specifies that an IDE CD-ROM drive is attached to the specified IDE channel. The BIOS does not attempt to search for other types of IDE disk drives on the specified channel.

➔ **ARMD** This option specifies an ATAPI Removable Media Device. These include, but are not limited to:

- ➔ **ZIP**
- ➔ **LS-120**

➔ **LBA/Large Mode [Auto]**

Use the **LBA/Large Mode** option to disable or enable BIOS to auto detects LBA (Logical Block Addressing). LBA is a method of addressing data on a disk drive. In LBA mode, the maximum drive capacity is 137 GB.

➔ **Disabled** BIOS is prevented from using the LBA mode control on the specified channel.

➔ **Auto** **DEFAULT** BIOS auto detects the LBA mode control on the specified channel.

➔ **Block (Multi Sector Transfer) [Auto]**

Use the **Block (Multi Sector Transfer)** to disable or enable BIOS to auto detect if the device supports multi-sector transfers.

➔ **Disabled** BIOS is prevented from using Multi-Sector Transfer on the specified channel. The data to and from the device occurs

one sector at a time.

➔ **Auto** **DEFAULT** BIOS auto detects Multi-Sector Transfer support on the drive on the specified channel. If supported the data transfer to and from the device occurs multiple sectors at a time.

➔ **PIO Mode [Auto]**

Use the **PIO Mode** option to select the IDE PIO (Programmable I/O) mode program timing cycles between the IDE drive and the programmable IDE controller. As the PIO mode increases, the cycle time decreases.

➔ **Auto** **DEFAULT** BIOS auto detects the PIO mode. Use this value if the IDE disk drive support cannot be determined.

➔ **0** PIO mode 0 selected with a maximum transfer rate of 3.3MBps

➔ **1** PIO mode 1 selected with a maximum transfer rate of 5.2MBps

➔ **2** PIO mode 2 selected with a maximum transfer rate of 8.3MBps

➔ **3** PIO mode 3 selected with a maximum transfer rate of 11.1MBps

➔ **4** PIO mode 4 selected with a maximum transfer rate of 16.6MBps

(This setting generally works with all hard disk drives manufactured after 1999. For other disk drives, such as IDE CD-ROM drives, check the specifications of the drive.)

➔ **DMA Mode [Auto]**

Use the **DMA Mode** BIOS selection to adjust the DMA mode options.

➔ **Auto** **DEFAULT** BIOS auto detects the DMA mode. Use this value if the IDE disk drive support cannot be determined.

- **SWDMA0** Single Word DMA mode 0 selected with a maximum data transfer rate of 2.1MBps
- **SWDMA1** Single Word DMA mode 1 selected with a maximum data transfer rate of 4.2MBps
- **SWDMA2** Single Word DMA mode 2 selected with a maximum data transfer rate of 8.3MBps
- **MWDMA0** Multi Word DMA mode 0 selected with a maximum data transfer rate of 4.2MBps
- **MWDMA1** Multi Word DMA mode 1 selected with a maximum data transfer rate of 13.3MBps
- **MWDMA2** Multi Word DMA mode 2 selected with a maximum data transfer rate of 16.6MBps
- **UDMA1** Ultra DMA mode 0 selected with a maximum data transfer rate of 16.6MBps
- **UDMA1** Ultra DMA mode 1 selected with a maximum data transfer rate of 25MBps
- **UDMA2** Ultra DMA mode 2 selected with a maximum data transfer rate of 33.3MBps
- **UDMA3** Ultra DMA mode 3 selected with a maximum data transfer rate of 44MBps (To use this mode, it is required that an 80-conductor ATA cable is used.)
- **UDMA4** Ultra DMA mode 4 selected with a maximum data transfer rate of 66.6MBps (To use this mode, it is required that an 80-conductor ATA cable is used.)
- **UDMA5** Ultra DMA mode 5 selected with a maximum data transfer

rate of 99.9MBps (To use this mode, it is required that an 80-conductor ATA cable is used.)

➔ **S.M.A.R.T [Auto]**

Use the **S.M.A.R.T** option to auto-detect, disable or enable Self-Monitoring Analysis and Reporting Technology (SMART) on the drive on the specified channel. **S.M.A.R.T** predicts impending drive failures. The **S.M.A.R.T** BIOS option enables or disables this function.

➔ **Auto**	**DEFAULT**	BIOS auto detects HDD SMART support.
➔ **Disabled**		Prevents BIOS from using the HDD SMART feature.
➔ **Enabled**		Allows BIOS to use the HDD SMART feature

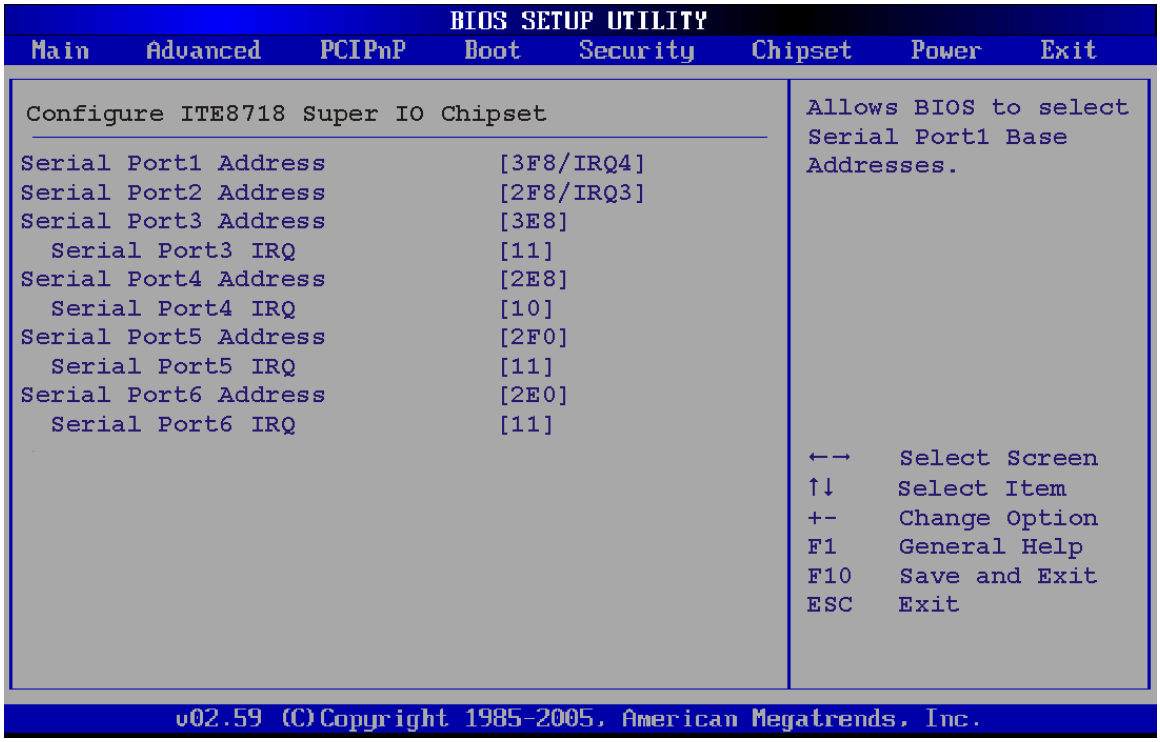
➔ **32Bit Data Transfer [Enabled]**

Use the **32Bit Data Transfer** BIOS option to enables or disable 32-bit data transfers.

➔ **Disabled**		Prevents the BIOS from using 32-bit data transfers.
➔ **Enabled**	**DEFAULT**	Allows BIOS to use 32-bit data transfers on supported hard disk drives.

5.3.3 Super IO Configuration

Use the **Super IO Configuration** menu (**BIOS Menu 6**) to set or change the configurations for the FDD controllers, parallel ports and serial ports.



BIOS Menu 6: Super IO Configuration

➔ **Serial Port1 Address [3F8/IRQ4]**

Use the **Serial Port1 Address** option to select the Serial Port 1 base address.

➔ **Disabled** No base address is assigned to Serial Port 1

➔ **3F8/IRQ4** **DEFAULT** Serial Port 1 I/O port address is 3F8 and the interrupt address is IRQ4

➔ **3E8/IRQ4** Serial Port 1 I/O port address is 3E8 and the interrupt address is IRQ4

➔ **2E8/IRQ3** Serial Port 1 I/O port address is 2E8 and the interrupt

address is IRQ3

➔ **Serial Port2 Address [2F8/IRQ3]**

Use the **Serial Port2 Address** option to select the Serial Port 2 base address.

➔ **Disabled**		No base address is assigned to Serial Port 2
➔ **2F8/IRQ3**	**DEFAULT**	Serial Port 2 I/O port address is 3F8 and the interrupt address is IRQ3
➔ **3E8/IRQ4**		Serial Port 2 I/O port address is 3E8 and the interrupt address is IRQ4
➔ **2E8/IRQ3**		Serial Port 2 I/O port address is 2E8 and the interrupt address is IRQ3

➔ **Serial Port3 Address [3E8]**

Use the **Serial Port3 Address** option to select the base addresses for serial port 3

➔ **Disabled**		No base address is assigned to serial port 3
➔ **3E8**	**DEFAULT**	Serial port 3 I/O port address is 3E8
➔ **2E8**		Serial port 3 I/O port address is 2E8
➔ **2F0**		Serial port 3 I/O port address is 2F0
➔ **2E0**		Serial port 3 I/O port address is 2E0

➔ **Serial Port3 IRQ [11]**

Use the **Serial Port3 IRQ** option to select the interrupt address for serial port 3.

➔ **10**		Serial port 3 IRQ address is 10
➔ **11**	**DEFAULT**	Serial port 3 IRQ address is 11

➔ **Serial Port4 Address [2E8]**

Use the **Serial Port4 IRQ** option to select the interrupt address for serial port 4.

➔ **Disabled**		No base address is assigned to serial port 3
➔ **3E8**		Serial port 4 I/O port address is 3E8
➔ **2E8**	**DEFAULT**	Serial port 4 I/O port address is 2E8
➔ **2F0**		Serial port 4 I/O port address is 2F0
➔ **2E0**		Serial port 4 I/O port address is 2E0

➔ **Serial Port4 IRQ [10]**

Use the **Serial Port4 IRQ** option to select the interrupt address for serial port 4.

➔ **10**	**DEFAULT**	Serial port 4 IRQ address is 10
➔ **11**		Serial port 4 IRQ address is 11

➔ **Serial Port5 Address [2F0]**

Use the **Serial Port5 Address** option to select the base addresses for serial port 5

➔ **Disabled**		No base address is assigned to serial port 5
➔ **3E8**		Serial port 5 I/O port address is 2F0
➔ **2E8**		Serial port 5 I/O port address is 2E8
➔ **2F0**	**DEFAULT**	Serial port 5 I/O port address is 2F0
➔ **2E0**		Serial port 5 I/O port address is 2E0

➔ **Serial Port5 IRQ [11]**

Use the **Serial Port3 IRQ** option to select the interrupt address for serial port 5.

- ➔ **10** Serial port 5 IRQ address is 10
- ➔ **11** **DEFAULT** Serial port 5 IRQ address is 11

➔ **Serial Port6 Address [2E0]**

Use the **Serial Port4 IRQ** option to select the interrupt address for serial port 6.

- ➔ **Disabled** No base address is assigned to serial port 6
- ➔ **3E8** Serial port 6 I/O port address is 3E8
- ➔ **2E8** Serial port 6 I/O port address is 2E8
- ➔ **2F0** Serial port 6 I/O port address is 2F0
- ➔ **2E0** **DEFAULT** Serial port 6 I/O port address is 2E0

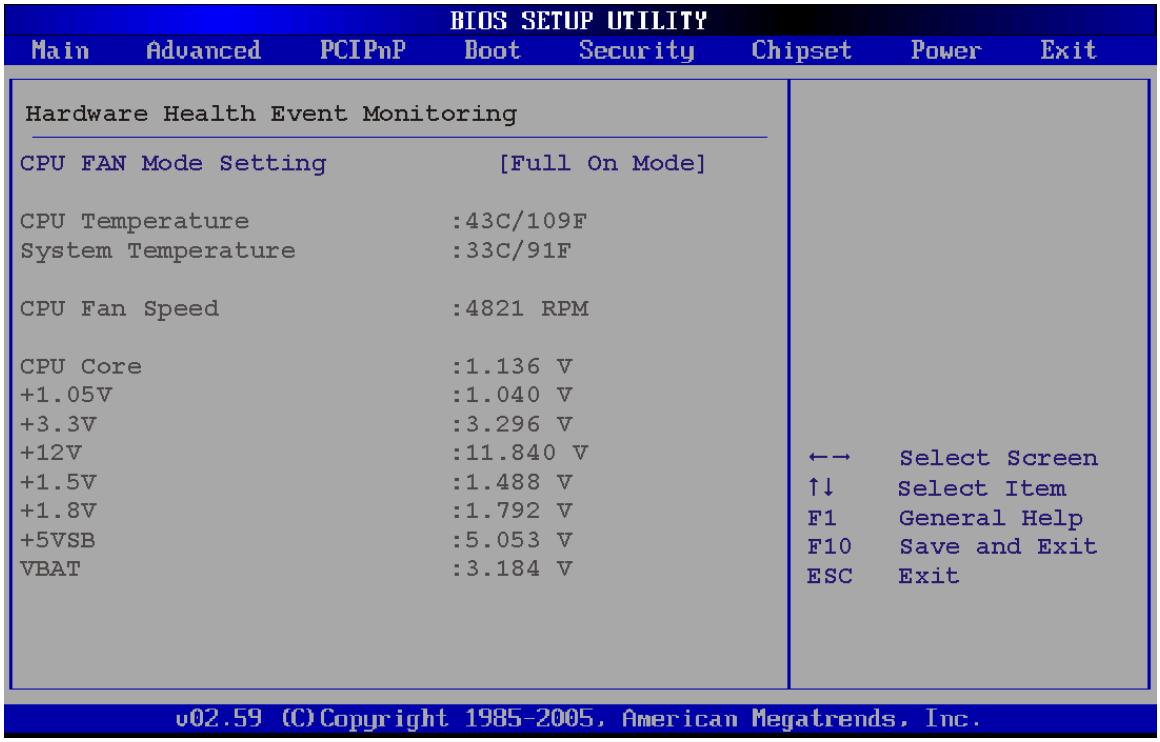
➔ **Serial Port6 IRQ [10]**

Use the **Serial Port6 IRQ** option to select the interrupt address for serial port 6.

- ➔ **10** Serial port 6 IRQ address is 10
- ➔ **11** **DEFAULT** Serial port 6 IRQ address is 11

5.3.4 Hardware Health Configuration

The **Hardware Health Configuration** menu (**BIOS Menu 7**) shows the operating temperature, fan speeds and system voltages.



BIOS Menu 7: Hardware Health Configuration

➔ **CPU FAN Mode Setting [Full On Mode]**

Use the **CPU FAN Mode Setting** option to configure the second fan.

➔ **Full On Mode**	**DEFAULT**	Fan is on all the time
➔ **Automatic mode**		Fan is off when the temperature is low enough. Parameters must be set by the user.
➔ **PWM Manual mode**		Pulse width modulation set manually

When the **CPU FAN Mode Setting** option is in the **Automatic Mode**, the following parameters can be set.

