AMI311-970

User Manual

2016 Feb Ver. A1

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Safety Information

Your AMI311-970 is designed and tested to meet the latest standards of safety for information technology equipment. However, to ensure your safety, it is important that you read the following safety instructions

Setting up your system

- Read and follow all instructions in the documentation before you operate your system.
- Do not use this product near water.
- Set up the system on a stable surface. Do not secure the system on any unstable plane.
- Do not place this product on an unstable cart, stand, or table. The product may fall, causing serious damage to the product.
- Slots and openings on the chassis are for ventilation. Do not block or cover these openings. Make sure you leave plenty of space around the system for ventilation. ***Never insert objects of any kind into the ventilation openings***.
- This system should be operated from the type of power indicated on the marking label. If you are not sure of the type of power available, consult your dealer or local power company.
- Use this product in environments with ambient temperatures between 0˚C and 40˚C.
- If you use an extension cord, make sure that the total ampere rating of the devices plugged into the extension cord does not exceed its ampere rating.
- DO NOT LEAVE THIS EQUIPMENT IN AN ENVIRONMENT WHERE THESTORAGE TEMPERATURE MAY GO BELOW -20° C (-4° F) OR ABOVE 80° C (176° F). THIS COULD DAMAGE THE EQUIPMENT. THE EQUIPMENT SHOULD BE IN A CONTROLLED ENVIRONMENT.

Care during use

- Do not walk on the power cord or allow anything to rest on it.
- Do not spill water or any other liquids on your system.
- When the system is turned off, a small amount of electrical current still flows. Always unplug all power, and network cables from the power outlets before cleaning the system.
- If you encounter the following technical problems with the product, unplug the power cord and contact a qualified service technician or your retailer.
  - The power cord or plug is damaged.
  - Liquid has been spilled into the system.
  - The system does not function properly even if you follow the operating instructions.
  - The system was dropped or the cabinet is damaged.

Lithium-Ion Battery Warning

CAUTION: Danger of explosion if battery is incorrectly replaced. Replace only with the same or equivalent type recommended by the manufacturer. Dispose of used batteries according to the manufacturer's instructions.

NO DISASSEMBLY

The warranty does not apply to the products that have been disassembled by users

WARNING
HAZARDOUS MOVING PARTS
KEEP FINGERS AND OTHER BODY PARTS AWAY

Acknowledgments

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CHAPTER 1 INTRODUCTION

1.1 General Description

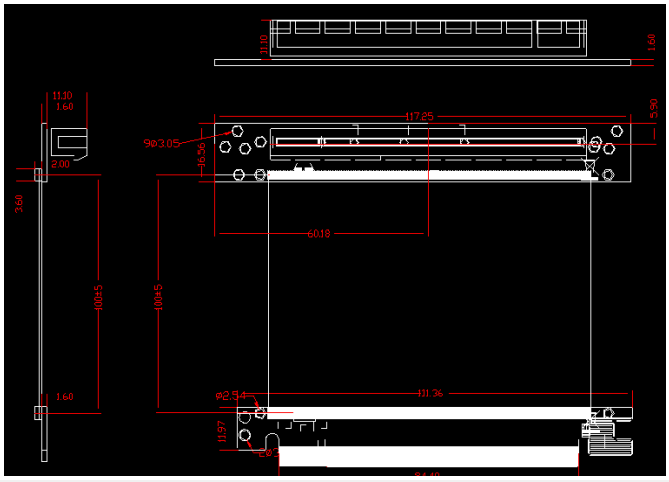
AMI311-970 Fanless Embedded Box PC comes with 3rd Gen. Intel® Core™ i7/i5/i3 Celeron Quad Core/Dual Core processors and Intel HD Integrated Graphics Engine with high computing performance. It supports DVI-I/DVI-D/DisplayPort display output, 2 x USB 3.0, 6 x USB 2.0, 1x PCI-E x(16) expansion slot, and 2 x Gigabit LAN giving a great selection for data communication in display applications. The rugged design 231 x 199 x 97.75 mm chassis come with one full-size internal PCI Express Mini Card slot and one half-size Mini Card slot to connect wireless through 3G or LTE. This embedded box computer is ideal for digital signage player, Kiosk, entry-level gaming, video surveillance, and other automation & embedded application.

1.2 System Specifications

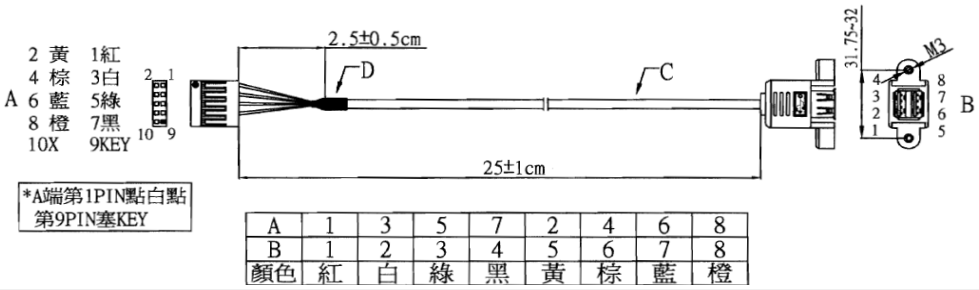
1.2.1 Hardware Specifications

Engineer Specifications

SPECIFICATION –SYSTEM	
CPU	
Model	Intel® 3nd Generation Core™ i7/i5/i3/Pentium AMI311-970F-1020E (Intel® Celeron™ 1020E 2.2 GHz) AMI311-970F-3120ME (Intel® Core™ i3-3120ME 2.4 GHz) AMI311-970F-3610ME (Intel® Core™ i5-3610ME 2.7 GHz) AMI311-970F-3612QM (Intel® Core™ i7-3612QM 2.1 GHz)
Speed	Up to 2.7 GHz
Cache	Up to 6MB Intel® Smart Cache
Socket	rPGA988B
Memory	
Configuration	2 x 4GB DDR3 SO-DIMM (non ECC) P/N : C0373900400080312P
Max. Support	Up to 16 GB
Rear I/O	
Display	Intel® 3nd Generation Core™ i5 Processor integrated HD Graphics 4000 - 1 x DVI-I + 1 x DVI-D (Dual Stack) - 1 x Display port
LAN / PHY	- 1st: Intel® 82579V GbE PHY - 2nd: Intel® 82583V GbE LAN - 2 x Gigabit RJ45 connector with 4 x USB 2.0
Audio	- Realtek ALC892 Audio Codec - 1 x 3 Port Audio Jack
USB 2.0 / 3.0	- 4 x USB 2.0 (with RJ-45) - 2 x USB 3.0
LPC I / O	- 1 x RS-232 + 1 x RS-232/422/485(Dual Stack)
Expansion slot	- 1 x PCIe x 16 Slot ● Description: RISER CARD;PCIE x16 [錦茂 CLKF797+797S16X] ● P/N: A008RSPCIE0201000P



Front Panel I/O	
USB 2.0 / 3.0	- 2 x USB 2.0 + 25 CM USB Cable ● Description: CABLE;USB-25 2-HEAD 8C 線 25CM ● P/N: C501USB2508252000P
Other	- IB881SW-R V-1.0 (HDD / Power LED + Power / Reset Button) ● Description: DIP PCBA;IB881SW-R V-1.0 DAUGHTER CARD RoHS ● P/N: ZD06IB881SW-10010P
Storage	
Drive Bays	- 1 x 2.5" SATA II or SATA III HDD/SSD ● Default = 100 GB HDD, Commercial grade ● P/N : A002HDDSLSTG10000P - SATA Cable 6CM ● Description: CBL;SATA-11A 7C 2-HEAD 6CM ● C501SATA110152A00P
Deployment	
Dimension	199mm(W) x 231 mm(H) x 97.75mm(D)
Power Supply	- 120W Power Adaptor ● Description: POWER SUPPLY;ADAPTER 120W 12V/10A _圓頭 W/LOCK, CCC Label[全漢 FSP120-AHAN1] RoHS



A	1	3	5	7	2	4	6	8
B	1	2	3	4	5	6	7	8
顏色	紅	白	綠	黑	黃	棕	藍	橙

	● P/N: A005PS120WM020000P
Certification	CE/FCC/LVD
Environmental	
Temperature	Operating Temperature: 0°C~45°C (32°F~113°F) Storage Temperature: -20°C ~ 80° C
Humidity	5%~90%@45°C ,non-condensing
Shock	IBASE Standard
Vibration	CFD: 1g rms / 5~500 MHZ random operation HDD: 0.25g 5~500 MHZ random operation
Other	RoHS

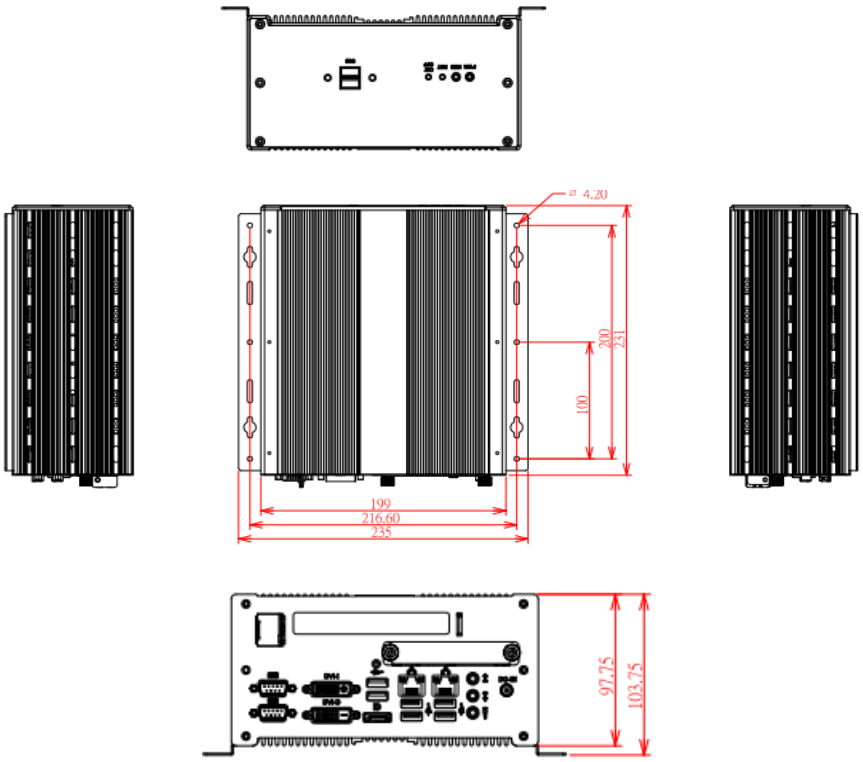
SPECIFICATION – MAINBOARD	
Model	MI970F P/N : ZD16MI970---12A20P
Form Factor	MINI-ITX
CPU	
Model	3rd Generation Intel® Core™ i7 / i5 / i3 / Celeron® QC/ DC processors
Speed	Up to 3.60 GHz (TDP=35W)
Cache	Up to 6MB Intel® Smart Cache
Socket	rPGA988B
CHIPSET	
Model	Intel® HM76 Express Chipset
BIOS	
Model	AMI BIOS, support ACPI Function
MEMORY	
Configuration	2 x DDR3 SO-DIMM sockets
Max. Support	16GB
I / O	
Display	Processor graphics (Gen 5.75 graphics engine) Supports CRT, DVI-I, DVI-D, LVDS and Display Port Supports 24-bit dual channel LVDS display

LAN / PHY	Intel® 82579V Gigabit LAN PHY Intel® 82583V PCI-E Gigabit LAN 2 x RJ-45 on board
Audio	Intel® HM76 PCH built-in high definition audio controller with Realtek ALC892 for 7.1 CH Audio
USB 2.0 / 3.0	4 USB 3.0 ports (2 ports on board, 2 ports via pin header) 8 USB 2.0 ports (4 ports on board, 4 ports via pin header)
LPC I / O	Fintek F81866AD-I Rear: 1 x RS-232 + 1 x RS232/422/485 Internal: 2 x RS-232
Serial ATA	4 x SATA II and 2 x SATA III
Expansion Slot	1 x PCIe x 16 2 x PCIe x 1 (1x Half-Size, 1x Full-Size)
Other	Digital I / O 4 in & 4 out
Rear I / O	Dual DB9 stack connector for COM 1 & 2 1 x DVI-I + DVI-D Dual stack connector 1 x Dual USB 3.0 stack connector + 1 x Display Port 2 x RJ-45 GbE + dual USB 2.0 stack connector 1 x 3 HD Audio Jack
Header / Connector	2 x SATA III, 4 x SATA II 2 x Mini PCIe Socket(1 x Full size & 1 x Half Size) 4 x USB 2.0, 1 x Dual LVDS, 2 x USB 3.0 2 x COM, 1 x Digital I/O 1 x LCD backlight control 1 x Front panel audio 1 x IrDA
SUPPORT	
Watchdog	Yes (256 segments, 0, 1, 2…255 sec/min)
H/W Monitor	Yes
EuP/ErP	Yes
iSMART	Yes
RoHS	Yes
DEPLOYMENT	
Dimension	170mm x 170mm
Power	ATX Main Power

