



IEI Technology Corp.



MODEL:
NANO-PV-D510A

**EPIC SBC with Intel® Atom™ D510 Dual Core Processor,
Gigabit Ethernet, USB, PCI-104, PCIe Mini Card, RS-232,
RS-232/422/485, SATA, CompactFlash® Type II
RoHS Compliant**

User Manual

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Revision

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Chapter

1

Introduction

1.1 Introduction

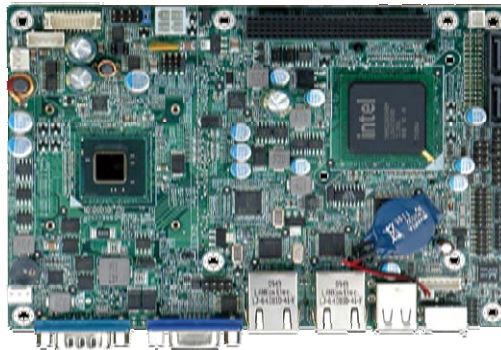


Figure 1-1: NANO-PV-D510A

The NANO-PV-D510A EPIC CPU card is an embedded 45 nm Intel® Atom™ processor platform. The Intel® Atom™ dual-core processor D510 embedded on the NANO-PV-D510A has a 1.66 GHz clock speed, and a 1 MB L2 cache. The NANO-PV-D510A supports one 200-pin 667/800 MHz 2.0 GB (max.) DDR2 SDRAM SO-DIMM. The board includes one LVDS connector (supports an 18-bit single-channel LVDS screen), one VGA connector, and supports a dual-display configuration. The NANO-PV-D510A also comes with two Gigabit Ethernet (GbE) connectors, two SATA connectors, eight USB 2.0 connectors, one PCI-104 slot, one PCIe Mini Card slot, three RS-232 connectors, one RS-232/422/485 and one CompactFlash® Type II slot.

1.2 Features

Some of the NANO-PV-D510A motherboard features are listed below:

- EPIC form factor
- RoHS compliant
- PCI-104 and PCIe expansion slots
- Supports one DDR2 SO-DIMM up to 2.0 GB
- Two Gigabit Ethernet controllers
- Supports 8 USB 2.0 ports

1.3 Connectors

The connectors on the NANO-PV-D510A are shown in the figure below.

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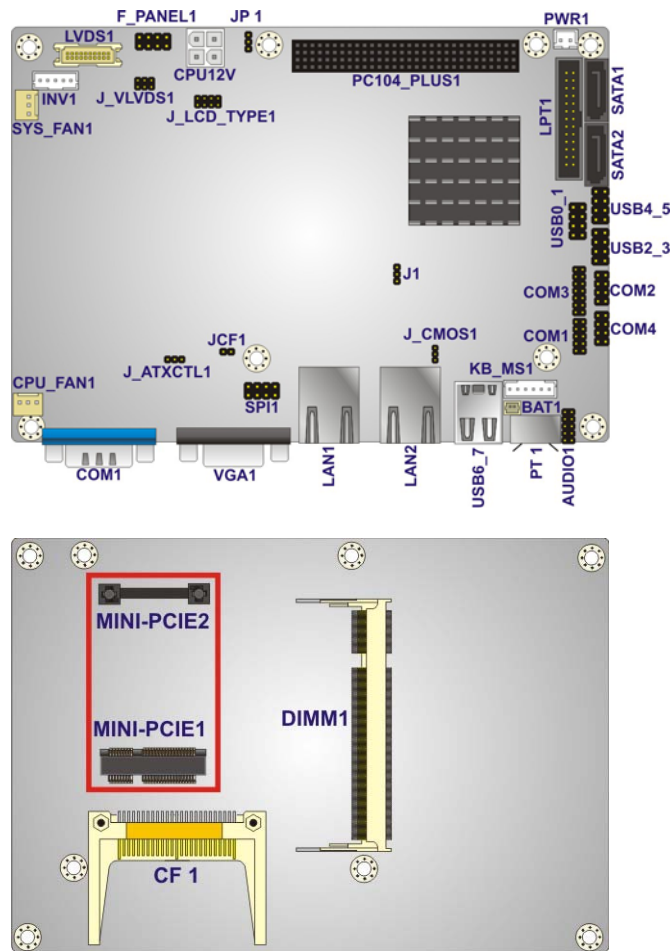


Figure 1-2: Connectors

1.4 Dimensions

The main dimensions of the NANO-PV-D510A are shown in the diagram below.

- Length: 165 mm
- Width: 115 mm

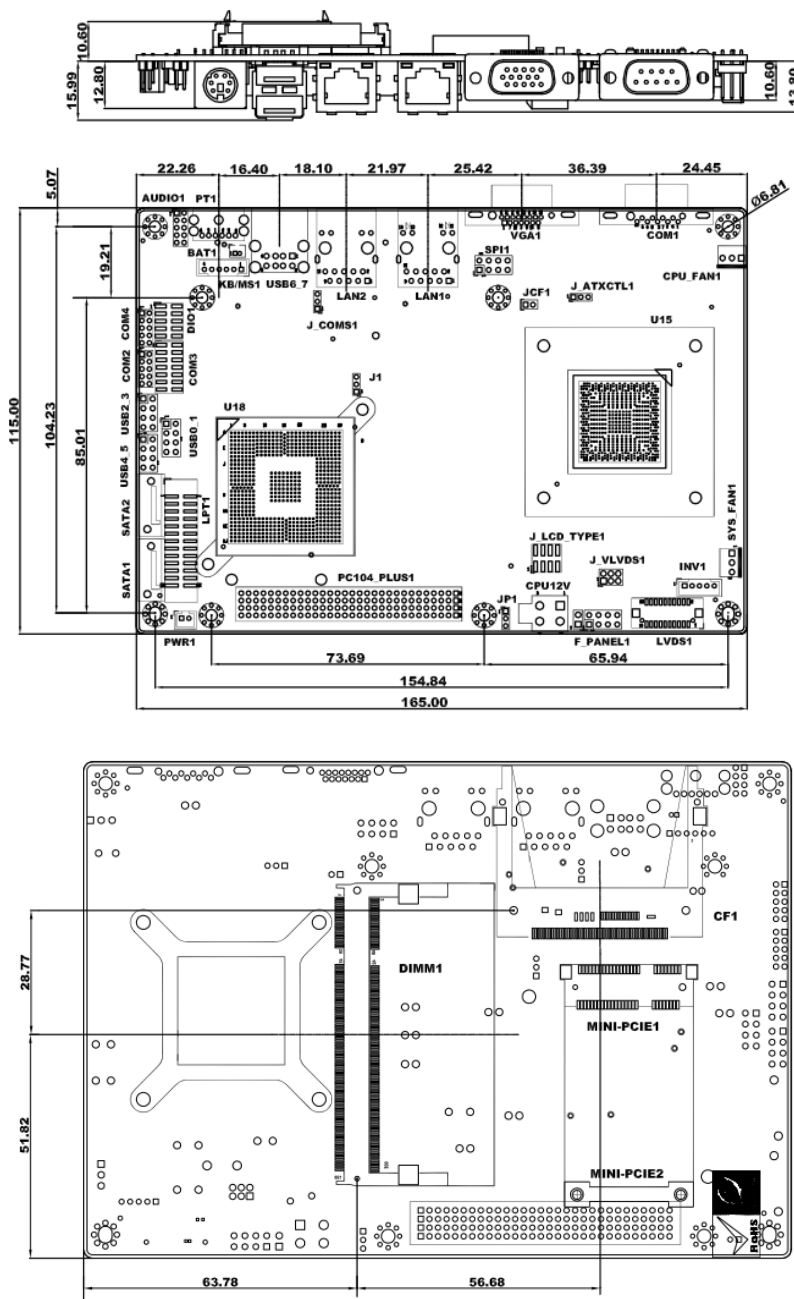


Figure 1-3: NANO-PV-D510A Dimensions (mm)

1.5 Data Flow

Figure 1-4 shows the data flow between the system chipset, the CPU and other components installed on the motherboard.

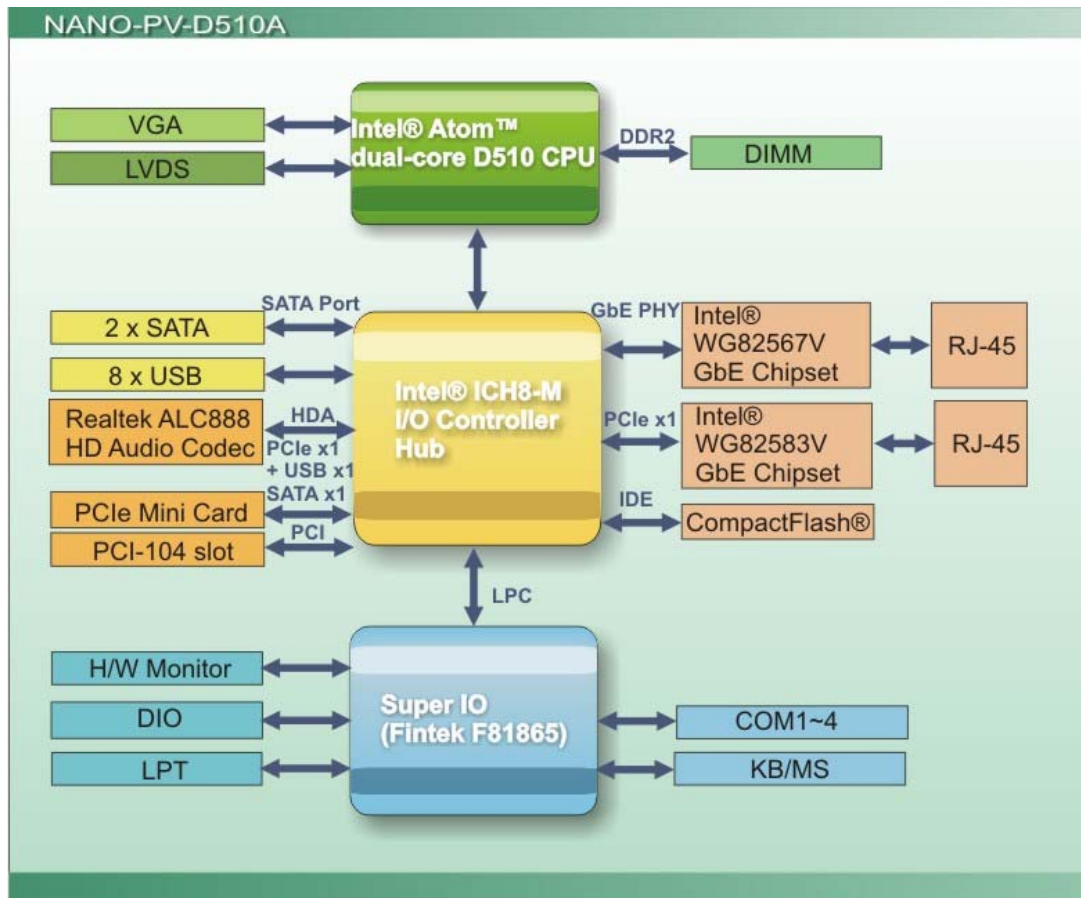


Figure 1-4: Data Flow Diagram

1.6 Technical Specifications

NANO-PV-D510A technical specifications are listed in **Table 1-1**.

Specification	NANO-PV-D510A
Form Factor	Epic
CPU	Intel® Atom™ D510 Dual Core Processor 1.66 GHz/1 MB L2 Cache
System Chipset	Intel® ICH8M

Specification	NANO-PV-D510A
Memory	One single-channel 2.0 GB (max.) 667/800 MHz DDR2 SDRAM SO-DIMM supported
Audio	Realtek ALC888 HD codec
LAN	Intel® GbE PHY W82567V and PCIe GbE W82583V
Super I/O Controller	Fintek F81865
BIOS	AMI BIOS
Watchdog Timer	Software programmable supports 1~255 sec. system reset
Expansion	
PCI	One PCI-104 slot
PCIe	One PCIe mini card slot
I/O Interface Connectors	
Audio Connectors	One audio connector by internal pin header
Display port	One VGA One internal LVDS connector
Ethernet	Two RJ-45 ports
Keyboard/Mouse	One dual PS/2 port One KB/MS connector via internal header
LPT	One Parallel port connector via internal pin header
Serial Ports	One RS-232 by DB-9 port Two RS-232 by internal pin headers One RS-232/422/485 by internal pin header
USB 2.0/1.1 ports	Two external USB ports Six USB via internal pin headers
Storage	
CompactFlash®	One CompactFlash® slot
Serial ATA	Two independent serial ATA (SATA) channels with 3.0 Gb/s data transfer rates

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Specification	NANO-PV-D510A
Environmental and Power Specifications	
Power Supply	12 V only, AT/ATX support by jumper
Power Consumption	12 V @ 1.63A DDR2 667 MHz 1 GB (Windows® XP, 3D mark®2001)
Operating temperature	-10°C ~ 60°C (requires cooler and silicone heat sink paste)
Humidity	5% ~ 95% (non-condensing)
Physical Specifications	
Dimensions	165 mm x 115 mm
Weight GW/NW	650g/280g

Table 1-1: Technical Specifications

Chapter

2

Unpacking

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2.1 Anti-static Precautions



WARNING!

Static electricity can destroy certain electronics. Make sure to follow the ESD precautions to prevent damage to the product, and injury to the user.

Make sure to adhere to the following guidelines:

- ***Wear an anti-static wristband:*** Wearing an anti-static wristband can prevent electrostatic discharge.
- ***Self-grounding:*** Touch a grounded conductor every few minutes to discharge any excess static buildup.
- ***Use an anti-static pad:*** When configuring any circuit board, place it on an anti-static mat.
- ***Only handle the edges of the PCB:*** Don't touch the surface of the motherboard. Hold the motherboard by the edges when handling.

2.2 Unpacking Precautions

When the NANO-PV-D510A is unpacked, please do the following:

- Follow the antistatic guidelines above.
- Make sure the packing box is facing upwards when opening.
- Make sure all the packing list items are present.

2.3 Packing List



NOTE:

If any of the components listed in the checklist below are missing, do not proceed with the installation. Contact the IEI reseller or vendor the NANO-PV-D510A was purchased from or contact an IEI sales representative directly by sending an email to sales@iei.com.tw.

The NANO-PV-D510A is shipped with the following components:

Quantity	Item and Part Number	Image
1	NANO-PV-D510A	
1	SATA and power cable (P/N: 32000-114000-RS)	
1	KB/MS PS/2 Y-cable (P/N: 32000-133200-RS)	
2	RS-232 cable (P/N: 32200-000049-RS)	
1	Audio cable (P/N: 32000-072100-RS)	
1	AT 12V Cable (P/N: 32100-087100-RS)	
1	Mini jumper pack (P/N: 33101-000657-RS)	

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1	Utility CD	
1	Quick Installation Guide	

2.3.1 Optional Items

The NANO-PV-D510A is shipped with the following components:

Item and Part Number	Image
SATA cable (P/N: 32000-062800-RS)	
SATA power cable (P/N: 32100-088600-RS)	
LPT cable (w/o bracket) (P/N: 32200-015100-RS)	
RS-232/422/485 cable (P/N: 32200-026500-RS)	
Dual USB cable (wo bracket) (P/N: 32000-044300-RS)	

Chapter

3

Connectors

3.1 Peripheral Interface Connectors

This chapter details all the jumpers and connectors.

3.1.1 Layout

The figures below show all the connectors and jumpers.

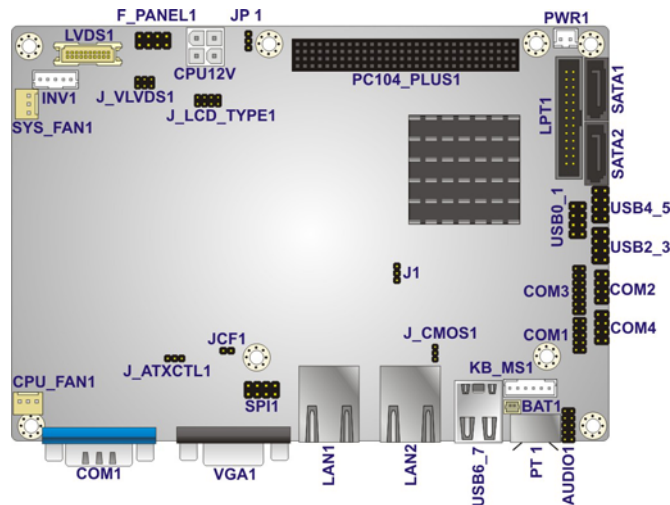


Figure 3-1: Connectors and Jumpers

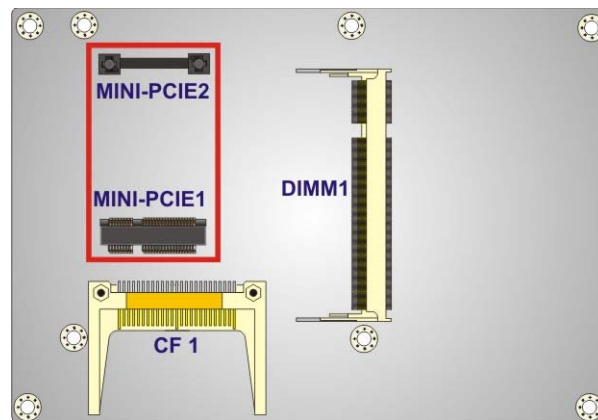


Figure 3-2: Connectors and Jumpers (Solder Side)

3.1.2 Peripheral Interface Connectors

The table below lists all the connectors on the board.

Connector	Type	Label
+12 V ATX power supply connector	4-pin ATX connector	CPU12V1
Audio connector	10-pin header	AUDIO1
Battery connector	2-pin header	BAT1
CompactFlash® (CF) connector	50-pin header	CF1
Digital I/O connector	10-pin header	DIO1
Inverter power connector	5-pin header	INV1
Fan connector	3-pin wafer	SYS_FAN1, CPU_FAN1
Front panel connector	8-pin header	F_PANEL1
Keyboard and mouse connector	6-pin wafer	KB/MS1
LVDS connector	20-pin crimp	LVDS1
Parallel port connector	26-pin header	LPT1
PCI-104 slot	120-pin slot	PCI104_PLUS1
PCIe Mini Card slot	52-pin slot	MINI-PCIE1, MINI-PCIE2
SATA connector	SATA connector	SATA1, SATA2
SATA power connector	2-pin header	PWR1
Serial port connector (COM2, COM4)	10-pin header	COM2, COM4
Serial port connector (COM3)	14-pin header	COM3
SPI Flash Connector	8-pin header	SPI1
USB connector	8-pin header	USB0_1, USB2_3, USB4_5

Table 3-1: Peripheral Interface Connectors

3.1.3 External Interface Panel Connectors

The table below lists the connectors on the external I/O panel.

Connector	Type	Label
Ethernet connector	RJ-45	LAN1, LAN2
Keyboard/Mouse connector	PS/2	PT1
RS-232 serial port connector	9-pin male	COM1
USB port, dual	USB port	USB6_7
VGA port connector	15-pin female	VGA1

Table 3-2: Rear Panel Connectors

3.2 Internal Peripheral Connectors

The section describes all of the connectors on the NANO-PV-D510A.

3.2.1 12V Power Connector

- CN Label:** CPU12V1
- CN Type:** 4-pin AT power connector
- CN Location:** See **Figure 3-3**
- CN Pinouts:** See **Table 3-3**

The 4-pin 12V power connector is connected to an AT or ATX power supply.

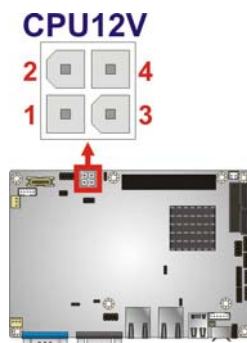


Figure 3-3: AT Power Connector Location

Pin	Description
1	GND
2	GND

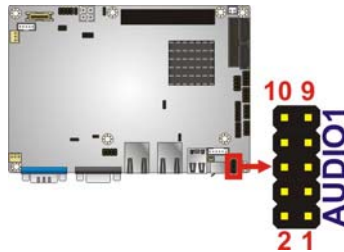
Pin	Description
3	EXT_12VIN
4	EXT_12VIN

Table 3-3: AT Power Connector Pinouts

3.2.2 Audio Kit Connector

CN Label: **AUDIO1**
CN Type: 10-pin header
CN Location: See **Figure 3-4**
CN Pinouts: See **Table 3-4**

This connector connects to an external audio kit.


Figure 3-4: Audio Kit Connector Location

Pin	Description	Pin	Description
1	LINEOUTR	2	LINE1R
3	GND	4	GND
5	LINEOUTL	6	LINE1L
7	GND	8	GND
9	FMIC1R	10	FMIC1L

Table 3-4: Audio Kit Connector Pinouts

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3.2.3 Battery Connector

CN Label:	BAT1
CN Type:	2-pin wafer (1x2)
CN Location:	See Figure 3-5
CN Pinouts:	See Table 3-5

This is connected to the system battery. The battery provides power to the system clock to retain the time when power is turned off.

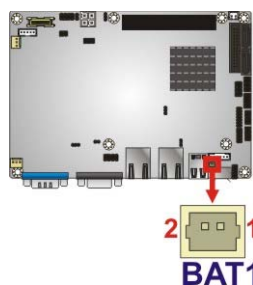


Figure 3-5: Battery Connector Location

Pin	Description
1	Battery+
2	Ground

Table 3-5: Battery Connector Pinouts

3.2.4 CompactFlash® Slot

CN Label:	CF1
CN Type:	CompactFlash® card slot
CN Location:	See Figure 3-6
CN Pinouts:	See Table 3-6

A CompactFlash® Type I/II card can be used in this slot.

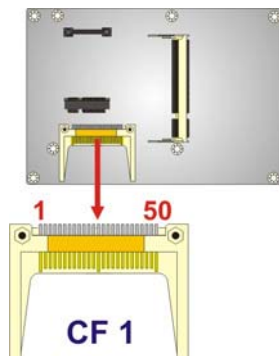


Figure 3-6: CompactFlash® Slot Location

Pin	Description	Pin	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	N/C	33	N/C
9	GROUND	34	IOR#
10	N/C	35	IOW#
11	N/C	36	VCC_COM
12	N/C	37	IRQ15
13	VCC_COM	38	VCC_COM
14	N/C	39	CSEL
15	N/C	40	N/C
16	N/C	41	HDD_RESET
17	N/C	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

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Pin	Description	Pin	Description
23	DATA 2	48	DATA 9
24	N/C	49	DATA 10
25	VCC-IN CHECK2	50	GROUND

Table 3-6: CompactFlash® Slot Pinouts

3.2.5 Digital I/O Connector

CN Label: DIO1

CN Type: 10-pin header

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

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

The digital I/O connector provides programmable input and output for external devices. The digital I/O provides 4-bit output and 4-bit input.

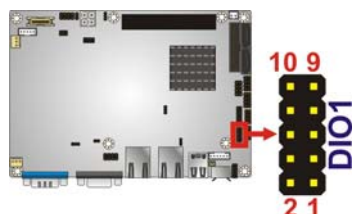


Figure 3-7: Digital I/O Connector Locations

Pin	Description	Pin	Description
1	GND	2	VCC
3	Output 3	4	Output 2
5	Output 1	6	Output 0
7	Input 3	8	Input 2
9	Input 1	10	Input 0

Table 3-7: Digital I/O Connector Pinouts

3.2.6 Fan Connector

- CN Label:** CPU_FAN1, SYS_FAN1
- CN Type:** 3-pin header
- CN Location:** See **Figure 3-8**
- CN Pinouts:** See **Table 3-8**

The fan connector attaches to a cooling fan.

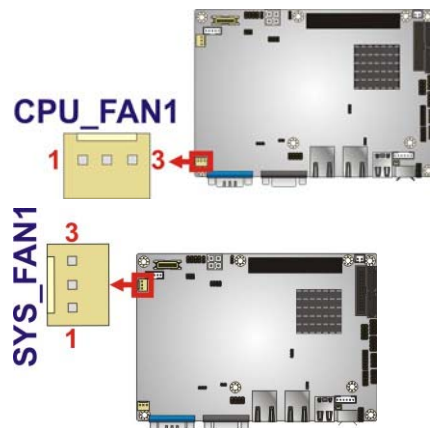


Figure 3-8: Fan Connector Location

Pin	Description
1	FANIO1
2	+12V
3	GND

Table 3-8: Fan Connector Pinouts

3.2.7 Front Panel Connector

- CN Label:** F_PANEL1
- CN Type:** 8-pin header (2x4)
- CN Location:** See **Figure 3-9**
- CN Pinouts:** See **Table 3-9**

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The front panel connector connects to the indicator LEDs and buttons on the computer's front panel.

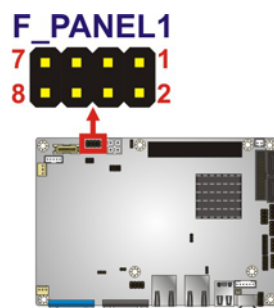


Figure 3-9: Front Panel Connector Pinout Locations (8-pin)

FUNCTION	PIN	DESCRIPTION	FUNCTION	PIN	DESCRIPTION
Power Button	1	PWR_BTN	Power LED	2	VCC5
	3	GND		4	GND
HDD LED	5	HDD_LED +	Reset Button	6	RESET
	7	HDD_LED -		8	GND

Table 3-9: Front Panel Connector Pinouts (8-pin)

3.2.8 LVDS Backlight Inverter Connector

CN Label: INV1

CN Type: 5-pin wafer (1x5)

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

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

The backlight inverter connector provides power to an LCD panel.

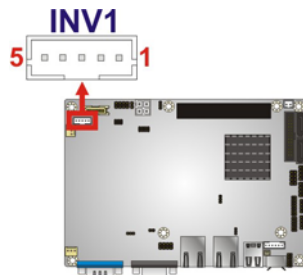


Figure 3-10: Backlight Inverter Connector Location

Pin	Description
1	BACKLIGHT ADJUST
2	GROUND
3	+ 12 V
4	GROUND
5	BACKLIGHT ENABLE

Table 3-10: Backlight Inverter Connector Pinouts

3.2.9 Keyboard/Mouse Connector

- CN Label:** KB/MS1
- CN Type:** 6-pin header (1x6)
- CN Location:** See **Figure 3-11**
- CN Pinouts:** See **Table 3-11**

The keyboard/mouse connector connects to a PS/2 Y-cable that can be connected to a PS/2 keyboard and mouse.

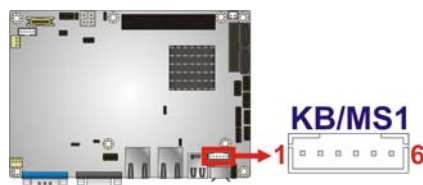


Figure 3-11: Keyboard/Mouse Connector Location

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Pin	Description
1	+5 V KB DATA
2	MS DATA
3	MS CLK
4	KB DATA
5	KB CLK
6	GROUND

Table 3-11: Keyboard/Mouse Connector Pinouts

3.2.10 LVDS LCD Connector

- CN Label:** LVDS1
- CN Type:** 30-pin crimp (2x15)
- CN Location:** See **Figure 3-12**
- CN Pinouts:** See **Table 3-12**

The LVDS connector is for an LCD panel connected to the board.