- CPU Temp. Limit of OFF
- CPU Temp. Limit of Start
- CPU Fan Start PWM
- Slope PWM 1

When the **CPU FAN Mode Setting** option is in the **PWM Manual Mode**, the following parameters can be set.

- CPU Fan PWM control

➔ CPU Temp. Limit of OFF [000]

WARNING:

Setting this value too high may cause the fan to stop when the CPU is at a high temperature and therefore cause the system to be damaged.

The **CPU Temp. Limit of OFF** option can only be set if the **CPU FAN Mode Setting** option is set to **Automatic Mode**. Use the **CPU Temp. Limit of OFF** option to select the CPU temperature at which the cooling fan should automatically turn off. To select a value, select the **CPU Temp. Limit of OFF** option and enter a decimal number between 000 and 127. The temperature range is specified below.

- Minimum Value: 0°C
- Maximum Value: 127°C

➔ **CPU Temp. Limit of Start [020]**

WARNING:

Setting this value too high may cause the fan to start only when the CPU is at a high temperature and therefore cause the system to be damaged.

The **CPU Temp. Limit of Start** option can only be set if the **CPU FAN Mode Setting** option is set to **Automatic Mode**. Use the **CPU Temp. Limit of Start** option to select the CPU temperature at which the cooling fan should automatically turn on. When the fan starts, it rotates using the starting pulse width modulation (PWM) specified in the **Fan 3 Start PWM** option below. To select a value, select the **CPU Temp. Limit of Start** option and enter a decimal number between 000 and 127. The temperature range is specified below.

- Minimum Value: 0°C
- Maximum Value: 127°C

➔ **CPU Fan Start PWM [070]**

The **Fan 3 Start PWM** option can only be set if the **CPU FAN Mode Setting** option is set to **Automatic Mode**. Use the **Fan 3 Start PWM** option to select the PWM mode the fan starts to rotate with after the temperature specified in the **Temperature 3 Limit of Start** is exceeded. The Super I/O chipset supports 128 PWM modes. To select a value, select the **Fan 3 Start PWM** option and enter a decimal number between 000 and 127. The temperature range is specified below.

- PWM Minimum Mode: 0
- PWM Maximum Mode: 127

➔ **Slope PWM [0.5 PWM]**

The **Slope PWM 1** option can only be set if the **CPU FAN Mode Setting** option is set to **Automatic Mode**. Use the **Slope PWM 1** option to select the linear rate at which the PWM mode increases with respect to an increase in temperature. A list of available options is shown below:

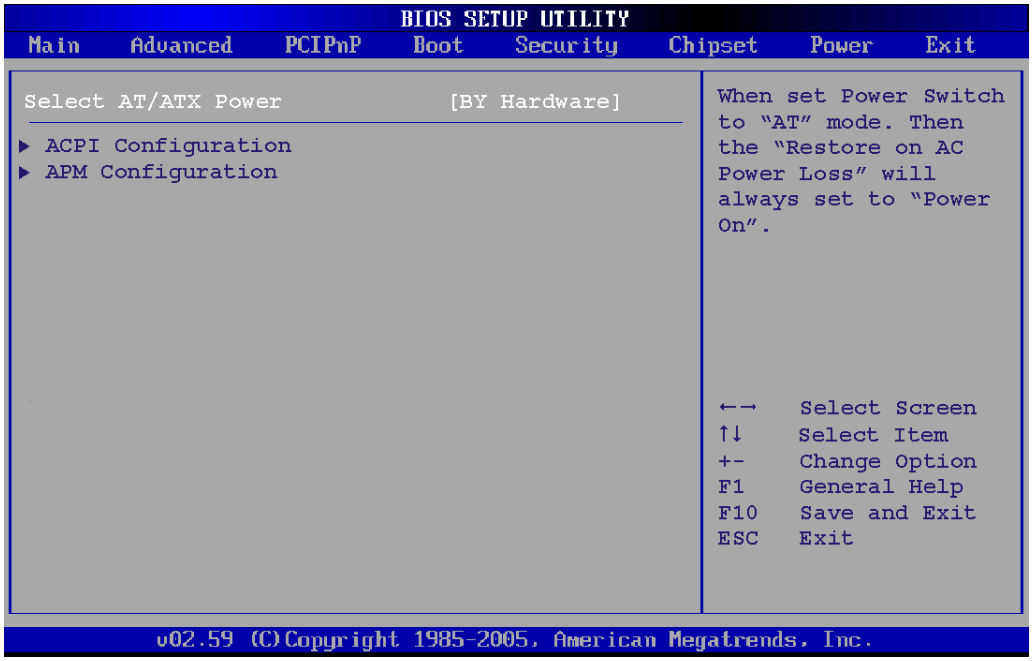
- 0 PWM
- 1 PWM
- 2 PWM
- 4 PWM
- 8 PWM
- 16 PWM
- 32 PWM
- 64 PWM

The following system parameters and values are shown. The system parameters that are monitored are:

- **System Temperatures**: The following system temperatures are monitored
  - CPU Temperature
  - System Temperature
- **Fan Speeds**: The CPU cooling fan speed is monitored.
  - CPU Fan Speed
- **Voltages**: The following system voltages are monitored
  - CPU Core
  - +1.05V
  - +3.30V
  - +12.0 V
  - +1.5V
  - +1.8V
  - 5VSB
  - VBAT

5.3.5 Power Configuration

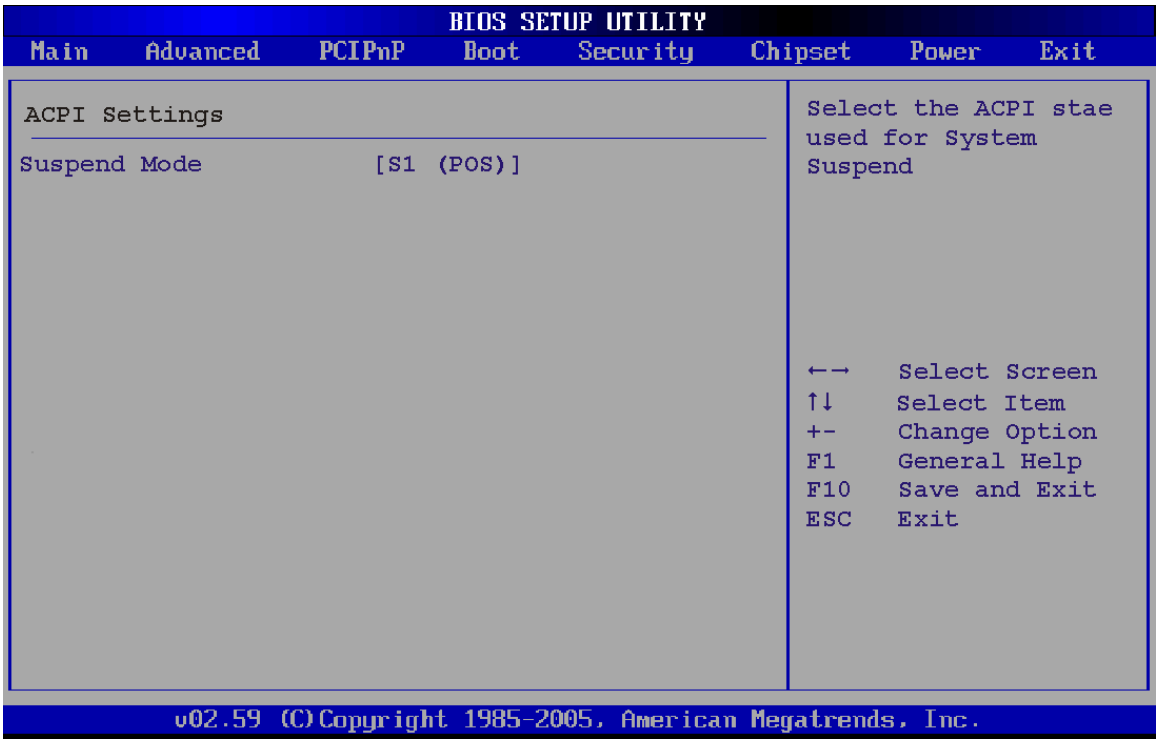
The **Power Configuration** menu (BIOS Menu 8) configures the Advanced Configuration and Power Interface (ACPI) and Power Management (APM) options.



BIOS Menu 8: Power Configuration

5.3.5.1 ACPI configuration

The **ACPI Configuration** menu (**BIOS Menu 9**) configures the Advanced Configuration and Power Interface (ACPI).



BIOS Menu 9: ACPI Configuration

➔ **Suspend Mode [S1(POS)]**

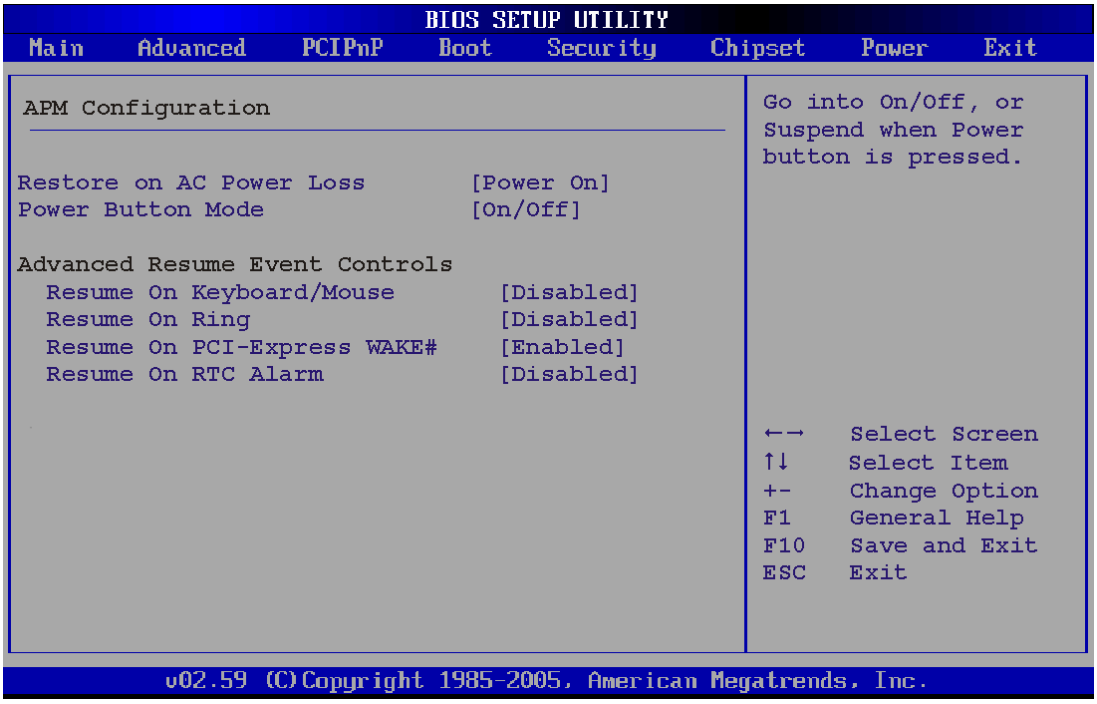
Use the **Suspend Mode** BIOS option to specify the sleep state the system enters when it is not being used.

➔ **S1 (POS)** **DEFAULT** System appears off. The CPU is stopped; RAM is refreshed; the system is running in a low power mode.

➔ **S3 (STR)** System appears off. The CPU has no power; RAM is in slow refresh; the power supply is in a reduced power mode.

5.3.5.2 APM Configuration

The **APM Configuration** menu (**BIOS Menu 10**) allows the advanced power management options to be configured.



BIOS Menu 10:Advanced Power Management Configuration

➔ **Restore on AC Power Loss [Last State]**

Use the **Restore on AC Power Loss** BIOS option to specify what state the system returns to if there is a sudden loss of power to the system.

➔ **Power Off** The system remains turned off

➔ **Power On** The system turns on

➔ **Last State** **DEFAULT** The system returns to its previous state. If it was on, it turns itself on. If it was off, it remains off.

➔ **Power Button Mode [On/Off]**

Use the **Power Button Mode** BIOS to specify how the power button functions.

➔ **On/Off** **DEFAULT** When the power button is pressed the system is either turned on or off

➔ **Suspend** When the power button is pressed the system goes into suspend mode

➔ **Resume on Keyboard/Mouse [Disabled]**

Use the **Resume on Keyboard/Mouse** BIOS option to enable activity on either the keyboard or mouse to rouse the system from a suspend or standby state. That is, the system is roused when the mouse is moved or a button on the keyboard is pressed.

➔ **Disabled** (Default) Wake event not generated by activity on the keyboard or mouse

➔ **Enabled** Wake event generated by activity on the keyboard or mouse

➔ **Resume on Ring [Disabled]**

Use the **Resume on Ring** BIOS option to enable activity on the RI (ring in) modem line to rouse the system from a suspend or standby state. That is, the system will be roused by an incoming call on a modem.

➔ **Disabled** **DEFAULT** Wake event not generated by an incoming call

➔ **Enabled** Wake event generated by an incoming call

➔ **Resume on PCI-Express WAKE# [Enabled]**

Use the **Resume PCI-Express WAKE#** BIOS option to enable activity on the PCI-Express WAKE# signal to rouse the system from a suspend or standby state.

➔ **Disabled** Wake event not generated by PCI-Express WAKE# signal activity

➔ **Enabled** **DEFAULT** Wake event generated by PCI-Express WAKE# signal activity

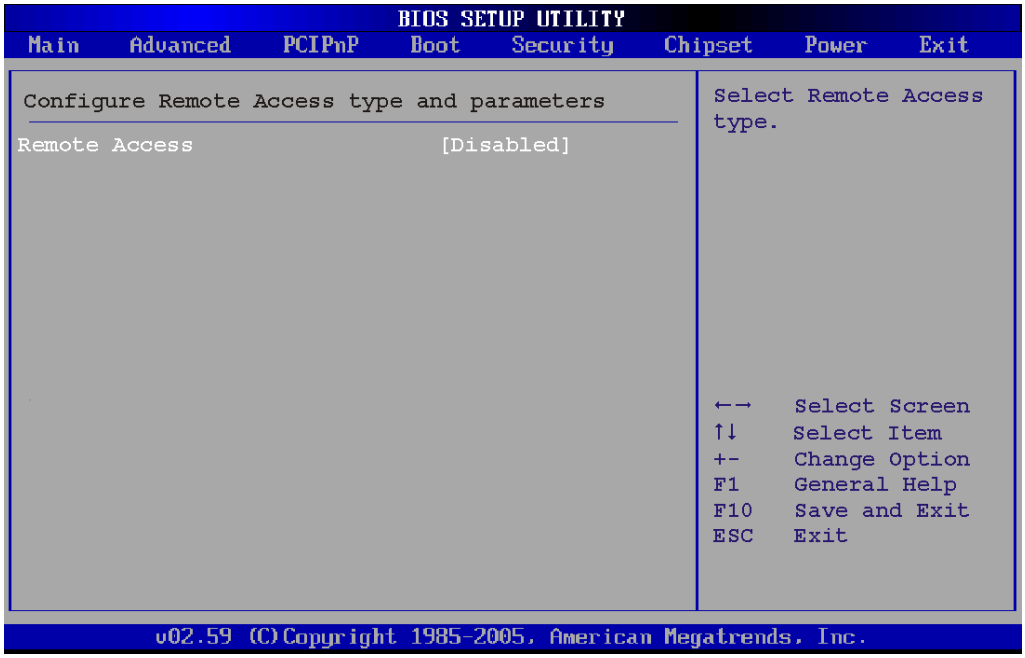
➔ **Resume On RTC Alarm [Disabled]**

Use the **Resume On RTC Alarm** option to specify the time the system should be roused from a suspended state.