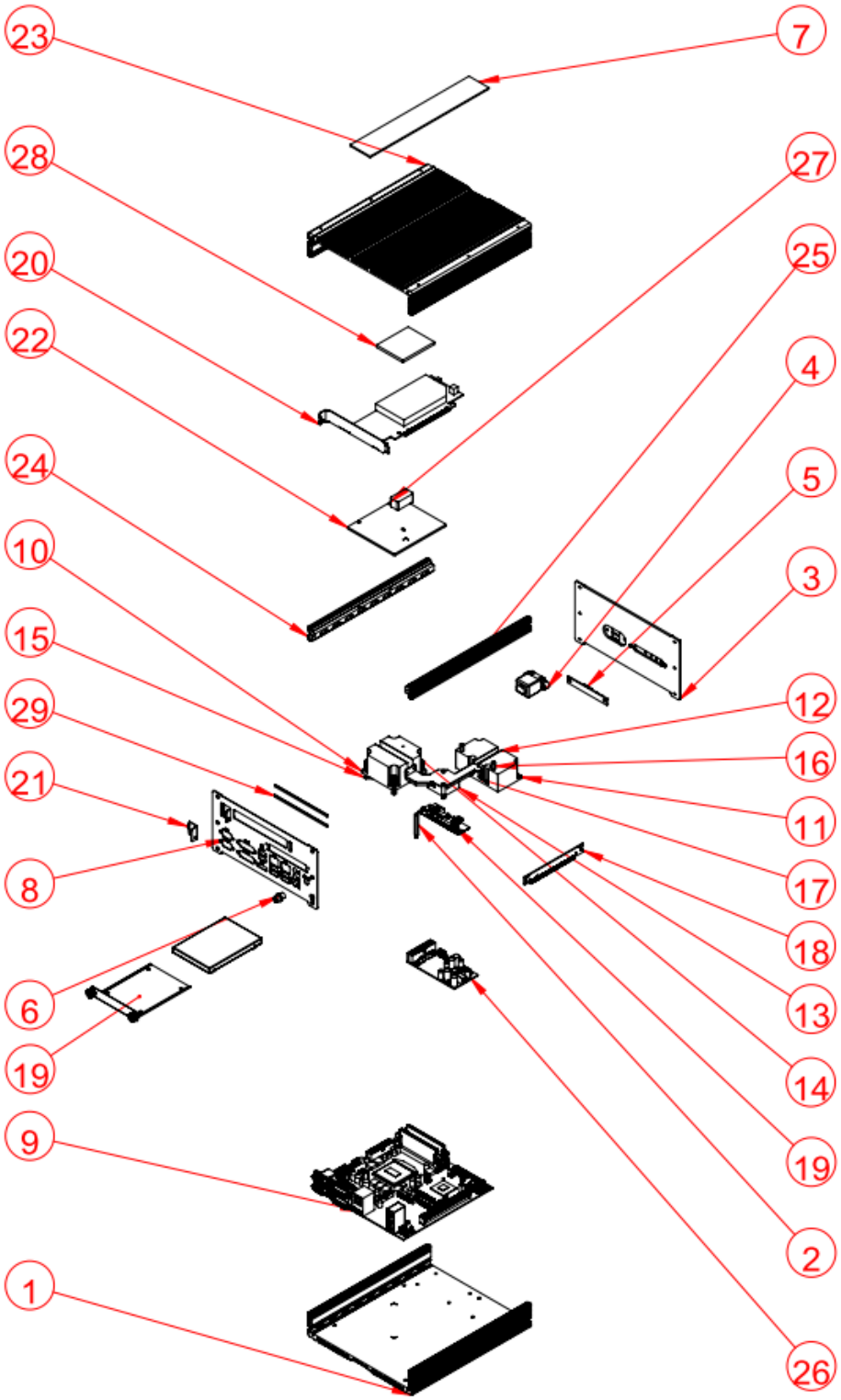
Certification	N/A
Environmental	
Temperature	Operating: 0°C~60°C (32°F~140°F) Storage: -20°C~80°C (-4°F~176°F)
Humidity	10%~90% (non-condensing)
Shock	N/A
Vibration	N/A

·This specification is subject to change without prior notice.

1.2.2 Dimensions



1.3 Exploded View of the AMI311-970 Assembly



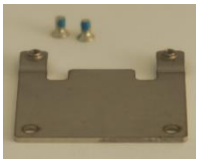
1.3.1 Parts Description

項次編號	零件名稱	數量
1	ami-300a_base fp	1
2	brazen post m3x33	1
3	AMI311-970FNX_front plt_A1	1
4	驊陞_USB	1
5	IB881-sw	1
6	dc jack_scd554	1
7	ami-300_name plt	1
8	AMI311-970FNX_rear plt_A1	1
9	MI970-10	1
10	AMI200-970_HS_A1	1
11	AMI200-970_HS-1_A1	1
12	AMI200-970_heat pipe_A1	1
13	AMI200-970_HS-2_A1	1
14	JAS190C-B_1	4
15	JAT222-A	1
16	brazen post m3x10	2
17	AMI200-970_HS brk_A1	1
18	PCI2 board	1
19	EZ S Driver module	1
20	CLKF797+797S 16X加線材	1
21	AMI311-970FNX_PCI brk_A1	1
22	AMI311-970FNX_HS-1_A1	1
23	ami-300_base	1
24	AMI311-970FNX_HSa_A1	1
25	AMI311-970FNX_HSa_A1	1
26	Power ID450	1
27	AMI311-970FNX_Rubber_A1	1
28	TM600 thermal pad	1
29	AMI311-970FNX_gasket_A1	2

1.4 Packing List

Item No.	Description	Qty
1	Driver CD	1
2	User manual	1
3	Wall mount kit	2

1.4.1 Optional Items

WiFi Solution	Description	
WiFi module	WIRELESS;PCI-E MINI CARD 802.11B/G/N [AW-NE238H] (A008WLAWNE238H000P)	
External Antenna	WiFi Antenna (A055RFA02C2M20800P)	
Internal cable-1/2	From Wifi module to Rear/Front panel (A055RFA0000021000P/A055RFA0000032000P)	 
Bracket	MPCIE-EXT V-B1 Bracket, RoHS; Extend Half to Full size. (SC2MPCIEEXT0B1100P)	
3G Solution	**Description**	
ZU 202	Wireless; 3.75G UMTS/HSPA [ZU202] RoHS (A008WIRELESS00520P)	
ZU 200	Wireless; 3.75G UMTS/HSPA & GPS Module [ZU200] RoHS (A008WIRELESS00510P)	
Cable	Cable; Antenna-2 30CM P 2pcs (C501ANT0200300000P)	
Antenna	Antenna; 3G, P, 2pcs (A055ANT0921Q2P000P)	

CHAPTER 2 MOTHERBOARD INTRODUCTION

2.1 Introduction

The IB908F is a Mini-ITX motherboard computer based on the Intel® HM76 chipset processors. The platform supports 3rd generation Intel® Core processor family with rPGA988B packing and feature an integrated dual-channel DDR3 memory controller as well as a graphics core.

The MI970F platform is well-suited for low-power and high-performance designs in a broad range of markets including Industrial Control & Automation, Digital Signage, Thin Client, Electronic Gaming Machines, and SMB storage appliances.

MI970F Features:

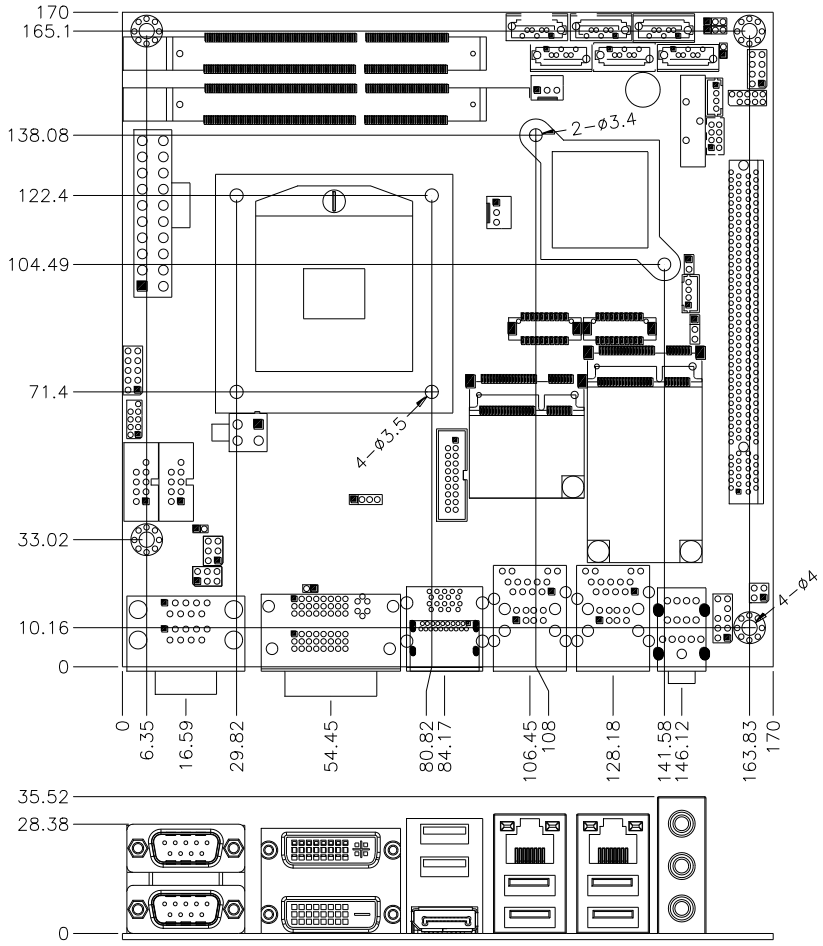
- Supports Intel® 3rd Generation Core i7/i5/i3 QC/DC mobile processors
- Two DDR3 SO-DIMM, 1066/1333/1600MHz, Max. 16GB memory
- Dual Intel® PCI-Express Gigabit LAN
- Integrated Graphics for DVI-I, DVI-D/DisplayPort/LVDS displays
- 4x SATA 2.0, 2x SATA 3.0, 8x USB 2.0, USB 3.0 (4 ports), 4x COM, Watchdog timer
- 1x PCI-E (x16), 2x Mini PCI-E
- Optional AMT (MI970VF only)

Product Name	**MI970F**
Form Factor	Mini-ITX
CPU Type	- Intel® 3rd Generation Core TMi7/i5/i3 mobile processors - rPGA package, 37.5 mm x 37.5mm - TDP: QC = 45W/ DC = 35W **Ivy Bridge CPU socket is compatible with Sandy Bridge CPU**
CPU Speed	Up to 2.7GHz
Cache	Up to 8MB
Chipset	Intel® QM77Platform Controller Hub (MI970VF) Intel® HM76Platform Controller Hub (MI970F) 25 x 27 mm package size

BIOS	AMI BIOS [16MB SPI ROM]
Memory	Intel® Ivy-Bridge mobile processors integrated memory controller DDRIII 1066/1333/1600 MHz - SO-DIMM [204-pin vertical type]x 2 (Non-ECC), Max. 16GB
Display	- Intel® Ivy-Bridge mobile processor integrated Gfx, supports 3 independent displays, Direct X 11, OpenGL 3.1, Open CL 1.1 ●DVI-I X 1 (thru Level shifter ASM1442) ●DVI-D X 1 (thru DP to DVI converter ANX9830C) ●DisplayPort x 1 ●LVDS : DF13 x 2 for dual channel 24-bit support
LAN	1. Intel® Lewisville 82579LM GbE PHY [MI970VF only] or Intel® Lewisville 82579V GbE PHY [MI970F only] 2. Intel® 82583V as 2nd GbE
USB (Universal Serial Bus)	USB 2.0 host controller [Panther Point integrated], supports 8 ports - 4 ports in the rear panel - 2 ports via onboard pin header (2.0mm pitch) - 2 ports via MiniPCIe sockets USB 3.0 host controller [Panther Point integrated], support 4 ports - 2 ports in the rear panel - 2 ports via onboard box-header type [Blue color]
Serial ATA Ports	Intel® QM77 PCH built-in SATA controller, supports total 6 ports 2 x SATA (3.0) 6Gbps+ 4 x SATA (2.0) 3Gbps ports
Audio	Intel® QM77 PCH built-in High Definition Audio controller + Realtek ALC892 w/ 7.1 channels
LPC I/O	Fintek F81866AD-I (128-pin LQFP [14mm x 14 mm]) COM1 (RS232/422/485) [EXAR SP339EER1 232/422/485 transceiver x 1 for jumper-less] COM2/COM3/COM4 (RS232), Hardware Monitor (2 thermal inputs,4 voltage monitor inputs & 2 Fan headers) [CPU FAN & SYS FAN(DC Fan type, 3-pin connector)] COM1/2 with pin-9 with power for 2 ports (500 mA for each

	port)
Digital IO	4 in & 4 out
Expansion Slots	- PCI-Express (16x) x1 [Gen 3.0 PEG] - Mini PCI-Express x1 port [Full-sized] w/mSATA +USB 2.0 support - Mini PCI-Express x1 port [Half-sized] w/ USB 2.0 support
Edge Connector	Dual DB9 stack connector for COM #1 / #2 DVI-D + DVI-I stack connector x 1 USB(3.0) dual stack + DP connector x1 RJ-45 + dual USB(2.0) stack connector x2 Triplet type Jack 3 x 1 for HD Audio
On Board Header/Connector	2 ports x SATA III [Blue color] , 4 ports x SATA II , mSATA (w/JEDEC MO-300) [Share with SATA #5] DF-11 8 pins connector x 1 for 2 ports USB 2.0 DF-13 20 pins connector x 2 for dual –channel LVDS 2x10 pins box-header x 1 for 2 ports USB 3.0 [Blue color] 2x5 pins pin-header x 1 for front panel audio [Support 7.1 Channel] 2x5 pins pin-header x 2 for COM3 & COM4 2x5 pins pin-header x 1 for Digital IO 4 pins box header x 1 for LCD backlight control
Watchdog Timer	Yes (256 segments, 0, 1, 2…255 sec/min)
System Voltage	ATX standard 20-pin type 4 pin type (+12V only)[For full system loading usage]
RoHS	Yes
Board Size	170mm x 170mm
OS supporting	- Windows 7 / Embedded - Linux