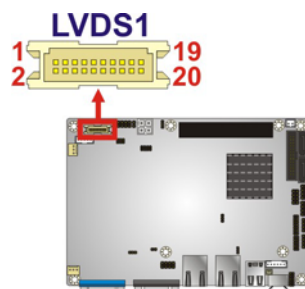


Figure 3-12: LVDS Connector Location

Pin	Description	Pin	Description
1	GROUND	2	GROUND
3	LVDSA_DATA0 +	4	LVDSA_DATA0 -
5	LVDSA_DATA1 +	6	LVDSA_DATA1 -
7	LVDSA_DATA2 +	8	LVDSA_DATA2 -
9	LVDSA_CLK +	10	LVDSA_CLK -
11	N/C	12	N/C

Pin	Description	Pin	Description
13	GROUND	14	GROUND
15	LDDC_DATA	16	LDDC_CLK
17	VCC_LCD	18	VCC_LCD
19	VCC_LCD	20	VCC_LCD

Table 3-12: LVDS Connector Pinouts

3.2.11 Parallel Port Connector

- CN Label:** LPT1
- CN Type:** 26-pin box header
- CN Location:** See **Figure 3-13**
- CN Pinouts:** See **Table 3-13**

The parallel port connector connects to a parallel port connector interface or some other parallel port device such as a printer.

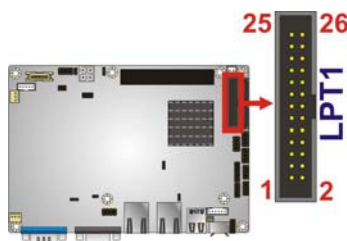


Figure 3-13: Parallel Port Connector Location

Pin	Description	Pin	Description
1	STROBE#	2	DATA 0
3	DATA 1	4	DATA 2
5	DATA 3	6	DATA 4
7	DATA 5	8	DATA 6
9	DATA 7	10	ACKNOWLEDGE
11	BUSY	12	PAPER EMPTY
13	PRINTER SELECT	14	AUTO FORM FEED #
15	ERROR#	16	INITIALIZE
17	PRINTER SELECT LN#	18	GROUND

Pin	Description	Pin	Description
19	GROUND	20	GROUND
21	GROUND	22	GROUND
23	GROUND	24	GROUND
25	GROUND	26	NC

Table 3-13: Parallel Port Connector Pinouts

3.2.12 PCI-104 Connector

- CN Label:** PCI104_PLUS1
- CN Type:** PCI-104 connector
- CN Location:** See **Figure 3-14**
- CN Pinouts:** See **Table 3-14**

The PCI-104 connector is for installing a PCI-104 expansion card.

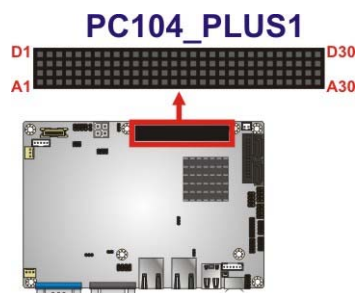


Figure 3-14: PCI-104 Connector Location

Pin	Row A	Row B	Row C	Row D
1	GND	TBD1	5 V	AD00
2	VI/O1	AD02	AD01	+5 V
3	AD05	GND	AD04	AD03
4	C/BE0 #	AD07	GND	AD06
5	GND	AD09	AD08	GND
6	AD11	VI/O2	AD10	M66EN
7	AD14	AD13	GND	AD12
8	+3.3 V	C/BE1 #	AD15	+3.3 V

Pin	Row A	Row B	Row C	Row D
9	SERR#	GND	SB0#	PAR
10	GND	PERR#	+3.3 V	SDONE
11	STOP#	+3.3 V	LOCK#	GND
12	+3.3 V	TRDY#	GND	DEVSEL#
13	FRAME#	GND	IRDY#	+3.3 V
14	GND	AD16	+3.3 V	C/BE2#
15	AD18	+3.3 V	AD17	GND
16	AD21	AD20	GND	AD19
17	+3.3 V	AD23	AD22	+3.3 V
18	IDSEL0	GND	IDSEL1	IDSEL2
19	AD24	C/BE3#	VI/O1	IDSEL3
20	GND	AD26	AD25	GND
21	AD29	+5 V	AD28	AD27
22	+5 V	AD30	GND	AD31
23	REQ0#	GND	REQ1#	VI/O2
24	GND	REQ2#	+5 V	GNT0#
25	GNT1#	VI/O3	GNT2#	GND
26	+5 V	CLK0	GND	CLK1
27	CLK2	+5 V	CLK3	GND
28	GND	INTD#	+5 V	RST#
29	+12 V	INTA#	INTB#	INTC#
30	-12 V	TBD2	TBD	GND

Table 3-14: PCI-104 Connector Pinouts

3.2.13 PCIe Mini Card Slot

CN Label: MINI-PCIE1, MINI-PCIE2

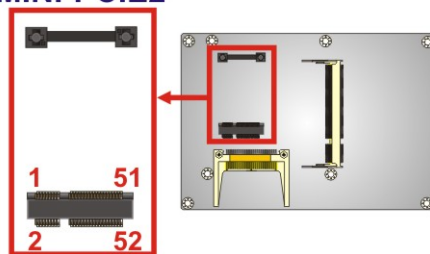
CN Type: PCIe Mini card slot

CN Location: See Figure 3-15

CN Pinouts: See Table 3-15

The PCIe Mini card slot is for installing PCIe Mini expansion cards.

MINI-PCIE2



MINI-PCIE1

Figure 3-15: PCIe Mini Card Slot Location

Pin	Description	Pin	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	1.5 V
29	GND	30	SMBCLK
31	PETN2	32	SMBDATA
33	PETP2	34	GND
35	GND	36	USB-
37	GND	38	USB+
39	VCC3	40	GND
41	VCC3	42	N/C
43	GND	44	RF_LINK#
45	SATA_TXP1	46	BLUELED#

Pin	Description	Pin	Description
47	SATA_TXN1	48	1.5V
49	SATA_RXN1	50	GND
51	SATA_RXP1	52	VCC3

Table 3-15: PCIe Mini Card Slot Pinouts

3.2.14 SATA Drive Connectors

- CN Label:** SATA1, SATA2
- CN Type:** 7-pin SATA drive connectors
- CN Location:** See Figure 3-16
- CN Pinouts:** See Table 3-16

The SATA connectors connect to SATA hard drives or optical drives.

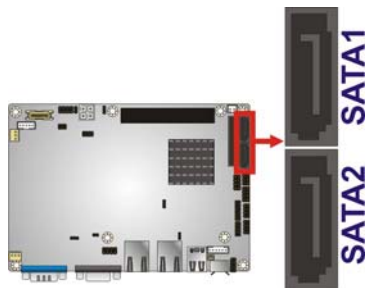


Figure 3-16: SATA Drive Connector Location

Pin	Description
1	GND
2	TX+
3	TX-
4	GND
5	RX-
6	RX+
7	GND

Table 3-16: SATA Drive Connector Pinouts

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3.2.15 SATA Power Connector

CN Label:	PWR1
CN Type:	2-pin header
CN Location:	See Figure 3-17
CN Pinouts:	See Table 3-17

Use the SATA Power Connector to connect to SATA device power connections.

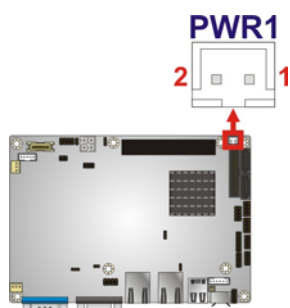


Figure 3-17: SATA Power Connector Locations

Pin	Description
1	+5V
2	GND

Table 3-17: SATA Power Connector Pinouts

3.2.16 Serial Port Connectors

CN Label:	COM2, COM4
CN Type:	10-pin header (2x5)
CN Location:	See Figure 3-18
CN Pinouts:	See Table 3-18

These connectors provide RS-232 communications.

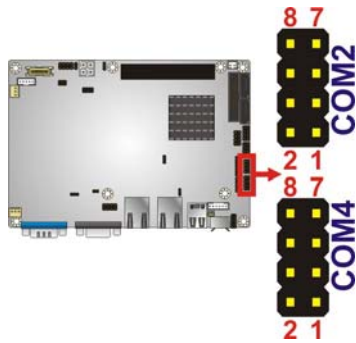


Figure 3-18: Serial Port Connector Locations

Pin	Description	Pin	Description
1	Data Carrier Direct (DCD)	2	Data Set Ready (DSR)
3	Receive Data (RXD)	4	Request To Send (RTS)
5	Transmit Data (TXD)	6	Clear To Send (CTS)
7	Data Terminal Ready (DTR)	8	Ring Indicator (RI)
9	Ground (GND)	10	N/C

Table 3-18: Serial Port Connector Pinouts

3.2.17 Serial Port Connector

CN Label: COM3

CN Type: 14-pin header (2x7)

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

CN Pinouts: See **Table 3-19**

Used for RS-232/422/485 communications.

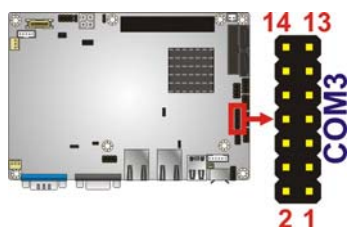


Figure 3-19: Serial Port Connector Location

Pin	Description	Pin	Description
1	DCD	2	NDSR2
3	RXD	4	NRTS2
5	TXD	6	NCTS2
7	DTR	8	NR12
9	GND	10	GND
11	TXD485+	12	TXD485-
13	RXD485+	14	RXD485-

Table 3-19: Serial Port Connector Pinouts

3.2.18 SPI Flash Connector

- CN Label:** SPI1
- CN Type:** 8-pin header (2x4)
- CN Location:** See **Figure 3-20**
- CN Pinouts:** See **Table 3-20**

The 8-pin SPI Flash connector is used to flash the BIOS.

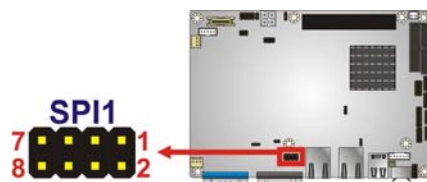


Figure 3-20: SPI Flash Connector

Pin	Description	Pin	Description
1	VCC	2	GND
3	CS#	4	CLOCK
5	SO	6	SI
7	NC	8	NC

Table 3-20: SPI Flash Connector

3.2.19 USB Connector

CN Label: USB0_1, USB2_3 and USB4_5

CN Type: 8-pin header (2x4)

CN Location: See **Figure 3-21**

CN Pinouts: See **Table 3-21**

The USB connectors connect to USB devices. Each pin header provides two USB ports.

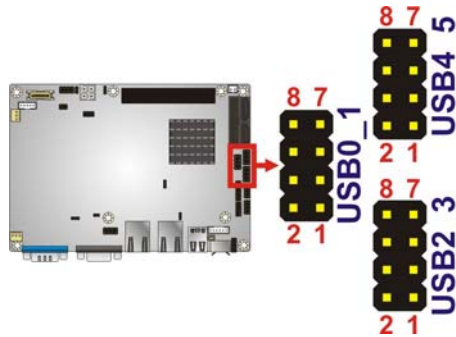


Figure 3-21: USB Connector Pinout Locations

Pin	Description	Pin	Description
1	VCC	2	GND
3	DATAN-	4	DATAM+
5	DATAN+	6	DATAM-
7	GND	8	VCC

Table 3-21: USB Port Connector Pinouts

3.3 External Peripheral Interface Connector Panel

The figure below shows the external peripheral interface connector (EPIC) panel. The EPIC panel consists of the following:

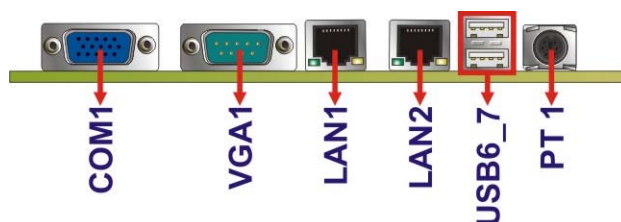


Figure 3-22: External Peripheral Interface Connector

3.3.1 Keyboard/Mouse Connector

CN Label:	PT1
CN Type:	PS/2
CN Location:	See Figure 3-22
CN Pinouts:	See Table 3-22

The keyboard and mouse connector is a standard PS/2 connector.

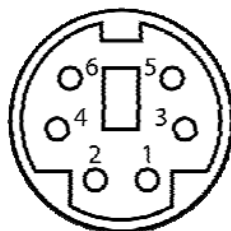


Figure 3-23: PS/2 Pinout and Configuration

Pin	Description
1	KB DATA
2	MS DATA
3	GND
4	VCC
5	KB CLOCK
6	MS CLOCK

Table 3-22: Keyboard Connector Pinouts

3.3.2 LAN Connector

CN Label: LAN1
CN Type: RJ-45
CN Location: See **Figure 3-24**
CN Pinouts: See **Table 3-23**

A 10/100/1000 Mb/s connection can be made to a Local Area Network.

Pin	Description	Pin	Description
1	MDIA3-	5	MDIA1+
2	MDIA3+	6	MDIA2+
3	MDIA2-	7	MDIA0-
4	MDIA1-	8	MDIA0+

Table 3-23: Ethernet Connector Pinouts

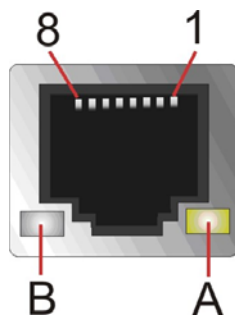


Figure 3-24: Ethernet Connector

LED	Description	LED	Description
A	on: linked blinking: data is being sent/received	B	off: 10 Mb/s green: 100 Mb/s orange: 1000 Mb/s

Table 3-24: Connector LEDs

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3.3.3 Serial Port Connectors (COM1)

CN Label:	COM1
CN Type:	DB-9 connector
CN Location:	See Figure 3-22
CN Pinouts:	See Table 3-25 and Figure 3-25

The serial port connects to a RS-232 serial communications device.

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

Table 3-25: Serial Port Pinouts

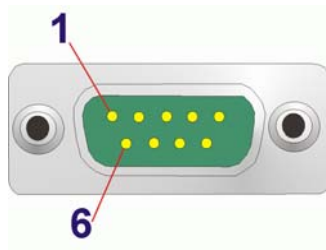


Figure 3-25: Serial Port Pinouts

3.3.4 USB Connector

CN Label:	USB6_7
CN Type:	USB port
CN Location:	See Figure 3-22
CN Pinouts:	See Table 3-26

The USB connector can be connected to a USB device.

Pin	Description	Pin	Description
1	USBV3L 5 V	2	GND
3	USBP4N	4	USBP5P
5	USBP4P	6	USBP5N
7	GND	8	USBV3L 5 V

Table 3-26: USB Port Pinouts

3.3.5 VGA Connector

CN Label: VGA1

CN Type: 15-pin Female

CN Location: See Figure 3-22

CN Pinouts: See Figure 3-26 and Table 3-27

Connects to a monitor that accepts a standard VGA input.

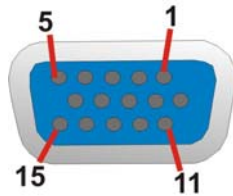


Figure 3-26: VGA Connector

Pin	Description	Pin	Description
1	RED	2	GREEN
3	BLUE	4	NC
5	GND	6	GND
7	GND	8	GND
9	CRT_VCC	10	GND
11	NC	12	DDC DAT
13	HSYNC	14	VSYNC
15	DDCCLK		

Table 3-27: VGA Connector Pinouts

Chapter

4

Installation

4.1 Anti-static Precautions



WARNING:

Failure to take ESD precautions during the installation of the NANO-PV-D510A may result in permanent damage to the NANO-PV-D510A and severe injury to the user.

Electrostatic discharge (ESD) can cause serious damage to electronic components, including the NANO-PV-D510A. Dry climates are especially susceptible to ESD. It is therefore critical that whenever the NANO-PV-D510A or any other electrical component is 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.
- ***Use an anti-static pad:*** When configuring the NANO-PV-D510A, place it on an anti-static pad. This reduces the possibility of ESD damaging the NANO-PV-D510A.
- ***Only handle the edges of the PCB:*** When handling the PCB, hold the PCB by the edges.

4.2 Installation Considerations



NOTE:

The following installation notices and installation considerations should be read and understood before installation. All installation notices must be strictly adhered to. Failing to adhere to these precautions may lead to severe damage and injury to the person performing the installation.

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WARNING:

The installation instructions described in this manual should be carefully followed in order to prevent damage to the components and injury to the user.

Before and during the installation please **DO** the following:

- **Read the user manual:**
 - The user manual provides a complete description of the NANO-PV-D510A installation instructions and configuration options.
- **Wear an electrostatic discharge cuff (ESD):**
 - Electronic components are easily damaged by ESD. Wearing an ESD cuff removes ESD from the body and helps prevent ESD damage.
- **Place the NANO-PV-D510A on an antistatic pad:**
 - When installing or configuring the motherboard, place it on an antistatic pad. This helps to prevent potential ESD damage.
- **Turn all power to the NANO-PV-D510A off:**
 - When working with the NANO-PV-D510A, make sure that it is disconnected from all power supplies and that no electricity is being fed into the system.

Before and during the installation of the NANO-PV-D510A **DO NOT**:

- Remove any of the stickers on the PCB board. These stickers are required for warranty validation.
- Use the product before verifying all the cables and power connectors are properly connected.
- Allow screws to come in contact with the PCB circuit, connector pins, or its components.

4.3 Memory Installation



WARNING:

Do not run the CPU without a heatsink and fan. Without the heatsink and fan, the high temperatures can destroy the CPU and other components. CPUs marked as fanless don't need the fan, but still need adequate ventilation.

The CPU, CPU cooling kit and DIMM are the most critical components of the NANO-PV-D510A. If one of these component is not installed the NANO-PV-D510A cannot run.

4.3.1 CompactFlash® Installation



NOTE:

Both CompactFlash® Type I and Type II cards are supported.

To install the CompactFlash® card, please follow the steps below.

Step 1: Locate the CF card socket. Locate the CompactFlash® slot.

Step 2: Align the CF card. Align the CompactFlash® card. The label side should be facing away from the board. The grooves on the CompactFlash® slot ensure that the card cannot be inserted the wrong way.

Step 3: Insert the CF card. Push until the CompactFlash® card is firmly seated in the slot. See Figure 4-1.

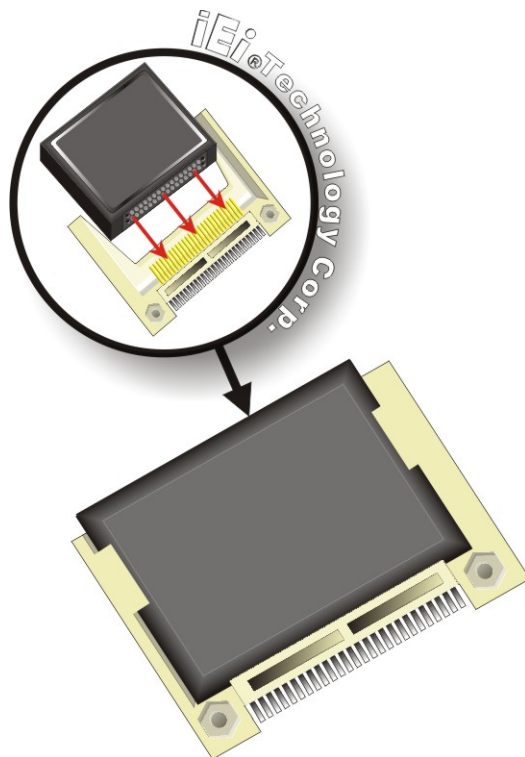


Figure 4-1: CompactFlash® Card Installation

4.3.2 PCIe Mini Card Installation

To install the PCIe Mini card, please refer to the diagram and instructions below.

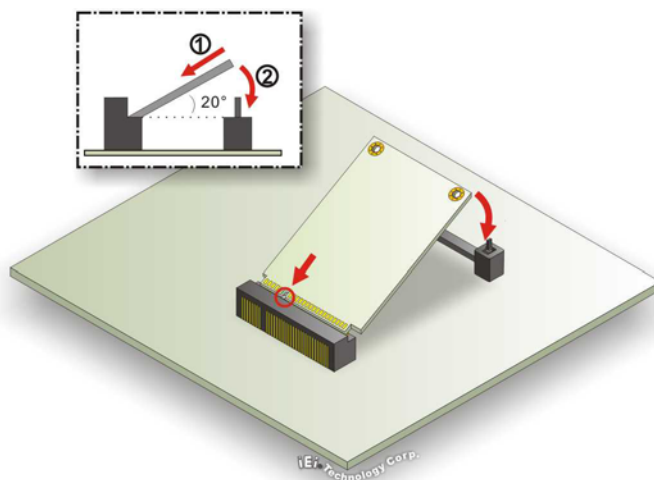


Figure 4-2: PCIe Mini Card Installation

Step 4: **Insert into the socket at and angle.** Line up the notch on the card with the notch on the connector. Slide the PCIe Mini card into the socket at an angle of about 20°.

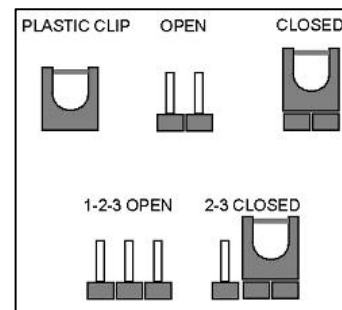
Step 5: **Push down until the card clips into place.** Push the other end of the card down until it clips into place on the plastic connector.

4.4 Jumper Settings



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.



The hardware jumpers must be set before installation. Jumpers are shown in Table 4-1.

Description	Label	Type
AT/ATX power select	J_AUTOPWR1	2-pin header
AT/ATX power select	J_ATXCTL1	3-pin header
CompactFlash® card setup	JCF1	3-pin header
Clear CMOS	J_CMOS1	3-pin header
PCI-104 voltage setup	JP1	3-pin header
LVDS voltage selection	J_VLVDS1	3-pin header
LVDS panel resolution select	J_LCD_TYPE1	3-pin header
COM3 function select	J1	3-pin header

Table 4-1: Jumpers

4.4.1 AT/ATX Power Select Jumper Settings

Jumper Label: J_AUTOPWR1

Jumper Type: 2-pin header

Jumper Settings: See Table 4-2

Jumper Location: See Figure 4-3

The AT Power Select jumper specifies the systems power mode as AT or ATX.

Setting	Description
Short	Use AT power
Open	Use ATX power

Table 4-2: AT/ATX Power Select Jumper Settings

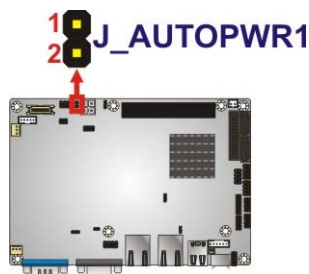


Figure 4-3: AT/ATX Power Select Jumper Settings

4.4.2 AT/ATX Power Select Jumper Settings

Jumper Label:	J_ATXCTL1
Jumper Type:	3-pin header
Jumper Settings:	See Table 4-2
Jumper Location:	See Figure 4-3

The AT Power Select jumper specifies the systems power mode as AT or ATX.

Setting	Description
Short 2-3	Use AT power
Short 1-2	Use ATX power

Table 4-3: AT/ATX Power Select Jumper Settings

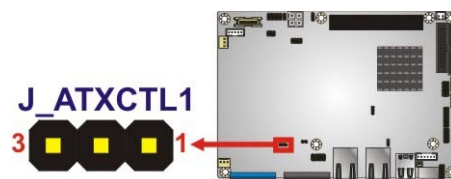


Figure 4-4: AT/ATX Power Select Jumper Settings

4.4.3 Clear CMOS Jumper

Jumper Label:	J_CMOS1
Jumper Type:	3-pin header
Jumper Settings:	See Table 4-4
Jumper Location:	See Figure 4-5

To reset the BIOS, move the jumper to the "Clear BIOS" position for 3 seconds or more, then move back to the default position.

Setting	Description
1-2	Keep current BIOS setup
2-3	Clear BIOS

Table 4-4: Clear BIOS Jumper Settings

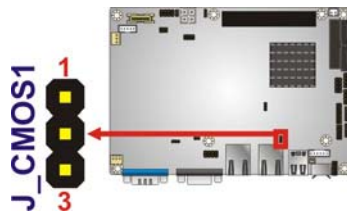


Figure 4-5: Clear BIOS Jumper Location

4.4.4 COM 3 Function Select Jumper

Jumper Label:	J1
Jumper Type:	3-pin header
Jumper Settings:	See Table 4-5
Jumper Location:	See Figure 4-6

The COM 3 Function Select jumper sets the communication protocol used by the third serial communications port (COM 3) as RS-232, RS-422/RS-485. The COM 3 Function Select settings are shown in the table below.

Setting	Description
Short 1-2	RS-232
Short 2-3	RS-422/RS-485

Table 4-5: COM 3 Function Select Jumper Settings

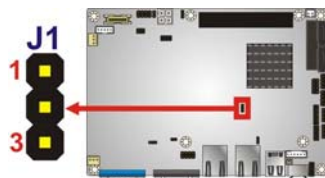


Figure 4-6: COM 3 Function Select Jumper Location

4.4.5 CompactFlash® Card Setup

Jumper Label:	JCF1
Jumper Type:	2-pin header
Jumper Settings:	See Table 4-6
Jumper Location:	See Figure 4-7

The CompactFlash® slot is connected through an IDE connection. This jumper sets the CompactFlash® card as the master or slave IDE device.

Setting	Description
Open	Slave
Closed	Master

Table 4-6: CompactFlash® Setup Jumper Settings

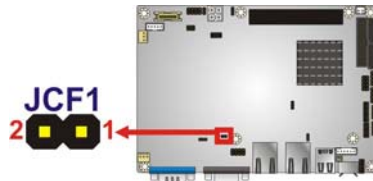


Figure 4-7: CompactFlash® Setup Jumper Location

4.4.6 LVDS Voltage Selection



WARNING:

Incorrect voltages can destroy the LCD panel. Make sure to select a voltage that matches the voltage required by the LCD panel.

Jumper Label:	J_VLVDS1
Jumper Type:	6-pin header
Jumper Settings:	See Table 4-7
Jumper Location:	See Figure 4-8

The LCD voltage selection jumper sets the voltage of the power supplied to the LCD panel.

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Setting	Description
1-2	+3.3 V
3-4	+5.0 V
5-6	+12 V

Table 4-7: LVDS Voltage Selection Jumper Settings

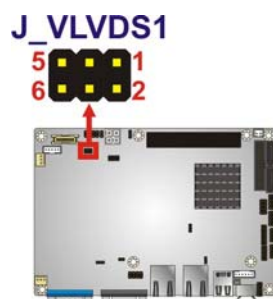


Figure 4-8: LVDS Voltage Selection Jumper Locations

4.4.7 LVDS Screen Resolution Selection

Jumper Label:	J_LCD_TYPE1
Jumper Type:	8-pin header
Jumper Settings:	See Table 4-7
Jumper Location:	See Figure 4-8

The **LVDS Screen Resolution Selection** jumper allows the LVDS screen voltage to be set. The **LVDS Screen Resolution Selection** jumper settings are shown in Table 4-7.

Pin	Description
Open	640 x 480 (18-bit)
Short 1-2	800 x 480 (18-bit)
Short 3-4	800 x 600 (18-bit)
Short 1-2 and 3-4	1024 x 600 (18-bit)
Short 5-6	1024 x 768 (18-bit)
Short 1-2 and 5-6	1280 x 720 (18-bit)
Short 3-4 and 5-6	1280 x 800 (18-bit)
Short 1-2, 3-4 and 5-6	1366 x 768 (18-bit)

Table 4-8: LVDS Screen Resolution Jumper Settings

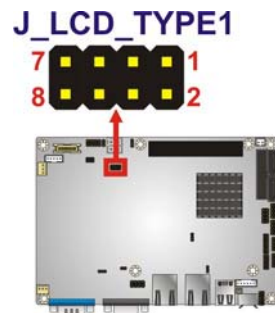


Figure 4-9: LVDS Screen Resolution Jumper Locations

4.4.8 PCI-104 Voltage Setup

Jumper Label:	JP1
Jumper Type:	3-pin header
Jumper Settings:	See Table 4-9
Jumper Location:	See Figure 4-10

This jumper selects the voltage supplied to the PCI-104 expansion module.