➔ **Disabled**	**DEFAULT**	The real time clock (RTC) cannot generate a wake event
➔ **Enabled**		If selected, the following appears with values that can be selected: ➔ **RTC Alarm Date (Days)** ➔ **System Time** After setting the alarm, the computer turns itself on from a suspend state when the alarm goes off.

5.3.6 Remote Configuration

Use the **Remote Access Configuration** menu (**BIOS Menu 11**) to configure remote access parameters. The **Remote Access Configuration** is an AMIBIOS feature and allows a remote host running a terminal program to display and configure the BIOS settings.



BIOS Menu 11: Remote Access Configuration [Advanced]

➔ **Remote Access [Disabled]**

Use the **Remote Access** option to enable or disable access to the remote functionalities of the system.

➔ **Disabled** **DEFAULT** Remote access is disabled.

➔ **Enabled** Remote access configuration options shown below appear:

- ➔ **Serial Port Number**
- ➔ **Serial Port Mode**
- ➔ **Flow Control**
- ➔ **Redirection after BIOS POST**
- ➔ **Terminal Type**

➔ **VT-UTF8 Combo Key Support**

These configuration options are discussed below.

➔ **Serial Port Number [COM1]**

Use the **Serial Port Number** option allows to select the serial port used for remote access.

➔ **COM1** **DEFAULT** System is remotely accessed through COM1

➔ **COM2** System is remotely accessed through COM2

NOTE: Make sure the selected COM port is enabled through the Super I/O configuration menu.

➔ **Base Address, IRQ [2F8h,3]**

The **Base Address, IRQ** option cannot be configured and only shows the interrupt address of the serial port listed above.

➔ **Serial Port Mode [115200 8,n,1]**

Use the **Serial Port Mode** option to select baud rate through which the console redirection is made. The following configuration options are available

- 115200 8,n,1 DEFAULT
- 57600 8,n,1
- 38400 8,n,1
- 19200 8,n,1
- 09600 8,n,1

NOTE:

Identical baud rate setting musts be set on the host (a management computer running a terminal software) and the slave

➔ **Flow Control [None]**

Use the **Flow Control** option to report the flow control method for the console redirection application.

➔ **None**	**DEFAULT**	No control flow,
➔ **Hardware**		Hardware is set as the console redirection
➔ **Software**		Software is set as the console redirection

➔ **Redirection After BIOS POST [Always]**

Use the **Redirection After BIOS POST** option to specify when console redirection should occur.

➔ **Disabled**		The console is not redirected after POST
➔ **Boot Loader**		Redirection is active during POST and during Boot Loader
➔ **Always**	**DEFAULT**	Redirection is always active (Some OSes may not work if set to Always)

➔ **Terminal Type [ANSI]**

Use the **Terminal Type** BIOS option to specify the remote terminal type.

➔ **ANSI**	**DEFAULT**	The target terminal type is ANSI
➔ **VT100**		The target terminal type is VT100
➔ **VT-UTF8**		The target terminal type is VT-UTF8

➔ **VT-UTF8 Combo Key Support [Disabled]**

Use the **VT-UFT8 Combo Key Support** option to enable additional keys that are not provided by VT100 for the PC 101 keyboard.

The VT100 Terminal Definition is the standard convention used to configure and conduct emergency management tasks with UNIX-based servers. VT100 does not support all keys on the standard PC 101-key layout, however. The VT-UTF8 convention makes available additional keys that are not provided by VT100 for the PC 101 keyboard.

➔ **Disabled** **DEFAULT** Disables the VT-UTF8 terminal keys

➔ **Enabled** Enables the VT-UTF8 combination key. Support for ANSI/VT100 terminals

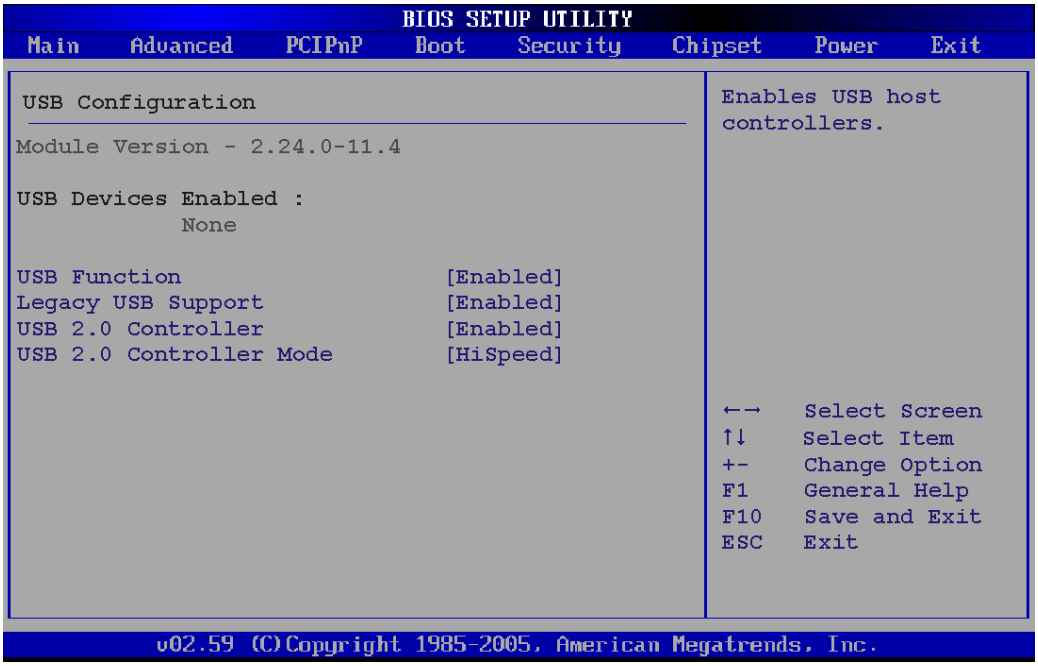
➔ **Sredir Memory Display Delay [Disabled]**

Use the **Sredir Memory Display Delay** option to select the delay before memory information is displayed. Configuration options are listed below

- No Delay DEFAULT
- Delay 1 sec
- Delay 2 sec
- Delay 4 sec

5.3.7 USB Configuration

Use the **USB Configuration** menu (**BIOS Menu 12**) to read USB configuration information and configure the USB settings.



BIOS Menu 12: USB Configuration

➔ **USB Functions [Enabled]**

Use the **USB Function** option to enable or disable the USB controllers.

➔ **Disabled**		USB controllers are enabled
➔ **Enabled**	**DEFAULT**	USB controllers are disabled

➔ **USB 2.0 Controller [Enabled]**

The **USB 2.0 Controller** BIOS option enables or disables the USB 2.0 controller

➔ **Disabled**		USB function disabled
➔ **Enabled**	**DEFAULT**	USB function enabled

➔ **USB2.0 Controller Mode [HiSpeed]**

The **USB2.0 Controller Mode** BIOS option sets the speed of the USB2.0 controller.

➔ **FullSpeed**		The controller is capable of operating at full speed 12 Mb/s
➔ **HiSpeed**	**DEFAULT**	The controller is capable of operating at high speed 480 Mb/s

➔ **Legacy USB Support [Enabled]**

Use the **Legacy USB Support** BIOS option to enable USB mouse and USB keyboard support.

Normally if this option is not enabled, any attached USB mouse or USB keyboard does not become available until a USB compatible operating system is fully booted with all USB drivers loaded. When this option is enabled, any attached USB mouse or USB keyboard can control the system even when there is no USB driver loaded onto the system.

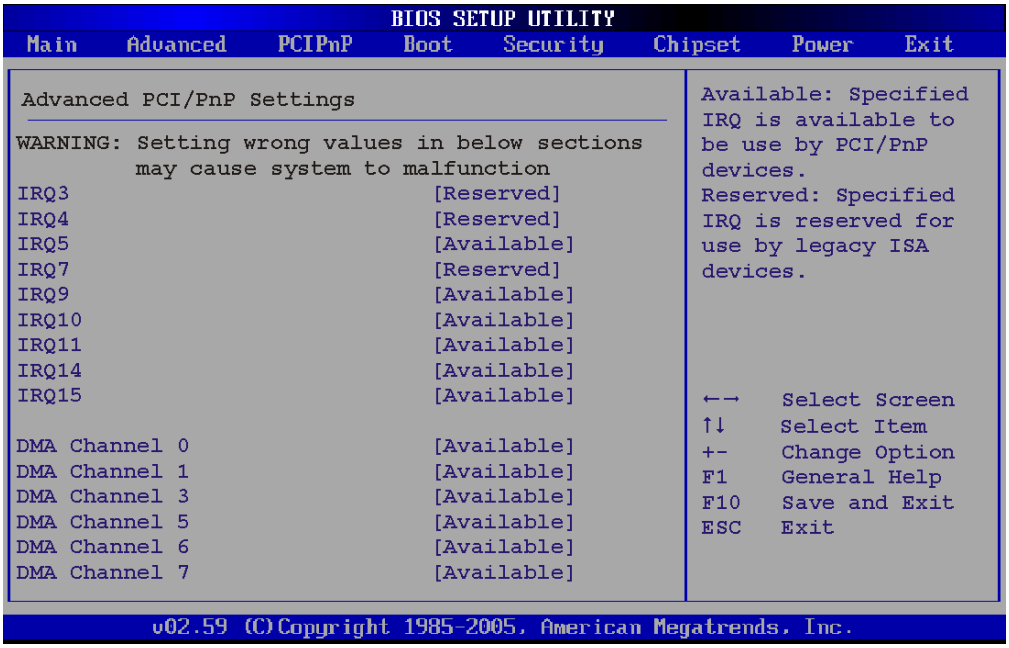
➔ **Disabled**		Legacy USB support disabled
➔ **Enabled**	**DEFAULT**	Legacy USB support enabled
➔ **Auto**		Legacy USB support disabled if no USB devices are connected

5.4 PCI/PnP

Use the PCI/PnP menu (BIOS Menu 13) to configure advanced PCI and PnP settings.

WARNING:

Setting wrong values for the BIOS selections in the PCIPnP BIOS menu may cause the system to malfunction.



BIOS Menu 13: PCI/PnP Configuration

➔ **IRQ# [Available]**

Use the **IRQ#** address to specify what IRQs can be assigned to a particular peripheral device.

➔ **Available** **DEFAULT** The specified IRQ is available to be used by PCI/PnP devices

➔ **Reserved** The specified IRQ is reserved for use by Legacy ISA devices

Available IRQ addresses are:

- IRQ3
- IRQ4
- IRQ5
- IRQ7
- IRQ9
- IRQ10

- IRQ 11
- IRQ 14
- IRQ 15

➔ **DMA Channel# [Available]**

Use the **DMA Channel#** option to assign a specific DMA channel to a particular PCI/PnP device.

➔ **Available**	**DEFAULT**	The specified DMA is available to be used by PCI/PnP devices
➔ **Reserved**		The specified DMA is reserved for use by Legacy ISA devices

Available DMA Channels are:

- DM Channel 0
- DM Channel 1
- DM Channel 3
- DM Channel 5
- DM Channel 6
- DM Channel 7

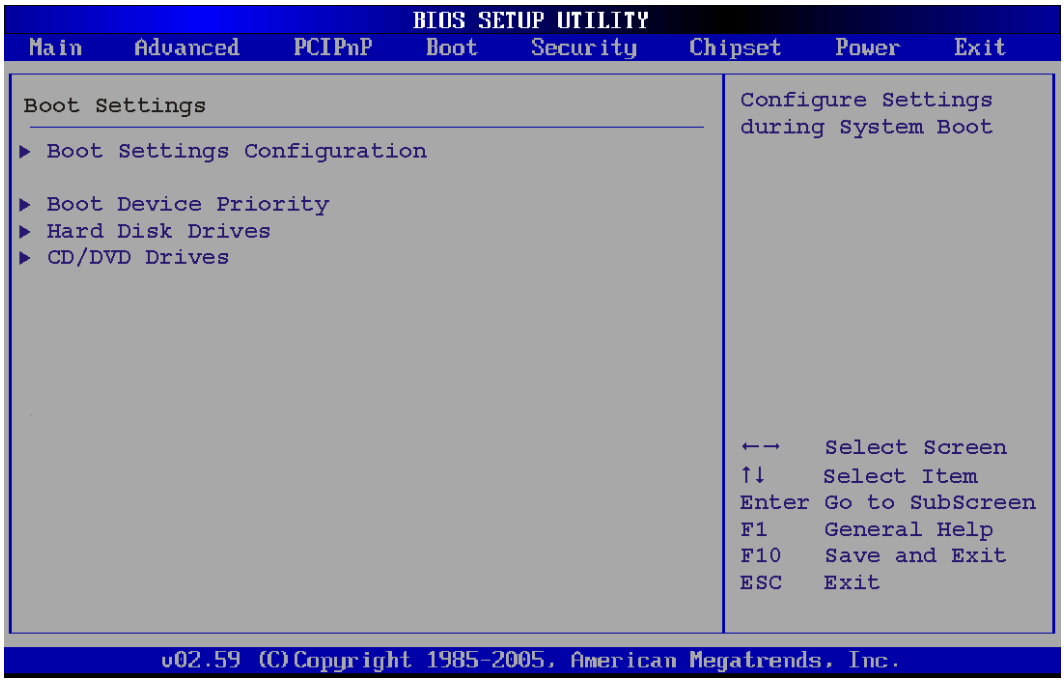
➔ **Reserved Memory Size [Disabled]**

Use the **Reserved Memory Size** BIOS option to specify the amount of memory that should be reserved for legacy ISA devices.

➔ **Disabled**	**DEFAULT**	No memory block reserved for legacy ISA devices
➔ **16K**		16KB reserved for legacy ISA devices
➔ **32K**		32KB reserved for legacy ISA devices
➔ **64K**		54KB reserved for legacy ISA devices

5.5 Boot

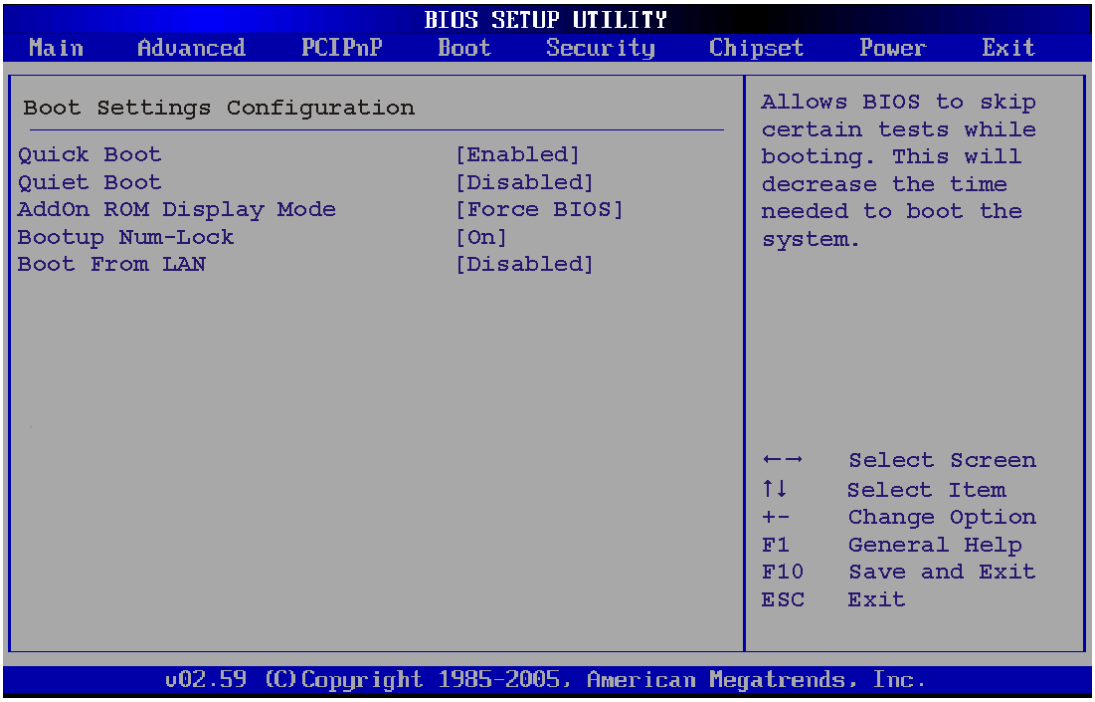
Use the Boot menu (BIOS Menu 14) to configure system boot options.