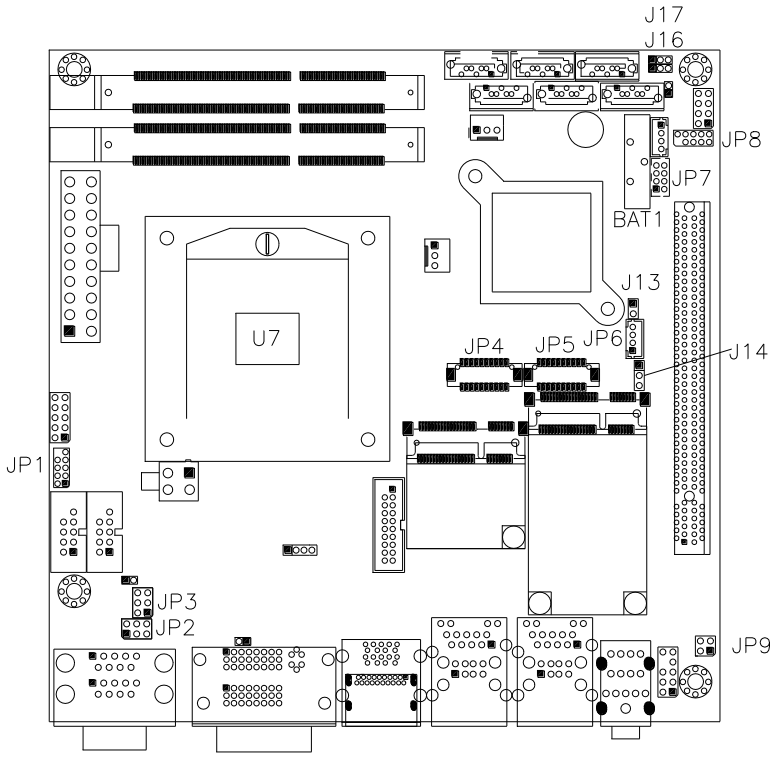
2.2 Board Dimensions



2.3 Setting the Jumpers

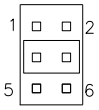
Jumpers are used on MI970F to select various settings and features according to your needs and applications. Contact your supplier if you have doubts about the best configuration for your needs. The following lists the connectors on MI970F and their respective functions.

2.4 Jumper Locations on MI970

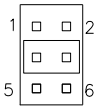


JP1: LPC debug Connector (Factory use only)

JP2: COM1 RS232 RI/+5V/+12V Power Setting

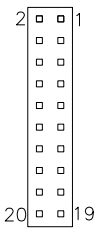
JP2	Setting	Function
	Pin 1-2 Short/Closed	+12V
	Pin 3-4 Short/Closed	RI
	Pin 5-6 Short/Closed	+5V

JP3: COM2 RS232 RI/+5V/+12V Power Setting

JP3	Setting	Function
	Pin 1-2 Short/Closed	+12V
	Pin 3-4 Short/Closed	RI
	Pin 5-6 Short/Closed	+5V

JP4, JP5: LVDS Connectors (1st channel, 2nd channel)

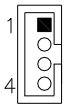
The LVDS connectors on board consist of the first channel (LVDS1) and second channel (LVDS2).



Signal Name	Pin #	Pin #	Signal Name
TX0-	2	1	TX0+
Ground	4	3	Ground
TX1-	6	5	TX1+
5V/3.3V	8	7	Ground
TX3-	10	9	TX3+
TX2-	12	11	TX2+
Ground	14	13	Ground
TXC-	16	15	TXC+

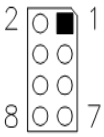
5V/3.3V	18	17	ENABKL
+12V	20	19	+12V

JP6: LCD Backlight Connector



Pin #	Signal Name
1	+12V
2	Backlight Enable
3	Brightness Control
4	Ground

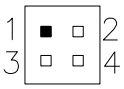
JP7: USB4/USB5 Connector



Signal Name	Pin #	Pin #	Signal Name
Vcc	1	2	Ground
D0-	3	4	D1+
D0+	5	6	D1-
Ground	7	8	Vcc

JP8: SPI Flash connector (Factory use only)

JP9: SPDIF I/O



Pin #	Signal Name
1	SPDIF IN
2	Ground
3	SPDIF OUT
4	Ground

J13: Flash Descriptor Security Override (Factory use only)

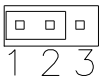
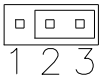
J13	Flash Descriptor Security Override

Open	Disabled (Default)
Close	Enabled

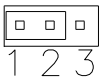
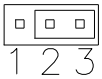
J14: LCD Panel Power Selection

J14	LCD Panel Power
	3.3V
	5V

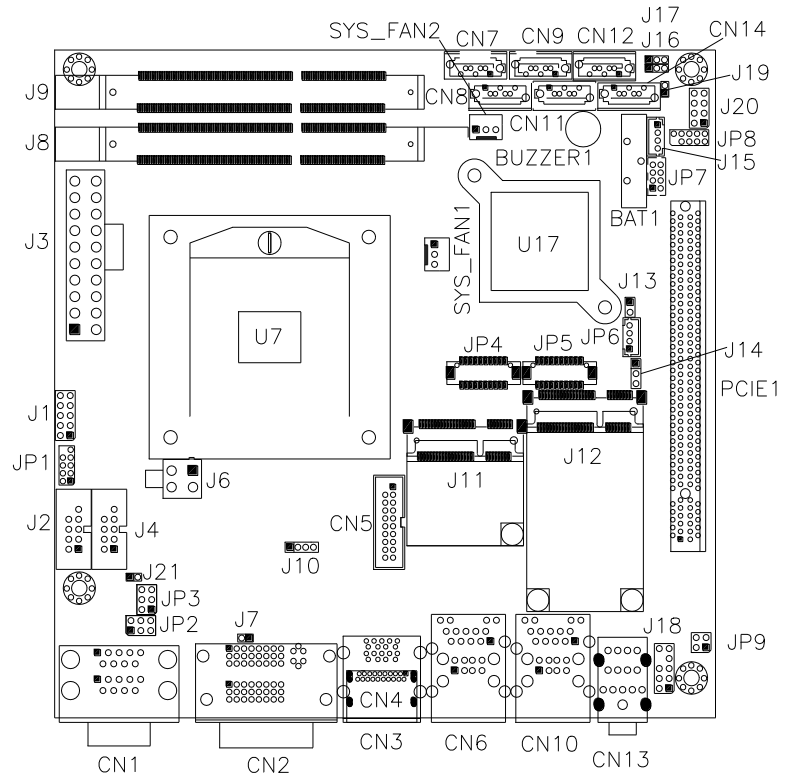
J16: Clear ME Contents

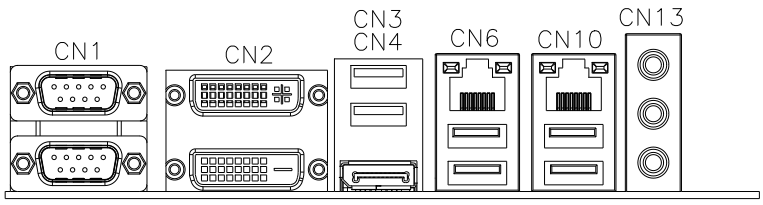
J16	Setting	Function
	Pin 1-2 Short/Closed	Normal
	Pin 2-3 Short/Closed	Clear

J17: Clear CMOS Contents

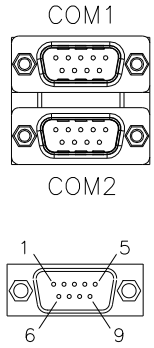
J17	Setting	Function
	Pin 1-2 Short/Closed	Normal
	Pin 2-3 Short/Closed	Clear CMOS

Connector Locations on MI970F



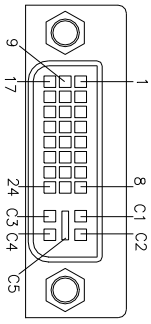


CN1: COM1 and COM2 Serial Ports

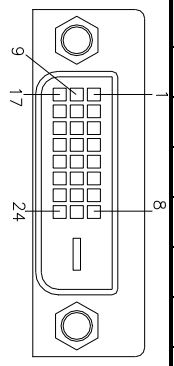


Pin #	Signal Name		
	RS-232	R2-422	RS-485
1	DCD	TX-	DATA-
2	RX	TX+	DATA+
3	TX	RX+	NC
4	DTR	RX-	NC
5	Ground	Ground	Ground
6	DSR	NC	NC
7	RTS	NC	NC
8	CTS	NC	NC
9	RI	NC	NC
10	NC	NC	NC

CN2: DVI-D and DVI-I Connector

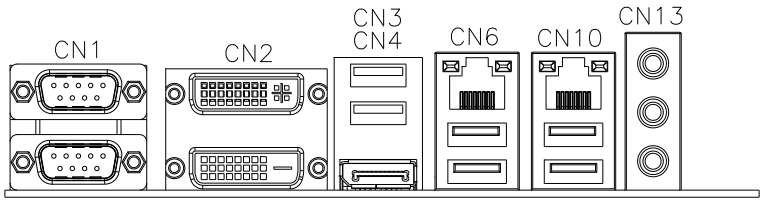


Signal Name	Pin #	Pin #	Signal Name
DATA 2-	1	16	HOT POWER
DATA 2+	2	17	DATA 0-
Shield 2/4	3	18	DATA 0+
DATA 4-	4	19	SHIELD 0/5
DATA 4+	5	20	DATA 5-
DDC CLOCK	6	21	DATA 5+
DDC DATA	7	22	SHIELD CLK
N.C	8	23	CLOCK -
DATA 1-	9	24	CLOCK +
DATA 1+	10	C1	Analog Red
SHIELD 1/3	11	C2	Analog Green
DATA 3-	12	C3	Analog Blue
DATA 3+	13	C4	Analog HYNC
DDC POWER	14	C5	A GROUND2
A GROUND 1	15	C6	A GROUND3



DVI-I

Signal Name	Pin #	Pin #	Signal Name
DATA 2-	1	16	HOT POWER
DATA 2+	2	17	DATA 0-
Shield 2/4	3	18	DATA 0+
DATA 4-	4	19	SHIELD 0/5
DATA 4+	5	20	DATA 5-
DDC CLOCK	6	21	DATA 5+
DDC DATA	7	22	SHIELD CLK
N.C	8	23	CLOCK -
DATA 1-	9	24	CLOCK +
DATA 1+	10	C1	N.C.
SHIELD 1/3	11	C2	N.C.
DATA 3-	12	C3	N.C.
DATA 3+	13	C4	N.C.
DDC POWER	14	C5	N.C.
A GROUND 1	15	C6	N.C.



CN3: USB3

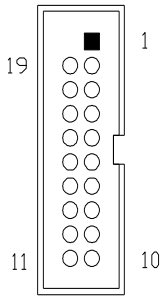
CN4: DisplayPort

CN6: Gigabit LAN (82579LM/V) +USB2 12/13

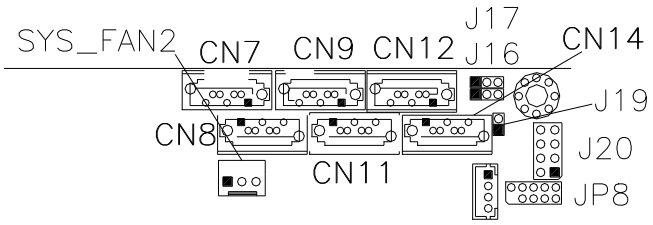
CN10: Gigabit LAN (82583V) + USB2 8/9

CN13: HDA Audio connector

CN5: USB3 Connector



Signal Name	Pin #	Pin #	Signal Name
Vcc	1	X	
P1_SSRX-	2	19	Vcc
P1_SSRX+	3	18	P2_SSRX-
GND	4	17	P2_SSRX+
P1_SSTX-	5	16	GND
P1_SSTX+	6	15	P2_SSTX-
GND	7	14	P2_SSTX+
P1_U2_D-	8	13	GND
P1_U2_D+	9	12	P2_U2_D-
NC	10	11	P2_U2_D+



CN7: SATA3 Connector Port2

CN8: SATA3 Connector Port1

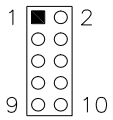
CN9: SATA2 Connector Port4

CN11: SATA2 Connector Port3

CN12: SATA2 Connector Port6 (Share with mSATA)

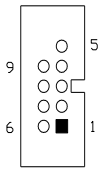
CN14: SATA2 Connector Port5

J1: Digital I/O Connector (4 in, 4 out)



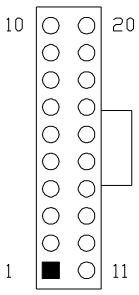
Signal Name	Pin #	Pin #	Signal Name
Ground	1	2	+5V
Out3	3	4	Out1
Out2	5	6	Out0
IN3	7	8	IN1
IN2	9	10	IN0

J4, J2: COM3, COM4 RS232 Serial Ports



Signal Name	Pin #	Pin #	Signal Name
DCD#	1	6	DSR#
SIN#	2	7	RTS#
SOUT	3	8	CTS#
DTR#	4	9	RI#
GND	5	X	KEY

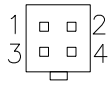
J3: ATX Power Supply Connector



Signal Name	Pin #	Pin #	Signal Name
3.3V	11	1	3.3V
-12V	12	2	3.3V
Ground	13	3	Ground
PS-ON	14	4	+5V
Ground	15	5	Ground
Ground	16	6	+5V
Ground	17	7	Ground
-5V	18	8	Power good
+5V	19	9	5VSB
+5V	20	10	+12V

J6: ATX 12V Power Connector

This connector supplies the CPU operating voltage.