Setting	Description
1-2	+5.0 V
2-3	+3.3 V

Table 4-9: PCI-104 Voltage Jumper Settings

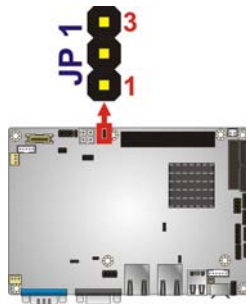


Figure 4-10: PCI-104 Voltage Jumper Location

4.5 Chassis Installation

4.5.1 Airflow



WARNING:

Airflow is critical for keeping components within recommended operating temperatures. The chassis should have fans and vents as necessary to keep things cool.

The NANO-PV-D510A must be installed in a chassis with ventilation holes on the sides allowing airflow to travel through the heat sink surface. In a system with an individual power supply unit, the cooling fan of a power supply can also help generate airflow through the board surface.

4.5.2 Motherboard Installation

To install the NANO-PV-D510A motherboard into the chassis please refer to the reference material that came with the chassis.

4.6 Internal Peripheral Device Connections

This section outlines the installation of peripheral devices to the onboard connectors.

4.6.1 AT/ATX Power Connection

Follow the instructions below to connect the NANO-PV-D510A to an AT or ATX power supply.



WARNING:

Disconnect the power supply power cord from its AC power source to prevent a sudden power surge to the NANO-PV-D510A.

Step 1: **Locate the power cable.** The power cable is shown in the packing list in Chapter 3.

Step 2: **Connect the Power Cable to the Motherboard.** Connect the 4-pin (2x2) Molex type power cable connector to the AT/ATX power connector on the motherboard. See Figure 4-11.

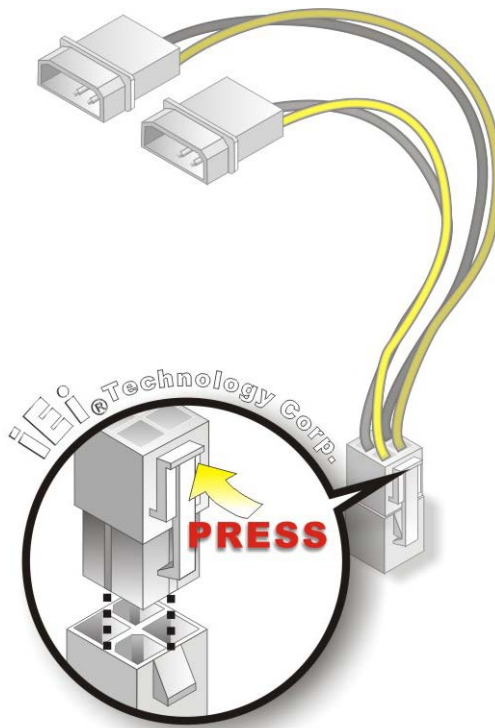


Figure 4-11: Power Cable to Motherboard Connection

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Step 3: Connect Power Cable to Power Supply. Connect one of the 4-pin (1x4) Molex type power cable connectors to an AT/ATX power supply. See Figure 4-12.

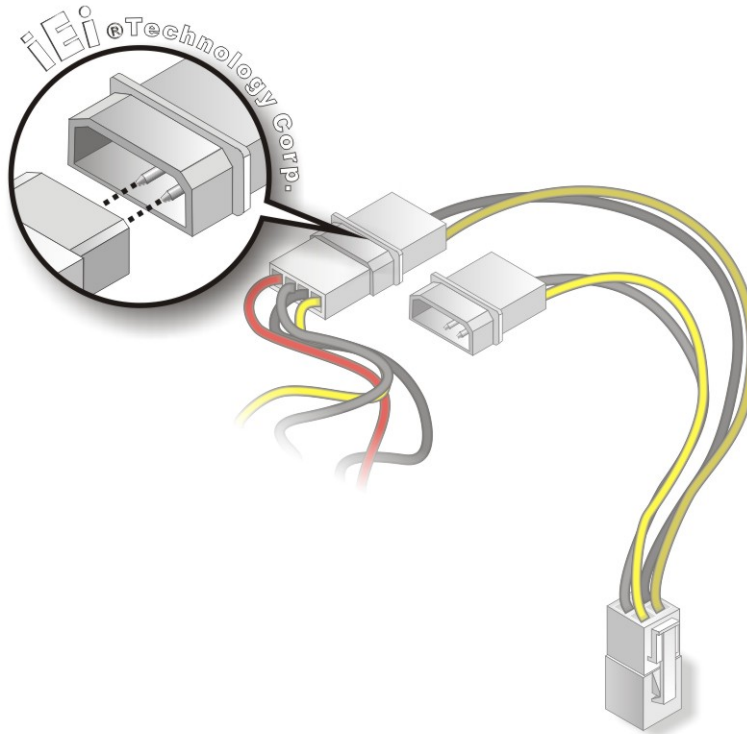


Figure 4-12: Connect Power Cable to Power Supply

4.6.2 Audio Cable Installation

The Audio Cable that came with the NANO-PV-D510A connects to the audio connector on the NANO-PV-D510A. The audio cable consists of three audio jacks. Mic-in connects to a microphone. Line-in provides a stereo line-level input to connect to the output of an audio device. Line-out, a stereo line-level output, connects to two amplified speakers. To install the audio cable, please refer to the steps below:

Step 4: Locate the audio connector. The location of the 10-pin audio connector is shown in **Chapter 3**.

Step 5: Align pin 1. Align pin 1 on the on-board connector with pin 1 on the audio kit connector. Pin 1 on the audio cable connector is indicated with a white dot. See Figure 4-13.

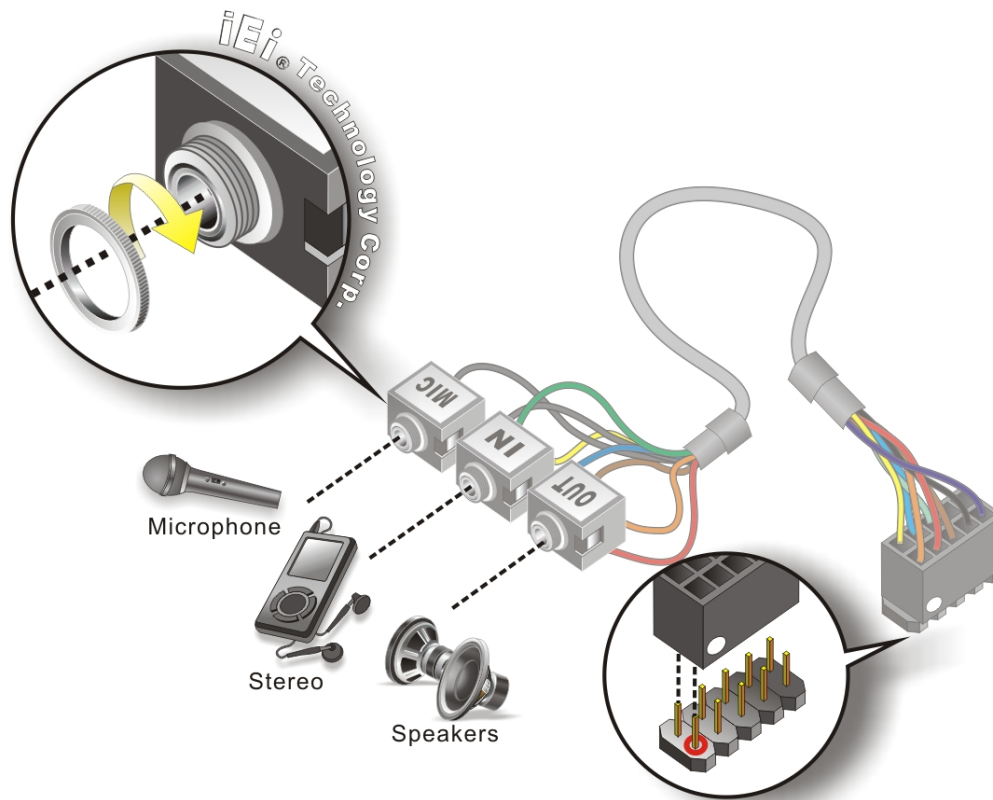


Figure 4-13: Audio Cable Connection

Connect the audio devices. Connect speakers to the line-out audio jack. Connect the output of an audio device to the line-in audio jack. Connect a microphone to the mic-in audio jack.

4.6.3 Keyboard/Mouse Connector

The NANO-PV-D510A is shipped with a keyboard/mouse Y-cable connector. The keyboard/mouse Y-cable connector connects to a keyboard/mouse connector on the NANO-PV-D510A and branches into two cables that are each connected to a PS/2 connector, one for a mouse and one for a keyboard. To connect the keyboard/mouse Y-cable connector, please follow the steps below.

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- Step 6: Locate the connector.** The location of the keyboard/mouse Y-cable connector is shown in **Chapter 3**.
- Step 7: Align the connectors.** Correctly align pin 1 on the cable connector with pin 1 on the NANO-PV-D510A keyboard/mouse connector. See Figure 4-14.
- Step 8: Insert the cable connectors** Once the cable connector is properly aligned with the keyboard/mouse connector on the NANO-PV-D510A, connect the cable connector to the on-board connectors. See Figure 4-14.

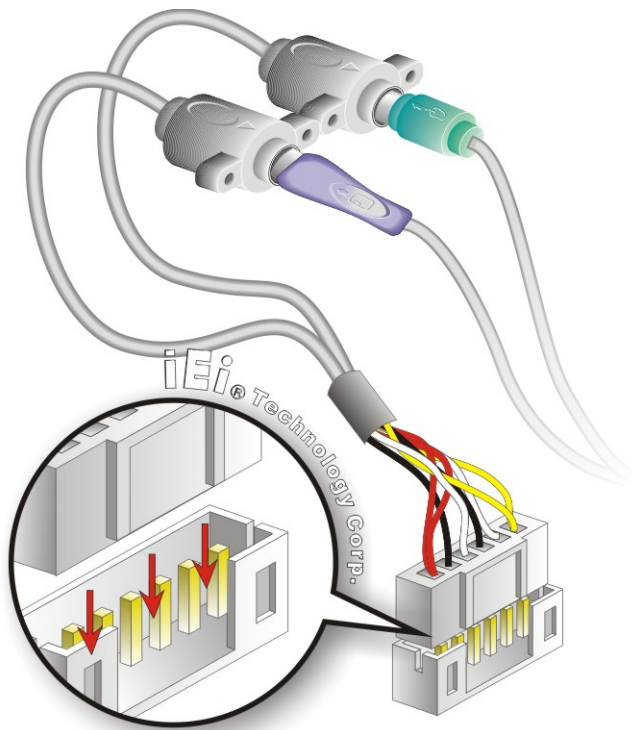


Figure 4-14: Keyboard/mouse Y-cable Connection

- Step 9: Attach PS/2 connectors to the chassis.** The keyboard/mouse Y-cable connector is connected to two PS/2 connectors. To secure the PS/2 connectors to the chassis please refer to the installation instructions that came with the chassis.
- Step 10: Connect the keyboard and mouse.** Once the PS/2 connectors are connected to the chassis, a keyboard and mouse can each be connected to one of the

PS/2 connectors. The keyboard PS/2 connector and mouse PS/2 connector are both marked. Please make sure the keyboard and mouse are connected to the correct PS/2 connector.

4.6.4 Single RS-232 Cable (w/o Bracket)

The single RS-232 cable consists of one serial port connector attached to a serial communications cable that is then attached to a D-sub 9 male connector. To install the single RS-232 cable, please follow the steps below.

Step 1: Locate the connector. The location of the RS-232 connector is shown in Chapter 3.

Step 2: Insert the cable connector. Insert the connector into the serial port box header. See Figure 4-15. A key on the front of the cable connectors ensures the connector can only be installed in one direction.

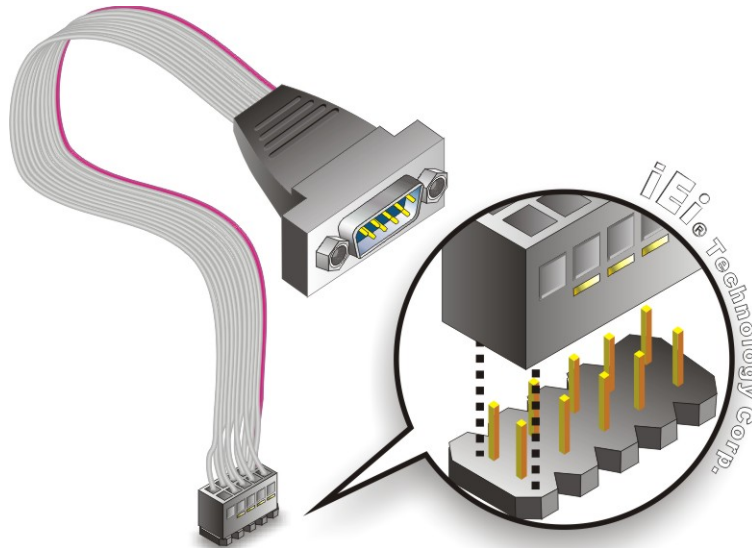


Figure 4-15: Single RS-232 Cable Installation

Step 3: Secure the bracket. The single RS-232 connector has two retention screws that must be secured to a chassis or bracket.

Step 4: Connect the serial device. Once the single RS-232 connector is connected to a chassis or bracket, a serial communications device can be connected to the system.

4.7 External Peripheral Interface Connection

The following external peripheral devices can be connected to the external peripheral interface connectors.

- RJ-45 Ethernet cable connectors
- PS/2 devices
- Serial port devices
- USB devices
- VGA monitors

To install these devices, connect the corresponding cable connector from the actual device to the corresponding NANO-PV-D510A external peripheral interface connector making sure the pins are properly aligned.

4.7.1 LAN Connection

There are two external RJ-45 LAN connectors. The RJ-45 connectors enable connection to an external network. To connect a LAN cable with an RJ-45 connector, please follow the instructions below.

Step 1: Locate the RJ-45 connectors. The locations of the USB connectors are shown in **Chapter 4**.

Step 2: Align the connectors. Align the RJ-45 connector on the LAN cable with one of the RJ-45 connectors on the NANO-PV-D510A. See **Figure 4-16**.

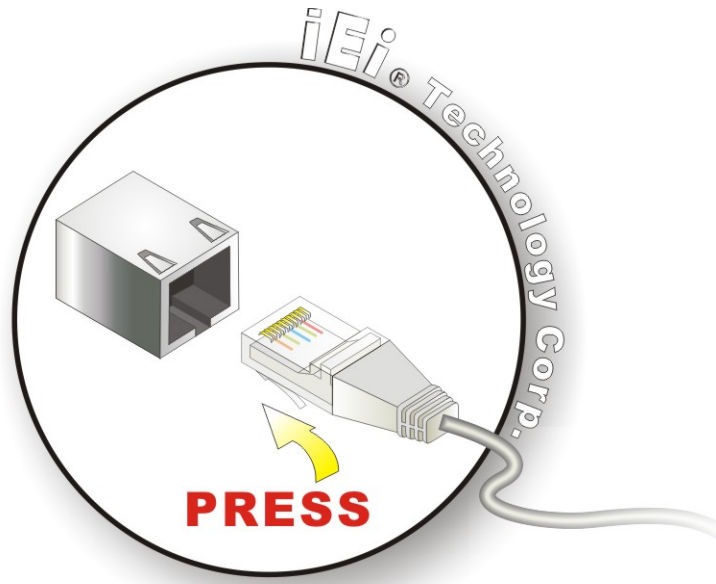


Figure 4-16: LAN Connection

Step 3: Insert the LAN cable RJ-45 connector. Once aligned, gently insert the LAN cable RJ-45 connector into the onboard RJ-45 connector.

4.7.2 PS/2 Y-Cable Connection

The NANO-PV-D510A has a PS/2 connector on the external peripheral interface panel. The dual PS/2 connector is connected to the PS/2 Y-cable that came with the NANO-PV-D510A. One of the PS/2 cables is connected to a keyboard and the other to a mouse to the system. Follow the steps below to connect a keyboard and mouse to the NANO-PV-D510A.

Step 1: Locate the dual PS/2 connector. The location of the PS/2 connector is shown in **Chapter 3**.

Step 2: Insert the keyboard/mouse connector. Insert the PS/2 connector on the end of the PS/2 y-cable into the external PS/2 connector. See **Figure 4-17**.

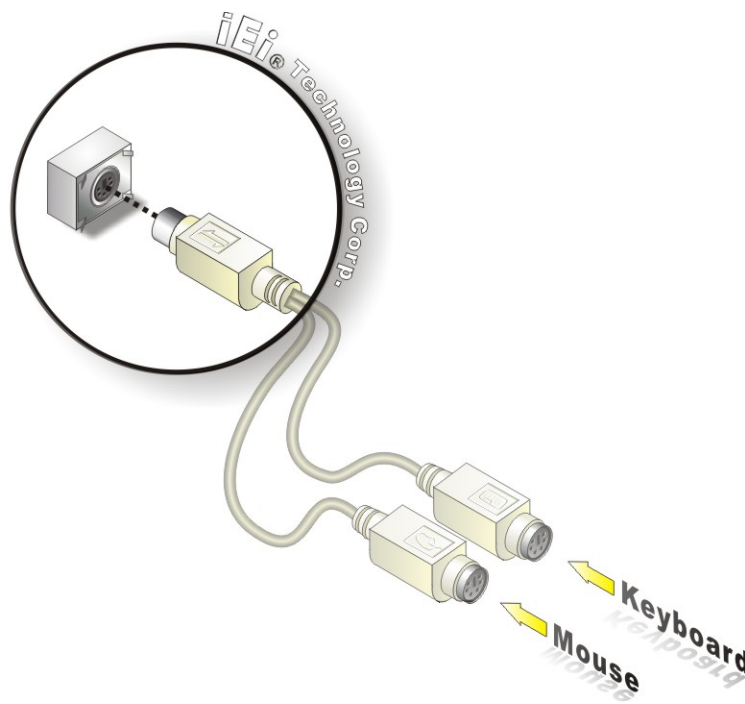


Figure 4-17: PS/2 Keyboard/Mouse Connector

Step 3: Connect the keyboard and mouse. Connect the keyboard and mouse to the appropriate connector. The keyboard and mouse connectors can be distinguished from each other by looking at the small graphic at the top of the connector.

4.7.3 Serial Device Connection

The NANO-PV-D510A has a single female DB-9 connector on the external peripheral interface panel for a serial device. Follow the steps below to connect a serial device to the NANO-PV-D510A.

Step 1: Locate the DB-9 connector. The location of the DB-9 connector is shown in Chapter 3.

Step 2: Insert the serial connector. Insert the DB-9 connector of a serial device into the DB-9 connector on the external peripheral interface. See Figure 4-18.

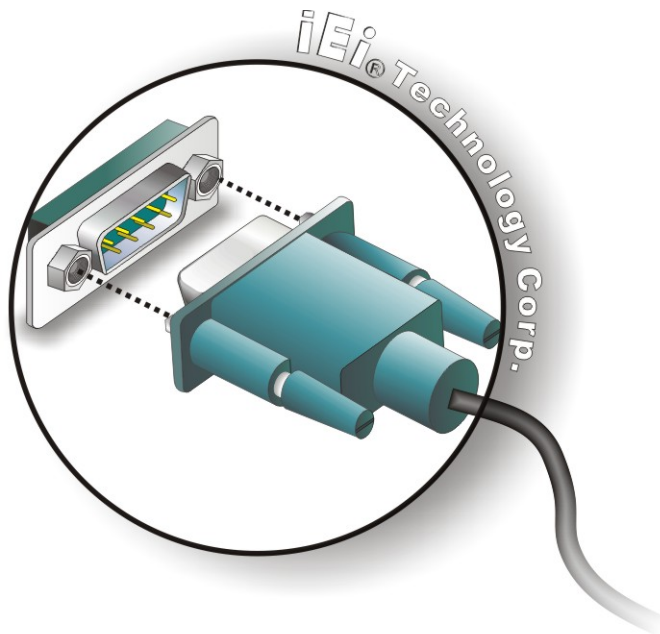


Figure 4-18: Serial Device Connector

Step 3: **Secure the connector.** Secure the serial device connector to the external interface by tightening the two retention screws on either side of the connector.

4.7.4 USB Connection

The external USB Series "A" receptacle connector provides easier and quicker access to external USB devices. Follow the steps below to connect USB devices to the NANO-PV-D510A.

Step 1: **Locate the USB Series "A" receptacle connectors.** The location of the USB Series "A" receptacle connectors are shown in **Chapter 3**.

Step 2: **Insert a USB Series "A" plug.** Insert the USB Series "A" plug of a device into the USB Series "A" receptacle on the external peripheral interface. See **Figure 4-19**.

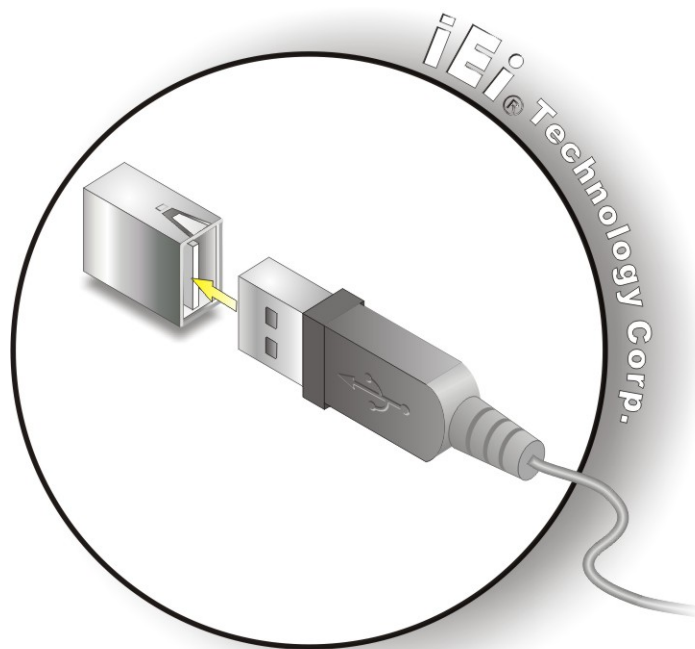


Figure 4-19: USB Connector

4.7.5 VGA Monitor Connection

The NANO-PV-D510A has a single female DB-15 connector on the external peripheral interface panel. The DB-15 connector is connected to a CRT or VGA monitor. To connect a monitor to the NANO-PV-D510A, please follow the instructions below.

- Step 3: Locate the female DB-15 connector.** The location of the female DB-15 connector is shown in **Chapter 3**.
- Step 4: Align the VGA connector.** Align the male DB-15 connector on the VGA screen cable with the female DB-15 connector on the external peripheral interface.
- Step 5: Insert the VGA connector.** Once the connectors are properly aligned with the insert the male connector from the VGA screen into the female connector on the NANO-PV-D510A. See **Figure 4-20**.

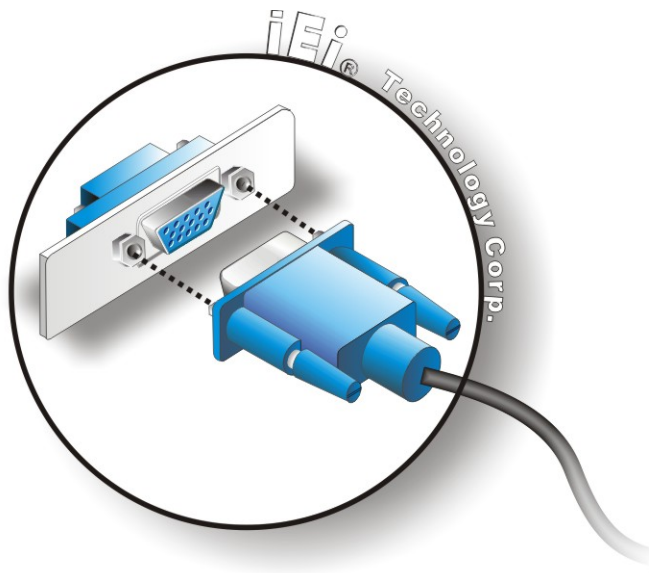


Figure 4-20: VGA Connector

Step 6: **Secure the connector.** Secure the DB-15 VGA connector from the VGA monitor to the external interface by tightening the two retention screws on either side of the connector.

4.8 Software Installation

All the drivers for the NANO-PV-D510A are on the CD that came with the system. To install the drivers, please follow the steps below.

Step 1: Insert the CD into a CD drive connected to the system.



NOTE:

If the installation program doesn't start automatically:
Click "Start->My Computer->CD Drive->autorun.exe"

Step 2: The driver main menu appears (Figure 4-21).

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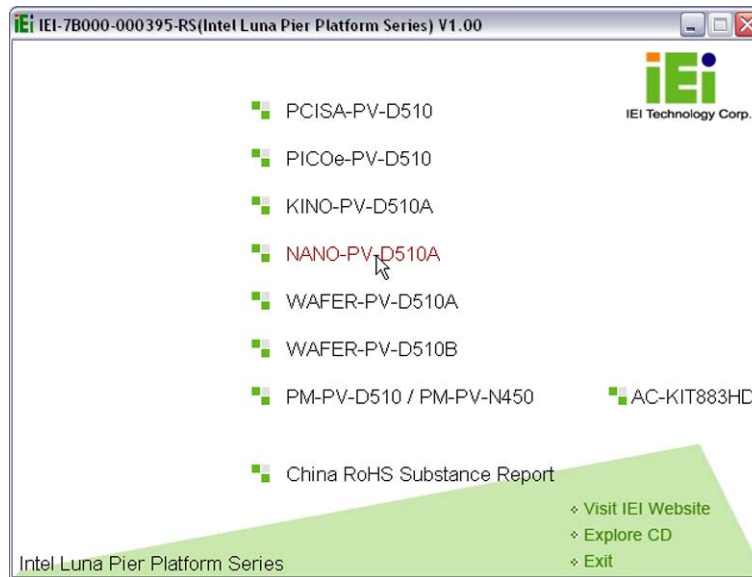


Figure 4-21: Introduction Screen

Step 3: Click NANO-PV-D510A.

Step 4: A new screen with a list of available drivers appears (Figure 4-22).

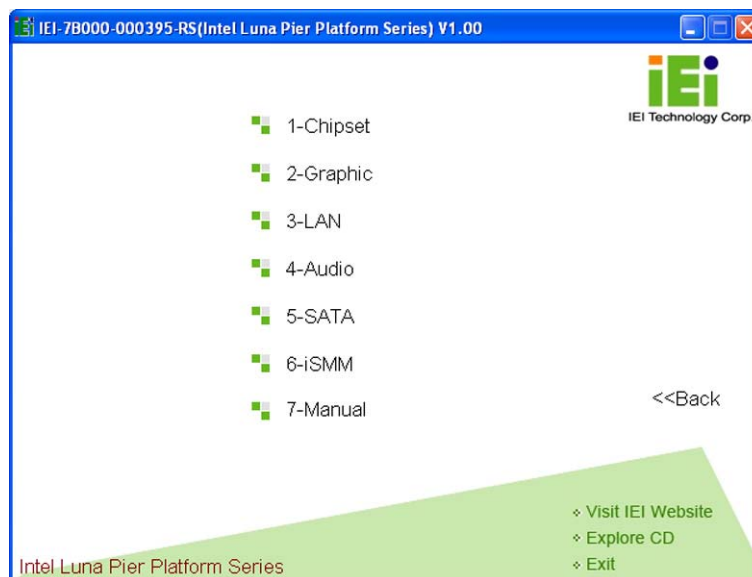


Figure 4-22: Available Drivers

Step 5: Install all of the necessary drivers in this menu.