BIOS Menu 14: Boot

5.5.1 Boot Settings Configuration

Use the Boot Settings Configuration menu (**BIOS Menu 14**) to configure advanced system boot options.



BIOS Menu 15: Boot Settings Configuration

➔ **Quick Boot [Enabled]**

Use the **Quick Boot** BIOS option to make the computer speed up the boot process.

➔ **Disabled**		No POST procedures are skipped
➔ **Enabled**	**DEFAULT**	Some POST procedures are skipped to decrease the system boot time

➔ **Quiet Boot [Disabled]**

Use the **Quiet Boot** BIOS option to select the screen display when the system boots.

➔ **Disabled**	**DEFAULT**	Normal POST messages displayed
➔ **Enabled**		OEM Logo displayed instead of POST messages

➔ **AddOn ROM Display Mode [Force BIOS]**

The **AddOn ROM Display Mode** option allows add-on ROM (read-only memory) messages to be displayed.

➔ **Force BIOS**	**DEFAULT**	Allows the computer system to force a third party BIOS to display during system boot.
➔ **Keep Current**		Allows the computer system to display the information during system boot.

➔ **Bootup Num-Lock [Off]**

The **Bootup Num-Lock** BIOS option allows the Number Lock setting to be modified during boot up.

➔ **Off**	**DEFAULT**	Does not enable the keyboard Number Lock automatically. To use the 10-keys on the keyboard, press the Number Lock key located on the upper left-hand corner of the 10-key pad. The Number Lock LED on the keyboard lights up when the Number Lock is engaged.
➔ **On**		Allows the Number Lock on the keyboard to be enabled automatically when the computer system boots up. This allows the immediate use of the 10-key numeric keypad located on the right side of the keyboard. To confirm this, the Number Lock LED light on the keyboard is lit.

➔ **Boot From LAN Support [Disabled]**

The **BOOT From LAN Support** option enables the system to be booted from a remote system.

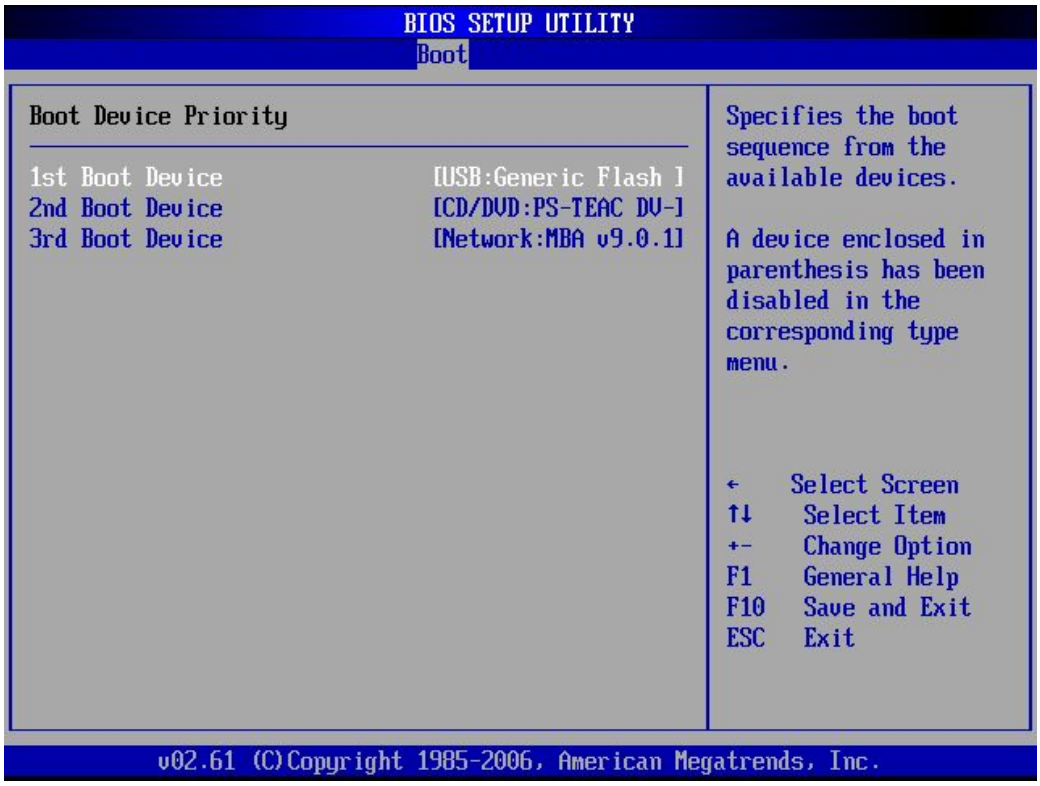
➔ **Disabled** **DEFAULT** Cannot be booted from a remote system through the LAN

➔ **Enabled** **DEFAULT** Can be booted from a remote system through the LAN

5.5.2 Boot Device Priority

Use the **Boot Device Priority** menu (**BIOS Menu 16**) to specify the boot sequence from the available devices. The following options are available:

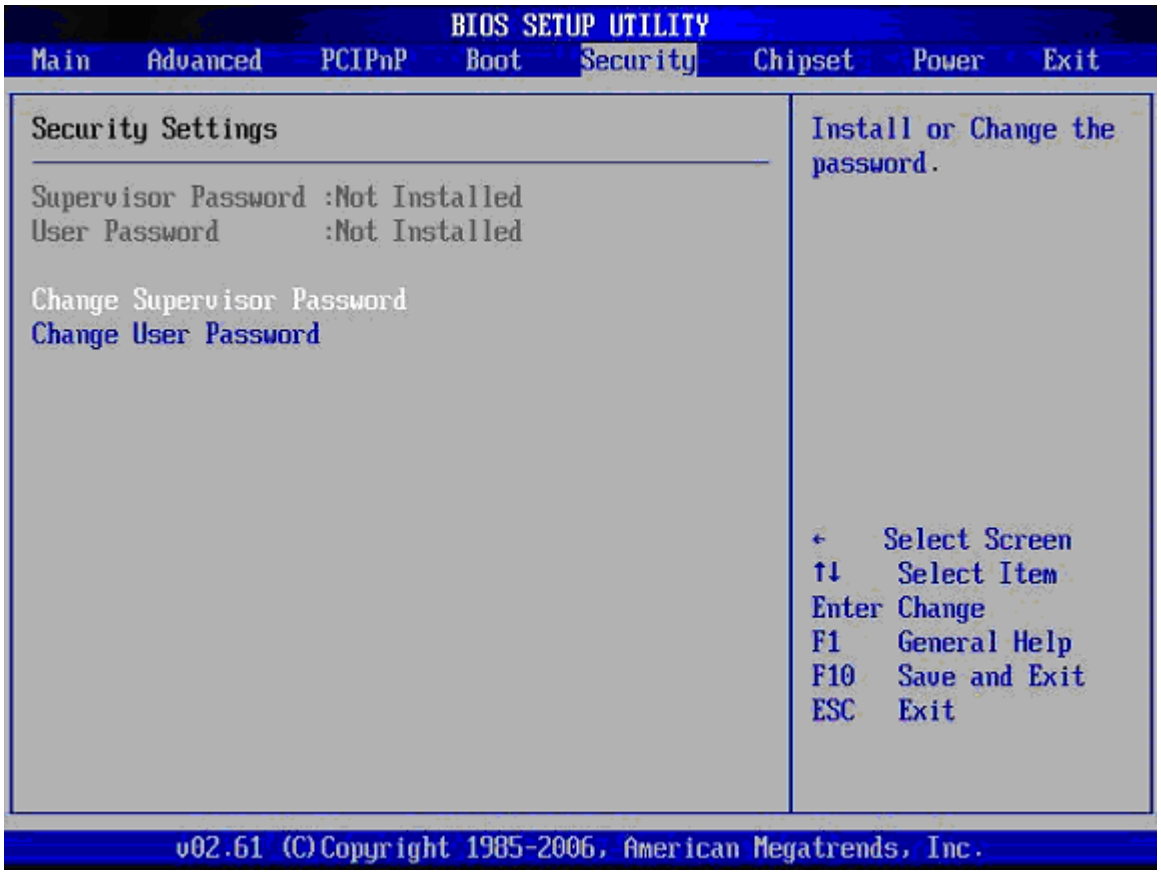
- 1st Boot Device
- 2nd Boot Device
- 3rd Boot Device



BIOS Menu 16: Boot Device Priority Settings

5.6 Security

Use the Security menu (**BIOS Menu 17**) to set system and user passwords.



BIOS Menu 17: Security

➔ **Change Supervisor Password**

Use the **Change Supervisor Password** to set or change a supervisor password. The default for this option is **Not Installed**. If a supervisor password must be installed, select this field and enter the password. After the password has been added, **Install** appears next to **Change Supervisor Password**.

➔ **Change User Password**

Use the **Change User Password** to set or change a user password. The default for this option is **Not Installed**. If a user password must be installed, select this field and enter the

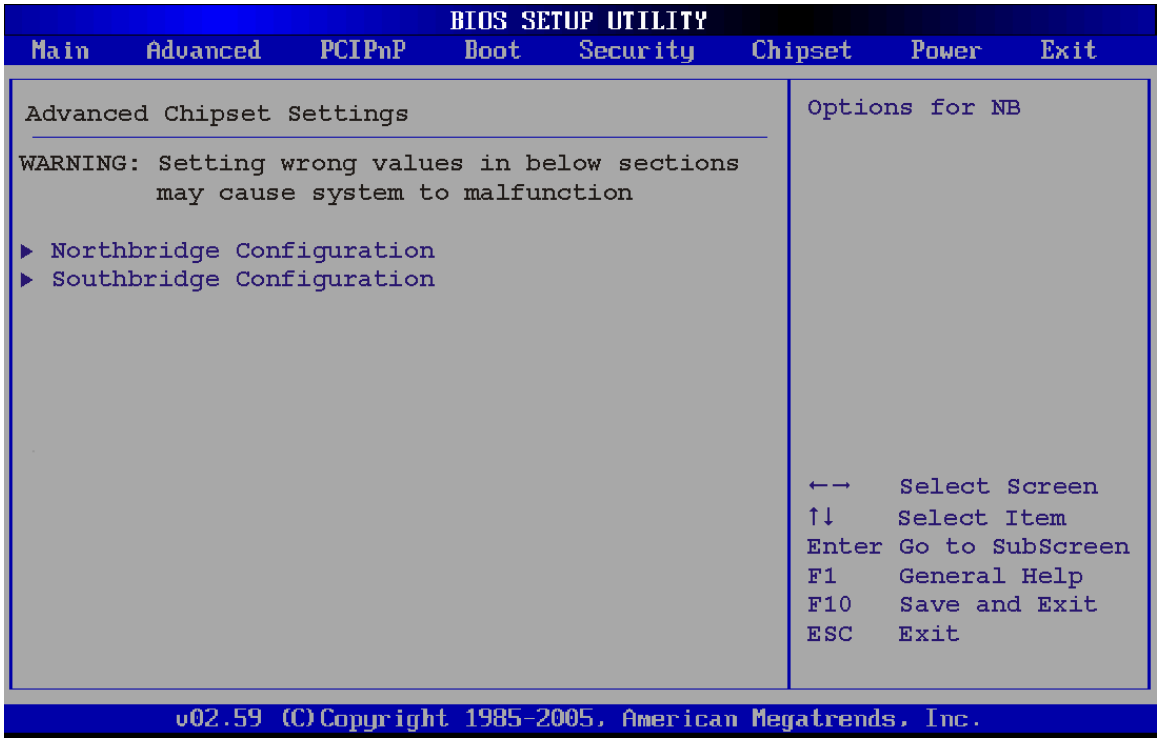
password. After the password has been added, **Install** appears next to **Change User Password**.

5.7 Chipset

Use the **Chipset** menu (**BIOS Menu 18**) to access the NorthBridge and SouthBridge configuration menus

WARNING!

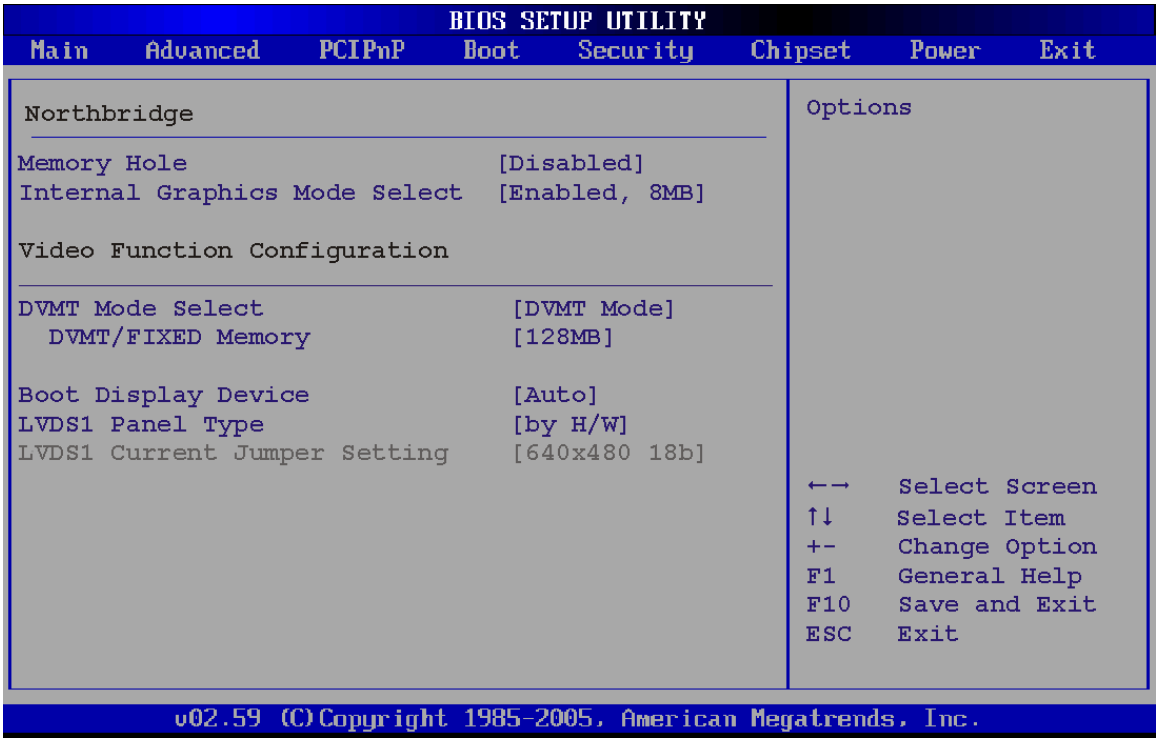
Setting the wrong values for the Chipset BIOS selections in the Chipset BIOS menu may cause the system to malfunction.