Pin #	Signal Name
1	Ground
2	Ground
3	+12V
4	+12V

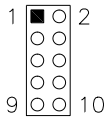
J8: DDR SO-DIMM Channel A

J9: DDR SO-DIMM Channel B

J11: Mini-PCIE Connector

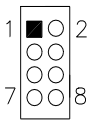
J12: Mini-PCIE Connector and mSATA/share with CN12

J18: Audio Pin Header for Chassis Front Panel



Signal Name	Pin #	Pin #	Signal Name
MIC IN_L	1	2	Ground
MIC IN_R	3	4	DET
LINE_R	5	6	Ground
Sense	7	8	KEY
LINE_L	9	10	Ground

J20: Front Panel

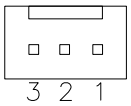


Signal Name	Pin #	Pin #	Signal Name
Power BTN	1	2	Power BTN
HDD LED+	3	4	HDD LED-
Reset BTN	5	6	Reset BTN
Power LED+	7	8	Power LED-

J21: PCIE Configuration (Support from PCB V1.1)

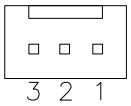
J21	PCIE Configuration
OPEN	PCIE X16 (DEFAULT)
CLOSE	PCIE X8, X8

SYS_FAN1: CPU Fan Power Connector



Pin #	Signal Name
1	Ground
2	+12V
3	Rotation detection

SYS_FAN2: System Fan Power Connector



Pin #	Signal Name
1	Ground
2	+12V
3	Rotation detection

CHAPTER 3 BIOS SETUP

This chapter describes the different settings available in the AMI BIOS that comes with the board. The topics covered in this chapter are as follows:

BIOS Introduction

The BIOS (Basic Input/Output System) installed in your computer system's ROM supports Intel processors. The BIOS provides critical low-level support for a standard device such as disk drives, serial ports and parallel ports. It also password protection as well as special support for detailed fine-tuning of the chipset controlling the entire system.

BIOS Setup

The BIOS provides a Setup utility program for specifying the system configurations and settings. The BIOS ROM of the system stores the Setup utility. When you turn on the computer, the BIOS is immediately activated. Pressing the <Del> key immediately allows you to enter the Setup utility. If you are a little bit late pressing the <Del> key, POST (Power On Self Test) will continue with its test routines, thus preventing you from invoking the Setup. If you still wish to enter Setup, restart the system by pressing the "Reset" button or simultaneously pressing the <Ctrl>, <Alt> and <Delete> keys. You can also restart by turning the system Off and back On again. The following message will appear on the screen:

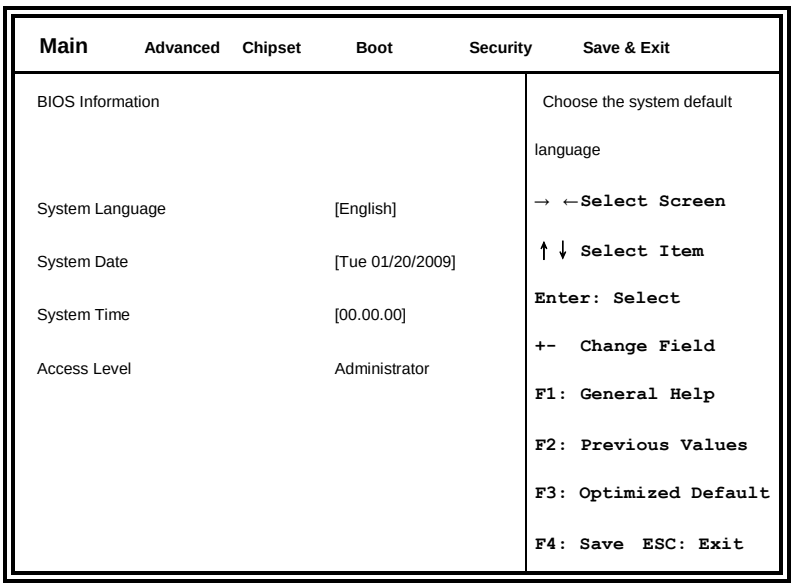
```
Press  <DEL> or <F2> to  Enter  Setup
```

In general, you press the arrow keys to highlight items, <Enter> to select, the <PgUp> and <PgDn> keys to change entries, <F1> for help and <Esc> to quit.

When you enter the Setup utility, the Main Menu screen will appear on the screen. The Main Menu allows you to select from various setup functions and exit choices.

Warning: *It is strongly recommended that you avoid making any changes to the chipset defaults. These defaults have been carefully chosen by both AMI and your system manufacturer to provide the absolute maximum performance and reliability. Changing the defaults could cause the system to become unstable and crash in some cases.*

Main Settings



System Date

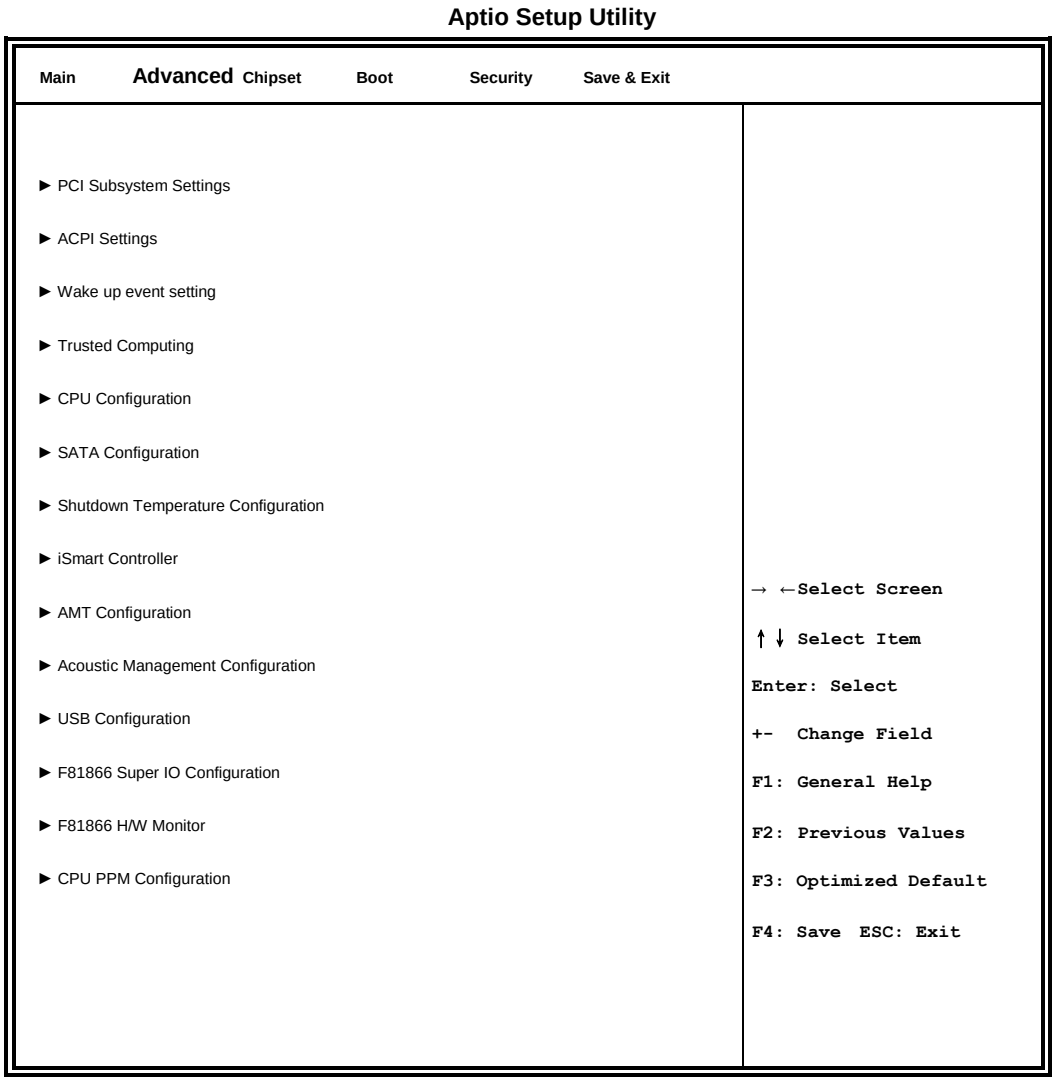
Set the Date. Use Tab to switch between Data elements.

System Time

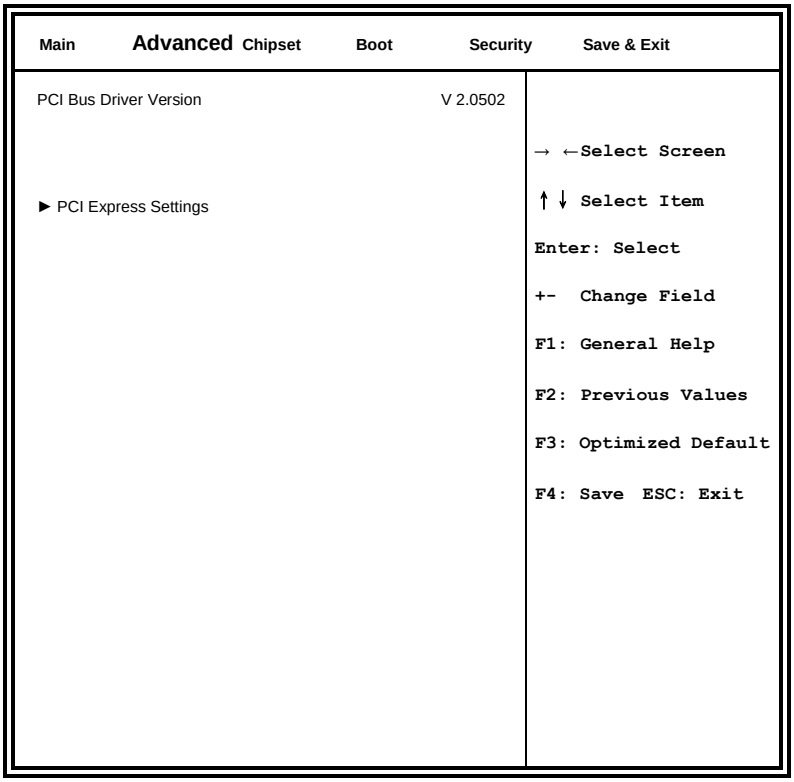
Set the Time. Use Tab to switch between Data elements.

Advanced Settings

This section allows you to configure and improve your system and allows you to set up some system features according to your preference.

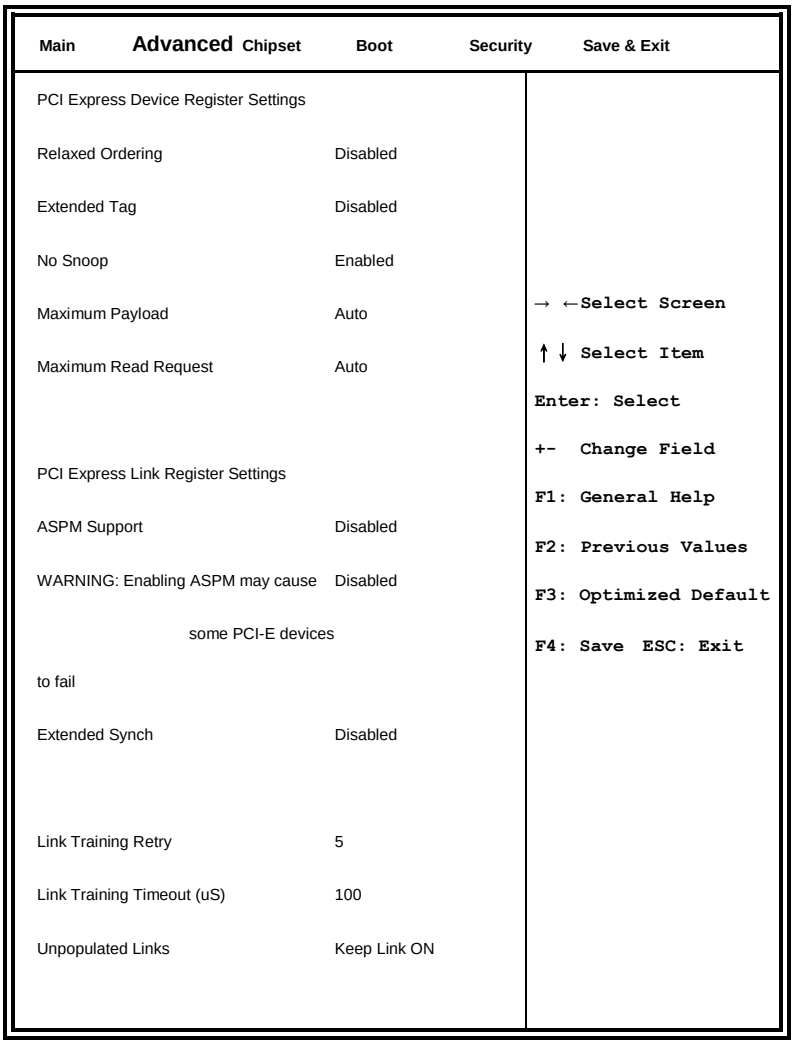


PCI Subsystem Settings



PCI Express Settings

Aptio Setup Utility



Relaxed Ordering

Enables or disables PCI Express Device Relaxed Ordering.

Extended Tag

If ENABLED allows device to use 8-bit Tag field as a requester.

No Snoop

Enables or disables PCI Express Device No Snoop option.

Maximum Payload

Set Maximum Payload of PCI Express Device or allow System BIOS to select the value.