Chapter

5

BIOS

5.1 Introduction

The BIOS is programmed onto the BIOS chip. The BIOS setup program allows changes to certain system settings. This chapter outlines the options that can 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

Key	Function
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:

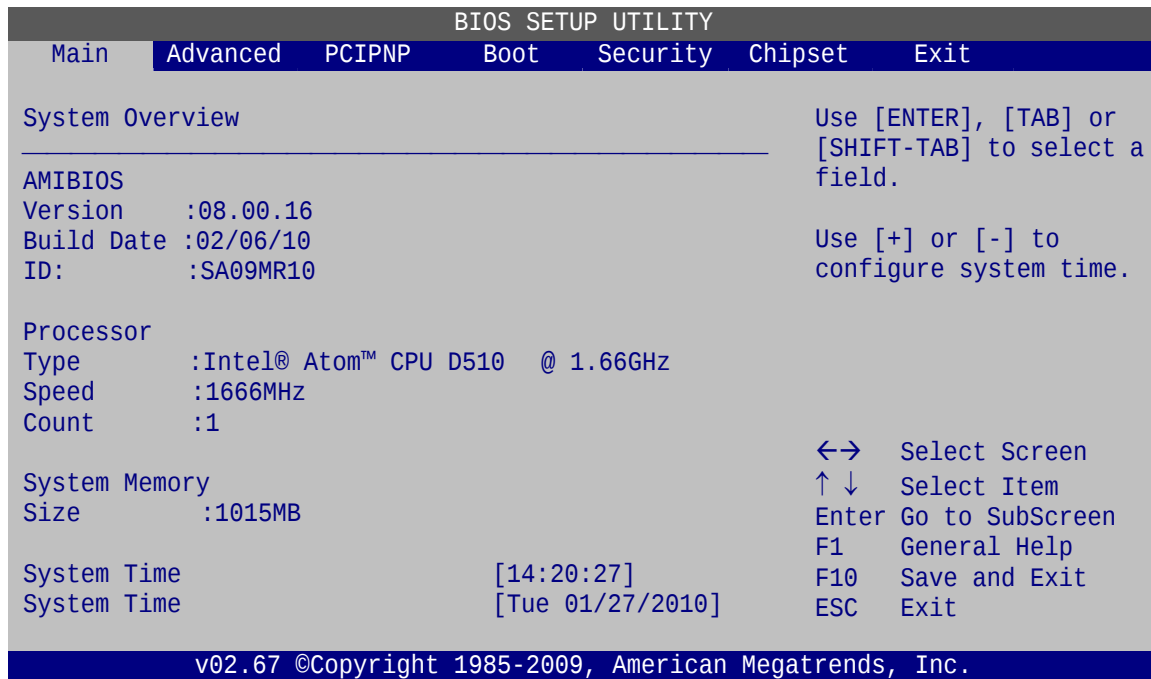
- Main – Changes the basic system configuration.
- Advanced – Changes the advanced system settings.
- PCIPnP – Changes the advanced PCI/PnP Settings
- Boot – Changes the system boot configuration.
- Security – Sets User and Supervisor Passwords.
- Chipset – Changes the chipset settings.
- Exit – Selects 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:

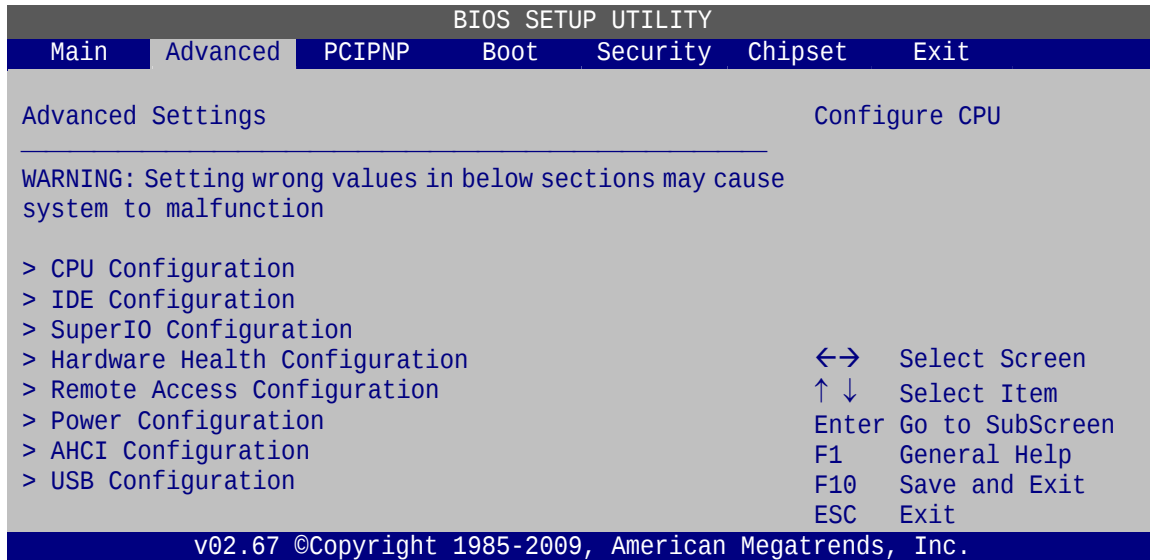


WARNING!

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**)
 - Super IO Configuration (see **Section 5.3.3**)
 - Hardware Health Configuration (see **Section 5.3.4**)
 - Remote Access Configuration (see **Section 5.3.5**)
 - Power Configuration (see **Section 5.3.6**)
 - AHCI Configuration (see **Section 5.3.7**)
 - USB Configuration (see **Section 5.3.8**)

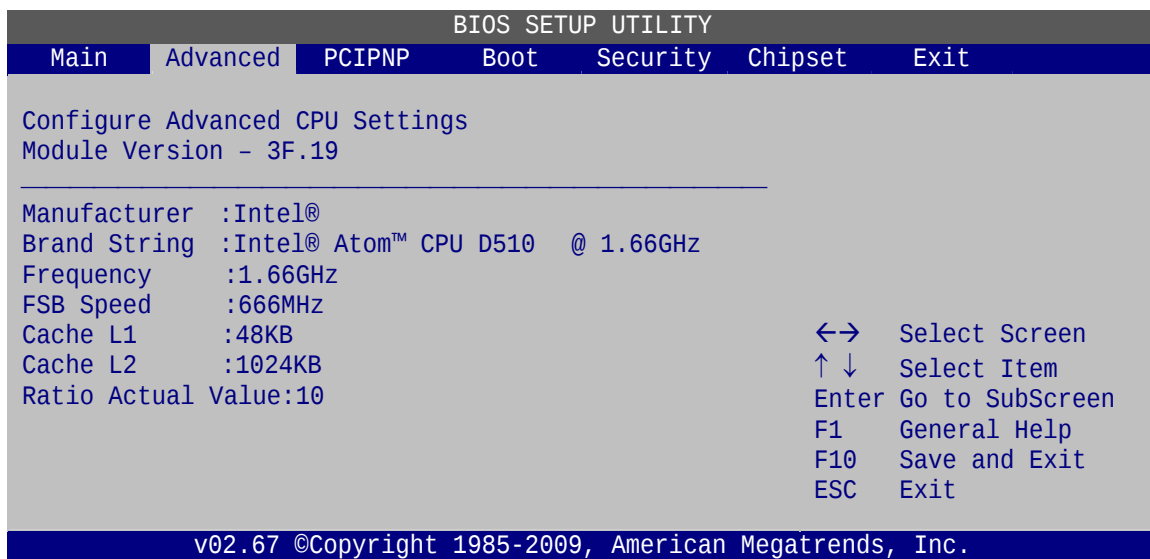
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BIOS Menu 2: Advanced

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

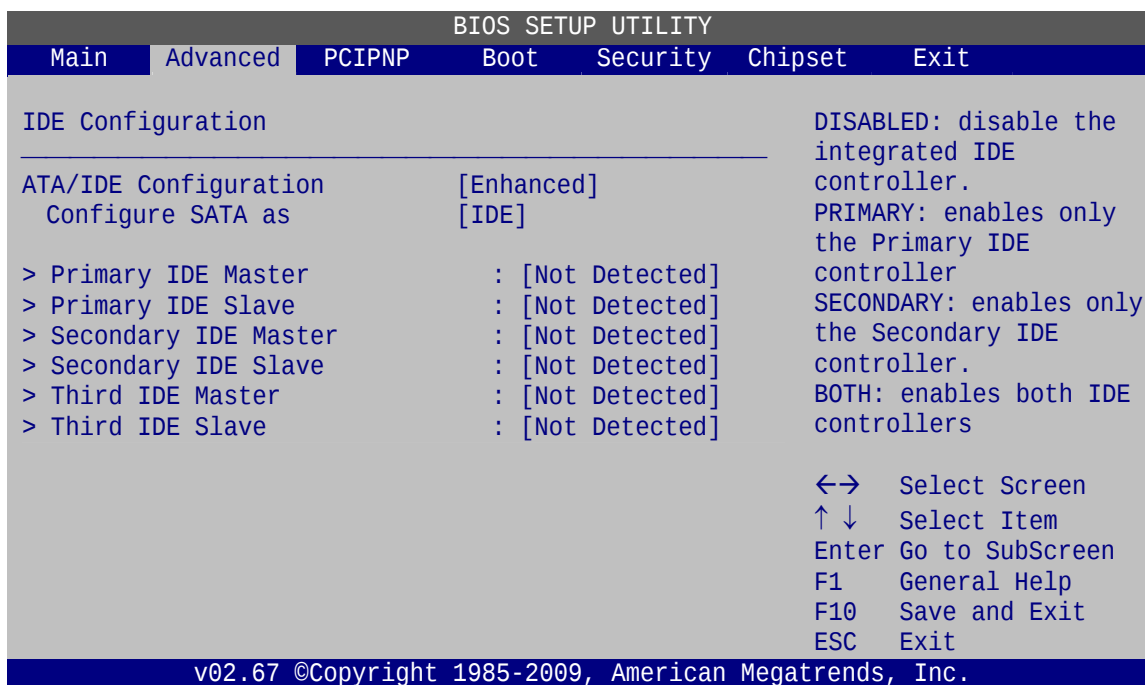
The CPU Configuration menu (**BIOS Menu 3**) lists the following CPU details:

- 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.

→ **Configure SATA as [IDE]**

Use the **Configure SATA as** option to configure SATA devices as normal IDE devices.

- **IDE** **DEFAULT** Configures SATA devices as normal IDE device.
- **AHCI** Configures SATA devices as an ACHI device.

→ **IDE Master and IDE Slave**

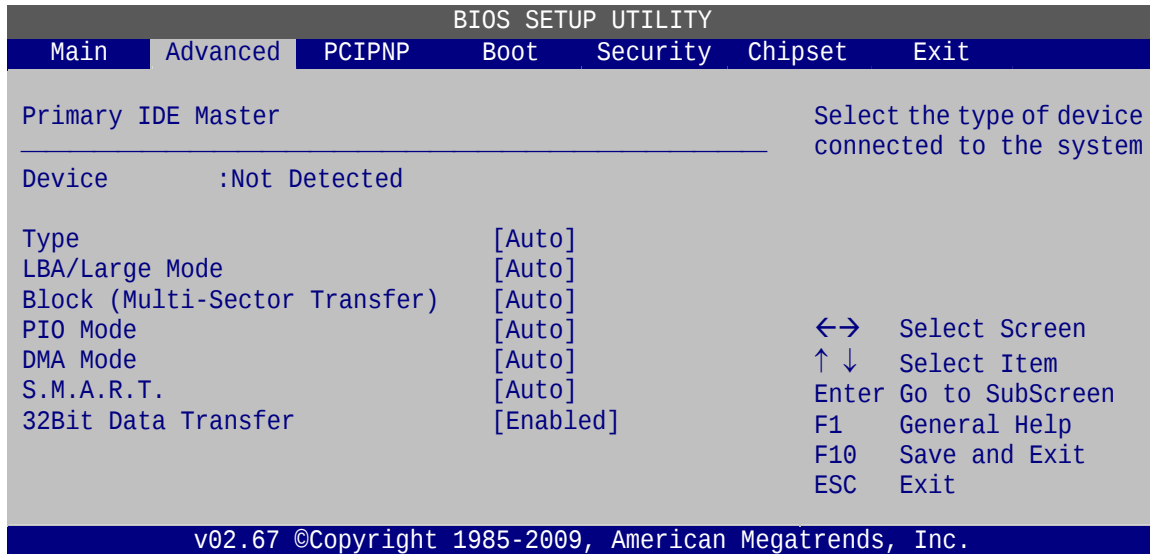
When entering setup, BIOS automatically detects the presence of IDE devices. BIOS displays the status of the auto detected IDE devices. The following IDE devices are detected and are shown in the **IDE Configuration** menu:

- Primary IDE Master
- Primary IDE Slave
- Secondary IDE Master
- Secondary IDE Slave
- Third IDE Master
- Third 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.

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- 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 automatically 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 3.3 MB/s
- **1** PIO mode 1 selected with a maximum transfer rate of 5.2 MB/s
- **2** PIO mode 2 selected with a maximum transfer rate of 8.3 MB/s
- **3** PIO mode 3 selected with a maximum transfer rate of 11.1 MB/s
- **4** PIO mode 4 selected with a maximum transfer rate of 16.6 MB/s
(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.

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- | | | | |
|---|---------------|----------------|---|
| ➔ | 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 2.1 MB/s |
| ➔ | SWDMA1 | | Single Word DMA mode 1 selected with a maximum data transfer rate of 4.2 MB/s |
| ➔ | SWDMA2 | | Single Word DMA mode 2 selected with a maximum data transfer rate of 8.3 MB/s |
| ➔ | MWDMA0 | | Multi Word DMA mode 0 selected with a maximum data transfer rate of 4.2 MB/s |
| ➔ | MWDMA1 | | Multi Word DMA mode 1 selected with a maximum data transfer rate of 13.3 MB/s |
| ➔ | MWDMA2 | | Multi Word DMA mode 2 selected with a maximum data transfer rate of 16.6 MB/s |
| ➔ | UDMA0 | | Ultra DMA mode 0 selected with a maximum data transfer rate of 16.6 MB/s |
| ➔ | UDMA1 | | Ultra DMA mode 1 selected with a maximum data transfer rate of 25 MB/s |
| ➔ | UDMA2 | | Ultra DMA mode 2 selected with a maximum data transfer rate of 33.3 MB/s |
| ➔ | UDMA3 | | Ultra DMA mode 3 selected with a maximum data transfer rate of 44 MB/s (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 66.6 MB/s (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 99.9 MB/s (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

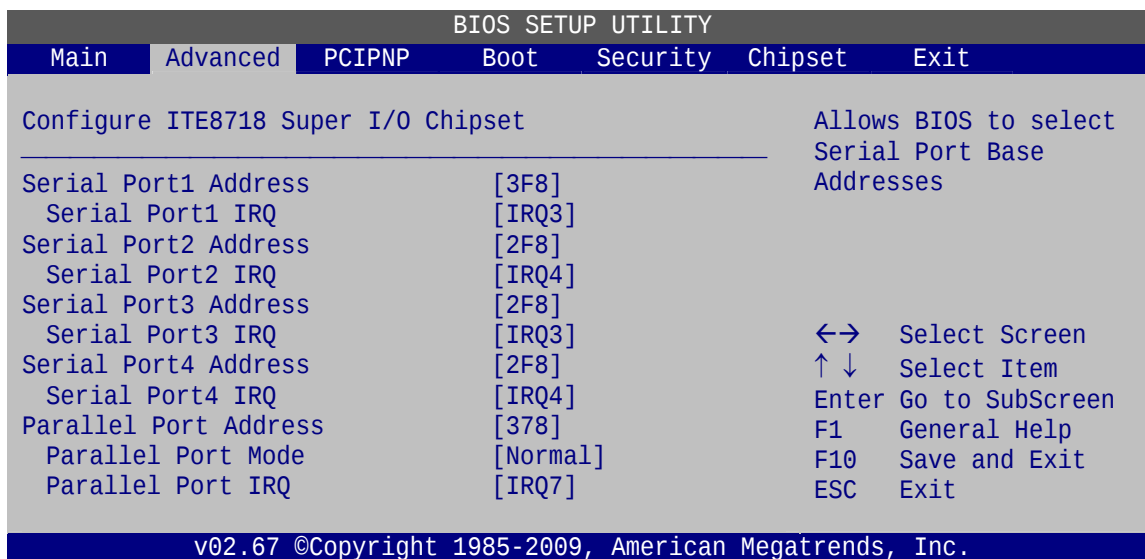
→ 32Bit Data Transfer [Enabled]

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

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→ Serial Port1 Address [3F8]

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** Serial Port 1 I/O port address is 3F8
- **2F8** **DEFAULT** Serial Port 1 I/O port address is 2F8
- **3E8** Serial Port 1 I/O port address is 3E8
- **2E8** Serial Port 1 I/O port address is 2E8

→ Serial Port1 IRQ [IRQ3]

Use the **Serial Port IRQ** selection to set the serial port interrupt address.

- **IRQ3** **DEFAULT** IRQ3 is assigned as the serial port interrupt address
- **IRQ4** IRQ4 is assigned as the serial port interrupt address

→ Serial Port2 Address [2F8]

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

- **Disabled** No base address is assigned to Serial Port 2
- **3F8** Serial Port 2 I/O port address is 3F8
- **2F8** **DEFAULT** Serial Port 2 I/O port address is 2F8
- **3E8** Serial Port 2 I/O port address is 3E8
- **2E8** Serial Port 2 I/O port address is 2E8

→ Serial Port2 IRQ [IRQ4]

Use the **Serial Port2 IRQ** selection to set the serial port interrupt address.

- **IRQ3** IRQ3 is assigned as the serial port interrupt address
- **IRQ4** **DEFAULT** IRQ4 is assigned as the serial port interrupt address

→ Serial Port3 Address [2F8]

Use the **Serial Port3 Address** option to select the Serial Port 3 base address.

- **Disabled** No base address is assigned to Serial Port 3
- **3F8** Serial Port 3 I/O port address is 3F8
- **2F8** **DEFAULT** Serial Port 3 I/O port address is 2F8
- **3E8** Serial Port 3 I/O port address is 3E8
- **2E8** Serial Port 3 I/O port address is 2E8

→ Serial Port3 IRQ [IRQ4]

Use the **Serial Port3 IRQ** selection to set the serial port interrupt address.

- **IRQ3** IRQ3 is assigned as the serial port interrupt address
- **IRQ4** **DEFAULT** IRQ4 is assigned as the serial port interrupt address

→ Serial Port4 Address [2F8]

Use the **Serial Port4 Address** option to select the Serial Port 4 base address.

- **Disabled** No base address is assigned to Serial Port 4
- **3F8** Serial Port 4 I/O port address is 3F8
- **2F8** **DEFAULT** Serial Port 4 I/O port address is 2F8
- **3E8** Serial Port 4 I/O port address is 3E8
- **2E8** Serial Port 4 I/O port address is 2E8

→ Serial Port4 IRQ [IRQ4]

Use the **Serial Port4 IRQ** selection to set the serial port interrupt address.

- **IRQ3** IRQ3 is assigned as the serial port interrupt address
- **IRQ4** **DEFAULT** IRQ4 is assigned as the serial port interrupt address

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➔ Parallel Port Address [Disabled]

Use the **Parallel Port Address** option to select the parallel port base address.

- ➔ **Disabled** **DEFAULT** No base address is assigned to the Parallel Port
- ➔ **378** Parallel Port I/O port address is 378
- ➔ **278** Parallel Port I/O port address is 278
- ➔ **3BC** Parallel Port I/O port address is 3BC

➔ Parallel Port Mode [Normal]

Use the **Parallel Port Mode** option to select the mode the parallel port operates in.

- ➔ **Normal** **DEFAULT** The normal parallel port mode is the standard mode for parallel port operation.
- ➔ **Bi-directional** Parallel port outputs are 8-bits long. Inputs are accomplished by reading 4 of the 8 bits on the status register.
- ➔ **EPP** The parallel port operates in the enhanced parallel port mode (EPP). The EPP mode supports bi-directional communication between the system and the parallel port device and the transmission rates between the two are much faster than the Normal mode.
- ➔ **ECP** The parallel port operates in the extended capabilities port (ECP) mode. The ECP mode supports bi-directional communication between the system and the parallel port device and the transmission rates between the two are much faster than the Normal mode

➔ **EPP+ECP**

The parallel port operates in the extended capabilities port (ECP) mode. The ECP mode supports bi-directional communication between the system and the parallel port device and the transmission rates between the two are much faster than the Normal mode

The parallel port is also be compatible with EPP devices described above

➔ **Parallel Port IRQ [IRQ7]**

Use the **Parallel Port IRQ** selection to set the parallel port interrupt address.

- ➔ **IRQ5** IRQ5 is assigned as the parallel port interrupt address
- ➔ **IRQ7 DEFAULT** IRQ7 is assigned as the parallel port interrupt address

5.3.4 Hardware Health Configuration

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

BIOS SETUP UTILITY						
Main	Advanced	PCIPNP	Boot	Security	Chipset	Exit
Hardware Health Configuration				Fan configuration mode setting		
CPU Fan Mode Setting		[Auto Fan by RPM]				
CPU Temp. Highest Limit		[050]				
CPU Temp. Second Limit		[040]				
CPU Temp. Third Limit		[030]				
CPU Temp. Lowest Limit		[020]				
CPU Fan Highest Limit		[100]				
CPU Fan Second Setting		[080]				
CPU Fan Third Setting		[070]				
CPU Fan Fourth Setting		[060]				
CPU Fan Lowest Setting		[050]				
CPU Temperature		:42°C/107°F				
SYSTEM Temperature		:38°C/100°F				
CPU Fan Speed		:4424 RPM				
SYS Fan Speed		:N/A				
VIN1 Vcore		:1.160 V				
VIN2 VCC5		:5.045 V				
VIN3 VCC12		:11.880 V				
VIN4 VCC1.8		:1.808 V				
VCC3		:3.296 V				
VSB		:3.440 V				
VBAT		:3.280 V				
				↔ Select Screen		
				↑↓ Select Item		
				Enter Go to SubScreen		
				F1 General Help		
				F10 Save and Exit		
				ESC Exit		
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BIOS Menu 7: Hardware Health Configuration

➔ CPU Fan Mode Setting [Auto Fan by RPM]

Use the **CPU Fan Mode Setting** option to configure the CPU fan.

➔	Auto Fan by RPM	DEFAULT	The fan adjusts its speed using these settings by RPM: - CPU Temp. Highest Limit - CPU Temp. Second Limit - CPU Temp. Third Limit - CPU Temp. Lowest Limit - CPU Fan Highest Setting - CPU Fan Second Setting - CPU Fan Third Setting - CPU Fan Fourth Setting - CPU Fan Lowest Setting
➔	Auto Fan by Duty Cycle		The fan adjusts its speed using these settings by Duty Cycle: - CPU Temp. Highest Limit - CPU Temp. Second Limit - CPU Temp. Third Limit - CPU Temp. Lowest Limit - CPU Fan Highest Setting - CPU Fan Second Setting - CPU Fan Third Setting - CPU Fan Fourth Setting - CPU Fan Lowest Setting
➔	Manual Mode by RPM		The fan spins at the speed set in: - Manual RPM Setting (Min=367 rpm, Max=10000 rpm)
➔	Manual Mode by Duty Cycle		The fan spins at the speed set in: - Manual DutyCycle Setting (Min=367 rpm, Max=10000 rpm)

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**NOTE:**

PWM functions are supported only when using a 4-pin fan. When using a 3-pin fan, the PWM functions are not supported.

→ CPU Temp. Highest Limit [050]

**WARNING:**

CPU failure can result if this value is set too high

The fan will turn off if the temperature falls below this value.

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

→ CPU Temp. Second Limit [040]

**WARNING:**

CPU failure can result if this value is set too high

When the fan is off, it will only start when the temperature exceeds this setting.

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

→ CPU Temp. Third Limit [030]

**WARNING:**

CPU failure can result if this value is set too high

When the fan is off, it will only start when the temperature exceeds this setting.

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

→ CPU Temp. Lowest Limit [020]



WARNING:

CPU failure can result if this value is set too high

When the fan is off, it will only start when the temperature exceeds this setting.

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

→ CPU Fan Highest Setting [100]

This value is always full speed and corresponds to the CPU Temp. Highest Limit.

- Minimum Value: 100
- Maximum Value: 100

→ CPU Fan Second Setting [080]

This value is always full speed and corresponds to the CPU Temp. Second Limit.

- Minimum Value: 0 (Auto Fan by DutyCycle) or 12 (Auto Fan by RPM)
- Maximum Value: 100

→ CPU Fan Third Setting [070]

This value is always full speed and corresponds to the CPU Temp. Third Limit

- Minimum Value: 0 (Auto Fan by DutyCycle) or 12 (Auto Fan by RPM)
- Maximum Value: 100

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→ CPU Fan Fourth Setting [060]

This value is always full speed and corresponds to the CPU Temp. Fourth Limit.

- Minimum Value: 0 (Auto Fan by DutyCycle) or 12 (Auto Fan by RPM)
- Maximum Value: 100

→ CPU Fan Lowest Setting [050]

This value is always full speed and corresponds to the CPU Temp. Lowest Limit.

- Minimum Value: 0 (Auto Fan by DutyCycle) or 12 (Auto Fan by RPM)
- Maximum Value: 100

→ Hardware Health Monitoring

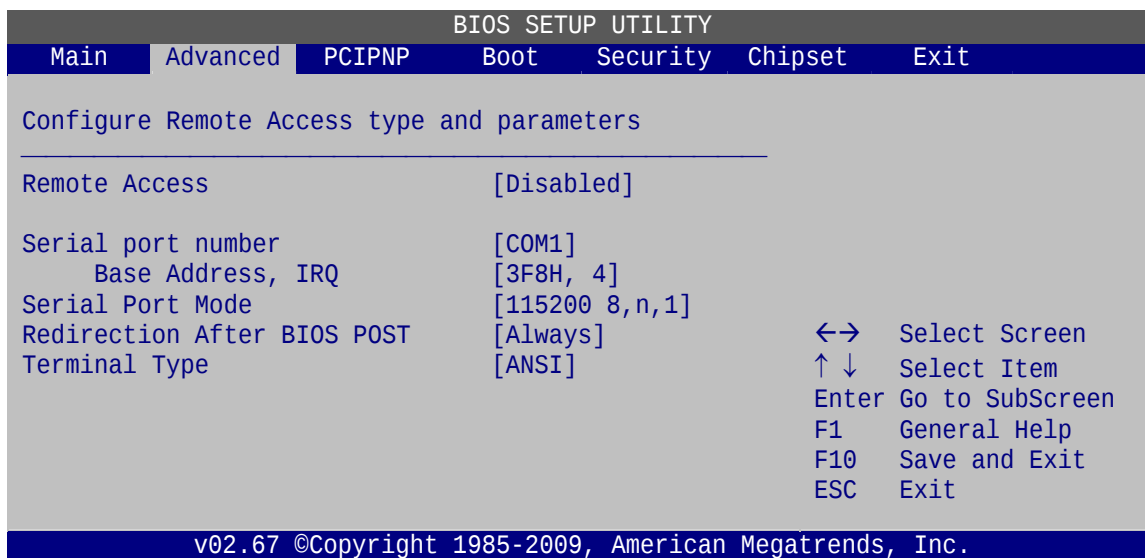
The following system parameters and values are shown. The system parameters that are monitored are:

- System Temperatures:
 - CPU Temperature
 - System Temperature
- Fan Speeds:
 - CPU Fan Speed
 - SYS Fan Speed
- Voltages:
 - VIN1 Vcore
 - VIN2 VCC5
 - VIN3 VCC12
 - VIN4 VCC1.8
 - VCC3
 - VSB
 - VBAT

5.3.5 Remote Access Configuration

Use the **Remote Access Configuration** menu (**BIOS Menu 8**) 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 8: Remote Access Configuration

→ 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.