BIOS Menu 18: Chipset

5.7.1 North Bridge Chipset Configuration

Use the **North Bridge Chipset Configuration** menu (BIOS Menu 18) to configure the Northbridge chipset settings.



BIOS Menu 19:North Bridge Chipset Configuration

➔ **Memory Hole [Disabled]**

The **Memory Hole** reserves the memory space between 15MB and 16MB for ISA expansion cards that require a specified area of memory to work properly. If an older ISA expansion card is used, please refer to the documentation that came with the card to see if it is necessary to reserve the space.

➔ **Disabled** **DEFAULT** Memory is not reserved for ISA expansion cards

➔ **Enabled** Memory is reserved for ISA expansion cards

➔ **Internal Graphics Mode Select [Enable, 8MB]**

The **Internal Graphic Mode Select** option determines the amount of system memory that can be used by the Internal graphics device.

➔ **Disable**		
➔ **Enable, 1MB**		1MB of memory used by internal graphics device
➔ **Enable, 8MB**	**DEFAULT**	8MB of memory used by internal graphics device

➔ **DVMT Mode Select [DVMT Mode]**

Use the **DVMT Mode Select** option to select the Intel Dynamic Video Memory Technology (DVMT) operating mode.

➔ **Fixed Mode**		A fixed portion of graphics memory is reserved as graphics memory.
➔ **DVMT Mode**	**DEFAULT**	Graphics memory is dynamically allocated according to the system and graphics needs.
➔ **Combo Mode**		A fixed portion of graphics memory is reserved as graphics memory. If more memory is needed, graphics memory is dynamically allocated according to the system and graphics needs.

➔ **DVMT/FIXED Memory**

Use the **DVMT/FIXED Memory** option to specify the maximum amount of memory that can be allocated as graphics memory. This option can only be configured for if **DVMT Mode** or **Fixed Mode** is selected in the **DVMT Mode Selec**t option. If **Combo Mode** is selected, the maximum amount of graphics memory is 128MB. Configuration options are listed below.

- 64MB
- 128MB **DEFAULT**

- Maximum DVMT

➔ **Boot Display Device [Auto]**

The **Boot Display Device** BIOS option selects the display device the system uses when it boots. The available options are listed below:

- Auto **DEFAULT**
- CRT
- LFP

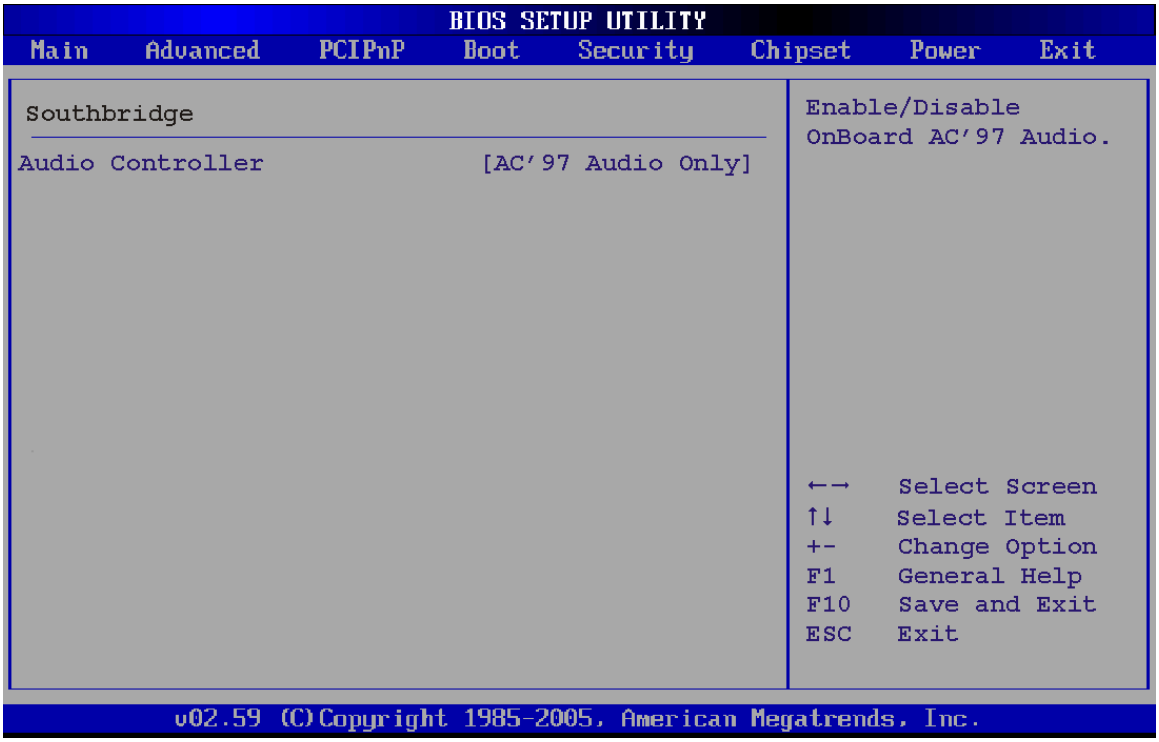
➔ **LVDS1 Panel Type**

Use the **LVDS Panel Type** to determine the LCD panel resolution. Configuration options are listed below:

- 640 x 480 18b
- 800 x 480 18b
- 800 x 600 18b
- 1024 x 768 18b
- 1280 x 1024 36b
- 1400 x 1050 36b
- 1440 x 900 36b
- 1600 x 1200 36b
- by H/W

5.7.2 SouthBridge Configuration

The **SouthBridge Configuration** menu (**BIOS Menu 20**) the southbridge chipset to be configured.



BIOS Menu 20:SouthBridge Chipset Configuration

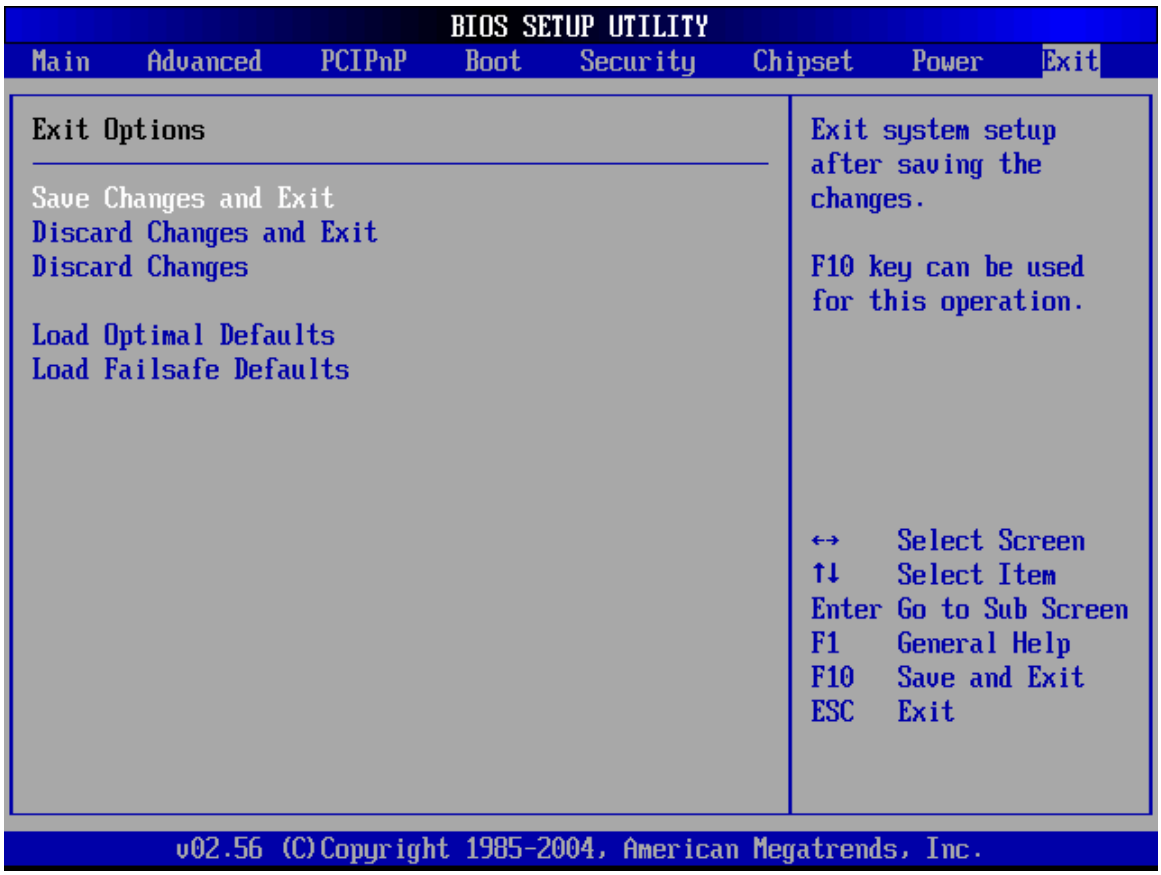
➔ **Audio Controller [All Disabled]**

The **Audio Controller** option enables or disables the audio controller.

➔	**AC'97 Audio Only**		The on-board AC'97 audio controller is enabled.
➔	**All Disabled**	**DEFAULT**	The on-board audio controller is disabled.

5.8 Exit

Use the **Exit** menu (**BIOS Menu 21**) to load default BIOS values, optimal failsafe values and to save configuration changes.



BIOS Menu 21:Exit

➔ **Save Changes and Exit**

Use the **Save Changes and Exit** option to save the changes made to the BIOS options and to exit the BIOS configuration setup program.

➔ **Discard Changes and Exit**

Use the **Discard Changes and Exit** option to exit the BIOS configuration setup program without saving the changes made to the system.

➔ **Discard Changes**

Use the **Discard Changes** option to discard the changes and remain in the BIOS configuration setup program.

➔ **Load Optimal Defaults**

Use the **Load Optimal Defaults** option to load the optimal default values for each of the parameters on the Setup menus. **F9 key can be used for this operation.**

➔ **Load Failsafe Defaults**

Use the **Load Failsafe Defaults** option to load failsafe default values for each of the parameters on the Setup menus. **F8 key can be used for this operation.**

Chapter

7

Software Drivers

6.1 Available Software Drivers

NOTE:

The content of the CD may vary throughout the life cycle of the product and is subject to change without prior notice. Visit the IEI website or contact technical support for the latest updates.

The following drivers can be installed on the system:

- Chipset
- VGA
- LAN
- Audio

Installation instructions are given below.

6.2 Starting the Driver Program

To access the driver installation programs, please do the following.

Step 1: Insert the CD-ROM that came with the system into a CD-ROM drive attached to the system.

Step 2: The list of drivers in **Figure 6-1** appears.

Figure 6-1: Drivers

6.3 Chipset Driver Installation

To install the chipset driver, please do the following.

Step 1: Access the driver list shown in Figure 6-1. (See **Section 6.2**)

Step 2: Click "**1-Chipset Driver**"

Step 3: The setup files are extracted as shown in **Figure 6-2**.

Figure 6-2: Chipset Driver Screen

Step 4: When the setup files are completely extracted the **Welcome Screen** in Figure 6-3 appears.

Figure 6-3: Chipset Driver Welcome Screen

Step 5: Click **Next** to continue.

Step 6: The license agreement in Figure 6-4 appears.

Step 7: Read the **License Agreement**.

Step 8: Click the **Yes** icon to continue.

Figure 6-4: Chipset Driver License Agreement

Step 9: The Read Me file in Figure 6-5 appears.

Step 10: Click **Next** to continue.

Figure 6-5: Chipset Driver Read Me File

Step 11: **Setup Operations** are performed as shown in Figure 6-6.

Figure 6-6: Chipset Driver Setup Operations

Step 12: Once the **Setup Operations** are complete, click the **Next** icon to continue.

Step 13: The **Finish** screen appears.

Step 14: Select "**Yes, I want to restart the computer now**" and click the **Finish** icon.

See Figure 6-7.

Figure 6-7: Chipset Driver Installation Finish Screen

6.4 VGA Driver Installation

To install the VGA driver, please do the following.

Step 1: Access the driver list shown in Figure 6-1. (See **Section 6.2**)

Step 2: Click "**2-VGA**"

Step 3: The VGA Read Me file in Figure 6-8 appears.

Step 4: Click **Next** to continue.

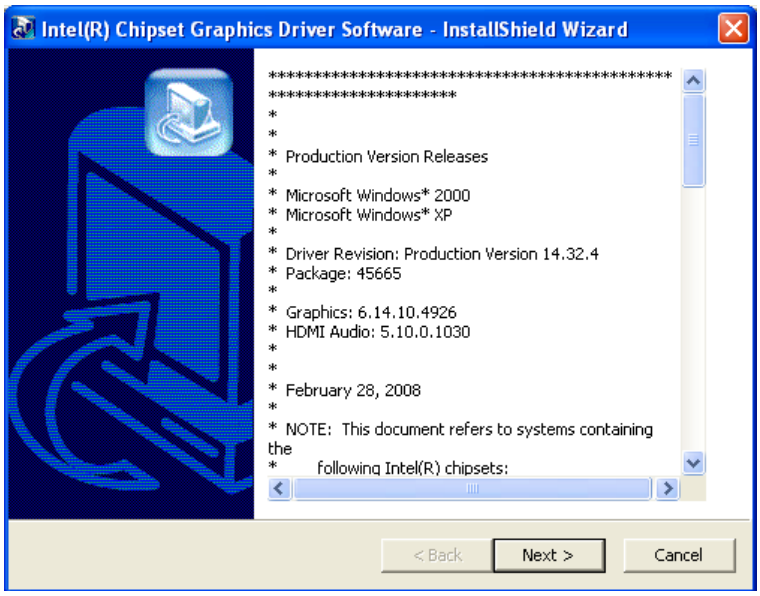


Figure 6-8: VGA Driver Read Me File

Step 5: The installation files are extracted. See Figure 6-9.

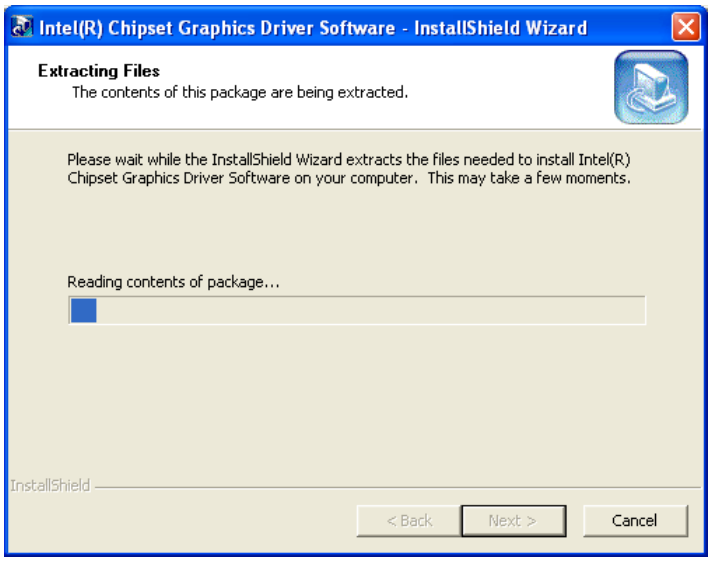


Figure 6-9: VGA Driver Setup Files Extracted

Step 6: The **Welcome Screen** in Figure 6-10 appears.