Maximum Read Request

Set Maximum Read Request Size of PCI Express Device or allow System BIOS to select the value.

ASPM Support

Set the ASPM Level: Force L0s – Force all links to L0s State:

AUTO – BIOS auto configure: DISABLE – Disables ASPM.

Extended Synch

If ENABLED allows generation of Extended Synchronization patterns.

Link Training Retry

Defines number of Retry Attempts software will take to retrain the link if previous training attempt was unsuccessful.

Link Training Timeout (uS)

Defines number of Microseconds software will wait before polling 'Link Training' bit in Link Status register. Value range from 10 to 1000 uS.

Unpopulated Links

In order to save power, software will disable unpopulated PCI Express links, if this option set to 'Disable Link'.

ACPI Settings

Aptio Setup Utility

Main	Advanced	Chipset	Boot	Security	Save & Exit

ACPI Settings		
Enable Hibernation	Enabled	→ ←Select Screen
ACPI Sleep State	S3 (Suspend to R…)	↑ ↓ Select Item
Lock Legacy Resources	Disabled	Enter: Select
S3 Video Repost	Disabled	+- Change Field
		F1: General Help
		F2: Previous Values
		F3: Optimized Default
		F4: Save
		ESC: Exit

Enable Hibernation

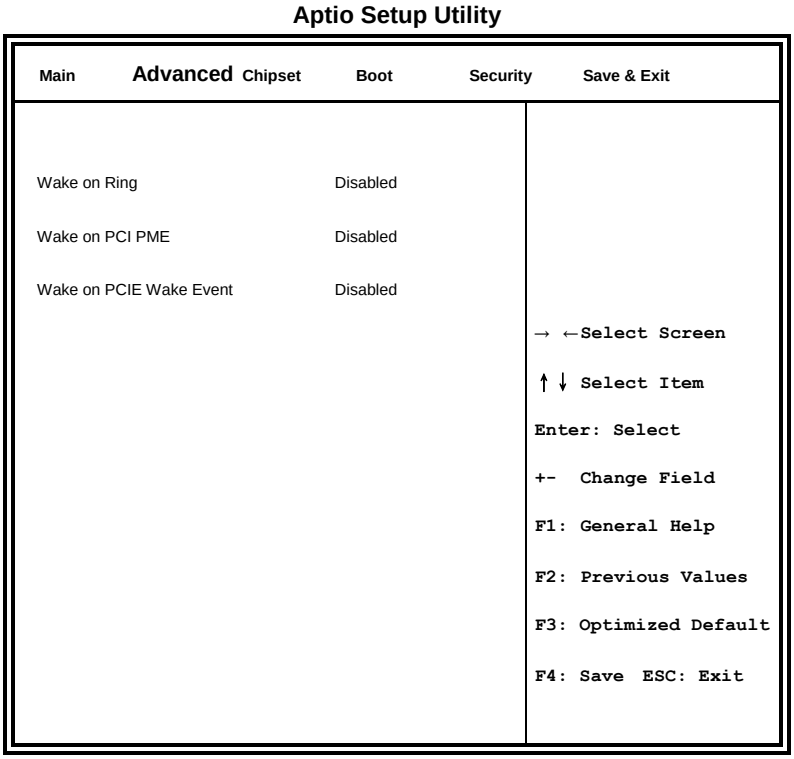
Enables or Disables System ability to Hibernate (OS/S4 Sleep State). This option may be not effective with some OS.

ACPI Sleep State
Select ACPI sleep state the system will enter, when the SUSPEND button is pressed.

Lock Legacy Resources
Enabled or Disabled Lock of Legacy Resources.

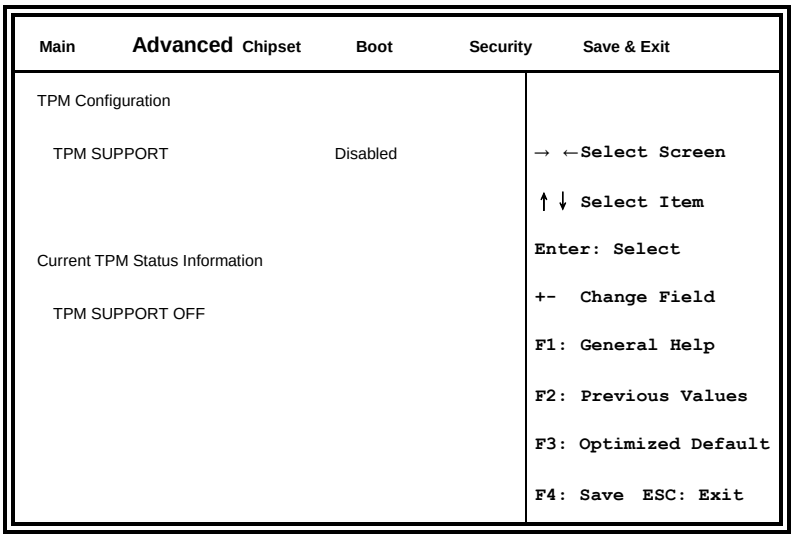
S3 Video Repost
Enable or disable S3 Video Repost.

Wake up event settings



Wake on PCIE PME Wake Event
The options are Disabled and Enabled.

Trusted Computing



TPM Support

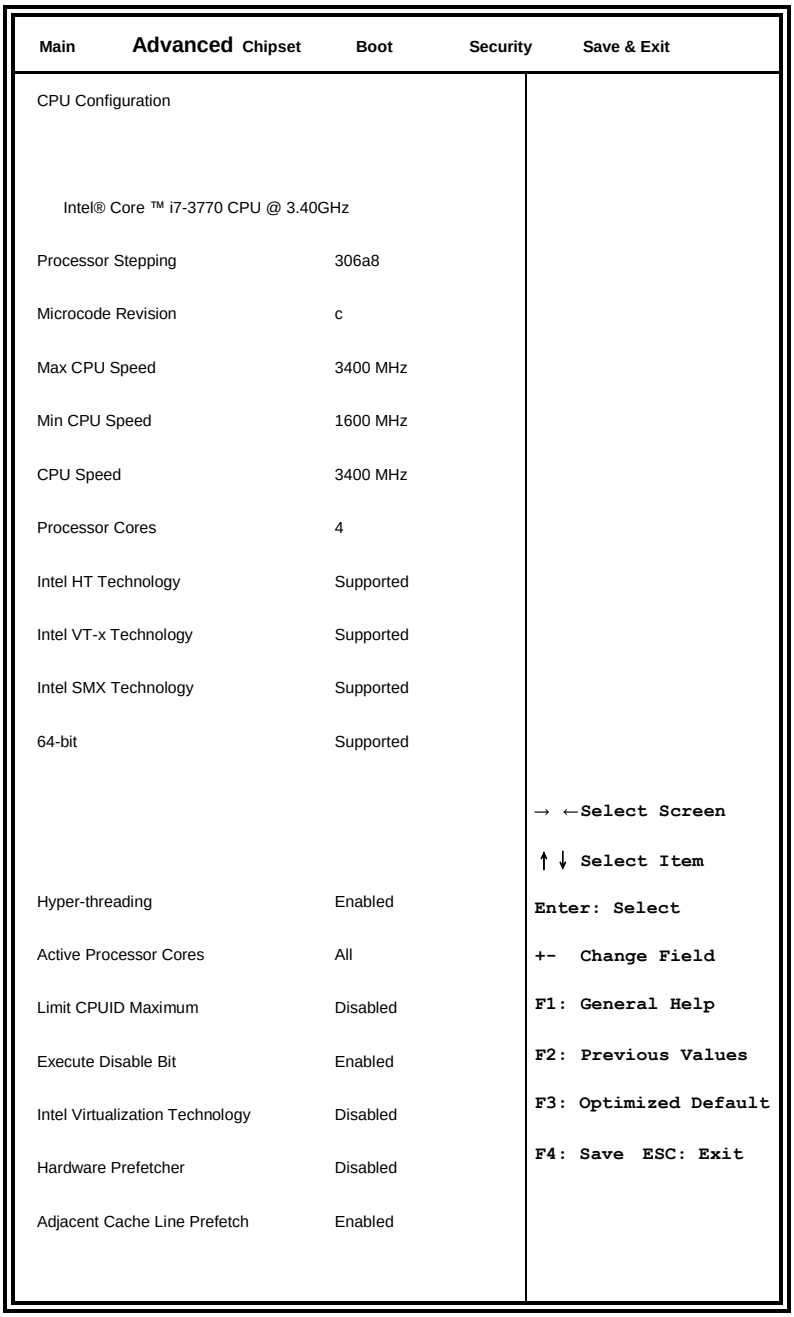
This configuration is supported only with MI970VF. Enables or Disables TPM support. O.S. will not show TPM. Reset of platform is required.

Security Device Support

Enables or disables BIOS support for security device. O.S. will not show Security Device. TCG EFI protocol and INT1A interface will not be available.

CPU Configuration

Aptio Setup Utility



Hyper-threading

Select the performance state that the BIOS will set before OS handoff.

Active Processor Cores

Number of cores to enable in each processor package.

Overclocking lock

Flex_RATIO(194)MSR

Limit CPUID Maximum

Disabled for Windows XP.

Execute Disable Bit

XD can prevent certain classes of malicious buffer overflow attacks when combined with a supporting OS

Intel Virtualization Technology

When enabled, a VMM can utilize the additional hardware capabilities provided by Vanderpool Technology.

CPU AES

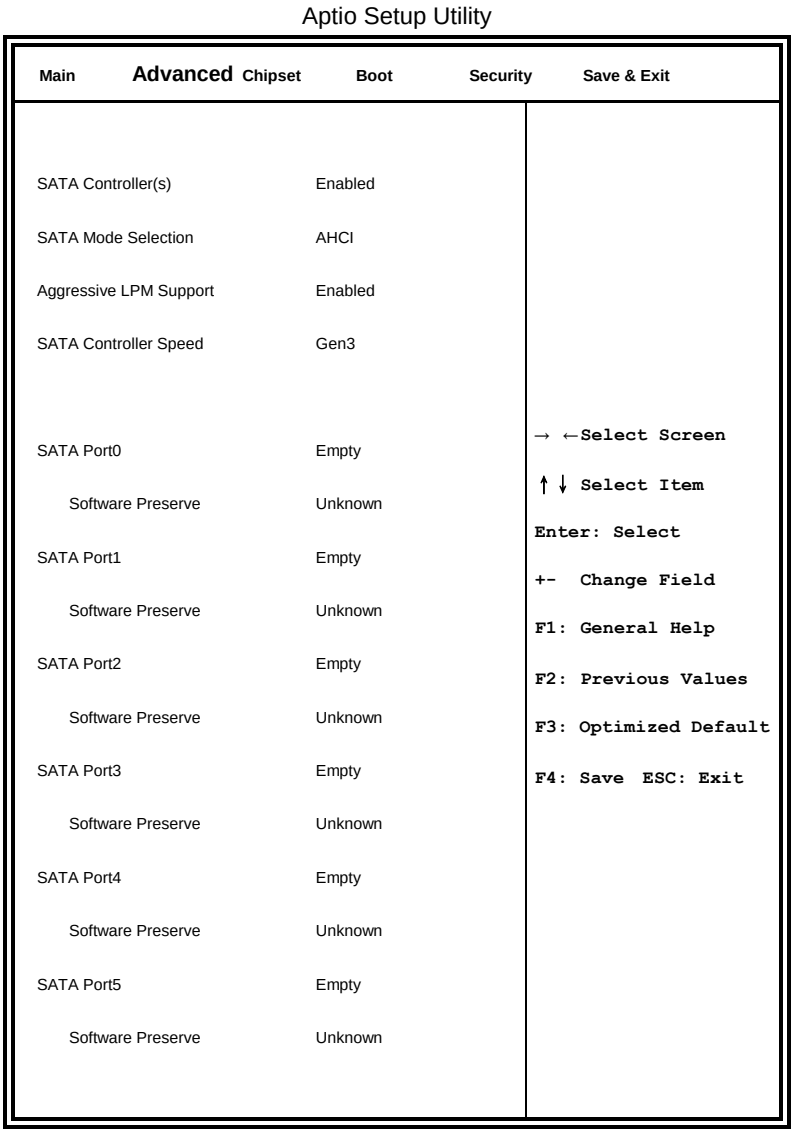
Enabled/Disabled CPU Advanced Encryption Standard instructions

EIST

Enabled/Disabled Intel Speedstep.

SATA Configuration

SATA Devices Configuration.



SATA Controller(s)

Enable / Disable Serial ATA Controller.

SATA Mode Selection

(1) IDE Mode.

(2) AHCI Mode.

(3) RAID Mode.

Hot Plug

Designates this port as Hot Plugable.

Shutdown Temperature Configuration

Aptio Setup Utility

Main	Advanced	Chipset	Boot	Security	Save & Exit
APCI Shutdown Temperature			Disabled		

→ ← Select Screen
↑ ↓ Select Item
Enter: Select
+- Change Field
F1: General Help
F2: Previous Values
F3: Optimized Default
F4: Save ESC: Exit

ACPI Shutdown Temperature

The default setting is Disabled.

iSmart Controller

Aptio Setup Utility

Main	**Advanced**	Chipset	Boot	Security	Save & Exit
iSmart Controller					
Power-On after Power failure			Disable		
Schedule Slot 1			None		
Schedule Slot 2			None		

→ ← Select Screen
↑ ↓ Select Item
Enter: Select
+- Change Field
F1: General Help
F2: Previous Values
F3: Optimized Default
F4: Save ESC: Exit

ISmart Controller

Setup the power on time for the system.

Schedule Slot 1 / 2

Setup the hour/minute for system power on.

Unconfigure ME

This configuration is supported only with IB902VF (with iAMT function). Perform AMT/ME unconfigure without password operation.