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→ Serial Port Number [COM1]

Use the **Serial Port Number** option 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 must be set on the host (a management computer running a terminal software) and the slave

→ 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.

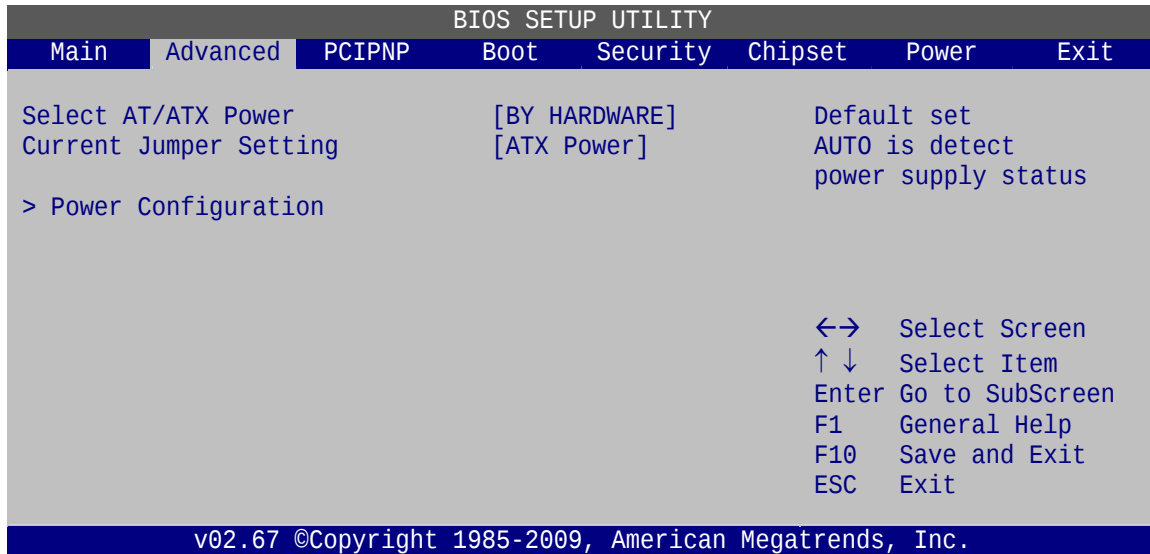
The VT100 Terminal Definition is the standard convention used to configure and conduct emergency management tasks with UNIX-based servers. VT100 does not support all keys on the standard PC 101-key layout, however. The VT-UTF8 convention makes available additional keys that are not provided by VT100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

5.3.6 Power Configuration

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

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BIOS Menu 9: ACPI Configuration

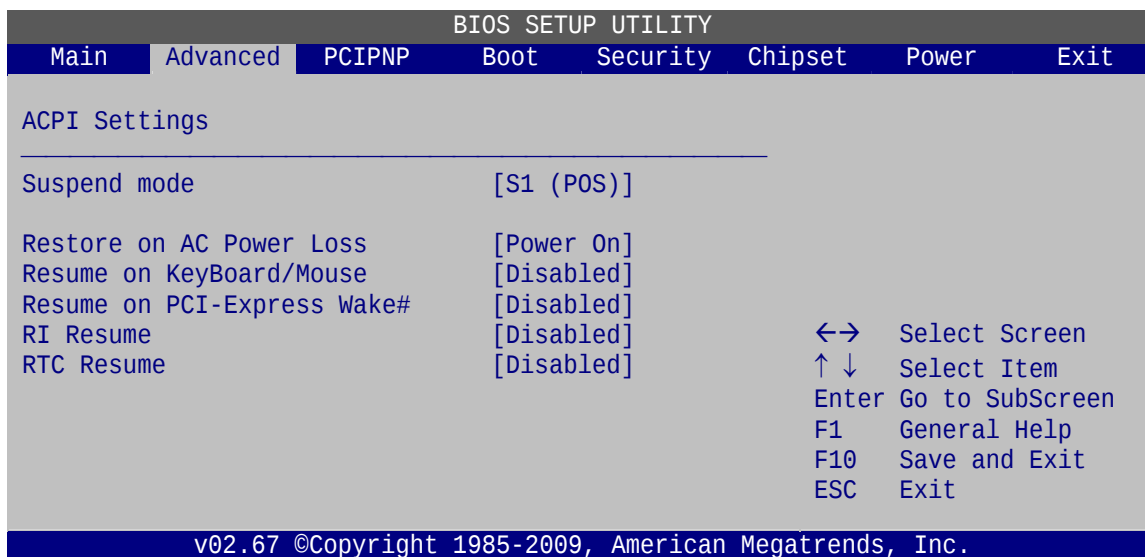
➔ Select AT/ATX Power [ATX Power]

Use the **Select AT/ATX Power** BIOS option to select the power mode for the system.

- ➔ **AT Power** Use AT power mode
- ➔ **ATX Power** **DEFAULT** Use ATX power mode
- ➔ **BY** The power mode is selected by the on-board jumper.
- HARDWARE**

5.3.6.1 ACPI Configuration

Use the **ACPI Configuration** menu (**BIOS Menu 10**) to select the ACPI state when the system is suspended.



BIOS Menu 10: General ACPI Configuration

→ Suspend Mode [S1 (POS)]

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

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

→ Restore on AC Power Loss [Power Off]

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

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→ 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 |
| → | Resume On KeyBoard | | Wake event generated by activity on the keyboard |
| → | Resume On Mouse | | Wake event generated by activity on the mouse |
| → | Enabled | | Wake event generated by activity on the keyboard or mouse |

→ Resume on PCI-Express WAKE# [Enabled]

The **Resume on PCI-Express WAKE#** BIOS option specifies if the system is roused from a suspended or standby state when there is activity on the PCI-Express bus.

- | | | | |
|---|-----------------|----------------|--|
| → | Disabled | | Wake event not generated by PCI-Express activity |
| → | Enabled | DEFAULT | Wake event generated by PCI-Express activity |

→ RI Resume [Disabled]

Use the **RI Resume** 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 |

→ RTC Resume [Disabled]

Use the **RTC Resume** 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 | | <p>If selected, the following appears with values that can be selected:</p> <p>RTC Alarm Date (Days)</p> <p>RTC Alarm Time</p> <p>After setting the alarm, the computer turns itself on from a suspend state when the alarm goes off.</p> |

5.3.7 AHCI Configuration

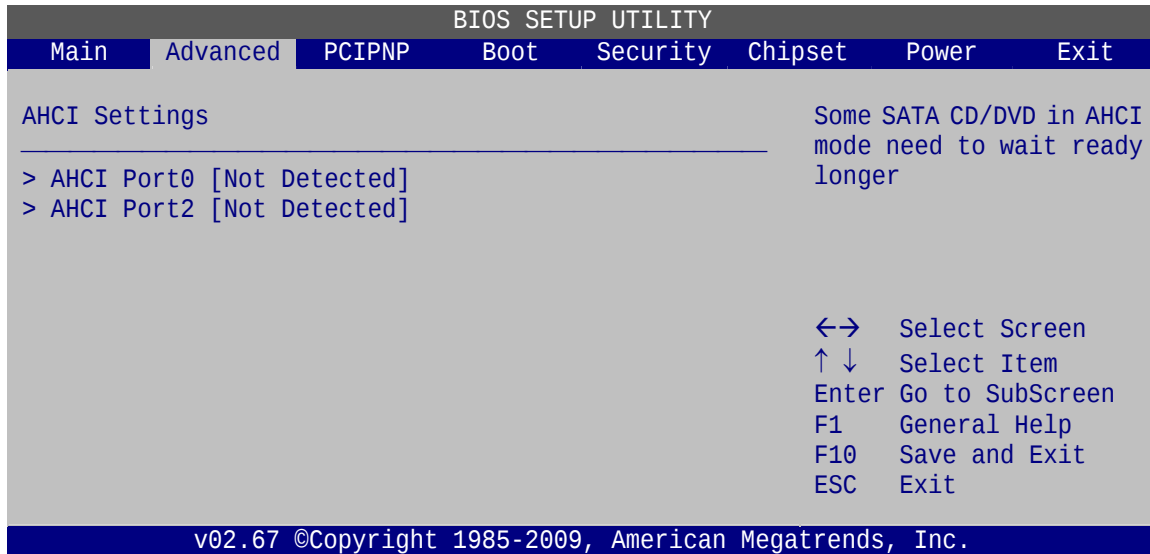


NOTE:

Advanced Host Controller Interface (AHCI) is a new programming interface for SATA host controllers. AHCI systems do not have master/slave designation for SATA devices, each device is treated as a master, and hardware-assisted native command queuing.

Use the **AHCI Settings** menu (**BIOS Menu 11**) to report on the auto-detection of devices connected to the onboard SATA drive connectors.

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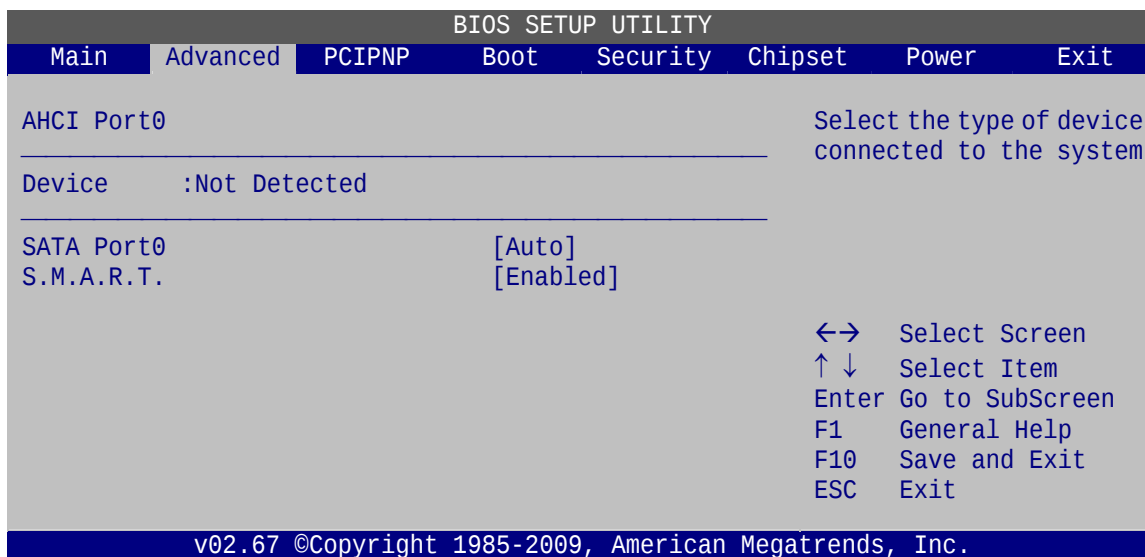
BIOS Menu 11: AHCI Configuration

→ AHCI Port n [Not Detected]

Use the **AHCI Port n** BIOS option to check what AHCI (Advanced Host Controller Interface) devices are detected on a specified SATA drive connector. If a device is detected, selecting the BIOS option, e.g. "**AHCI Port 3**" opens a new window.

5.3.7.1 AHCI Port n

Use the **AHCI Port n** configuration menu (**BIOS Menu 12**) to configure the drive connected to SATA connector n.



BIOS Menu 12: AHCI Port n Configuration Menu

➔ SATA Port n [Auto]

Use the **SATA Port n** option to enable the system to auto-detect the type of drive connected to SATA drive connector n.

➔ S.M.A.R.T [Enabled]

Use the **S.M.A.R.T** option to enable S.M.A.R.T (Self-Monitoring, Analysis, and Reporting Technology) on the drive connected to SATA drive connector n.

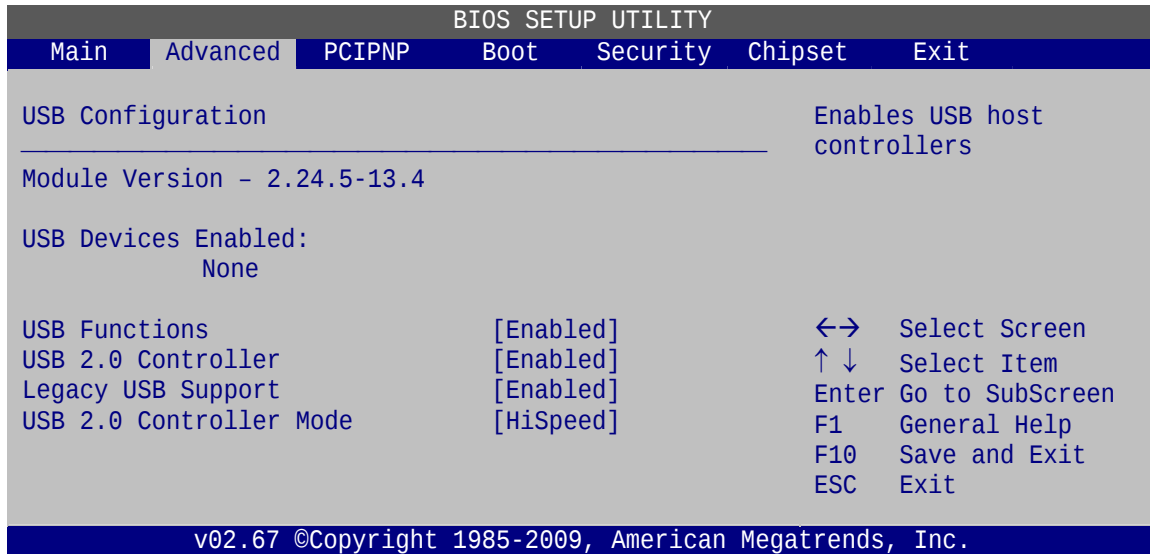
➔ **Enabled** **DEFAULT** S.M.A.R.T is enabled on the drive connected to SATA drive connector n on the system

➔ **Disabled** S.M.A.R.T is disabled on the drive connected to SATA drive connector n on the system

5.3.8 USB Configuration

Use the **USB Configuration** menu (**BIOS Menu 13**) to read USB configuration information and configure the USB settings.

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BIOS Menu 13: USB Configuration

➔ USB Configuration

The **USB Configuration** field shows the system USB configuration. The items listed are:

- Module Version: x.xxxxx.xxxxx

➔ USB Devices Enabled

The **USB Devices Enabled** field lists the USB devices that are enabled on the system

➔ USB Function [Enabled]

Use the **USB Function** BIOS option to enable or disable a specified number of USB ports. If no USB ports are being used, disabling the USB frees up system resources that can be redirected elsewhere.

- ➔ **Disabled** USB function support disabled
- ➔ **8 USB Ports** Eight USB ports are enabled
- ➔ **Enabled** **DEFAULT** USB ports are enabled

➔ USB 2.0 Controller [Enabled]

Use the **USB 2.0 Controller** BIOS option to enable or disable the USB 2.0 controller

- ➔ Disabled USB 2.0 controller disabled
- ➔ Enabled DEFAULT USB 2.0 controller enabled

➔ 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

➔ USB2.0 Controller Mode [HiSpeed]

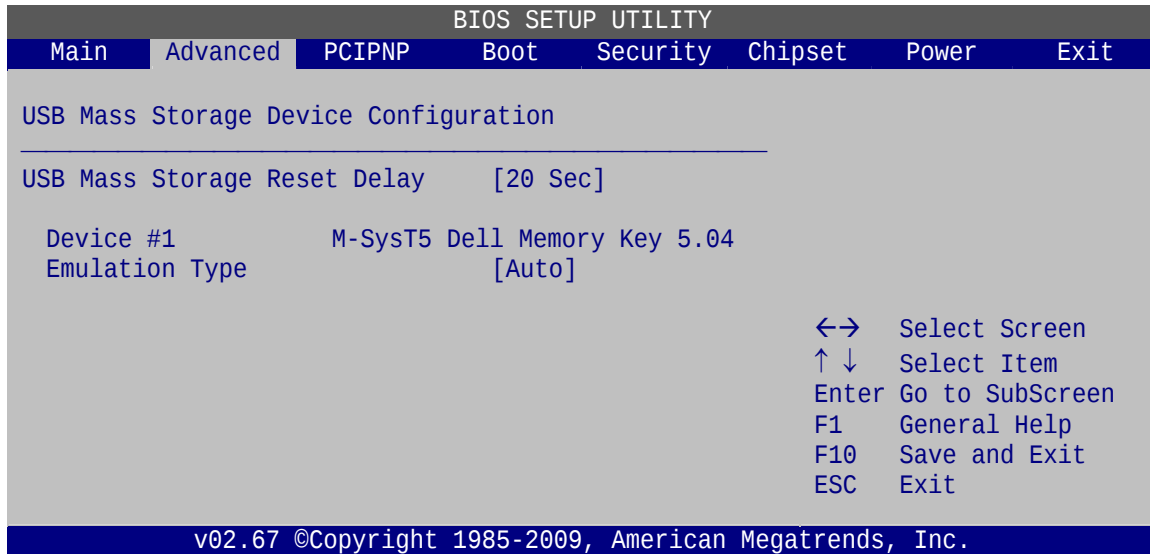
Use the **USB2.0 Controller Mode** option to set the speed of the USB2.0 controller.

- ➔ FullSpeed The controller is capable of operating at 12 Mb/s
- ➔ HiSpeed DEFAULT The controller is capable of operating at 480 Mb/s

5.3.8.1 USB Mass Storage Device Configuration

Use the **USB Mass Storage Device Configuration** menu (**BIOS Menu 14**) to configure USB mass storage class devices.

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BIOS Menu 14: USB Mass Storage Device Configuration

→ USB Mass Storage Reset Delay [20 Sec]

Use the **USB Mass Storage Reset Delay** option to set the number of seconds POST waits for the USB mass storage device after the start unit command.

- **10 Sec** POST waits 10 seconds for the USB mass storage device after the start unit command.
- **20 Sec** **DEFAULT** POST waits 20 seconds for the USB mass storage device after the start unit command.
- **30 Sec** POST waits 30 seconds for the USB mass storage device after the start unit command.
- **40 Sec** POST waits 40 seconds for the USB mass storage device after the start unit command.

→ Device

The **Device##** field lists the USB devices that are connected to the system.

→ Emulation Type [Auto]

Use the **Emulation Type** BIOS option to specify the type of emulation BIOS has to provide for the USB device.

➔	Auto	DEFAULT	BIOS auto-detects the current USB.
➔	Floppy		The USB device will be emulated as a floppy drive. The device can be either A: or B: responding to INT13h calls that return DL = 0 or DL = 1 respectively.
➔	Forced FDD		Allows a hard disk image to be connected as a floppy image. This option works only for drives formatted with FAT12, FAT16 or FAT32.
➔	Hard Disk		Allows the USB device to be emulated as hard disk responding to INT13h calls that return DL values of 80h or above.
➔	CDROM		Assumes the CD-ROM is formatted as bootable media. All the devices that support block sizes greater than 512 bytes can only be booted using this option.

5.4 PCI/PnP

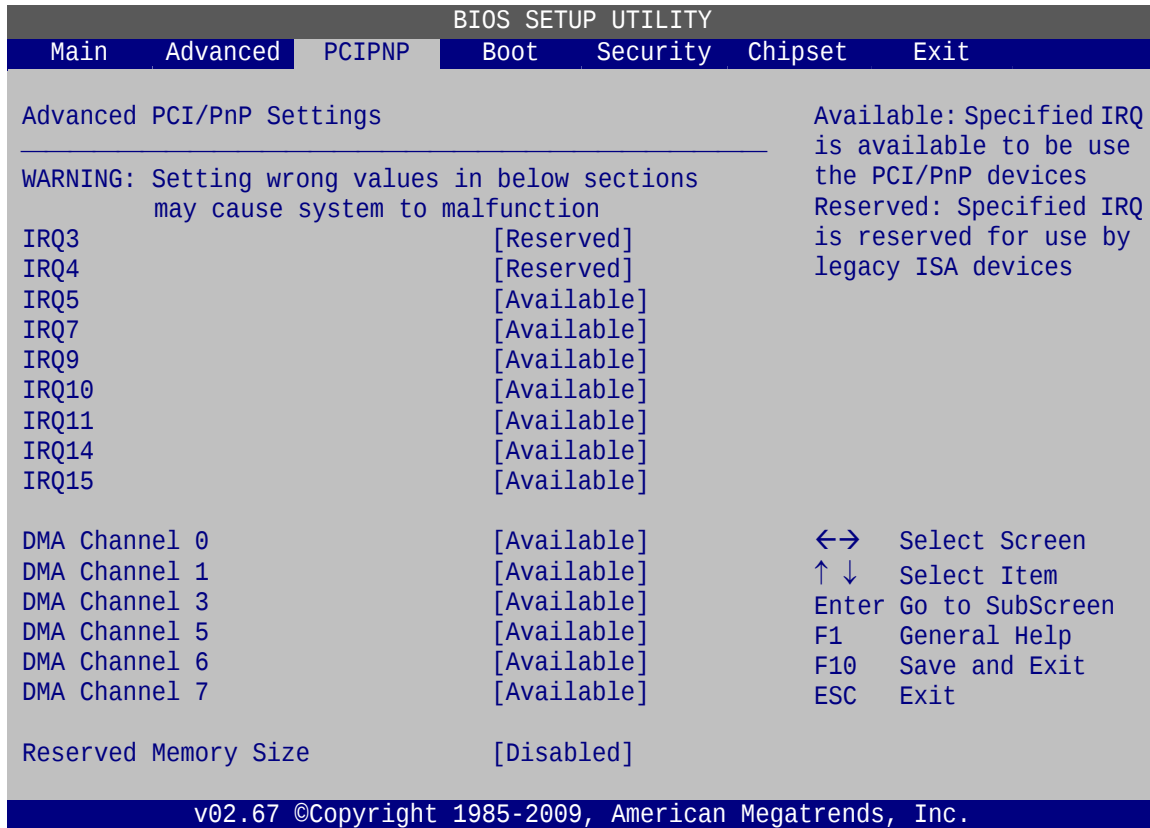
Use the **PCI/PnP** menu (**BIOS Menu 15**) to configure advanced PCI and PnP settings.



WARNING!

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

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BIOS Menu 15: 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

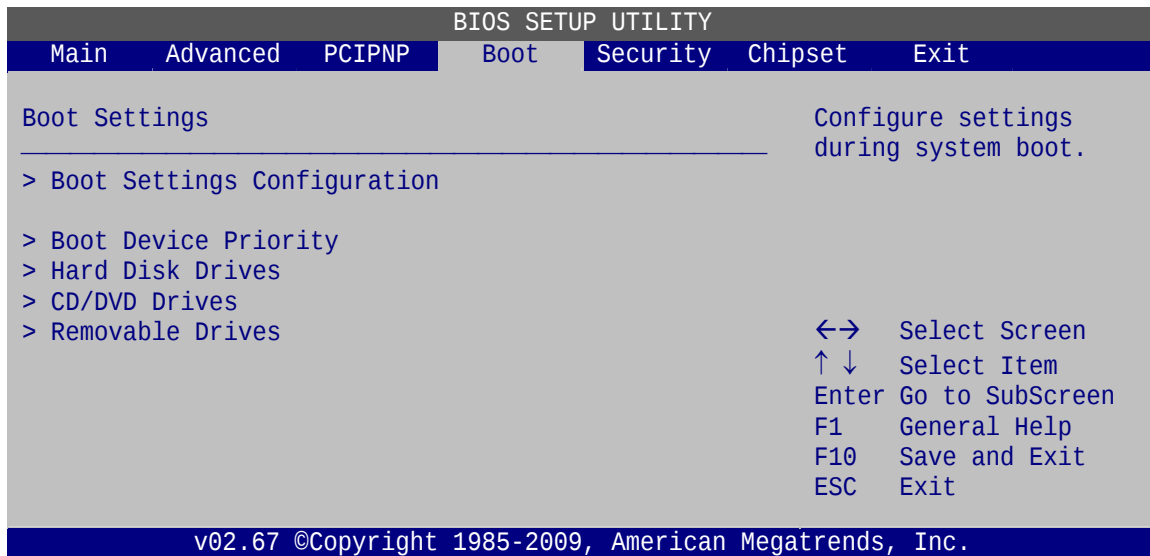
➔ **Reserved Memory Size [Disabled]**

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 | | 16 KB reserved for legacy ISA devices |
| ➔ | 32K | | 32 KB reserved for legacy ISA devices |
| ➔ | 64K | | 54 KB reserved for legacy ISA devices |

5.5 Boot

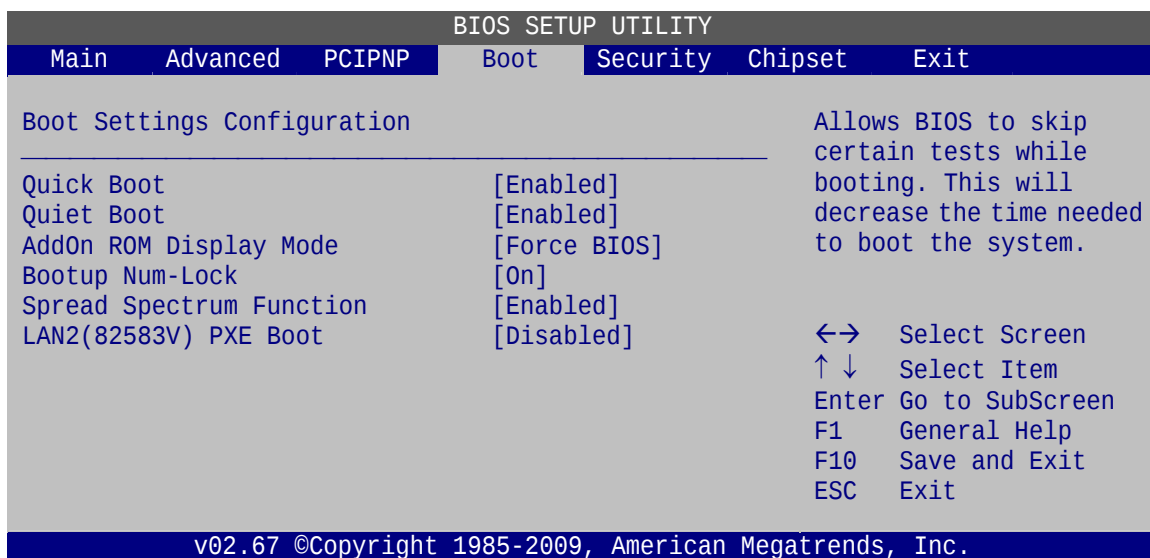
Use the **Boot** menu (**BIOS Menu 16**) to configure system boot options.



BIOS Menu 16: Boot

5.5.1 Boot Settings Configuration

Use the **Boot Settings Configuration** menu (**BIOS Menu 17**) to configure advanced system boot options.



BIOS Menu 17: 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 |

➔ **LAN2(82583V) PXE Boot [Disabled]**

Use the **LAN2(82583V) PXE Boot** option to enable the system to be booted from a remote system.

- | | | | |
|---|-----------------|----------------|---|
| ➔ | Disabled | DEFAULT | Cannot be booted from a remote system through the LAN2 port |
| ➔ | Enabled | DEFAULT | Can be booted from a remote system through the LAN2 port |

➔ **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]**

Use the **AddOn ROM Display Mode** option to allow add-on ROM (read-only memory) messages to be displayed.

- | | | | |
|---|---------------------|----------------|---|
| ➔ | Force BIOS | DEFAULT | The system forces third party BIOS to display during system boot. |
| ➔ | Keep Current | | The system displays normal information during system boot. |

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→ Bootup Num-Lock [On]

Use the **Bootup Num-Lock** BIOS option to specify if the number lock setting must be modified during boot up.

- **Off** 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** **DEFAULT** 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.