Figure 6-10: VGA Driver Welcome Screen

Step 7: Click **Next** to continue.

Step 8: The license agreement in Figure 6-11 appears.

Step 9: Read the **License Agreement**.

Step 10: Click the **Yes** icon to continue.

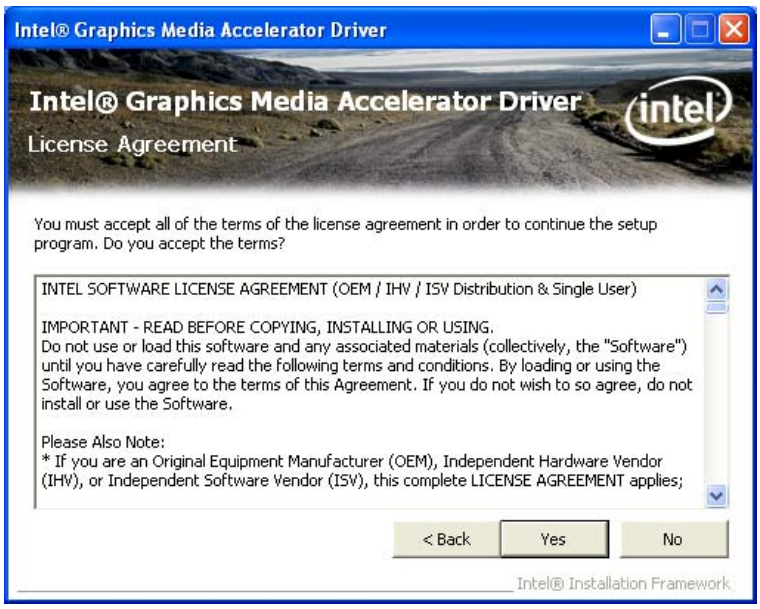


Figure 6-11: VGA Driver License Agreement

Step 11: The Read Me file in Figure 6-12 appears.

Step 12: Click **Next** to continue.

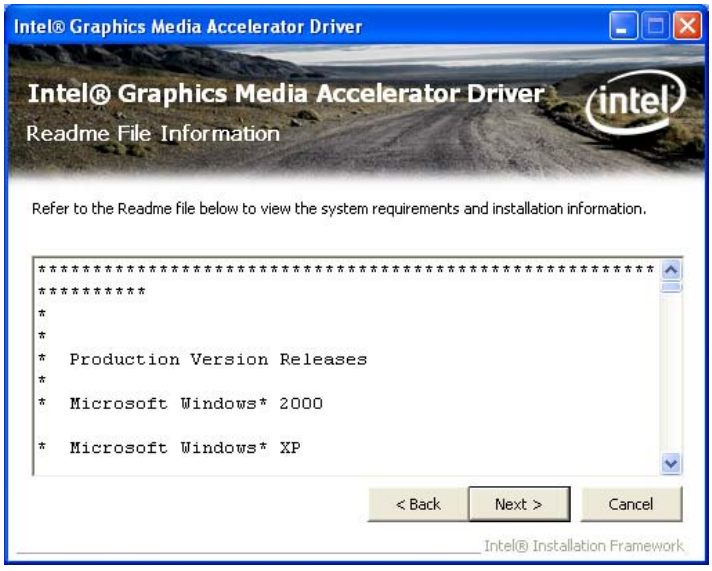


Figure 6-12: VGA Driver Read Me File

Step 13: **Setup Operations** are performed as shown in Figure 6-13.

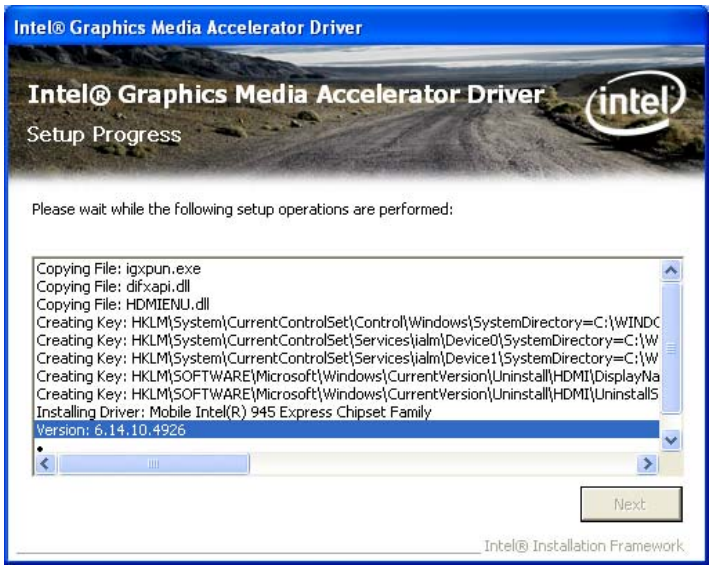


Figure 6-13: VGA Driver Setup Operations

Step 14: Once the **Setup Operations** are complete, click the **Next** icon to continue.

Step 15: The **Finish** screen appears.

Step 16: Select "**Yes, I want to restart the computer now**" and click the **Finish** icon.

See Figure 6-14.**Step 0:**

Figure 6-14: VGA Driver Installation Finish Screen

6.5 LAN Driver Installation

To install the chipset driver, please do the following.

Step 1: Access the driver list shown in Figure 6-1. (See **Section 6.2**)

Step 2: Click "**3-LAN**"

Step 3: The **Welcome** screen in Figure 6-15 appears.

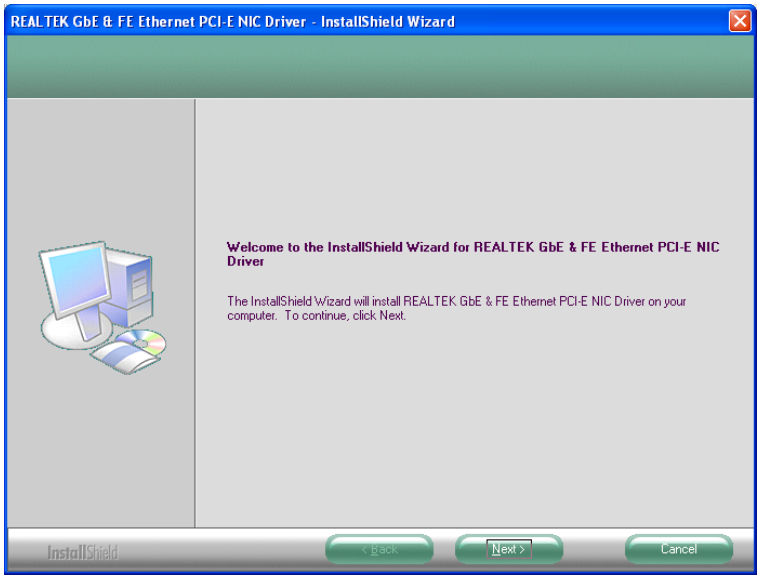


Figure 6-15: LAN Driver Welcome Screen

Step 4: Click **Next** to continue.

Step 5: The **Ready to Install** screen in Figure 6-16 appears.

Step 6: Click **Next** to proceed with the installation.

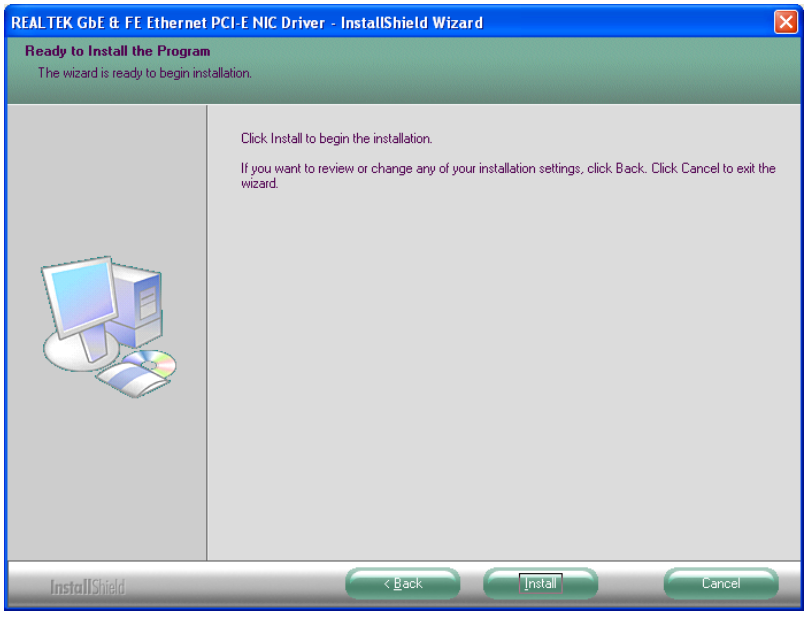


Figure 6-16: LAN Driver Welcome Screen

Step 7: The program begins to install.

Step 8: The installation progress can be monitored in the progress bar shown in Figure 6-17.

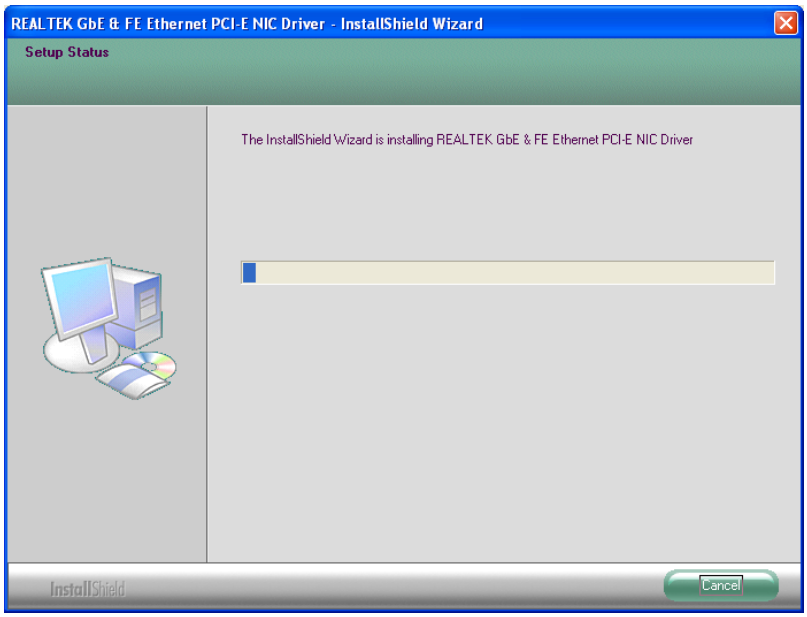


Figure 6-17: LAN Driver Installation

Step 9: When the driver installation is complete, the screen in Figure 6-18 appears.

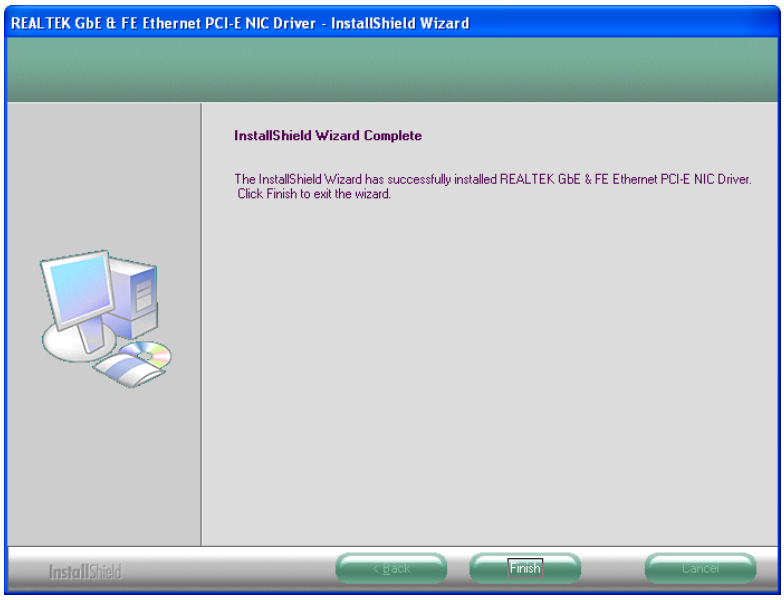


Figure 6-18: LAN Driver Installation Complete

6.6 Audio Driver Installation

To install the chipset driver, please do the following.

Step 1: Access the driver list shown in Figure 6-1. (See **Section 6.2**)

Step 2: Click "**4-Audio**"

Step 3: The screen in Figure 6-19 appears

WARNING:

The ECW-281B-945GSE does not support HD Audio. Please do not install the HD Audio driver onto the ECW-281B-945GSE.

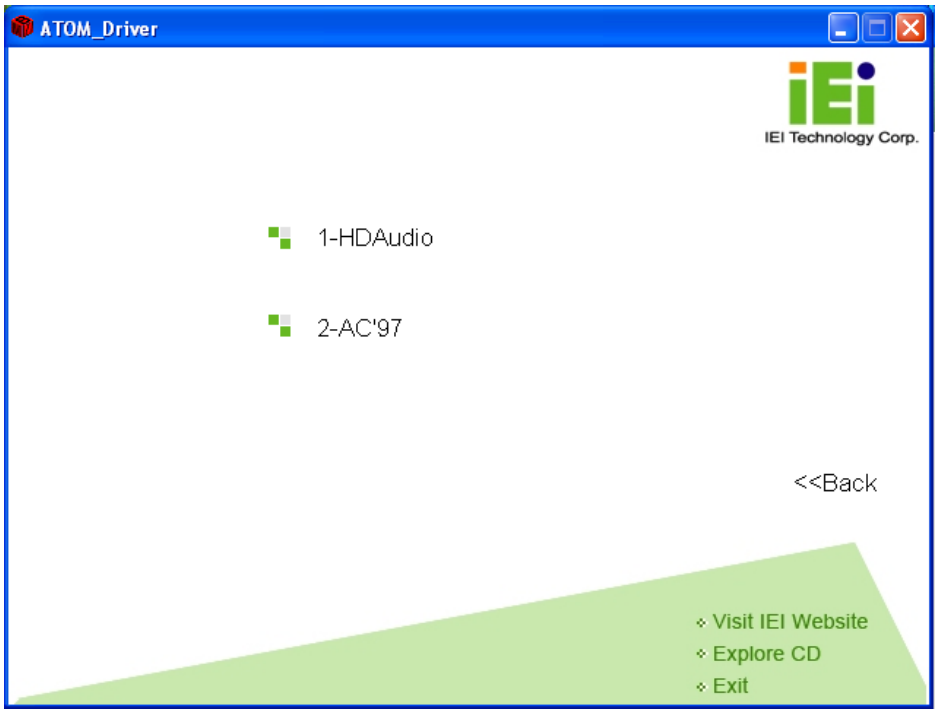


Figure 6-19: Audio Driver Options

Step 4: Select "**2-AC'97**" in Figure 6-19

Step 5: The installation files are extracted as shown in Figure 6-20.