Amt Wait Timer

Set timer to wait before sending ASF_GET_BOOT_OPTIONS.

Activate Remote Assistance Process

Trigger CIRA boot.

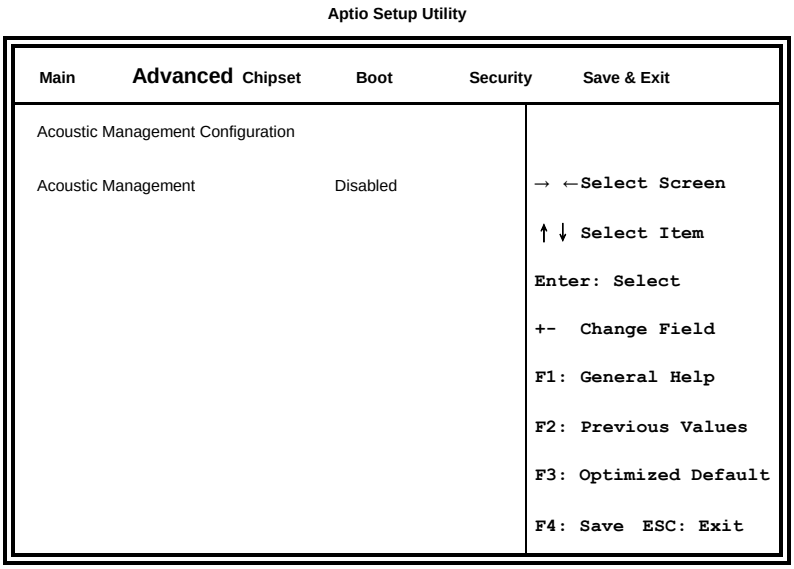
PET Progress

User can Enable/Disable PET Events progress to receive PET events or not.

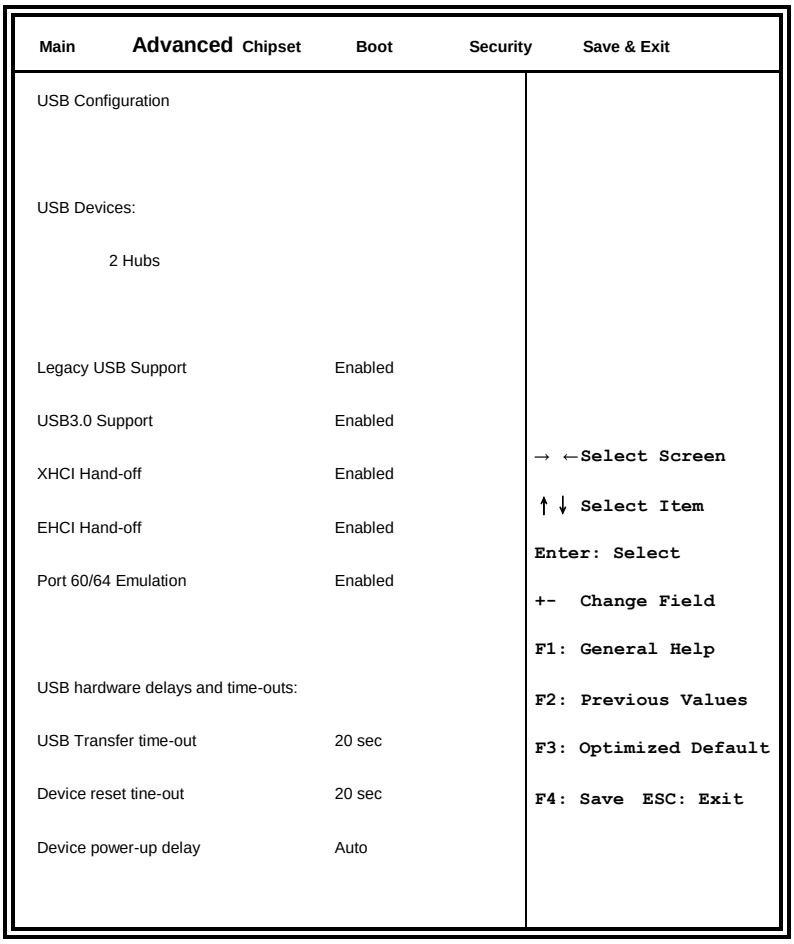
Watchdog Timer

This configuration is supported only with IB902VF (with iAMT function). Enable/Disable Watchdog Timer.

Acoustic Management Configuration



USB Configuration



Legacy USB Support

Enables Legacy USB support.

AUTO option disables legacy support if no USB devices are connected.

DISABLE option keeps USB devices available only for EFI applications.

USB3.0 Support

Enable/Disable USB3.0 (XHCI) Controller support.

XHCI Hand-off

This is a workaround for OSes without XHCI hand-off support. The XHCI ownership change should be claimed by XHCI driver.

EHCI Hand-off

Enabled/Disabled. This is a workaround for OSes without EHCI hand-off support. The EHCI ownership change should be claimed by EHCI driver.

USB Transfer time-out

The time-out value for Control, Bulk, and Interrupt transfers.

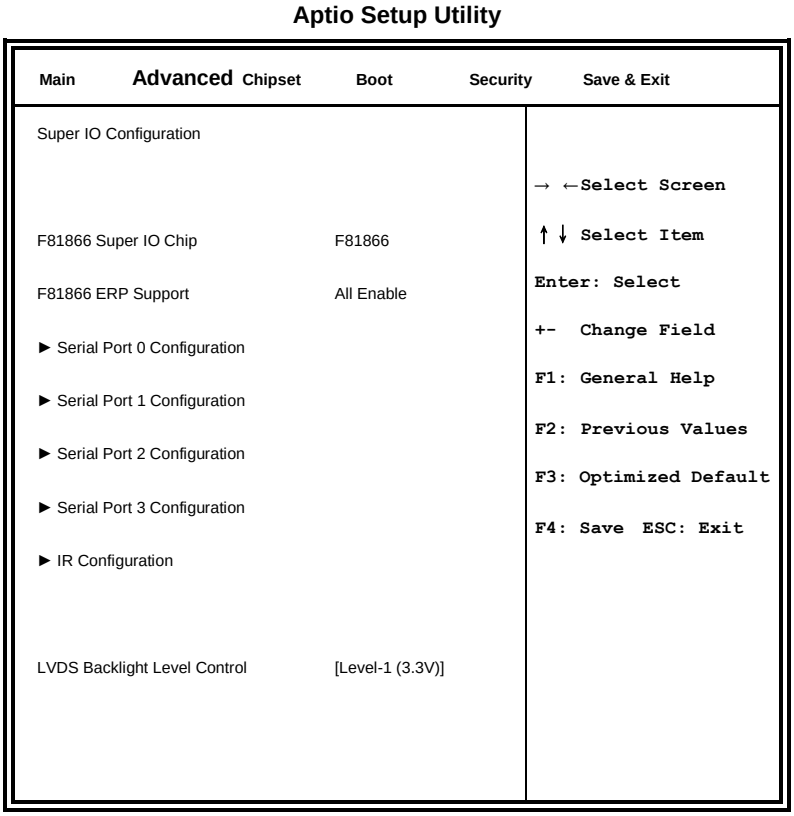
Device reset time-out

USB mass Storage device start Unit command time-out.

Device power-up delay

Maximum time the device will take before it properly reports itself to the Host Controller. 'Auto' uses default value: for a Root port it is 100ms, for a Hub port the delay is taken from Hub descriptor.

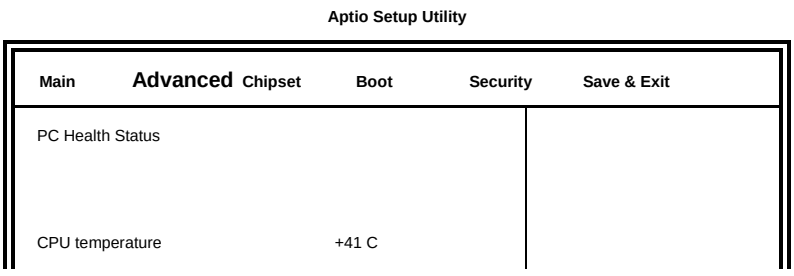
F81866 Super IO Configuration

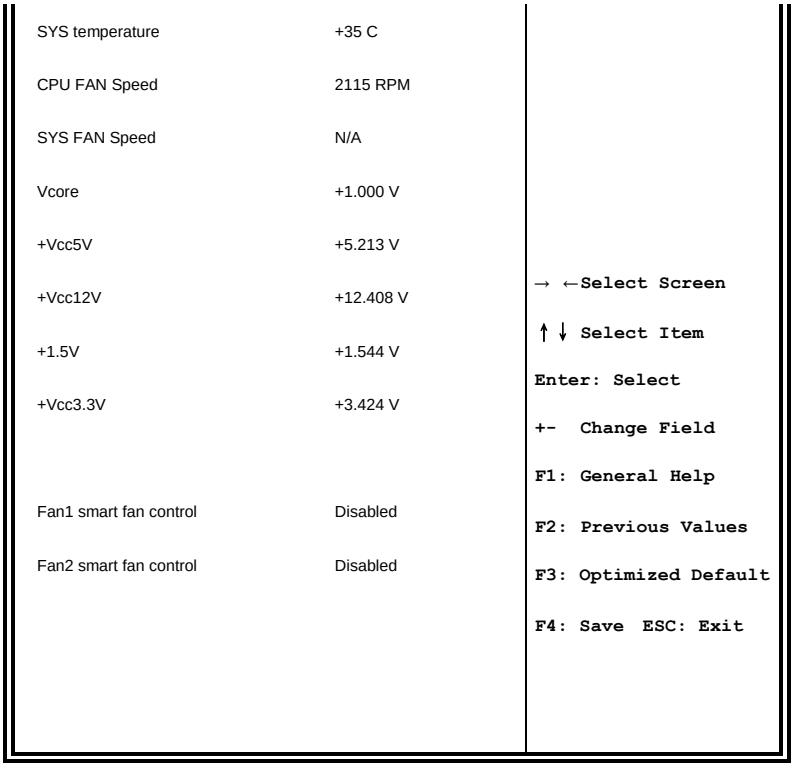


Serial Port Configuration

Set Parameters of Serial Ports. User can Enable/Disable the serial port and Select an optimal settings for the Super IO Device.

F81866 H/W Monitor





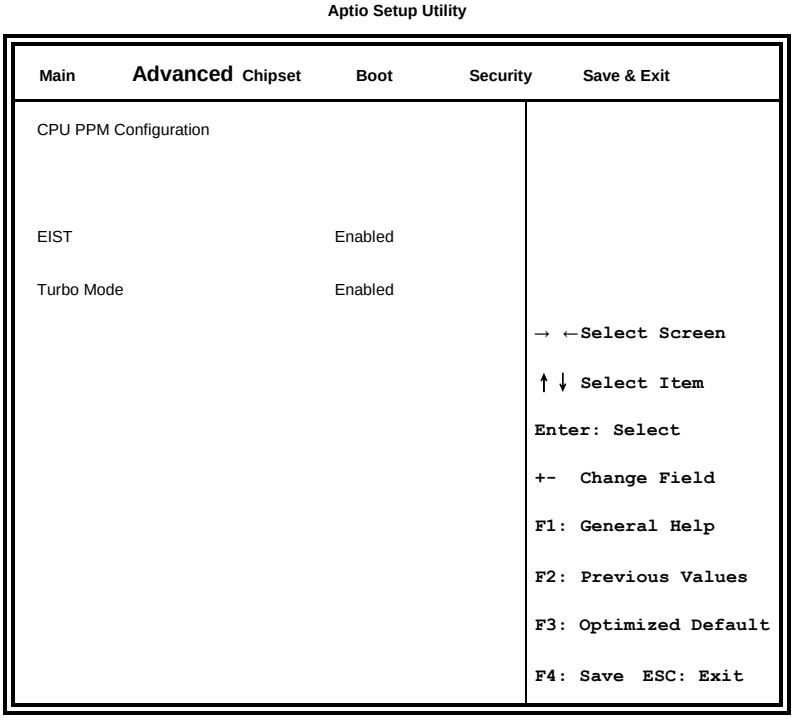
Temperatures/Voltages

These fields are the parameters of the hardware monitoring function feature of the motherboard. The values are read-only values as monitored by the system and show the PC health status.

Fan1/Fan2 Smart Fan Control

This field enables or disables the smart fan feature. At a certain temperature, the fan starts turning. Once the temperature drops to a certain level, it stops turning again.

CPU PPM Configuration

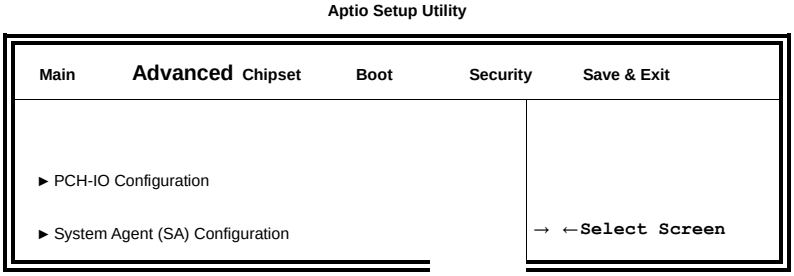


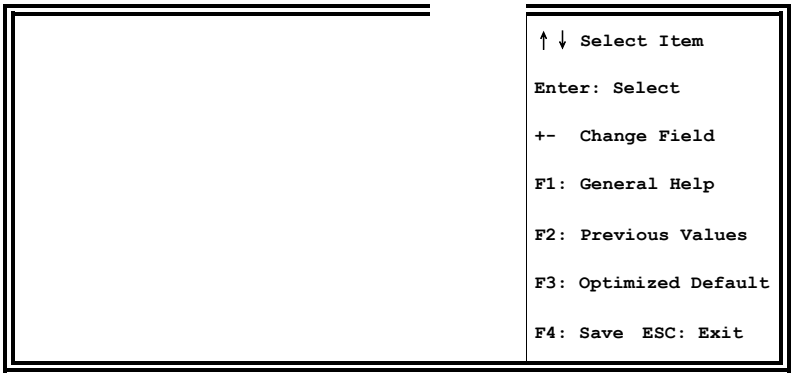
EIST

Enable/Disable Intel SpeedStep.