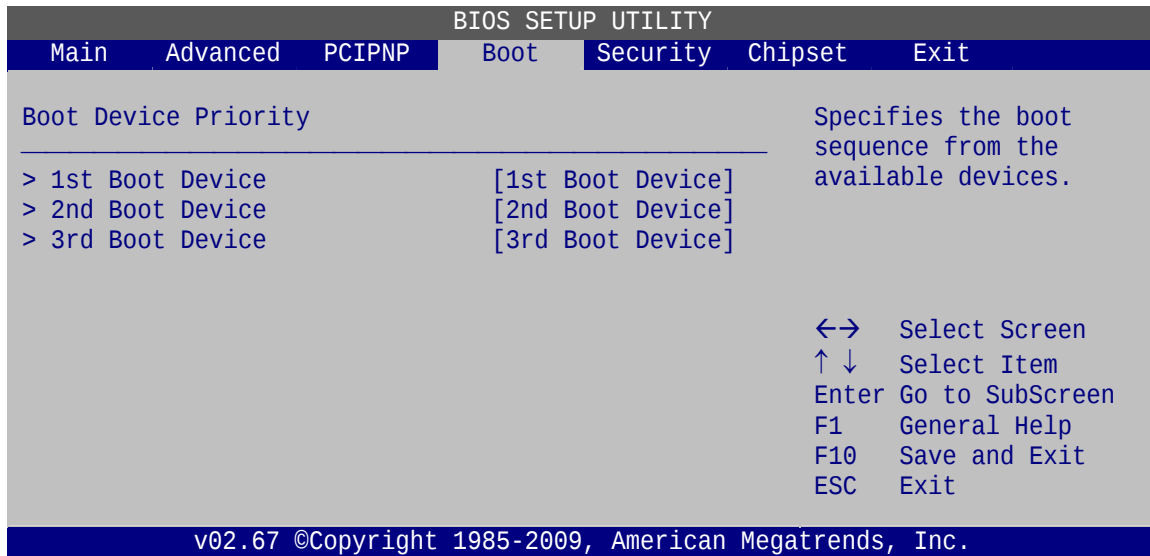
→ Spread Spectrum Function [Disabled]

The **Spread Spectrum Mode** option can help to improve CPU EMI issues.

- **Disabled** **DEFAULT** The spread spectrum mode is disabled
- **Enabled** The spread spectrum mode is enabled

5.5.2 Boot Device Priority

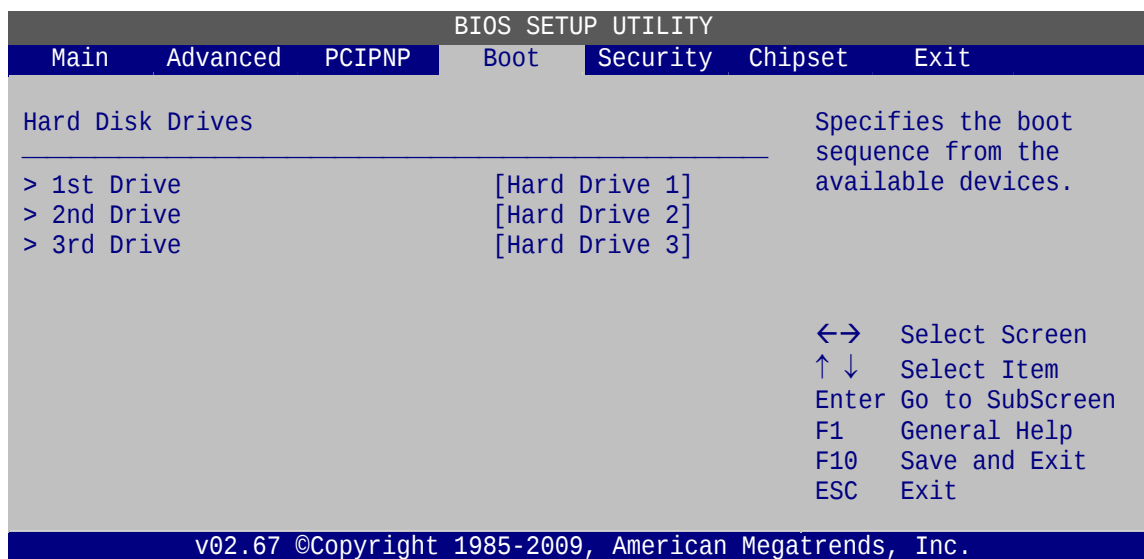
Use the **Boot Device Priority** menu (**BIOS Menu 18**) to specify the boot sequence from the available devices. The drive sequence also depends on the boot sequence in the individual device section.



BIOS Menu 18: Boot Device Priority Settings

5.5.3 Hard Disk Drives

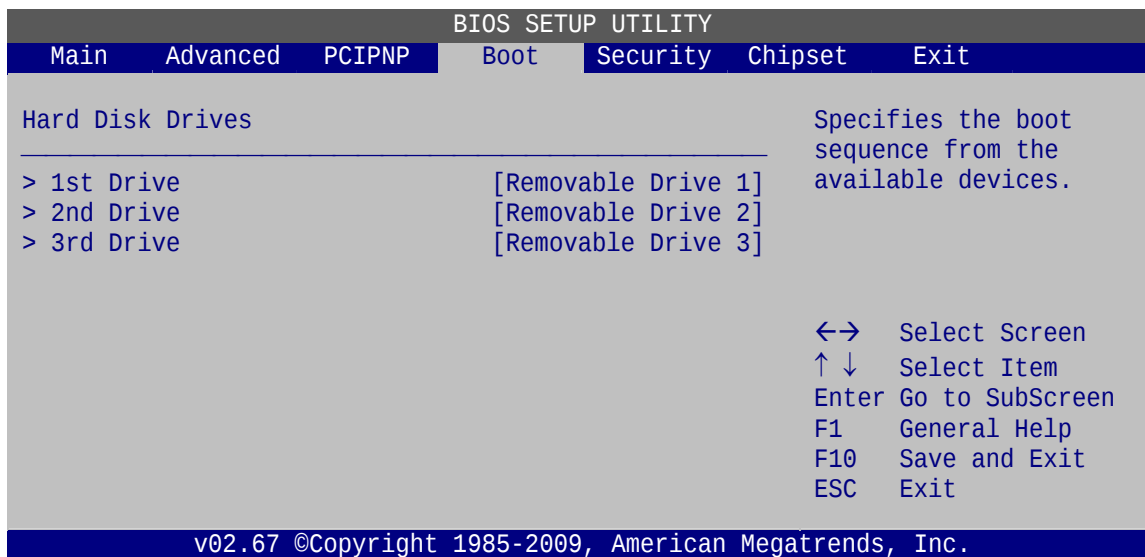
Use the **Hard Disk Drives** menu to specify the boot sequence of the available HDDs.
Only installed hard drives are shown.



BIOS Menu 19: Hard Disk Drives

5.5.4 Removable Drives

Use the **Removable Drives** menu (**BIOS Menu 20**) to specify the boot sequence of the removable drives. Only connected drives are shown.



BIOS Menu 20: Removable Drives

5.5.5 CD/DVD Drives

Use the **CD/DVD Drives** menu to specify the boot sequence of the available CD/DVD drives. When the menu is opened, the CD drives and DVD drives connected to the system are listed as shown below:

- 1st Drive [CD/DVD: PM-(part ID)]
- 2nd Drive [HDD: PS-(part ID)]
- 3rd Drive [HDD: SM-(part ID)]
- 4th Drive [HDD: SM-(part ID)]

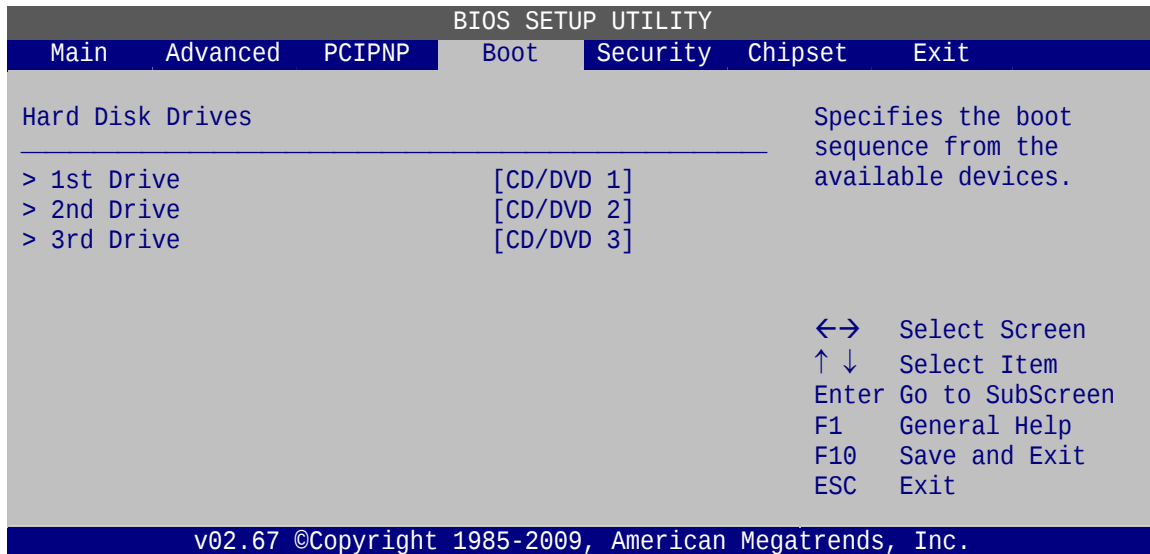


NOTE:

Only the drives connected to the system are shown. For example, if only two CDs or DVDs are connected only **"1st Drive"** and **"2nd Drive"** are listed.

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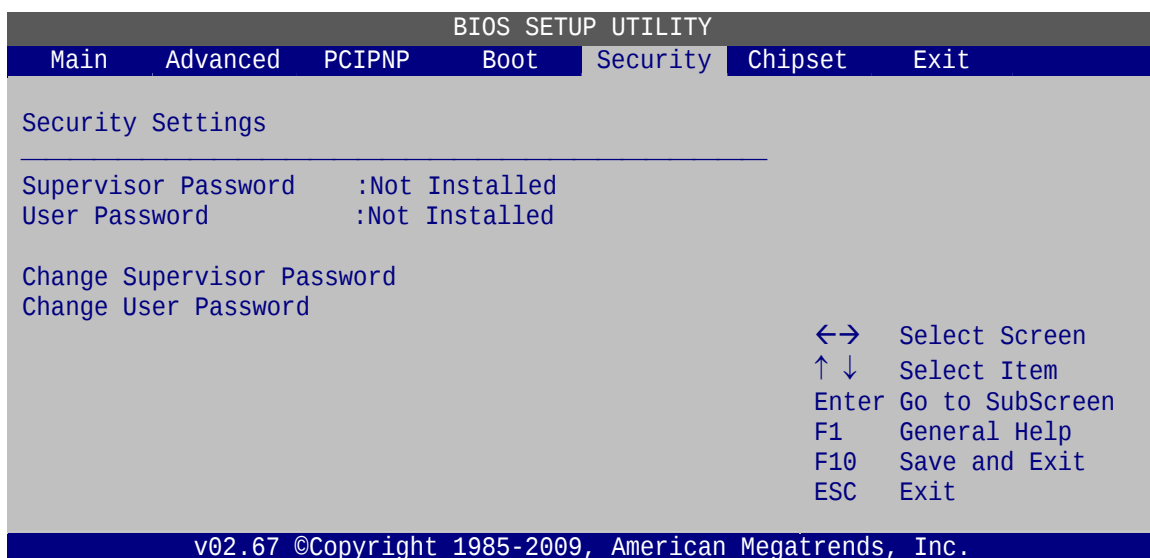
The boot sequence from the available devices is selected. If the “**1st Drive**” option is selected a list of available CD/DVD drives is shown. Select the first CD/DVD drive the system boots from. If the “**1st Drive**” is not used for booting this option may be disabled.



BIOS Menu 21: CD/DVD Drives

5.6 Security

Use the **Security** menu (**BIOS Menu 22**) to set system and user passwords.



BIOS Menu 22: 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**.

➔ **Clear User Password**

Use the **Clear User Password** to clear a user's password. The default for this option is **Not Installed**. If a user password must be cleared, use this option.

➔ **Boot Sector Virus Protection [Disabled]**

Use the **Boot Sector Virus Protection** to enable or disable boot sector protection.

- ➔ **Disabled** **DEFAULT** Disables the boot sector virus protection
- ➔ **Enabled** Enables the boot sector virus protection

5.7 Chipset

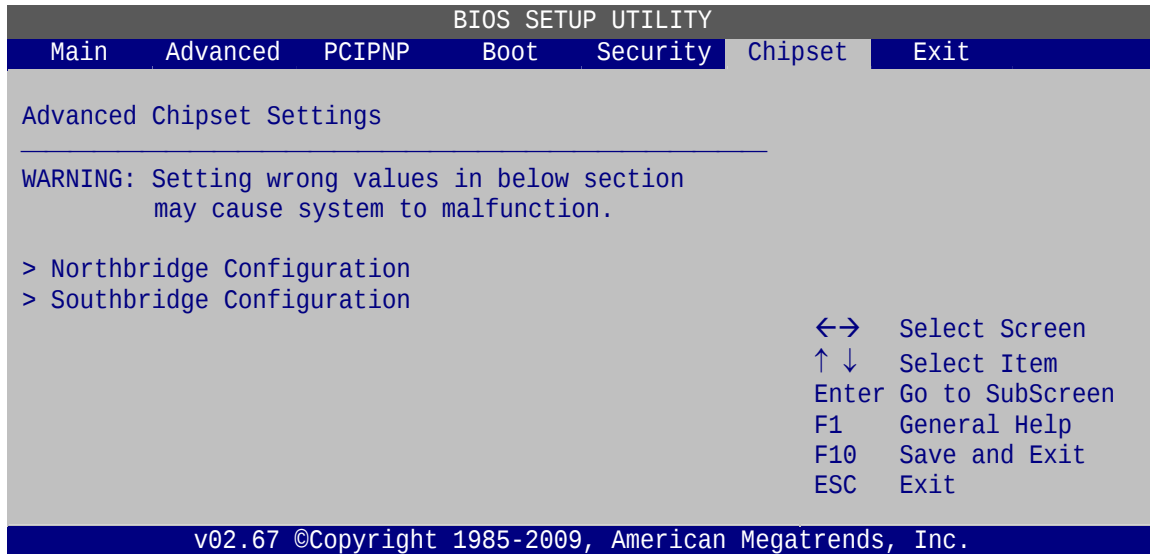
Use the **Chipset** menu (**BIOS Menu 23**) to access the Northbridge and Southbridge configuration menus



WARNING!

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

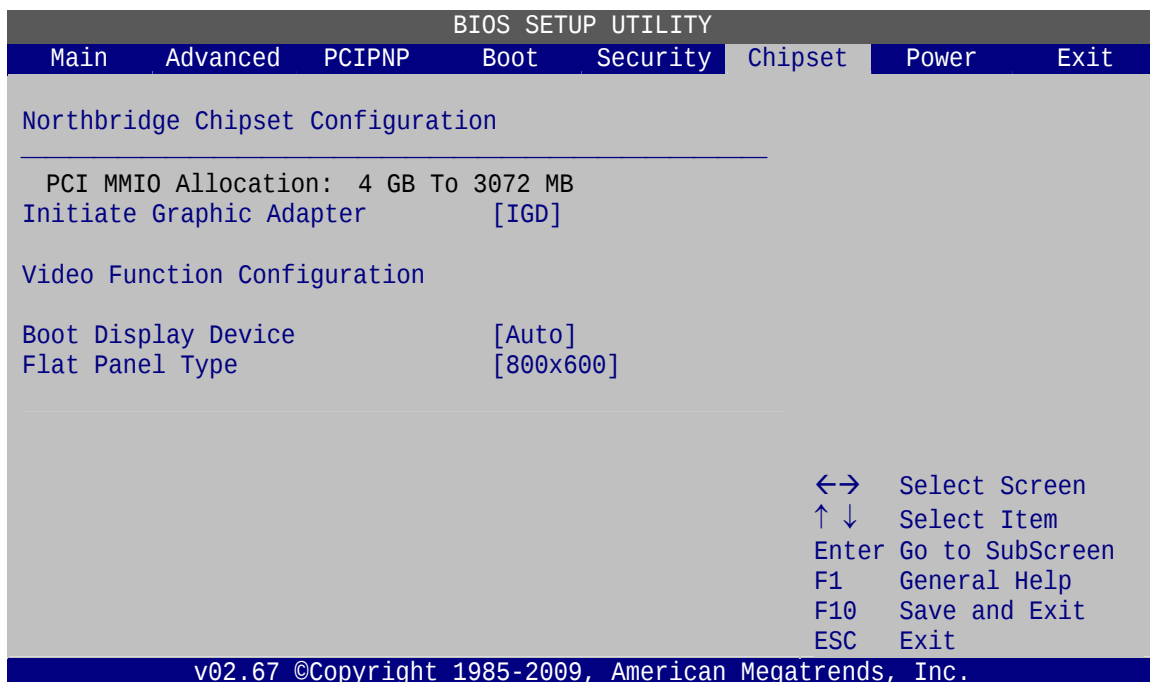
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BIOS Menu 23: Chipset

5.7.1 Northbridge Chipset Configuration

Use the **Northbridge Chipset Configuration** menu (BIOS Menu 24) to configure the Northbridge chipset.



BIOS Menu 24:Northbridge Chipset Configuration

→ Initiate Graphic Adapter

Use the **Initiate Graphic Adapter** option to select the graphics controller used as the primary boot device. Select either an integrated graphics controller (IGD) or a combination of PCI graphics controller, a PCI express (PEG) controller or an IGD. Configuration options are listed below:

- IGD
- PCI/IGD
- PCI/PEG
- PEG/IGD
- PEG/PCI DEFAULT

→ Boot Display Device [CRT]

Use the **Display Device Select** BIOS feature to determine what displays are used. Dual display functionality is enabled here. Dual display configuration options are listed below:

- Auto DEFAULT
- CRT
- LFP

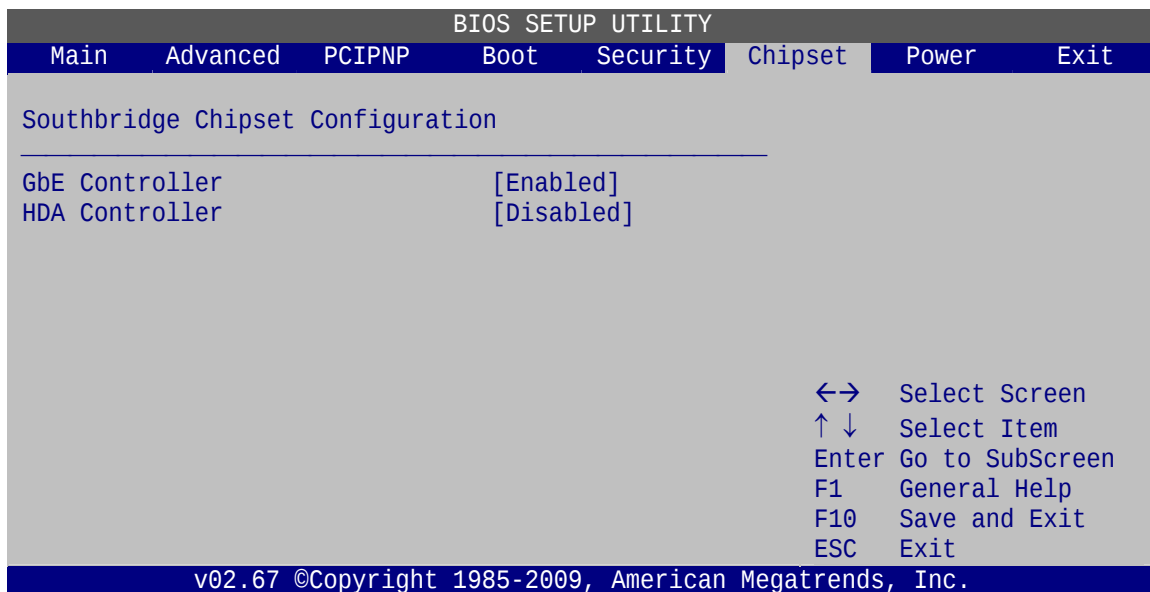
→ Flat Panel Type

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

- 640 x 480
- 800 x 480
- 800 x 600
- 1024 x 600
- 1024 x 768
- 1280 x 720
- 1280 x 800
- 1366 x 768
- 1280 x 768

5.7.2 Southbridge Configuration

Use the **Southbridge Configuration** menu (**BIOS Menu 25**) to configure the Southbridge chipset.



BIOS Menu 25:Southbridge Chipset Configuration

➔ GbE Controller [Enabled]

Use the **GbE Controller** option to enable or disable the GbE Ethernet controller.

- ➔ **Enabled** **DEFAULT** The GbE controller is enabled
- ➔ **Disabled** The GbE controller is disabled

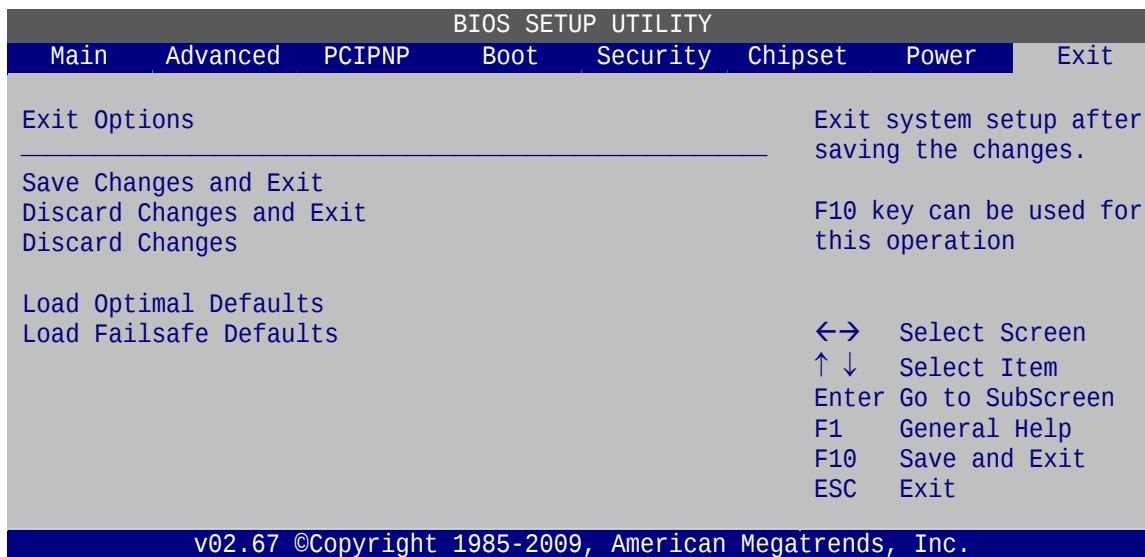
➔ HDA Controller [Disabled]

Use the **HDA Controller** option to enable or disable the High Definition Audio (HDA) controller.

- ➔ **Enabled** **DEFAULT** The HDA controller is enabled
- ➔ **Disabled** The HDA controller is disabled

5.8 Exit

Use the **Exit** menu (**BIOS Menu 26**) to load default BIOS values, optimal failsafe values and to save configuration changes.



BIOS Menu 26: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.**

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→ 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.**

Appendix**A**

BIOS Options

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Below is a list of BIOS configuration options in the BIOS chapter.

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Appendix**B**

One Key Recovery

B.1 One Key Recovery Introduction

The IEI one key recovery is an easy-to-use front end for the Norton Ghost system backup and recovery tool. The one key recovery provides quick and easy shortcuts for creating a backup and reverting to that backup or for reverting to the factory default settings.

To create the system backup the main storage device must be split into two partitions (three partitions for Linux). The first partition will be for the operating system, while the second partition will be invisible to the operating system and contain the backup made by the one key recovery software.

B.1.1 System Requirement

The partition created for recovery images must be big enough to contain both the factory default image and the user backup image. The size must be calculated before creating the partitions. Please take the following table as a reference when calculating the size of the partition.

	OS	OS Image after Ghost	Compression Ratio
Windows® 7	7 GB	5 GB	70%
Windows® XPE	776 MB	560 MB	70%
Windows® CE 6.0	36 MB	28 MB	77%



NOTE:

Specialized tools are required to change the partition size if the operating system is already installed.

B.1.2 Supported Operating System

The recovery CD is compatible with both Microsoft Windows and Linux operating system (OS). The supported OS versions are listed below.

- Microsoft Windows
 - Windows XP (Service Pack 2 or 3 required)
 - Windows Vista

- ☐ Windows 7
- ☐ Windows CE 5.0
- ☐ Windows CE 6.0
- ☐ Windows XP Embedded
- Linux
 - ☐ Fedora Core 12 (Constantine)
 - ☐ Fedora Core 11 (Leonidas)
 - ☐ Fedora Core 10 (Cambridge)
 - ☐ Fedora Core 8 (Werewolf)
 - ☐ Fedora Core 7 (Moonshine)
 - ☐ RedHat RHEL-5.4
 - ☐ RedHat 9 (Ghirke)
 - ☐ Ubuntu 8.10 (Intrepid)
 - ☐ Ubuntu 7.10 (Gutsy)
 - ☐ Ubuntu 6.10 (Edgy)
 - ☐ Debian 5.0 (Lenny)
 - ☐ Debian 4.0 (Etch)
 - ☐ SuSe 11.2
 - ☐ SuSe 10.3

**NOTE:**

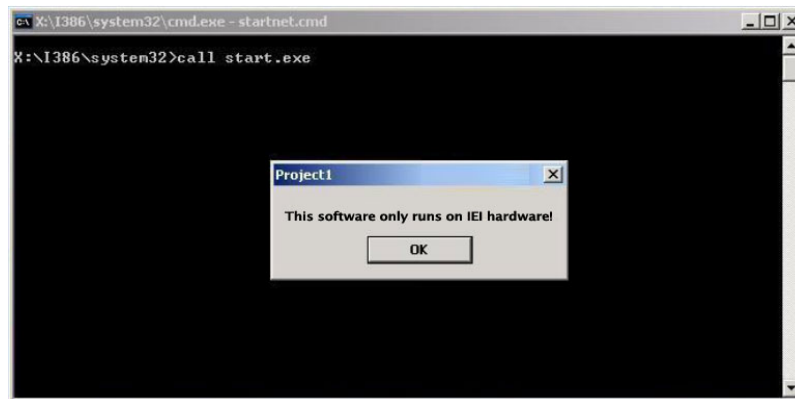
Installing unsupported OS versions may cause the recovery tool to fail.

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NOTE:

The recovery CD can only be used with IEI products. The software will fail to run and a warning message will appear when used on non-IEI hardware.



B.2 Setup Procedure for Windows

Prior to using the recovery tool to backup or restore system, a few setup procedures are required.

- Step 1:** Hardware and BIOS setup
- Step 2:** Create partitions
- Step 3:** Install operating system, drivers and system applications.
- Step 4:** Build-up recovery partition
- Step 5:** Create factory default image

The detailed descriptions are described in the following sections.

**NOTE:**

The setup procedures described below are for Microsoft Windows operating system users. For Linux system, most setup procedures are the same with Microsoft Windows except for several steps which is described in **Section B.3**.

B.2.1 Hardware and BIOS Setup

- Step 1:** Make sure the system is powered off and unplugged.
- Step 2:** Install a hard driver or SSD in the NANO-PV-D510A. An unformatted and unpartitioned disk is recommended.
- Step 3:** Connect an optical disk drive to the NANO-PV-D510A and insert the recovery CD.
- Step 4:** Turn on the system.
- Step 5:** Press the <DELETE> key as soon as the system is turned on to enter the BIOS.
- Step 6:** Select the connected optical disk drive as the 1st boot device. (**Boot → Boot Device Priority → 1st Boot Device**).
- Step 7:** Save changes and restart the computer. Continue to the next section for instructions on partitioning the internal storage.