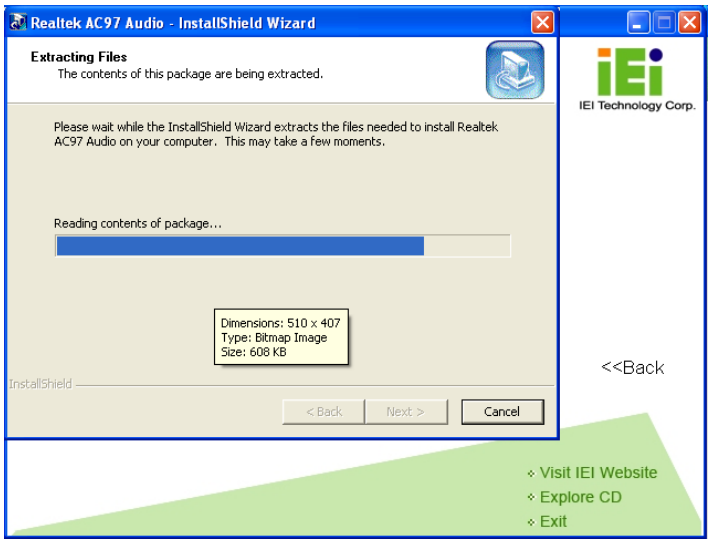


Figure 6-20: AC'97 Driver Installation File Extraction

Step 6: The AC'97 Driver Installation screen in Figure 6-21 appears.

Step 7: Click **Next** to continue.

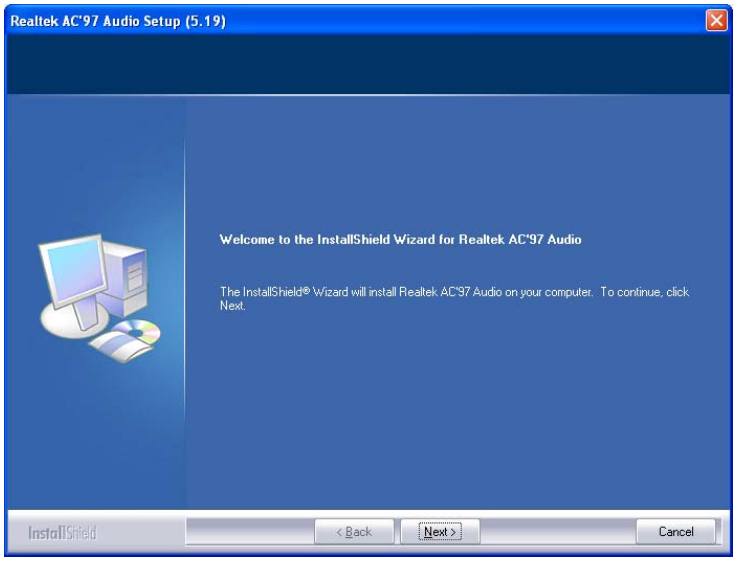


Figure 6-21: AC'97 Driver Installation Welcome Screen

Step 8: The Verification window in Figure 6-22 may appear.

Step 9: Click "**Continue Anyway**."

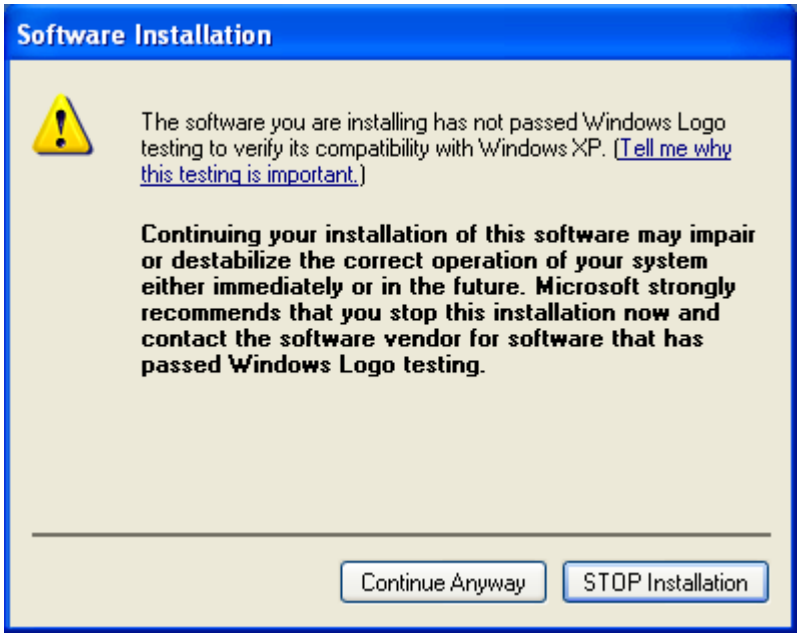


Figure 6-22: AC'97 Driver Installation Verification

Step 10: The driver installation begins. See Figure 6-23.

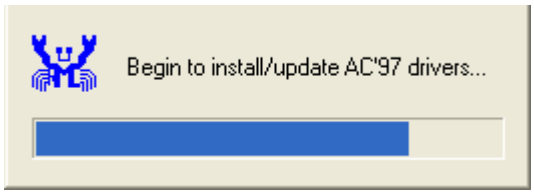


Figure 6-23: AC'97 Driver Installation

Step 11: When the driver is installed, the driver installation finish screen in Figure 6-24 appears.

Step 12: Select "**Yes, I wish to restart my computer now**" And click **Finish**

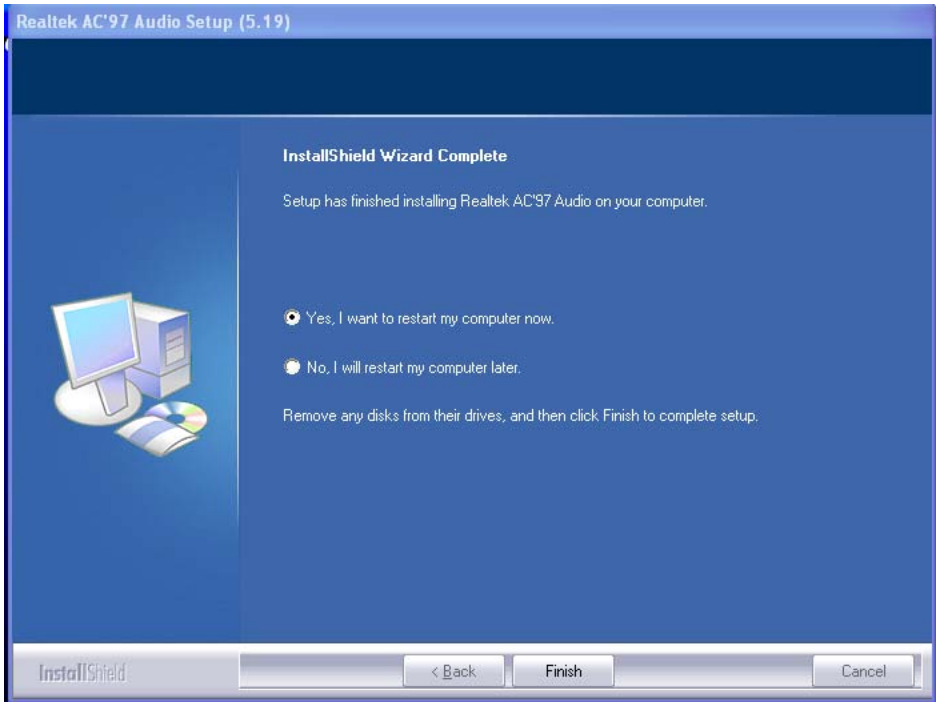


Figure 6-24: AC'97 Driver Installation Complete

Step 13: The system reboots.

Chapter

7

Troubleshooting and Maintenance

WARNING:

Take Anti-Static precautions whenever maintenance is being carried out on the system components. Failure to take anti-static precautions can cause permanent system damage. For more details on anti-static precautions, please refer to **Section 4.1**.

7.1 ECW-281B-945GSE System Maintenance Overview

NOTE:

When doing maintenance operations on the system, please follow the instructions in this chapter. Failure to follow these instructions may lead to personal injury and system damage.

To preserve the working integrity of the ECW-281B-945GSE embedded system, the system must be properly maintained. If embedded system components need replacement, the proper maintenance procedures must be followed to ensure the system can continue to operate normally.

7.2 System Troubleshooting

This section provides some simple troubleshooting suggestions.

7.2.1 The System Doesn't Turn On

If after turning the system on, there is no power (indicated by the power button on the front panel not turning on) please do the following:

Step 1: Check that the power cable connector is properly connected to the terminal block or power socket on the system front panel.

Step 2: Check that the power cable connector is properly plugged into the power source.

Step 3: Make sure the power button is turned on.

Step 4: Plug the system into a monitor and check to see if anything appears on the screen. If the boot-up screen appears it means the power LED has become disconnected. To fix this problem, open the top cover and reconnect the power LED to the motherboard.

If the above steps have been completed and the system still doesn't turn on, please do the following.

Step 1: Open the bottom surface (**Section 4.2.3**)

Step 2: Check the terminal block/power socket power cable connector is properly connected to the power module.

Step 3: Check that the power button cable connector is properly connected to the motherboard.

Step 4: Make sure the cable connecting to the terminal block/power socket are properly attached and have not become separated.

Step 5: Make sure the cable connecting the power button to the motherboard is still properly attached to the power button and has not been separated.

7.2.2 The System Doesn't Boot Up

If the system doesn't boot up please do the following:

Step 1: Check the power is turned on. See **Section 7.2.1** above.

Step 2: Make sure the SO-DIMM module is properly installed.

Step 3: Reset the system using the reset CMOS jumper.

7.2.3 More Troubleshooting

- ***Nothing appears on the monitor after booting up the system***: Make sure the monitor is properly connected to the system and the monitor is connected to a power supply and turned on.

WARNING!

If all troubleshooting measures have been taken and the system still fails to start, contact the IEI reseller or vendor you purchased the ECW-281B-945GSE from or contact an IEI sales representative directly. To contact an IEI sales representative, please send an email to sales@iei.com.tw.

7.3 Component Replacement Procedure

WARNING!

Users are not advised to attempt to repair or replace any internal or external components of the ECW-281B-945GSE embedded system other than those listed below. If any other components fail or need replacement, contact the IEI reseller or vendor you purchased the ECW-281B-945GSE from or contact an IEI sales representative directly. To contact an IEI sales representative, please send an email to sales@iei.com.tw.

The embedded system components listed below can all be replaced if they fail:

- SO-DIMM module
- Internal hard disk drive (see **Section 4.2.5**)

7.3.1 SO-DIMM Replacement

WARNING:

Using incorrectly specified SO-DIMM may cause permanently damage the ECW-281B-945GSE. Please make sure the purchased SO-DIMM complies with the memory specifications of the ECW-281B-945GSE.

To replace a SO-DIMM memory module into a SO-DIMM socket, please follow the steps below.

Step 1: **Remove the bottom surface panel.** Place the ECW-281B-945GSE on an anti-static pad with the bottom panel facing up and the bottom surface removed. (see **Section 4.2.3**).

Step 2: **Locate the SO-DIMM** (**Figure 7-1**).

Figure 7-1: SO-DIMM Cover Plate

Step 3: **Remove the SO-DIMM** by releasing the arms on the SO-DIMM socket.

Step 4: **Align the new SO-DIMM with the socket**. The SO-DIMM must be oriented in such a way that the notch in the middle of the SO-DIMM must be aligned with the plastic bridge in the socket (**Figure 7-2**).

Step 5: **Insert the SO-DIMM**. Push the SO-DIMM chip into the socket at an angle

(**Figure 7-2**).

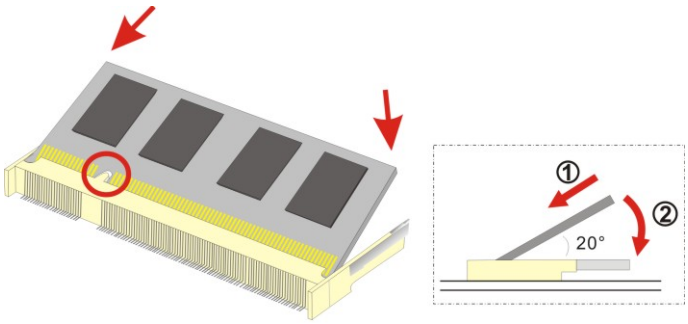


Figure 7-2: SO-DIMM Installation

Step 6: **Open the SO-DIMM socket arms**. Gently pull the arms of the SO-DIMM socket out and push the rear of the SO-DIMM down. (See **Figure 7-2**)

Step 7: **Secure the SO-DIMM**. Release the arms on the SO-DIMM socket. They clip into place and secure the SO-DIMM in the socket.

Appendix

A

Safety Precautions

WARNING:

The precautions outlined in this chapter should be strictly followed. Failure to follow these precautions may result in permanent damage to the ECW-281B-945GSE.

A.1 Safety Precautions

Please follow the safety precautions outlined in the sections that follow:

A.1.1 General Safety Precautions

Please ensure the following safety precautions are adhered to at all times.

- ***Follow the electrostatic precautions*** outlined below whenever the ECW-281B-945GSE is opened.
- ***Make sure the power is turned off and the power cord is disconnected*** whenever the ECW-281B-945GSE is being installed, moved or modified.
- ***Do not apply voltage levels that exceed the specified voltage range***. Doing so may cause fire and/or an electrical shock.
- ***Electric shocks can occur*** if the ECW-281B-945GSE chassis is opened when the ECW-281B-945GSE is running.
- ***Do not drop or insert any objects*** into the ventilation openings of the ECW-281B-945GSE.
- ***If considerable amounts of dust, water, or fluids enter the ECW-281B-945GSE***, turn off the power supply immediately, unplug the power cord, and contact the ECW-281B-945GSE vendor.
- **DO NOT**:
  - Drop the ECW-281B-945GSE against a hard surface.
  - In a site where the ambient temperature exceeds the rated temperature

A.1.2 Anti-static Precautions

WARNING:

Failure to take ESD precautions during the installation of the ECW-281B-945GSE may result in permanent damage to the ECW-281B-945GSE and severe injury to the user.

Electrostatic discharge (ESD) can cause serious damage to electronic components, including the ECW-281B-945GSE. Dry climates are especially susceptible to ESD. It is therefore critical that whenever the ECW-281B-945GSE is opened and any of the electrical components are handled, the following anti-static precautions are strictly adhered to.

- ***Wear an anti-static wristband***: Wearing a simple anti-static wristband can help to prevent ESD from damaging any electrical component.
- ***Self-grounding***: Before handling any electrical component, touch any grounded conducting material. During the time the electrical component is handled, frequently touch any conducting materials that are connected to the ground.
- ***Use an anti-static pad***: When configuring or working with an electrical component, place it on an antic-static pad. This reduces the possibility of ESD damage.
- ***Only handle the edges of the electrical component***: When handling the electrical component, hold the electrical component by its edges.

A.2 Maintenance and Cleaning Precautions

When maintaining or cleaning the ECW-281B-945GSE, please follow the guidelines below.

A.2.1 Maintenance and Cleaning

Prior to cleaning any part or component of the ECW-281B-945GSE, please read the details below.