Chipset Settings

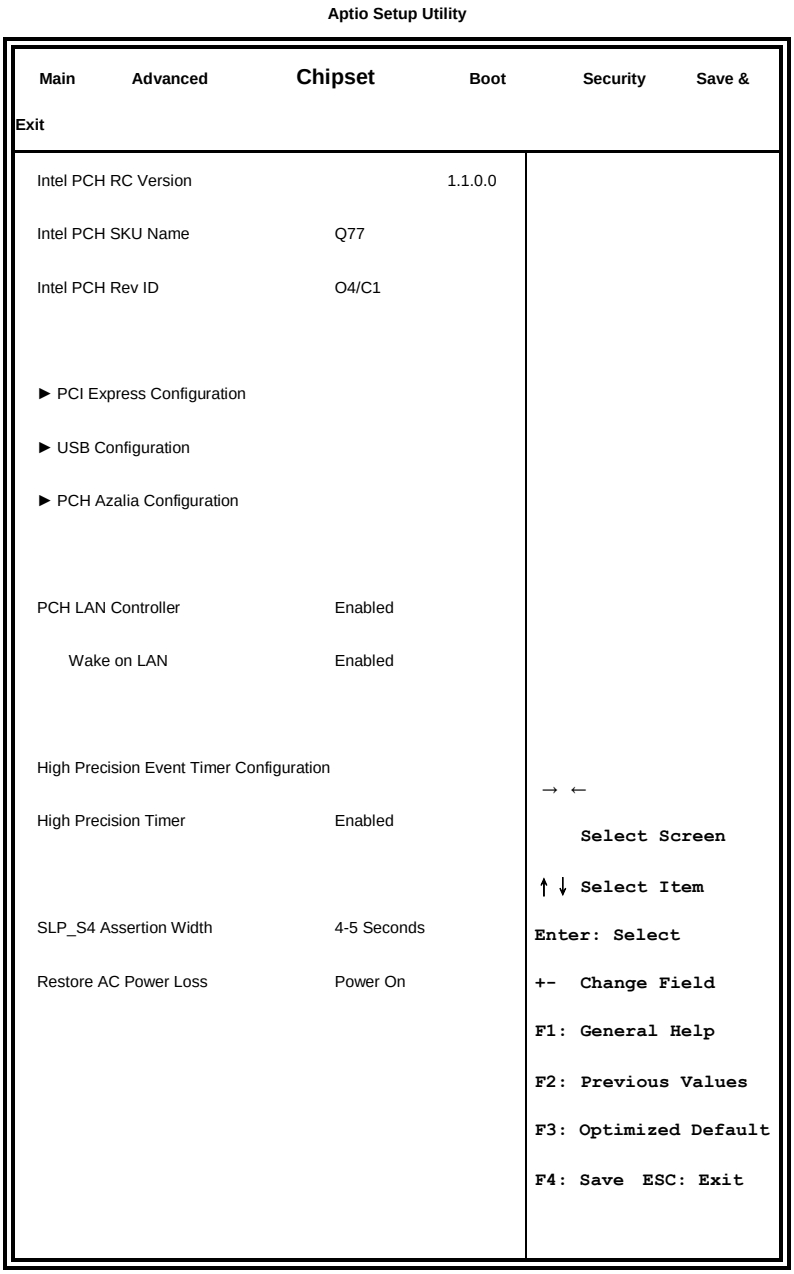
This section allows you to configure and improve your system and allows you to set up some system features according to your preference.




↑↓ Select Item
Enter: Select
+- Change Field
F1: General Help
F2: Previous Values
F3: Optimized Default
F4: Save ESC: Exit

PCH-IO Configuration

This section allows you to configure the North Bridge Chipset.



PCH LAN Controller

Enable or disable onboard NIC.

Wake on LAN

Enable or disable integrated LAN to wake the system. (The Wake On LAN cannot be disabled if ME is on at Sx state.)

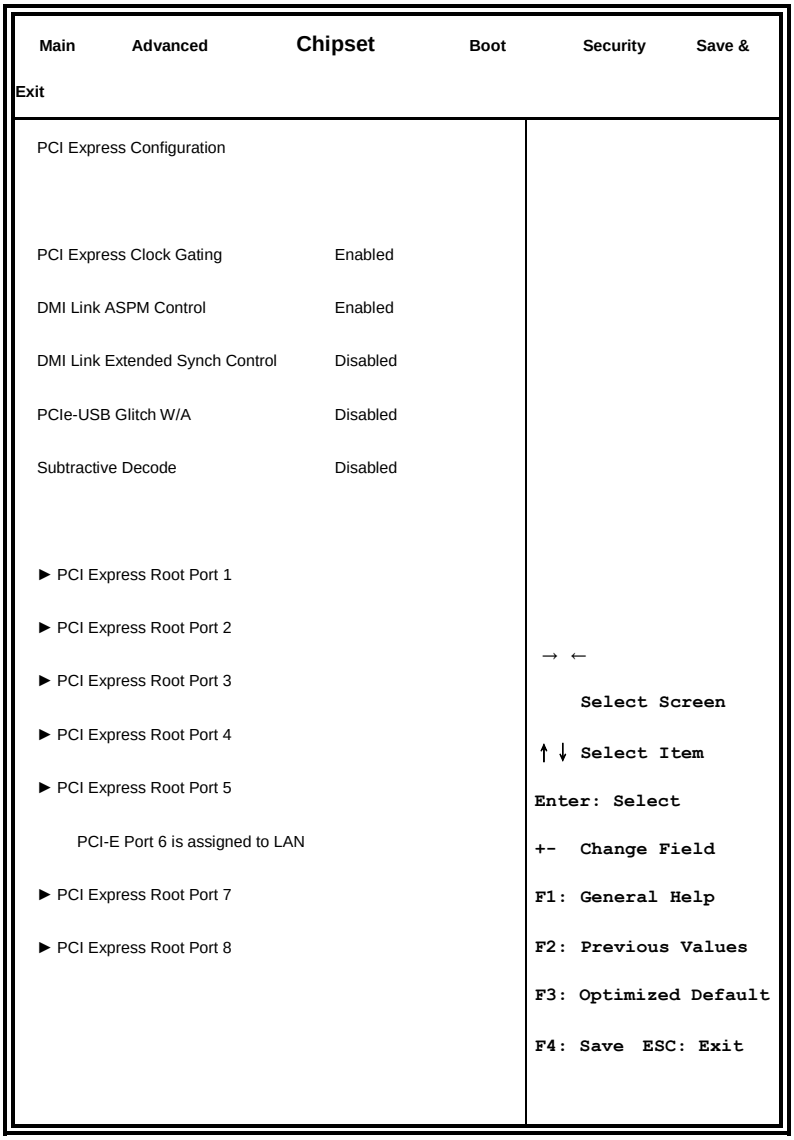
SLP_S4 Assertion Width

Select a minimum assertion width of the SLP_S4# signal.

Restore AC Power Loss

Select AC power state when power is re-applied after a power failure.

PCI Express Configuration



PCI Express Clock Gating

Enable or disable PCI Express Clock Gating for each root port.

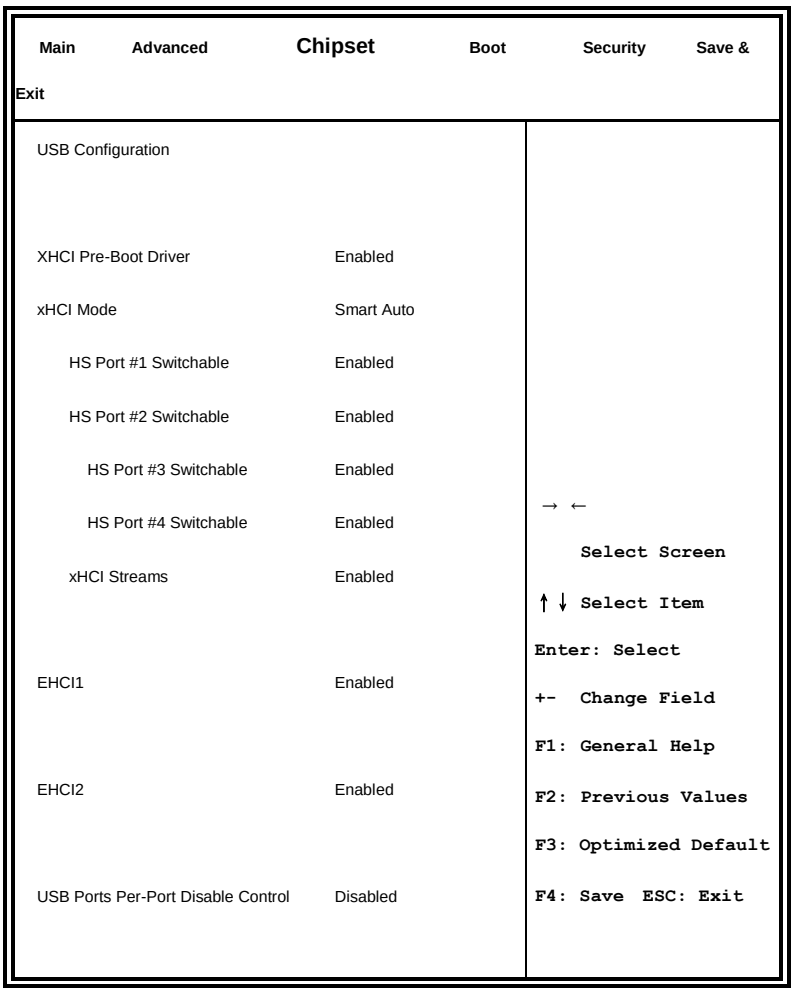
DMI Link ASPM Control

The control of Active State Power Management on both NB side and SB side of the DMI link.

PCIe-USB Glitch W/A

PCIe-USB Glitch W/A for bad USB device(s) connected behind PCIE/PEG port.

USB Configuration



HS Port #1/2/3/4 Switchable

Allows for HS port switching between xHCI and EHCI. If disabled, port is routed to EHCI. If HS port is routed to xHCI, the corresponding SS port is enabled.

xHCI Streams

Enable or disable xHCI Maximum Primary Stream Array Size.

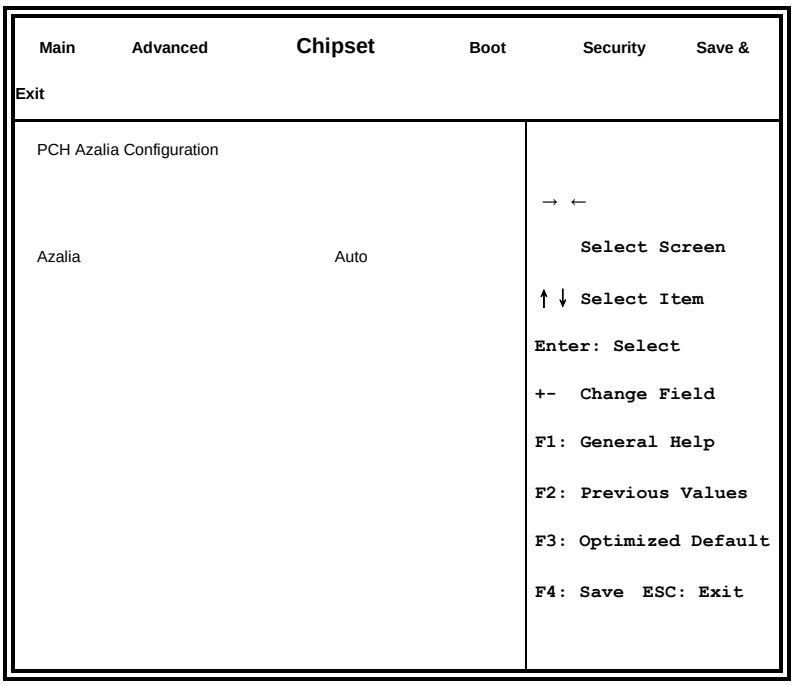
EHCI1/2

Control the USAB EHCI (USB 2.0) functions. One EHCI controller must always be enabled.

USB Ports Per-Port Disable Control

Control each of the USB ports (0~13) disabling.

PCH Azalia Configuration



Azalia

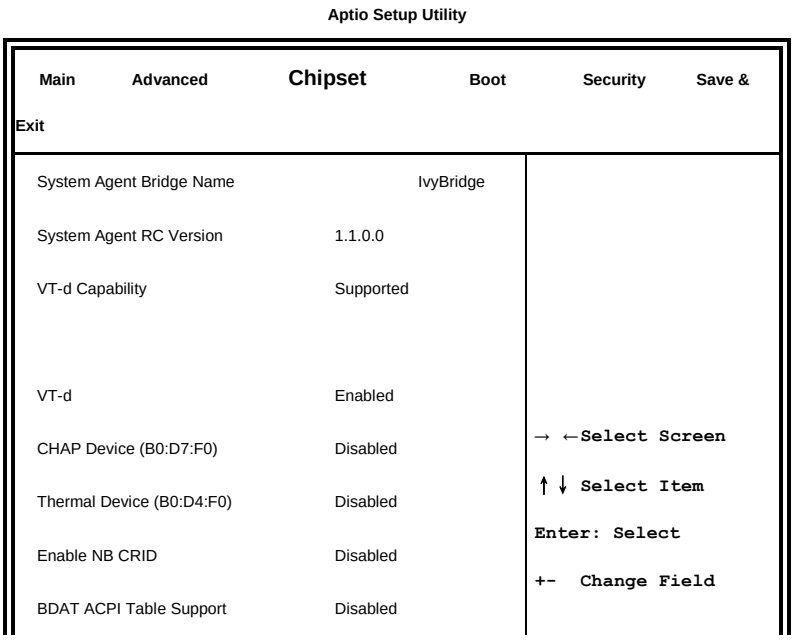
Control Detection of the Azalia device.