B.2.2 Create Partitions

- Step 1:** Put the recovery CD in the optical drive.
- Step 2:** Turn on the system.
- Step 3:** When prompted, press any key to boot from the recovery CD. It will take a while to launch the recovery tool. Please be patient.
- Step 4:** The recovery tool setup menu is shown as below.

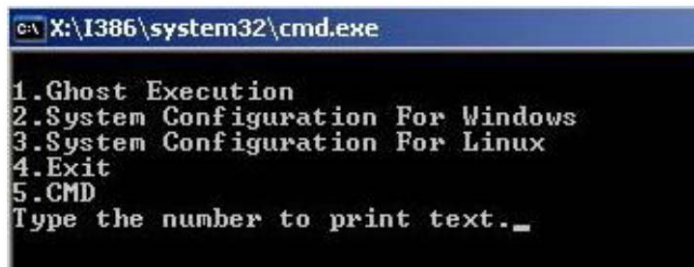


Figure B-1: Recovery Tool Setup Menu

Step 5: Press <5> then <Enter>.

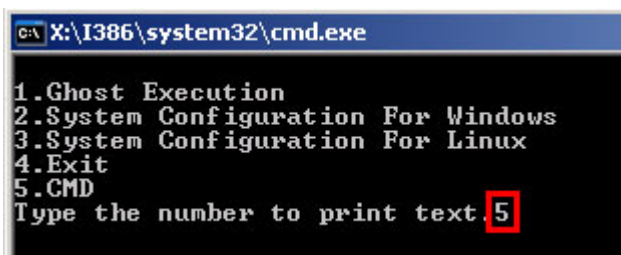


Figure B-2: Command Mode

Step 6: The command prompt window appears. Type the following commands (marked in red) to create two partitions. One is for the OS installation; the other is for saving recovery files and images which will be an invisible partition.

(Press <Enter> after entering each line below)

system32>diskpart

DISKPART>list vol

DISKPART>sel disk 0

DISKPART>create part pri size= ____

DISKPART>assign letter=N

DISKPART>create part pri size= ____

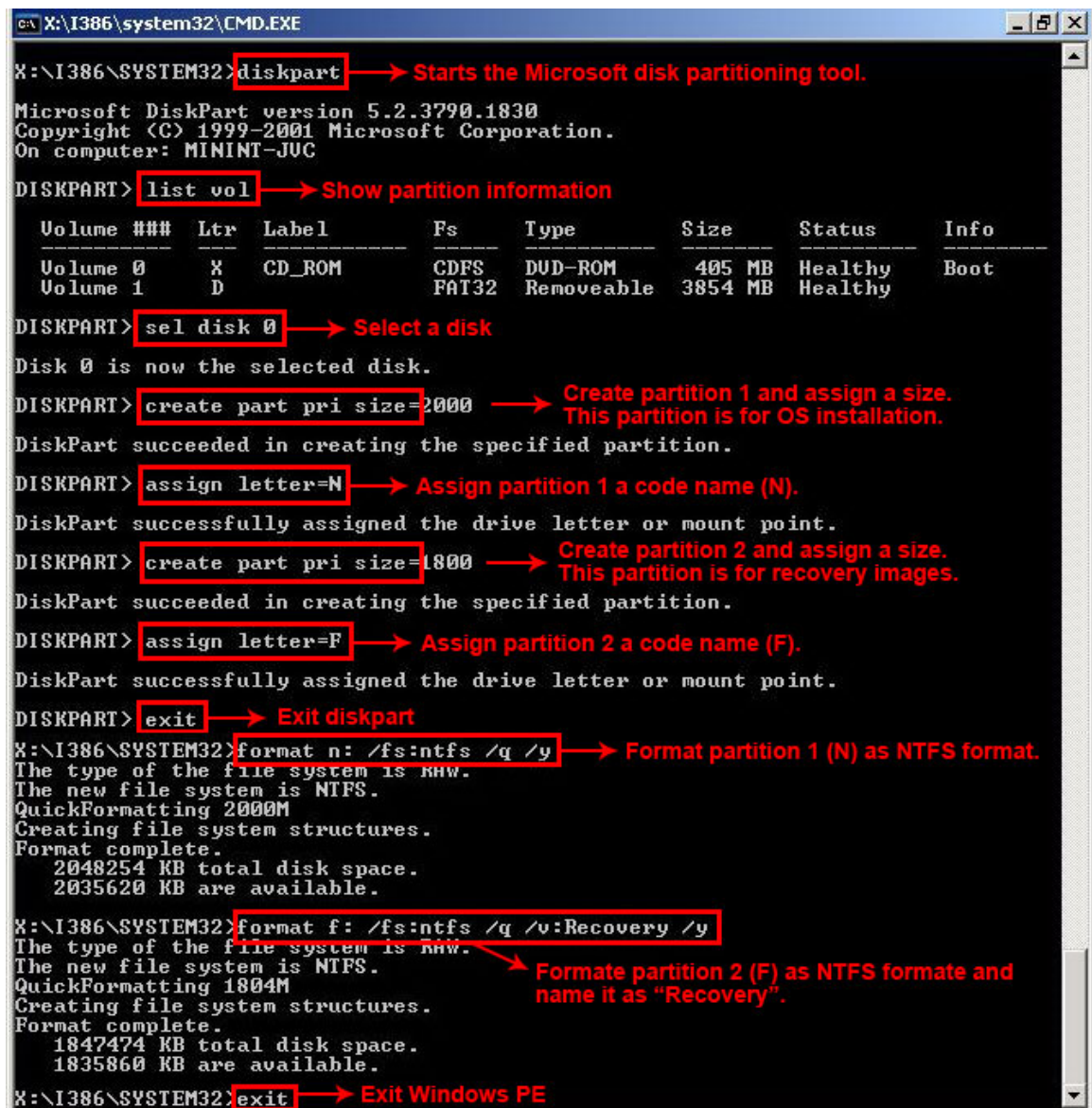
DISKPART>assign letter=F

DISKPART>exit

system32>format N: /fs:ntfs /q /y

system32>format F: /fs:ntfs /q /v:Recovery /y

system32>exit



```
X:\I386\SYSTEM32\CMD.EXE
X:\I386\SYSTEM32>diskpart → Starts the Microsoft disk partitioning tool.

Microsoft DiskPart version 5.2.3790.1830
Copyright (C) 1999-2001 Microsoft Corporation.
On computer: MININT-JUC

DISKPART>list vol → Show partition information

   Volume ###  Ltr  Label          Fs      Type          Size      Status       Info
   -----
   Volume 0      X    CD_ROM          CDFS     DUD-ROM        405 MB    Healthy      Boot
   Volume 1      D    CD_ROM          FAT32     Removeable    3854 MB    Healthy

DISKPART>sel disk 0 → Select a disk
Disk 0 is now the selected disk.

DISKPART>create part pri size=2000 → Create partition 1 and assign a size.
                                     This partition is for OS installation.
DiskPart succeeded in creating the specified partition.

DISKPART>assign letter=N → Assign partition 1 a code name (N).
DiskPart successfully assigned the drive letter or mount point.

DISKPART>create part pri size=1800 → Create partition 2 and assign a size.
                                     This partition is for recovery images.
DiskPart succeeded in creating the specified partition.

DISKPART>assign letter=F → Assign partition 2 a code name (F).
DiskPart successfully assigned the drive letter or mount point.

DISKPART>exit → Exit diskpart

X:\I386\SYSTEM32>format n: /fs:ntfs /q /y → Format partition 1 (N) as NTFS format.
The type of the file system is RAW.
The new file system is NTFS.
QuickFormatting 2000M
Creating file system structures.
Format complete.
2048254 KB total disk space.
2035620 KB are available.

X:\I386\SYSTEM32>format f: /fs:ntfs /q /v:Recovery /y
The type of the file system is RAW.
The new file system is NTFS.
QuickFormatting 1804M
Creating file system structures.
Format complete.
1847474 KB total disk space.
1835860 KB are available.

X:\I386\SYSTEM32>exit → Exit Windows PE
```

Figure B-3: Partition Creation Commands



NOTE:

Use the following commands to check if the partitions were created successfully.

```
X:\I386\SYSTEM32>diskpart
Microsoft DiskPart version 5.2.3790.1830
Copyright (C) 1999-2001 Microsoft Corporation.
On computer: MININT-JUC

DISKPART> sel disk 0
Disk 0 is now the selected disk.

DISKPART> list part

   Partition ###   Type              Size          Offset
-----
Partition 1       Primary           2000 MB         32 KB
Partition 2       Primary           1804 MB        2000 MB

DISKPART> exit
```

Step 7: Press any key to exit the recovery tool and automatically reboot the system.

Please continue to the following procedure: Build-up Recovery Partition.

B.2.3 Install Operating System, Drivers and Applications

Install the operating system onto the unlabelled partition. The partition labeled as "Recovery" is for use by the system recovery tool and should not be used for installing the operating system or any applications.



NOTE:

The operating system installation program may offer to reformat the chosen partition. DO NOT format the partition again. The partition has already been formatted and is ready for installing the new operating system.

To install the operating system, insert the operating system installation CD into the optical drive. Restart the computer and follow the installation instructions.

B.2.4 Build-up Recovery Partition

Step 1: Put the recover CD in the optical drive.

Step 2: Start the system.

Step 3: Press any key to boot from the recovery CD. It will take a while to launch the recovery tool. Please be patient.

Step 4: When the recovery tool setup menu appears, press <2> then <Enter>.

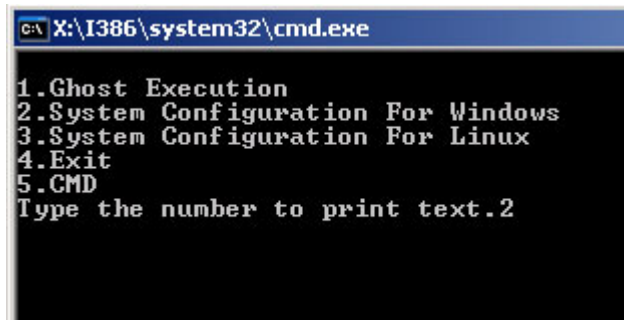


Figure B-4: System Configuration for Windows

Step 5: The Symantec Ghost window appears and starts configuring the system to build-up a recovery partition. In this process, the partition which is created for recovery files in **Section B.2.2** is hidden and the recovery tool is saved in this partition.

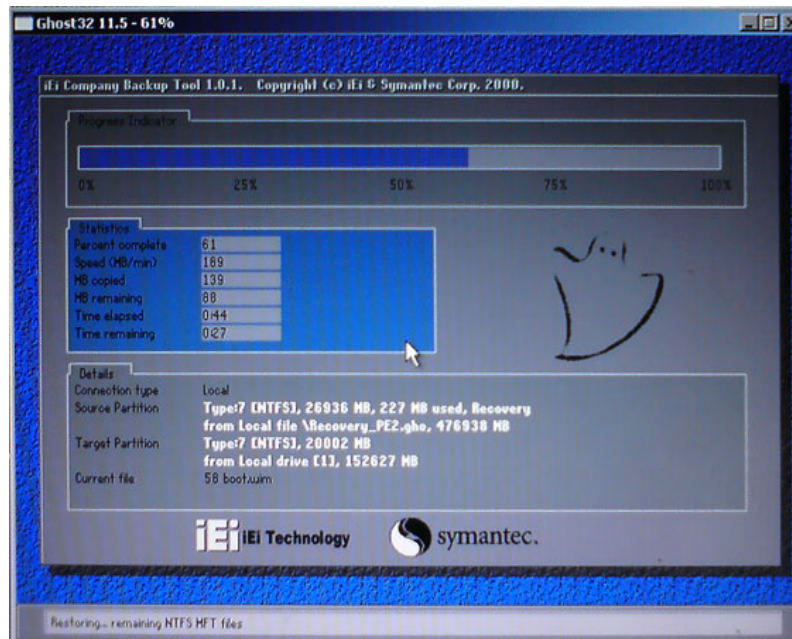
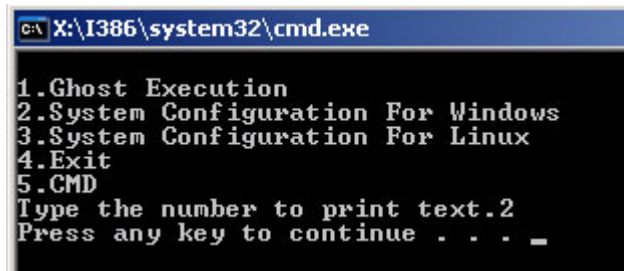


Figure B-5: Build-up Recovery Partition

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Step 6: After completing the system configuration, press any key in the following window to reboot the system.



```
C:\X:\I386\system32\cmd.exe
1.Ghost Execution
2.System Configuration For Windows
3.System Configuration For Linux
4.Exit
5.CMD
Type the number to print text.2
Press any key to continue . . . _
```

Figure B-6: Press any key to continue

Step 7: Eject the recovery CD.

B.2.5 Create Factory Default Image



NOTE:

Before creating the factory default image, please configure the system to a factory default environment, including driver and application installations.

To create a factory default image, please follow the steps below.

Step 1: Turn on the system. When the following screen displays (**Figure B-7**), press the <F3> key to access the recovery tool. The message will display for 10 seconds, please press F3 before the system boots into the operating system.

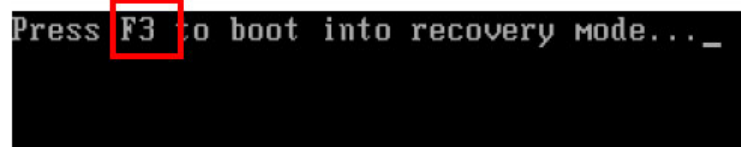


Figure B-7: Press F3 to Boot into Recovery Mode

Step 2: The recovery tool menu appears. Type <4> and press <Enter>. (**Figure B-8**)

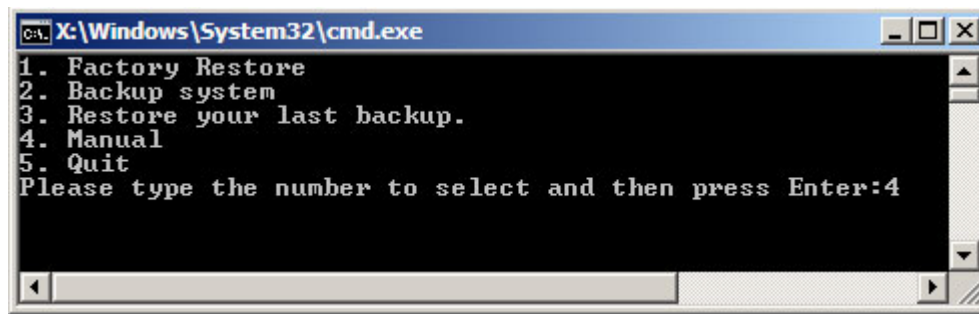


Figure B-8: Recovery Tool Menu

Step 3: The About Symantec Ghost window appears. Click **OK** button to continue.

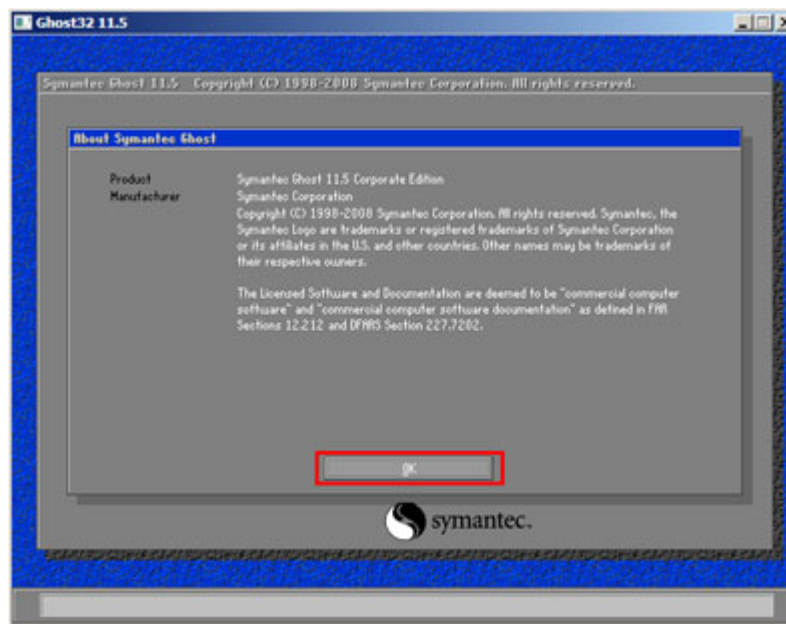


Figure B-9: About Symantec Ghost Window

Step 4: Use mouse to navigate to the option shown below (**Figure B-10**).

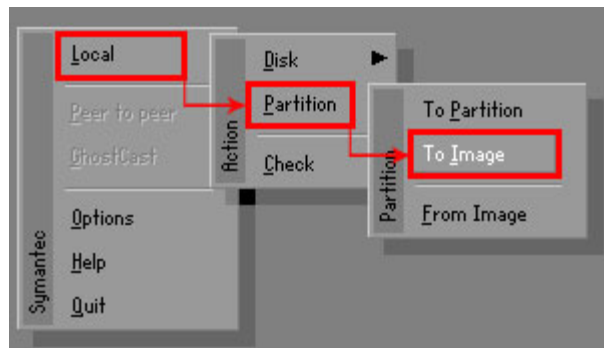


Figure B-10: Symantec Ghost Path

Step 5: Select the local source drive as shown in **Figure B-11**. Then click OK.

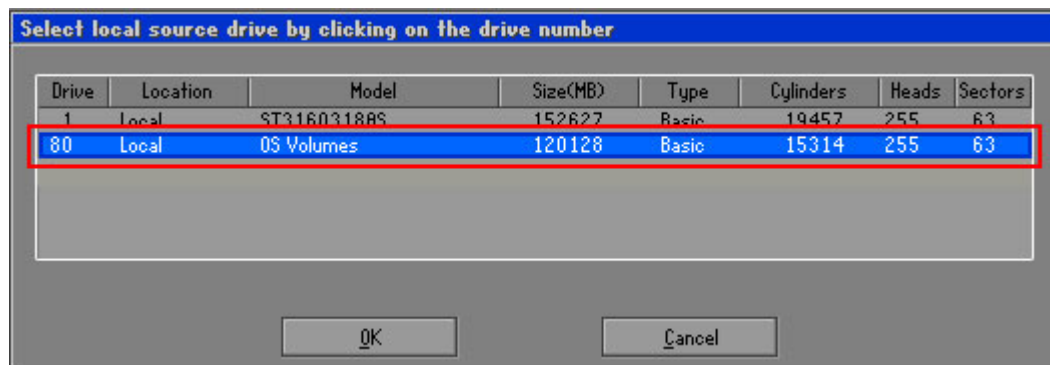


Figure B-11: Select a Local Source Drive

Step 6: Select a source partition from basic drive as shown in **Figure B-12**. Then click OK.

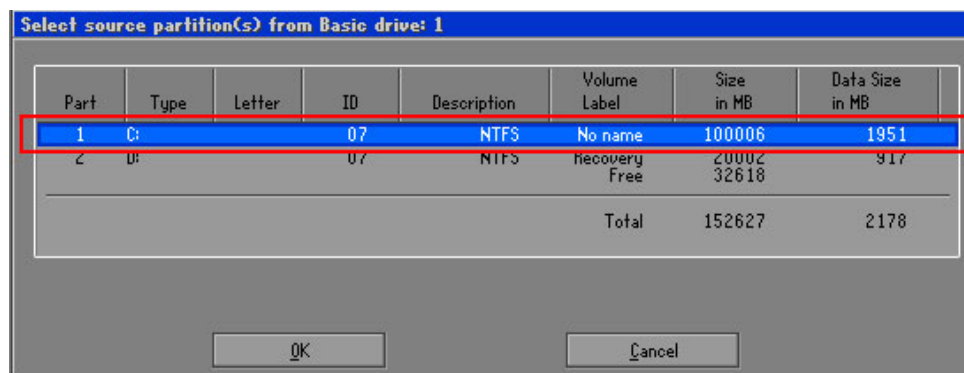


Figure B-12: Select a Source Partition from Basic Drive

Step 7: Select **1.2: [Recovery] NTFS drive** and enter a file name called **iei** (Figure B-13). Click **Save**. The factory default image will then be saved in the selected recovery drive and named IEI.GHO.



WARNING:

The file name of the factory default image must be **iei.GHO**.

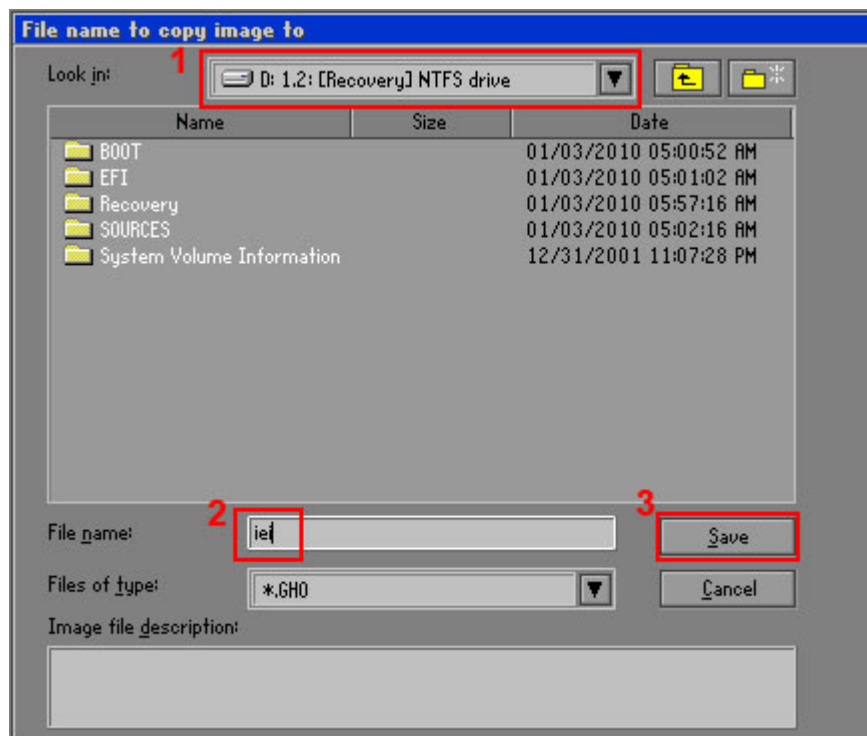


Figure B-13: File Name to Copy Image to

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Step 8: When the Compress Image screen in **Figure B-14** prompts, click **High** to make the image file smaller.

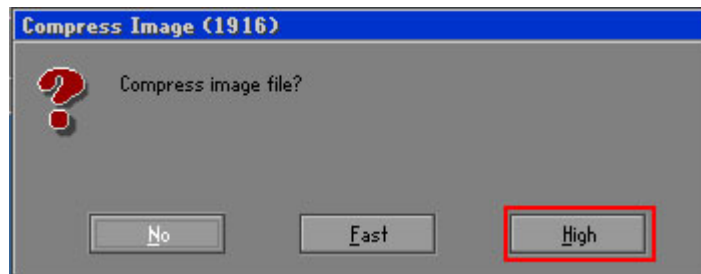


Figure B-14: Compress Image

Step 9: The Proceed with partition image creation window appears, click **Yes** to continue.

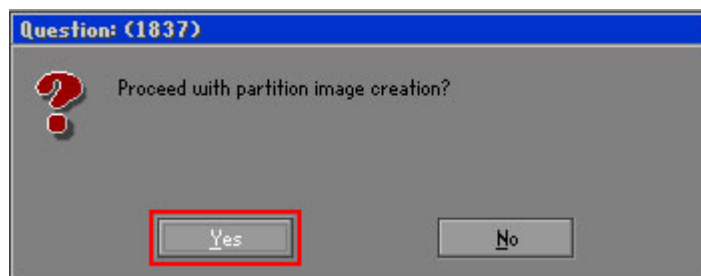


Figure B-15: Image Creation Confirmation

Step 10: The Symantec Ghost starts to create the factory default image (**Figure B-16**).

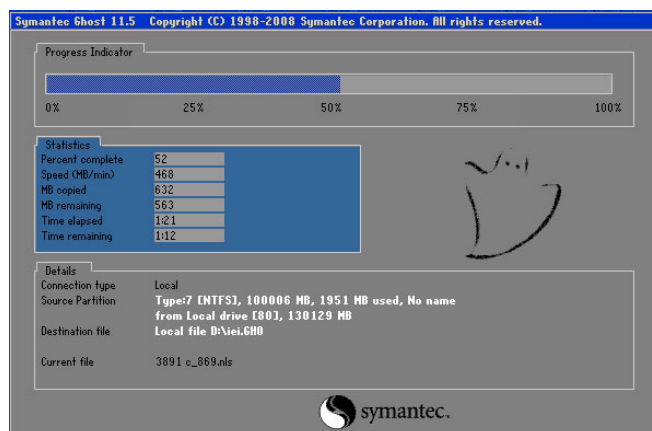


Figure B-16: Image Creation Complete

Step 11: When the image creation completes, a screen prompts as shown in **Figure B-17**.

Click **Continue** and close the Ghost window to exit the program.

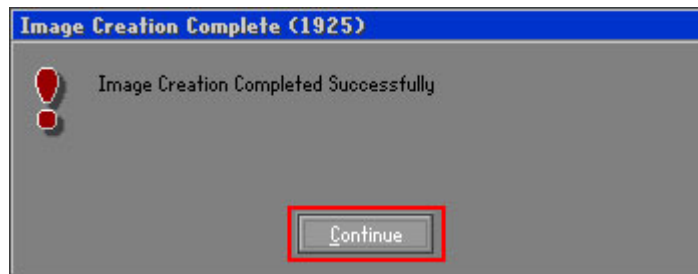


Figure B-17: Image Creation Complete

Step 12: The recovery tool main menu window is shown as below. Press any key to reboot the system.

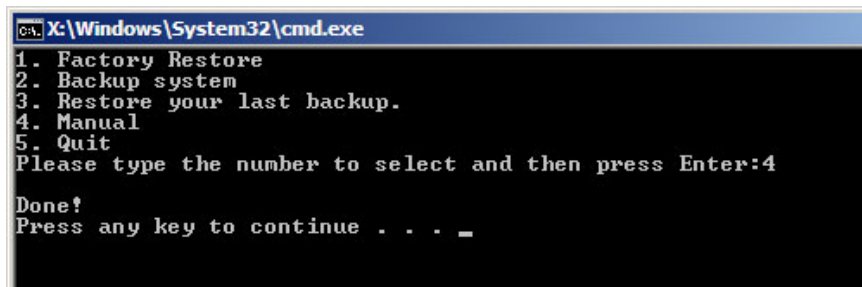


Figure B-18: Press Any Key to Continue

B.3 Setup Procedure for Linux

The initial setup procedures for Linux system are mostly the same with the procedure for Microsoft Windows. Please follow the steps below to setup recovery tool for Linux OS.

Step 1: **Hardware and BIOS setup.** Refer to **Section B.2.1**.

Step 2: **Install Linux operating system.** Make sure to install GRUB (v0.97 or earlier) MBR type and Ext3 partition type. Leave enough space on the hard drive to create the recover partition later.



NOTE:

If the Linux OS is not installed with GRUB (v0.97 or earlier) and Ext3, the Symantec Ghost may not function properly.

While installing Linux OS, please create two partitions:

- Partition 1: /
- Partition 2: **SWAP**



NOTE:

Please reserve enough space for partition 3 for saving recovery images.