- The interior of the ECW-281B-945GSE does not require cleaning. Keep fluids away from the ECW-281B-945GSE interior.
- Be cautious of all small removable components when vacuuming the ECW-281B-945GSE.
- Turn the ECW-281B-945GSE off before cleaning the ECW-281B-945GSE.
- Never drop any objects or liquids through the openings of the ECW-281B-945GSE.
- Be cautious of any possible allergic reactions to solvents or chemicals used when cleaning the ECW-281B-945GSE.
- Avoid eating, drinking and smoking within vicinity of the ECW-281B-945GSE.

A.2.2 Cleaning Tools

Some components in the ECW-281B-945GSE may only be cleaned using a product specifically designed for the purpose. In such case, the product will be explicitly mentioned in the cleaning tips. Below is a list of items to use when cleaning the ECW-281B-945GSE.

. ***Cloth*** – Although paper towels or tissues can be used, a soft, clean piece of cloth is recommended when cleaning the ECW-281B-945GSE.

Water or rubbing alcohol – A cloth moistened with water or rubbing alcohol can be used to clean the ECW-281B-945GSE.

Using solvents – The use of solvents is not recommended when cleaning the ECW-281B-945GSE as they may damage the plastic parts.

Vacuum cleaner – Using a vacuum specifically designed for computers is one of the best methods of cleaning the ECW-281B-945GSE. Dust and dirt can restrict the airflow in the ECW-281B-945GSE and cause its circuitry to corrode.

Cotton swabs - Cotton swaps moistened with rubbing alcohol or water are excellent tools for wiping hard to reach areas.

Foam swabs - Whenever possible, it is best to use lint free swabs such as foam swabs for cleaning.

Appendix

B

IEI Embedded System Series

B.1 IEI Embedded System Series

B.1.1 Overview

IEI embedded industrial PC systems are ideal for manufacturing and automation environments where heavy processing demands exist. These systems are designed to operate effectively within high-stress environments that have diverse operational conditions. This appendix introduces the full range of IEI embedded systems.

B.1.2 IEI Embedded System Series

The embedded system series are:

- ECW-180A
- ECW-180B
- ECW-181A
- ECW-181B
- ECW-281B
- ECN-171B
- ECN-171B
- ECK-3688G
- ECK-3699G
- IBOX-500A
- IBOX-650

B.1.3 IEI Embedded System Series Variations

The differences between the series are listed below.

	Motherboard	Cooling	CompactFlash	Drive Bays
ECW-180A	WAFER	Two cooling fans	One CF slot	None
ECW-180B	WAFER	Fanless	One CF slot	None
ECW-181A	WAFER	Two cooling fans	One CF slot	Two 2.5” drive bays
ECW-181B	WAFER	Fanless	One CF slot	Two 2.5” drive bays
ECN-171B	NANO	Fanless	One CF slot	None
ECN-171B	NANO	Fanless	One CF slot	One 2.5” drive bay
ECK-3688G	NANO	One cooling fan	None	One 2.5” drive bay
ECK-3699G	NANO	Two cooling fans	None	One 2.5” drive bay (optional)
IBOX-500A	AFLMB-LX-800	Fanless	One CF slot	None
IBOX-650A	-	Fanless	One CF slot	One 3.5” drive bay

Table B-1: Embedded System Series Overview

B.2 Embedded System Solutions

The different IEI Embedded System solutions are listed below. For further information, please contact an IEI distributor, reseller, vendor or IEI sales representative. Please also visit the IEI website (www.ieiworld.com).

B.2.1 AMD® Geode® LX800 500MHz Solutions

All the models listed in the table below support an AMD® Geode® LX800 500MHz CPU.

Model Number	System Chipset	DC Input	Fan	Drive Bays
ECW-180AS1	AMD® CS5536	12V	Two	None
ECW-180AS1WD	AMD® CS5536	9V ~ 36V	Two	None
ECW-180BS1	AMD® CS5536	12V	None	None
ECW-180BS1WD	AMD® CS5536	9V ~ 36V	None	None
ECW-181AS1	AMD® CS5536	12V	Two	Two 2.5” HDD

Model Number	System Chipset	DC Input	Fan	Drive Bays
ECW-181AS1WD	AMD® CS5536	9V ~ 36V	Two	Two 2.5” HDD
ECW-181BS1	AMD® CS5536	12V	None	Two 2.5” HDD
ECW-181BS1WD	AMD® CS5536	9V ~ 36V	None	Two 2.5” HDD
ECK-3688GA	AMD® CS5536	12V	One	One 2.5” HDD
IBOX-500A	AMD® CS5536	12V	None	None

Table B-2: AMD® Geode® LX800 Embedded System Solutions

B.2.2 AMD® Geode® GX466 333MHz Solutions

All the models listed in the table below support an AMD® Geode® GX466 333MHz CPU.

Model Number	System Chipset	DC Input	Fan	Drive Bays
ECW-180AS2	AMD® CS5536	12V	Two	None
ECW-180AS2WD	AMD® CS5536	9V ~ 36V	Two	None
ECW-180BS2	AMD® CS5536	12V	None	None
ECW-180BS2WD	AMD® CS5536	9V ~ 36V	None	None
ECW-181AS2	AMD® CS5536	12V	Two	Two 2.5” HDD
ECW-181AS2WD	AMD® CS5536	9V ~ 36V	Two	Two 2.5” HDD
ECW-181BS2	AMD® CS5536	12V	None	Two 2.5” HDD
ECW-181BS2WD	AMD® CS5536	9V ~ 36V	None	Two 2.5” HDD

Table B-3: AMD® Geode® GX466 Embedded System Solutions

B.2.3 VIA® LUKE® 1GHz Solutions

All the models listed in the table below support a VIA® LUKE® 1GHz CPU.

Model Number	System Chipset	DC Input	Fan	Drive Bays
ECW-180AS3	VIA® VT8237R+	12V	Two	None
ECW-180AS3WD	VIA® VT8237R+	9V ~ 36V	Two	None
ECW-180BS3	VIA® VT8237R+	12V	None	None
ECW-180BS3WD	VIA® VT8237R+	9V ~ 36V	None	None
ECW-181AS3	VIA® VT8237R+	12V	Two	Two 2.5” HDD
ECW-181AS3WD	VIA® VT8237R+	9V ~ 36V	Two	Two 2.5” HDD

Model Number	System Chipset	DC Input	Fan	Drive Bays
ECW-181BS3	VIA® VT8237R+	12V	None	Two 2.5” HDD
ECW-181BS3WD	VIA® VT8237R+	9V ~ 36V	None	Two 2.5” HDD
ECK-3688GB	VIA® VT8237R+	12V	One	One 2.5” HDD

Table B-4: VIA® LUKE® Embedded System Solutions

B.2.4 VIA® MARK® 800MHz Solutions

All the models listed in the table below support a VIA® MARK® 800MHz CPU.

Model Number	System Chipset	DC Input	Fan	Drive Bays
ECW-180AS4	VIA® VT82C686B	12V	Two	None
ECW-180AS4WD	VIA® VT82C686B	9V ~ 36V	Two	None
ECW-180BS4	VIA® VT82C686B	12V	None	None
ECW-180BS4WD	VIA® VT82C686B	9V ~ 36V	None	None
ECW-181AS4	VIA® VT82C686B	12V	Two	Two 2.5” HDD
ECW-181AS4WD	VIA® VT82C686B	9V ~ 36V	Two	Two 2.5” HDD
ECW-181BS4	VIA® VT82C686B	12V	None	Two 2.5” HDD
ECW-181BS4WD	VIA® VT82C686B	9V ~ 36V	None	Two 2.5” HDD

Table B-5: VIA® MARK® Embedded System Solutions

B.2.5 Intel® Celeron® M 1 GHz Solutions

The model listed in the table below support an Intel® Celeron® M 1 GHz zero cache CPU.

Model Number	System Chipset	DC Input	Fan	Drive Bays
ECW-281B	Intel® 945GSE + ICH7-M	12V or 9V~36V	No	One 2.5” HDD

Table B-6: Intel® Celeron® M 1 GHz Solutions

B.2.6 Intel® Celeron® M 1.5GHz Solutions

All the models listed in the table below support an Intel® Celeron® M 1.5GHz CPU.

Model Number	System Chipset	DC Input	Fan	Drive Bays
ECW-180AS5X	SiS 661CX + SiS 964	12V	Two	None
ECW-180AS5XWD	SiS 661CX + SiS 964	9V ~ 36V	Two	None
ECW-181AS5X	SiS 661CX + SiS 964	12V	Two	Two 2.5” HDD
ECW-181AS5XWD	SiS 661CX + SiS 964	9V ~ 36V	Two	Two 2.5” HDD
ECN-171BSE0-CM15G	Intel® 945GSE + ICH7-M	12V	None	None
ECN-171BSE0-WD-CM15G	Intel® 945GSE + ICH7-M	9V ~ 36V	None	None
ECN-171BSEA-CM15G	Intel® 945GSE + ICH7-M	12V	None	None
ECN-171BSEA-WD-CM15G	Intel® 945GSE + ICH7-M	9V ~ 36V	None	None
ECN-171BSEB-CM15G	Intel® 945GSE + ICH7-M	12V	None	None
ECN-171BSEB-WD-CM15G	Intel® 945GSE + ICH7-M	9V ~ 36V	None	None
ECN-171BSE0-CM15G	Intel® 945GSE + ICH7-M	12V	None	One 2.5” HDD
ECN-171BSE0-WD-CM15G	Intel® 945GSE + ICH7-M	9V ~ 36V	None	One 2.5” HDD
ECN-171BSEA-CM15G	Intel® 945GSE + ICH7-M	12V	None	One 2.5” HDD
ECN-171BSEA-WD-CM15G	Intel® 945GSE + ICH7-M	9V ~ 36V	None	One 2.5” HDD
ECN-171BSEB-CM15G	Intel® 945GSE + ICH7-M	12V	None	One 2.5” HDD
ECN-171BSEB-WD-CM15G	Intel® 945GSE + ICH7-M	9V ~ 36V	None	One 2.5” HDD
ECK-3688GDX	SiS 661CX + SiS 964	12V	One	One 2.5” HDD

Model Number	System Chipset	DC Input	Fan	Drive Bays
				(optional)

Table B-7: Intel® Celeron® M 1.5GHz Solutions

B.2.7 Intel® Pentium® M 1.6GHz Solutions

All the models listed in the table below support an Intel® Pentium® M 1.6GHz CPU.

Model Number	System Chipset	DC Input	Fan	Drive Bays
ECN-171BSE0-PM16G	Intel® 945GSE + ICH7-M	12V	None	None
ECN-171BSE0-WD-PM16G	Intel® 945GSE + ICH7-M	9V ~ 36V	None	None
ECN-171BSEC-PM16G	Intel® 945GSE + ICH7-M	12V	None	None
ECN-171BSEC-WD-PM16G	Intel® 945GSE + ICH7-M	9V ~ 36V	None	None
ECN-171BSE0-PM16G	Intel® 945GSE + ICH7-M	12V	None	One 2.5” HDD
ECN-171BSE0-WD-PM16G	Intel® 945GSE + ICH7-M	9V ~ 36V	None	One 2.5” HDD
ECN-171BSEC-PM16G	Intel® 945GSE + ICH7-M	12V	None	One 2.5” HDD
ECN-171BSEC-WD-PM16G	Intel® 945GSE + ICH7-M	9V ~ 36V	None	One 2.5” HDD

Table B-8: Intel® Pentium® M Embedded System Solutions

B.2.8 Intel® Socket 479 Pentium®/Celeron® M 2GHz Solutions

All the models listed in the table below support an Intel® Socket 479 Pentium®/Celeron® M 2GHz CPU with a 400/533MHz FSB (front side bus).

Model Number	System Chipset	DC Input	Fan	Drive Bays
ECW-180AS5S	SiS 661CX + SiS 964	12V	Two	None
ECW-180AS5SWD	SiS 661CX + SiS 964	9V ~ 36V	Two	None

ECW-181AS5S	SiS 661CX + SiS 964	12V	Two	Two 2.5” HDD
ECW-181AS5SWD	SiS 661CX + SiS 964	9V ~ 36V	Two	Two 2.5” HDD
ECK-3688GDS	SiS 661CX + SiS 964	12V	One	One 2.5” HDD (optional)

Table B-9: Intel® Socket 479 Pentium®/Celeron® M Embedded System Solutions

B.2.9 LGA 775 Intel® Pentium® 4/ Pentium® D Solutions

All the models listed in the table below support a LGA 775 Intel® Pentium® 4/ Pentium® D CPU.

Model Number	System Chipset	DC Input	Fan	Drive Bays
ECK-3699GE	Intel® 945G + ICH7	19V DC	Two	One 2.5” HDD (optional)
ECK-3699GH	SiS 661CX + SiS 966	19V DC	Two	One 2.5” HDD (optional)

Table B-10: LGA 775 Intel® Pentium® 4/ Pentium® D System Solutions

B.2.10 Intel® Socket 479 Core Duo/Solo Solutions

All the models listed in the table below support an Intel® Socket 479 Core Duo/Solo CPU with a 667MHz FSB (front side bus).

Model Number	System Chipset	DC Input	Fan	Drive Bays
ECK-3699GF	Intel® 945GM + ICH7M	19V DC	Two	One 2.5” HDD (optional)

Table B-11: Intel® Socket 479 Core Duo/Solo System Solutions

Appendix

C

BIOS Menu Options

C.1 BIOS Configuration Options

Below is a list of BIOS configuration options described in **Chapter 5**.

Appendix

D

Watchdog Timer

NOTE:

The following discussion applies to DOS environment. IEI support is contacted or the IEI website visited for specific drivers for more sophisticated operating systems, e.g., Windows and Linux.

The Watchdog Timer is provided to ensure that standalone systems can always recover from catastrophic conditions that cause the CPU to crash. This condition may have occurred by external EMI or a software bug. When the CPU stops working correctly, Watchdog Timer either performs a hardware reset (cold boot) or a Non-Maskable Interrupt (NMI) to bring the system back to a known state.

A BIOS function call (INT 15H) is used to control the Watchdog Timer:

INT 15H:

AH – 6FH Sub-function:	
AL – 2:	Sets the Watchdog Timer's period.
BL:	Time-out value (Its unit-second is dependent on the item "Watchdog Timer unit select" in CMOS setup).

Table D-1: AH-6FH Sub-function

Call sub-function 2 to set the time-out period of Watchdog Timer first. If the time-out value is not zero, the Watchdog Timer starts counting down. While the timer value reaches zero, the system resets. To ensure that this reset condition does not occur, calling sub-function 2 must periodically refresh the Watchdog Timer. However, the Watchdog timer is disabled if the time-out value is set to zero.

A tolerance of at least 10% must be maintained to avoid unknown routines within the operating system (DOS), such as disk I/O that can be very time-consuming.

NOTE:

When exiting a program it is necessary to disable the Watchdog Timer, otherwise the system resets.

Example program:

```
; INITIAL TIMER PERIOD COUNTER
;
W_LOOP:

        MOV     AX, 6F02H       ;setting the time-out value
        MOV     BL, 30          ;time-out value is 48 seconds
        INT      15H
 ;
; ADD THE APPLICATION PROGRAM HERE
;
        CMP      EXIT_AP, 1     ;is the application over?
        JNE      W_LOOP         ;No, restart the application

        MOV     AX, 6F02H       ;disable Watchdog Timer
        MOV     BL, 0           ;
        INT      15H
;
; EXIT ;
```