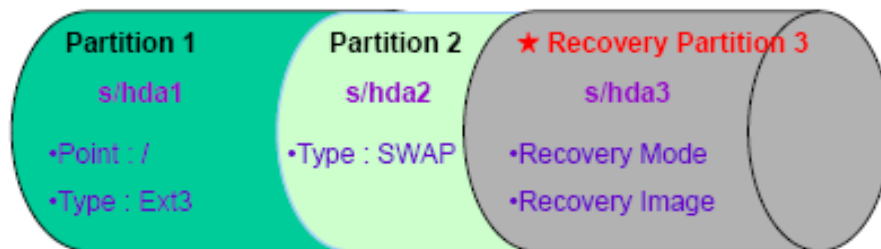


Figure B-19: Partitions for Linux

Step 3: Create a recovery partition. Insert the recovery CD into the optical disk drive.

Follow **Step 1 ~ Step 3** described in **Section B.2.2**. Then type the following commands (marked in red) to create a partition for recovery images.

```
system32>diskpart
DISKPART>list vol
DISKPART>sel disk 0
DISKPART>create part pri size= ____
DISKPART>assign letter=N
DISKPART>exit
```

```
system32>format N: /fs:ntfs /q /v:Recovery /y
```

```
system32>exit
```

Step 4: Build-up recovery partition. Press any key to boot from the recovery CD. It will take a while to launch the recovery tool. Please be patient. When the recovery tool setup menu appears, type <3> and press <Enter> (**Figure B-20**). The Symantec Ghost window appears and starts configuring the system to build-up a recovery partition. After completing the system configuration, press any key to reboot the system. Eject the recovery CD.

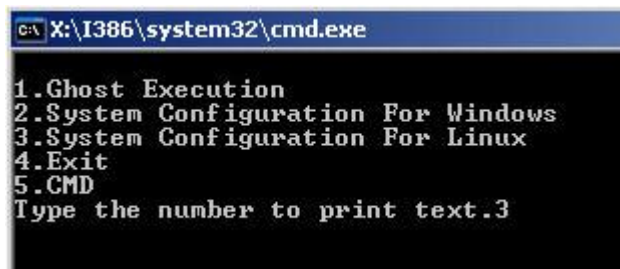


Figure B-20: System Configuration for Linux

Step 5: Access the recovery tool main menu by modifying the “menu.lst”. To first access the recovery tool main menu, the menu.lst must be modified. In Linux system, enter Administrator (root). When prompt appears, type:

```
cd /boot/grub
```

```
vi menu.lst
```

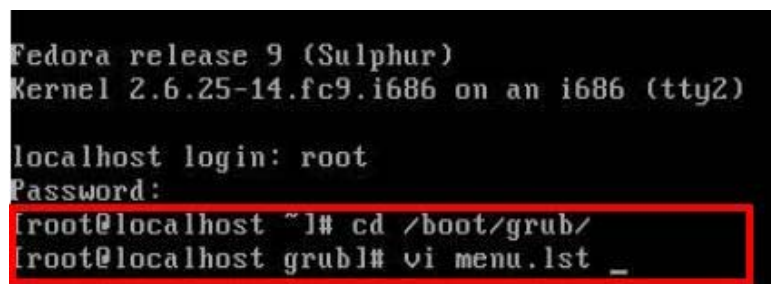


Figure B-21: Access menu.lst in Linux (Text Mode)

Step 6: Modify the menu.lst as shown below.

```
#boot=/dev/sda
default=0
timeout=10
splashimage=(hd0,0)/grub/splash.xpm.gz
hiddenmenu
title Fedora (2.6.25-14.fc9.i686)
    root (hd0,0)
    kernel /vmlinuz-2.6.25-14.fc9.i686 ro root=UUID=10f1acd
ac38b5c78910 rhgb quiet
    initrd /initrd-2.6.25-14.fc9.i686.img

title Recovery Partition
    root (hd0,2)
    makeactive
    chainloader +1
```

- Type command:
title Recovery Partition
root (hd0,2)
makeactive
chainloader +1

Step 7: The recovery tool menu appears. (Figure B-22)

```
1. Factory Restore
2. Backup system
3. Restore your last backup.
4. Manual
5. Quit
Please type the number to select and then press Enter:
```

Figure B-22: Recovery Tool Menu

Step 8: Create a factory default image. Follow **Step 2 ~ Step 12** described in **Section B.2.5** to create a factory default image. **3**

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B.4 Recovery Tool Functions

After completing the initial setup procedures as described above, users can access the recovery tool by pressing **<F3>** while booting up the system. The main menu of the recovery tool is shown below.

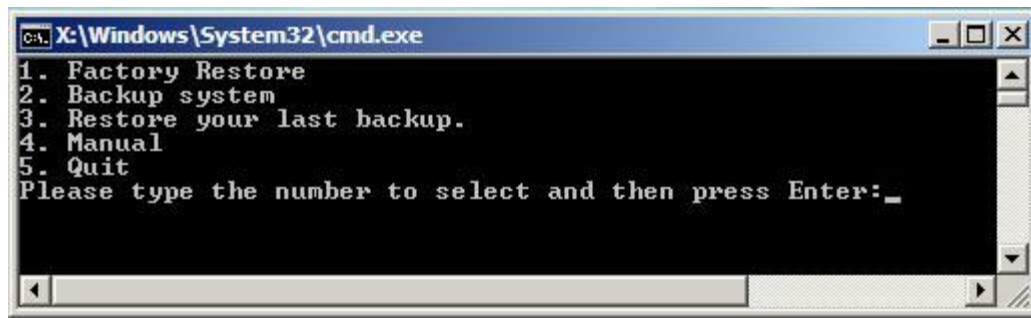


Figure B-23: Recovery Tool Main Menu

The recovery tool has several functions including:

1. **Factory Restore:** Restore the factory default image (iei.GHO) created in **Section B.2.5**.
2. **Backup system:** Create a system backup image (iei_user.GHO) which will be saved in the hidden partition.
3. **Restore your last backup:** Restore the last system backup image
4. **Manual:** Enter the Symantec Ghost window to configure manually.
5. **Quit:** Exit the recovery tool and restart the system.



WARNING:

Please do not turn off the system power during the process of system recovery or backup.



WARNING:

All data in the system will be deleted during the system recovery. Please backup the system files before restoring the system (either Factory Restore or Restore Backup).

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B.4.1 Factory Restore

To restore the factory default image, please follow the steps below.

Step 9: Type <1> and press <Enter> in the main menu.

Step 10: The Symantec Ghost window appears and starts to restore the factory default. A factory default image called **iei.GHO** is created in the hidden Recovery partition.

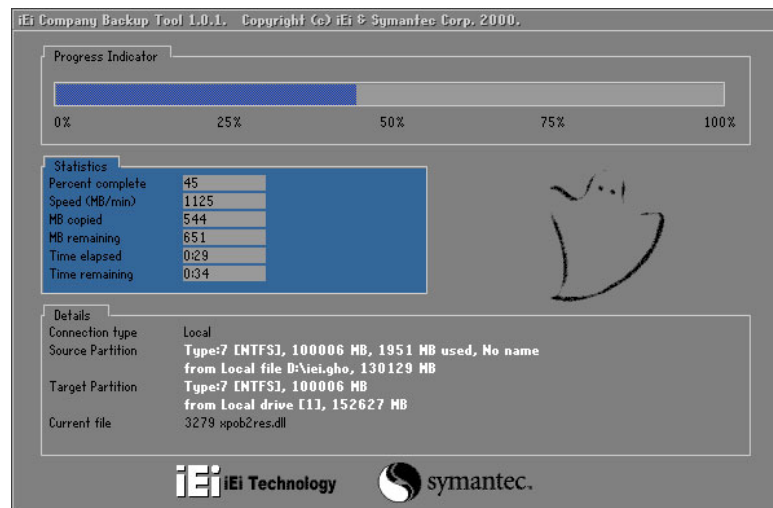


Figure B-24: Restore Factory Default

Step 11: The screen is shown as in **Figure B-25** when completed. Press any key to reboot the system. 

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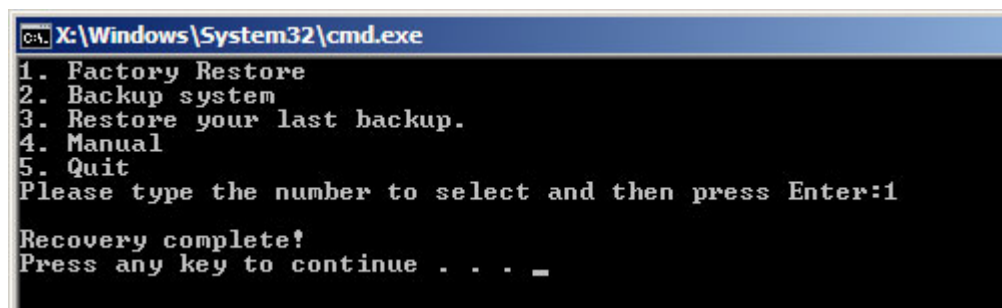


Figure B-25: Recovery Complete Window

B.4.2 Backup System

To backup the system, please follow the steps below.

Step 12: Type <2> and press <Enter> in the main menu.

Step 13: The Symantec Ghost window appears and starts to backup the system. A backup image called **iei_user.GHO** is created in the hidden Recovery partition.

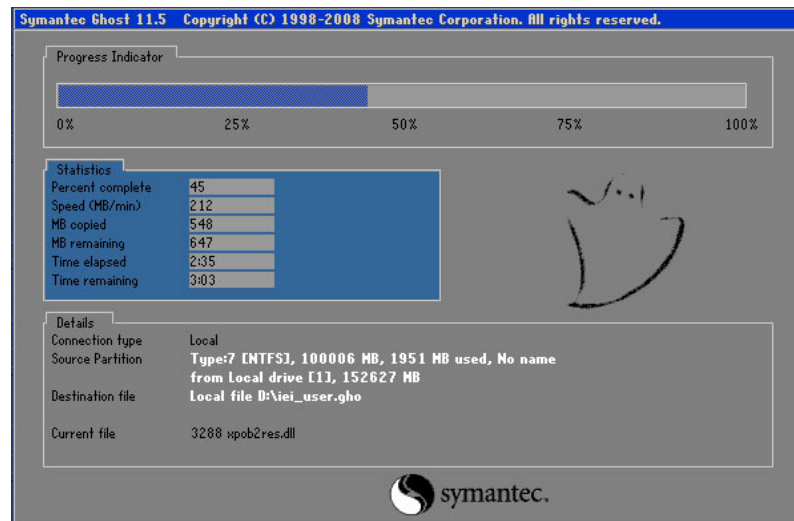


Figure B-26: Backup System

Step 14: The screen is shown as in **Figure B-27** when system backup is completed.

Press any key to reboot the system. 

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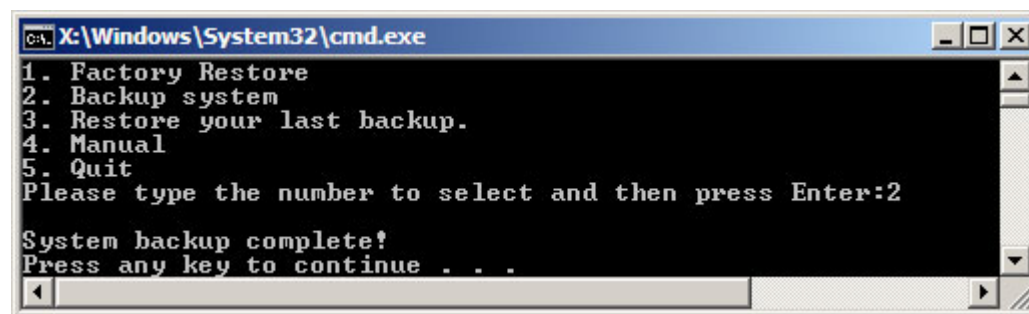


Figure B-27: System Backup Complete Window

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B.4.3 Restore Your Last Backup

To restore the last system backup, please follow the steps below.

Step 15: Type <3> and press <Enter> in the main menu.

Step 16: The Symantec Ghost window appears and starts to restore the last backup image (iei_user.GHO).

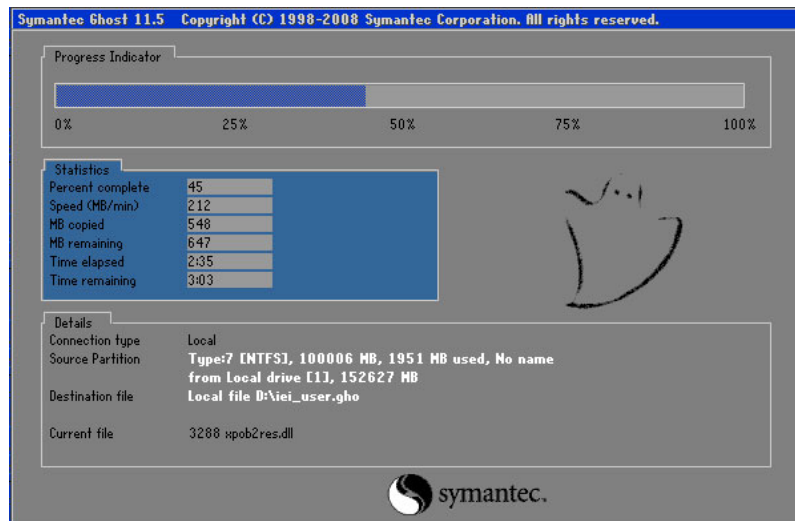


Figure B-28: Restore Backup

Step 17: The screen is shown as in **Figure B-29** when backup recovery is completed.

Press any key to reboot the system. 

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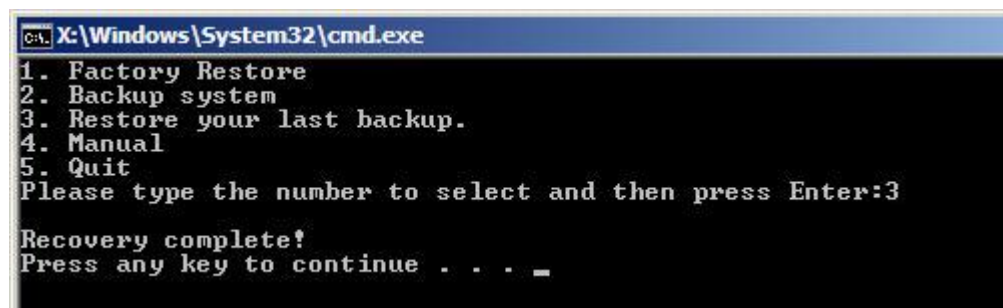


Figure B-29: Restore System Backup Complete Window

B.4.4 Manual

To restore the last system backup, please follow the steps below.

Step 18: Type <4> and press <Enter> in the main menu.

Step 19: The Symantec Ghost window appears. Use the Ghost program to backup or recover the system manually.

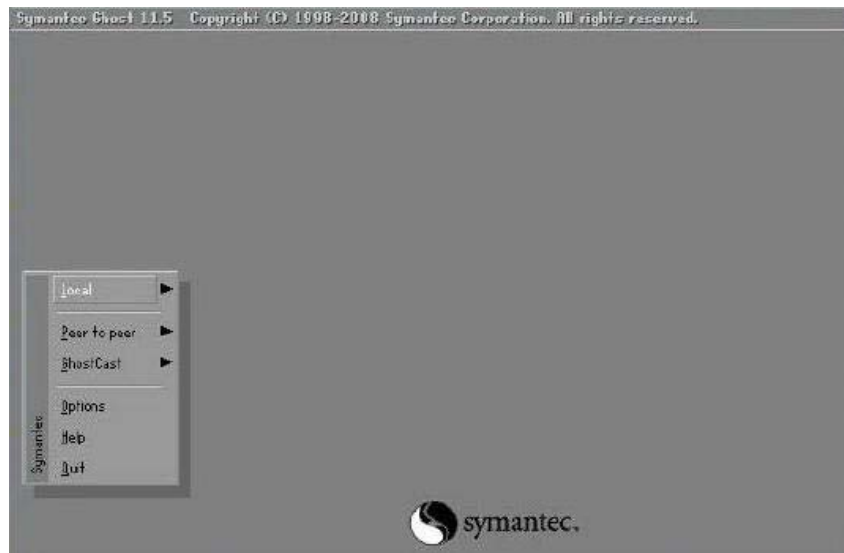


Figure B-30: Symantec Ghost Window

Step 20: When backup or recovery is completed, press any key to reboot the system.

Appendix

C

Terminology

AC '97	Audio Codec 97 (AC'97) refers to a codec standard developed by Intel® in 1997.
ACPI	Advanced Configuration and Power Interface (ACPI) is an OS-directed configuration, power management, and thermal management interface.
AHCI	Advanced Host Controller Interface (AHCI) is a SATA Host controller register-level interface.
ATA	The Advanced Technology Attachment (ATA) interface connects storage devices including hard disks and CD-ROM drives to a computer.
ARMD	An ATAPI Removable Media Device (ARMD) is any ATAPI device that supports removable media, besides CD and DVD drives.
ASKIR	Amplitude Shift Keyed Infrared (ASKIR) is a form of modulation that represents a digital signal by varying the amplitude ("volume") of the signal. A low amplitude signal represents a binary 0, while a high amplitude signal represents a binary 1.
BIOS	The Basic Input/Output System (BIOS) is firmware that is first run when the computer is turned on and can be configured by the end user
CODEC	The Compressor-Decompressor (CODEC) encodes and decodes digital audio data on the system.
CompactFlash®	CompactFlash® is a solid-state storage device. CompactFlash® devices use flash memory in a standard size enclosure. Type II is thicker than Type I, but a Type II slot can support both types.
CMOS	Complimentary metal-oxide-conductor is an integrated circuit used in chips like static RAM and microprocessors.
COM	COM refers to serial ports. Serial ports offer serial communication to expansion devices. The serial port on a personal computer is usually a male DB-9 connector.
DAC	The Digital-to-Analog Converter (DAC) converts digital signals to analog signals.
DDR	Double Data Rate refers to a data bus transferring data on both the rising and falling edges of the clock signal.

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DMA	Direct Memory Access (DMA) enables some peripheral devices to bypass the system processor and communicate directly with the system memory.
DIMM	Dual Inline Memory Modules are a type of RAM that offer a 64-bit data bus and have separate electrical contacts on each side of the module.
DIO	The digital inputs and digital outputs are general control signals that control the on/off circuit of external devices or TTL devices. Data can be read or written to the selected address to enable the DIO functions.
EHCI	The Enhanced Host Controller Interface (EHCI) specification is a register-level interface description for USB 2.0 Host Controllers.
EIDE	Enhanced IDE (EIDE) is a newer IDE interface standard that has data transfer rates between 4.0 MBps and 16.6 MBps.
EIST	Enhanced Intel® SpeedStep Technology (EIST) allows users to modify the power consumption levels and processor performance through application software. The application software changes the bus-to-core frequency ratio and the processor core voltage.
FSB	The Front Side Bus (FSB) is the bi-directional communication channel between the processor and the Northbridge chipset.
GbE	Gigabit Ethernet (GbE) is an Ethernet version that transfers data at 1.0 Gbps and complies with the IEEE 802.3-2005 standard.
GPIO	General purpose input
HDD	Hard disk drive (HDD) is a type of magnetic, non-volatile computer storage device that stores digitally encoded data.
ICH	The Input/Output Control Hub (ICH) is an Intel® Southbridge chipset.
IrDA	Infrared Data Association (IrDA) specify infrared data transmission protocols used to enable electronic devices to wirelessly communicate with each other.
L1 Cache	The Level 1 Cache (L1 Cache) is a small memory cache built into the system processor.
L2 Cache	The Level 2 Cache (L2 Cache) is an external processor memory cache.

LCD	Liquid crystal display (LCD) is a flat, low-power display device that consists of two polarizing plates with a liquid crystal panel in between.
LVDS	Low-voltage differential signaling (LVDS) is a dual-wire, high-speed differential electrical signaling system commonly used to connect LCD displays to a computer.
POST	The Power-on Self Test (POST) is the pre-boot actions the system performs when the system is turned-on.
RAM	Random Access Memory (RAM) is volatile memory that loses data when power is lost. RAM has very fast data transfer rates compared to other storage like hard drives.
SATA	Serial ATA (SATA) is a serial communications bus designed for data transfers between storage devices and the computer chipsets. The SATA bus has transfer speeds up to 1.5 Gbps and the SATA II bus has data transfer speeds of up to 3.0 Gbps.
S.M.A.R.T	Self Monitoring Analysis and Reporting Technology (S.M.A.R.T) refers to automatic status checking technology implemented on hard disk drives.
UART	Universal Asynchronous Receiver-transmitter (UART) is responsible for asynchronous communications on the system and manages the system's serial communication (COM) ports.
UHCI	The Universal Host Controller Interface (UHCI) specification is a register-level interface description for USB 1.1 Host Controllers.
USB	The Universal Serial Bus (USB) is an external bus standard for interfacing devices. USB 1.1 supports 12Mbps data transfer rates and USB 2.0 supports 480Mbps data transfer rates.
VGA	The Video Graphics Array (VGA) is a graphics display system developed by IBM.

Appendix

D

Digital I/O Interface

D.1 Introduction

The DIO connector on the NANO-PV-D510A is interfaced to GPIO ports on the Super I/O chipset. The DIO has both 4-bit digital inputs and 4-bit digital outputs. The digital inputs and digital outputs are generally control signals that control the on/off circuit of external devices or TTL devices. Data can be read or written to the selected address to enable the DIO functions.



NOTE:

For further information, please refer to the datasheet for the Super I/O chipset.

D.2 DIO Connector Pinouts

The following table describes how the DIO connector pins are connected to the Super I/O GPIO port 1.

Pin	Description	Super I/O Pin	Super I/O Pin Description
1	Ground	N/A	N/A
2	VCC	N/A	N/A
3	Output 3	GP27	General purpose I/O port 2 bit 7.
4	Output 2	GP26	General purpose I/O port 2 bit 6.
5	Output 1	GP25	General purpose I/O port 2 bit 5.
6	Output 0	GP24	General purpose I/O port 2 bit 4.
7	Input 3	GP23	General purpose I/O port 2 bit 3.
8	Input 2	GP22	General purpose I/O port 2 bit 2
9	Input 1	GP21	General purpose I/O port 2 bit 1
10	Input 0	GP20	General purpose I/O port 2 bit 0

Table D-1: Digital I/O Connector Pinouts

D.3 Assembly Language Samples

D.3.1 Enable the DIO Input Function

The BIOS interrupt call INT 15H controls the digital I/O. An assembly program to enable digital I/O input functions is listed below.

MOV	AX, 6F08H	Sets the digital port as input
INT	15H	Initiates the INT 15H BIOS call

D.3.2 Enable the DIO Output Function

The BIOS interrupt call INT 15H controls the digital I/O. An assembly program to enable digital I/O output functions is listed below.

MOV	AX, 6F09H	Sets the digital port as output
MOV	BL, 09H	
INT	15H	Initiates the INT 15H BIOS call

Appendix

E

Watchdog Timer



NOTE:

The following discussion applies to DOS. Contact IEI support or visit the IEI website for drivers for other operating systems.

The Watchdog Timer is a hardware-based timer that attempts to restart the system when it stops working. The system may stop working because of external EMI or software bugs. The Watchdog Timer ensures that standalone systems like ATMs will automatically attempt to restart in the case of system problems.

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 E-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. When 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:

The Watchdog Timer is activated through software. The software application that activates the Watchdog Timer must also deactivate it when closed. If the Watchdog Timer is not deactivated, the system will automatically restart after the Timer has finished its countdown.

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 ;

Appendix

F

Compatibility

**NOTE:**

The compatible items described here have been tested by the IEI R&D team and found to be compatible with the NANO-PV-D510A

F.1 Compatible Operating Systems

The following operating systems have been successfully run on the NANO-PV-D510A.

- MS-DOS 6.22
- Microsoft Windows XP (32-bit) SP2
- Microsoft Windows XP (64-bit) SP2
- Microsoft Vista (32-bit) Ultimate
- Microsoft Vista (64-bit) Ultimate
- Microsoft Windows 7 Ultimate
- Fedora cove 11
- Red Hat Enterprise Linux

F.2 Compatible Memory Modules



NOTE:

The memory modules listed below have been tested on the NANO-PV-D510A other memory modules that comply with the specifications may also work on the NANO-PV-D510A but have not been tested.

The following memory modules have been successfully tested on the NANO-PV-D510A.

Manufacturer	Capacity	Speed	Type
Kingston	1 GB	667 MHz	DDR2 SO-DIMM
Kingston	2 GB	667 MHz	DDR2 SO-DIMM
Kingston	1 GB	800 MHz	DDR2 SO-DIMM
Kingston	2 GB	800 MHz	DDR2 SO-DIMM
Transcend	1 GB	667 MHz	DDR2 SO-DIMM
Transcend	2 GB	667 MHz	DDR2 SO-DIMM
Transcend	512 MB	800 MHz	DDR2 SO-DIMM
Transcend	1 GB	800 MHz	DDR2 SO-DIMM
Transcend	2 GB	800 MHz	DDR2 SO-DIMM
Apacer	2 GB	667 MHz	DDR2 SO-DIMM
Apacer	1 GB	800 MHz	DDR2 SO-DIMM
Apacer	2 GB	800 MHz	DDR2 SO-DIMM

Table F-1: Compatible Memory Modules

Appendix

G

Hazardous Materials Disclosure

G.1 Hazardous Materials Disclosure Table for IPB Products Certified as RoHS Compliant Under 2002/95/EC Without Mercury

The details provided in this appendix are to ensure that the product is compliant with the Peoples Republic of China (China) RoHS standards. The table below acknowledges the presences of small quantities of certain materials in the product, and is applicable to China RoHS only.

A label will be placed on each product to indicate the estimated “Environmentally Friendly Use Period” (EFUP). This is an estimate of the number of years that these substances would “not leak out or undergo abrupt change.” This product may contain replaceable sub-assemblies/components which have a shorter EFUP such as batteries and lamps. These components will be separately marked.

Please refer to the table on the next page.

Part Name	Toxic or Hazardous Substances and Elements					
	Lead (Pb)	Mercury (Hg)	Cadmium (Cd)	Hexavalent Chromium (CR(VI))	Polybrominated Biphenyls (PBB)	Polybrominated Diphenyl Ethers (PBDE)
Housing	X	O	O	O	O	X
Display	X	O	O	O	O	X
Printed Circuit Board	X	O	O	O	O	X
Metal Fasteners	X	O	O	O	O	O
Cable Assembly	X	O	O	O	O	X
Fan Assembly	X	O	O	O	O	X
Power Supply Assemblies	X	O	O	O	O	X
Battery	O	O	O	O	O	O
O: This toxic or hazardous substance is contained in all of the homogeneous materials for the part is below the limit requirement in SJ/T11363-2006 X: This toxic or hazardous substance is contained in at least one of the homogeneous materials for this part is above the limit requirement in SJ/T11363-2006						

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此附件旨在确保本产品符合中国 RoHS 标准。以下表格标示此产品中某有毒物质的含量符合中国 RoHS 标准规定的限量要求。

本产品上会附有“环境友好使用期限”的标签，此期限是估算这些物质“不会有泄漏或突变”的年限。本产品可能包含有较短的环境友好使用期限的可替换元件，像是电池或灯管，这些元件将会单独标示出来。

部件名称	有毒有害物质或元素					
	铅 (Pb)	汞 (Hg)	镉 (Cd)	六价铬 (CR(VI))	多溴联苯 (PBB)	多溴二苯 醚 (PBDE)
壳体	X	O	O	O	O	X
显示	X	O	O	O	O	X
印刷电路板	X	O	O	O	O	X
金属螺帽	X	O	O	O	O	O
电缆组装	X	O	O	O	O	X
风扇组装	X	O	O	O	O	X
电力供应组装	X	O	O	O	O	X
电池	O	O	O	O	O	O
O: 表示该有毒有害物质在该部件所有物质材料中的含量均在 SJ/T11363-2006 标准规定的限量要求以下。						
X: 表示该有毒有害物质至少在该部件的某一均质材料中的含量超出 SJ/T11363-2006 标准规定的限量要求。						