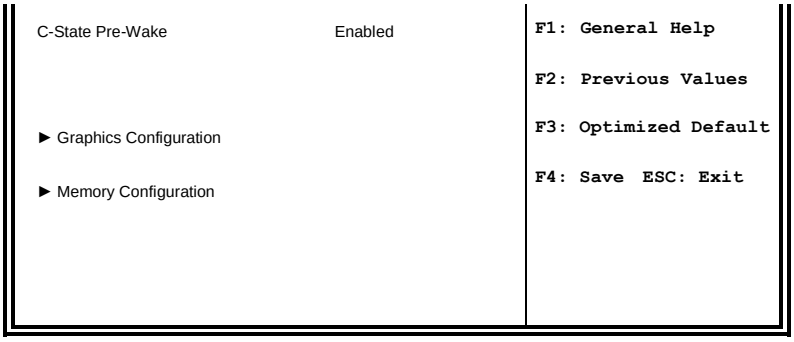
Disabled = Azalia will unconditionally disabled.

Enabled Azalia will be unconditionally enabled.

Auto = Azalia will enabled if present, disabled otherwise.

System Agent (SA) Configuration





VT-d

Check to enable VT-d function on MCH.

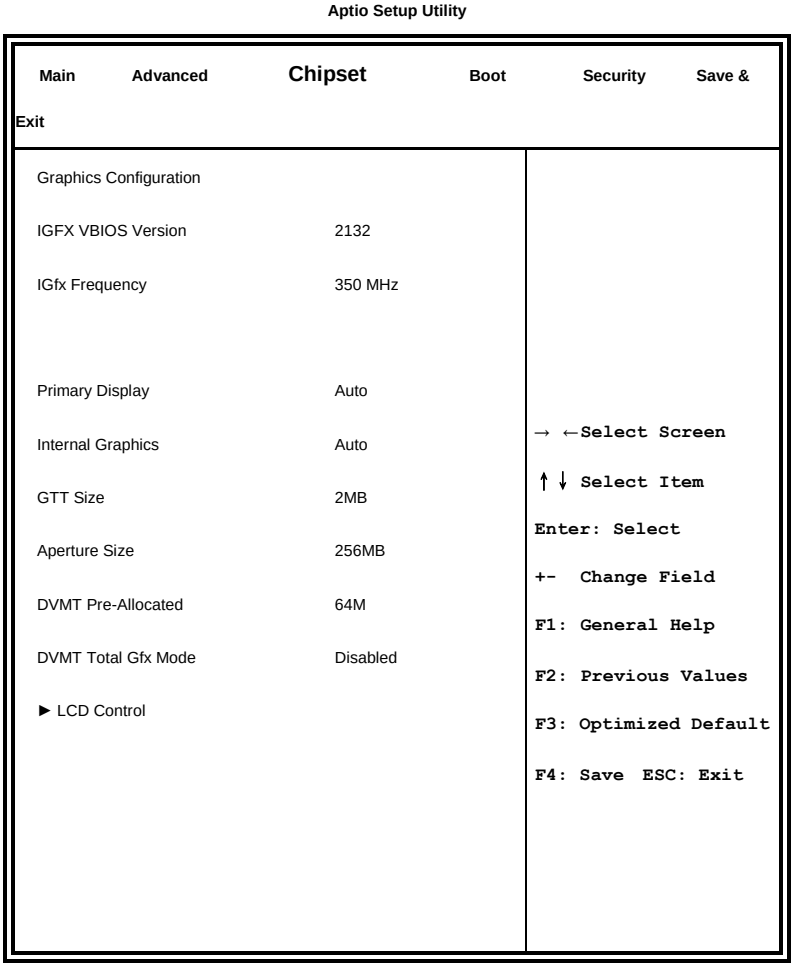
Enable NB CRID

Enable or disable NB CRID WorkAround.

C-State Pre-Wake

Controls C-State Pre-Wake feature for ARAT, in SSKPD[57].

Graphics Configuration



Primary Display

Select which of IGFX/PEG/PCI graphics device should be primary display or select SG for switchable Gfx.

Internal Graphics

Keep IGD enabled based on the setup options.

DVMT Pre-Allocated

Select DVMT 5.0 Pre-Allocated (Fixed) graphics memory size used by the internal graphics device.

DVMT Total Gfx Mem

Select DVMT 5.0 total graphics memory size used by the internal graphics device.

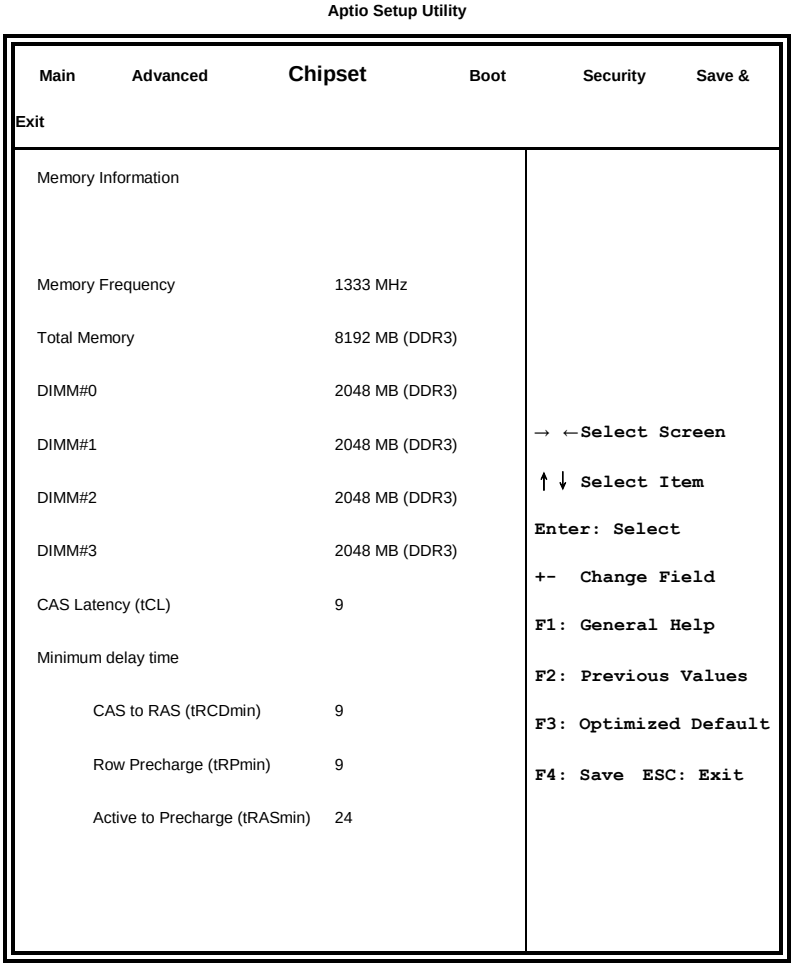
Gfx Low Power Mode

This option is applicable for SFF only.

Primary IGFX Boot Display (LCD Control)

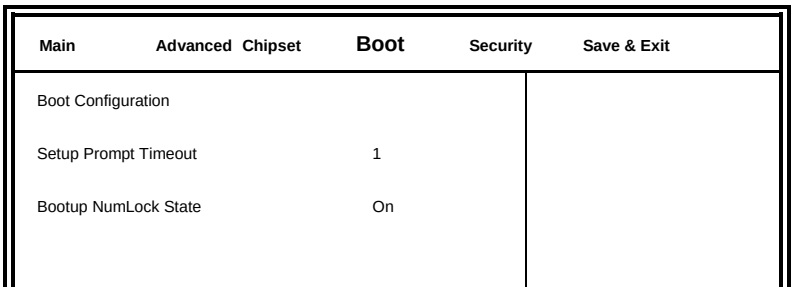
Select the Video Device that will be activated during POST. This has no effect if external graphics present. Secondary booty display selection will appear based on your selection. VGA modes will be supported only on primary display.

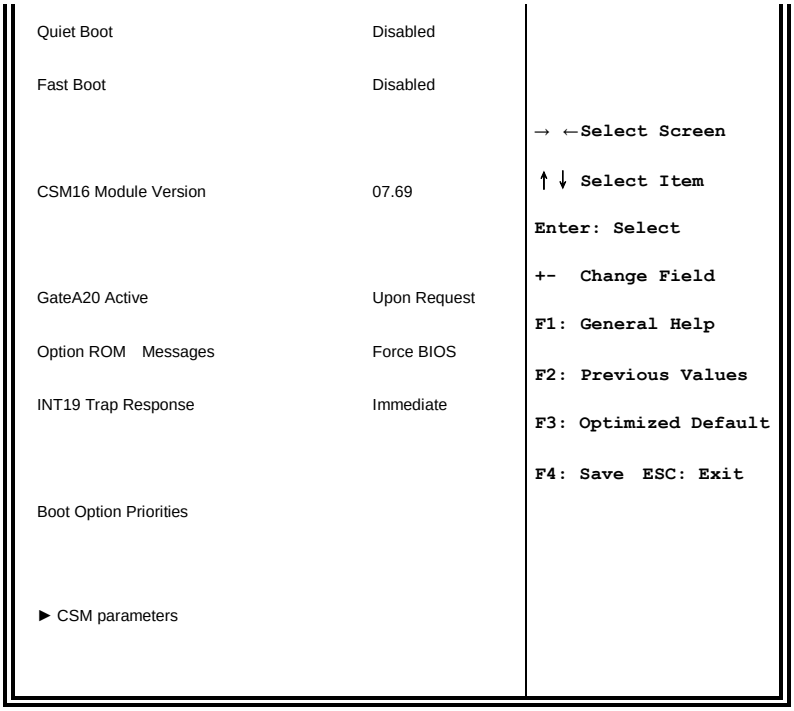
Memory Configuration



Boot Settings

This section allows you to configure the boot settings.





Setup Prompt Timeout

Number of seconds to wait for setup activation key.

65535(0xFFFF) means indefinite waiting.

Bootup NumLock State

Select the keyboard NumLock state.

Quiet Boot

Enables/Disables Quiet Boot option.

Fast Boot

Enables/Disables boot with initialization of a minimal set of devices required to launch active boot option. Has no effect for BBS boot options.

GateA20 Active

UPON REQUEST – GA20 can be disabled using BIOS services.

ALWAYS – do not allow disabling GA20; this option is useful when any RT code is executed above 1MB.

Option ROM Messages

Set display mode for Option ROM. Options are Force BIOS and Keep Current.

INT19 Trap Response

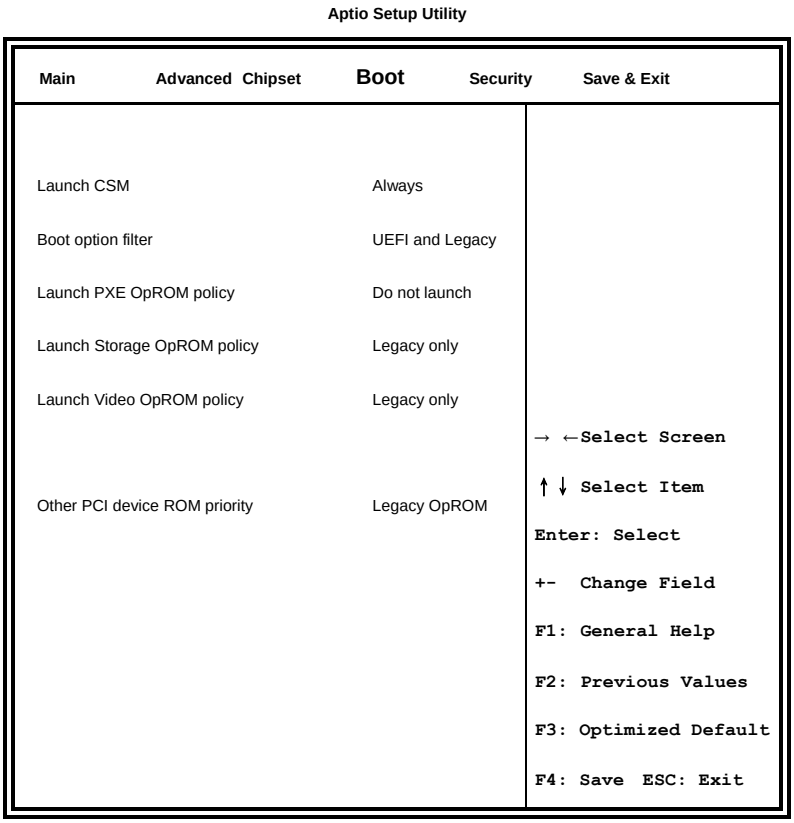
Enable: Allows Option ROMs to trap Int 19.

Boot Option Priorities

Sets the system boot order.

CSM parameters

This section allows you to configure the boot settings.



Boot option filter

This option controls what devices system can boot to.

Launch PXE OpROM policy

Controls the execution of UEFI and Legacy PXE OpROM.

Launch Storatge OpROM policy

Controls the execution of UEFI and Legacy Storage OpROM.

Launch Video OpROM policy

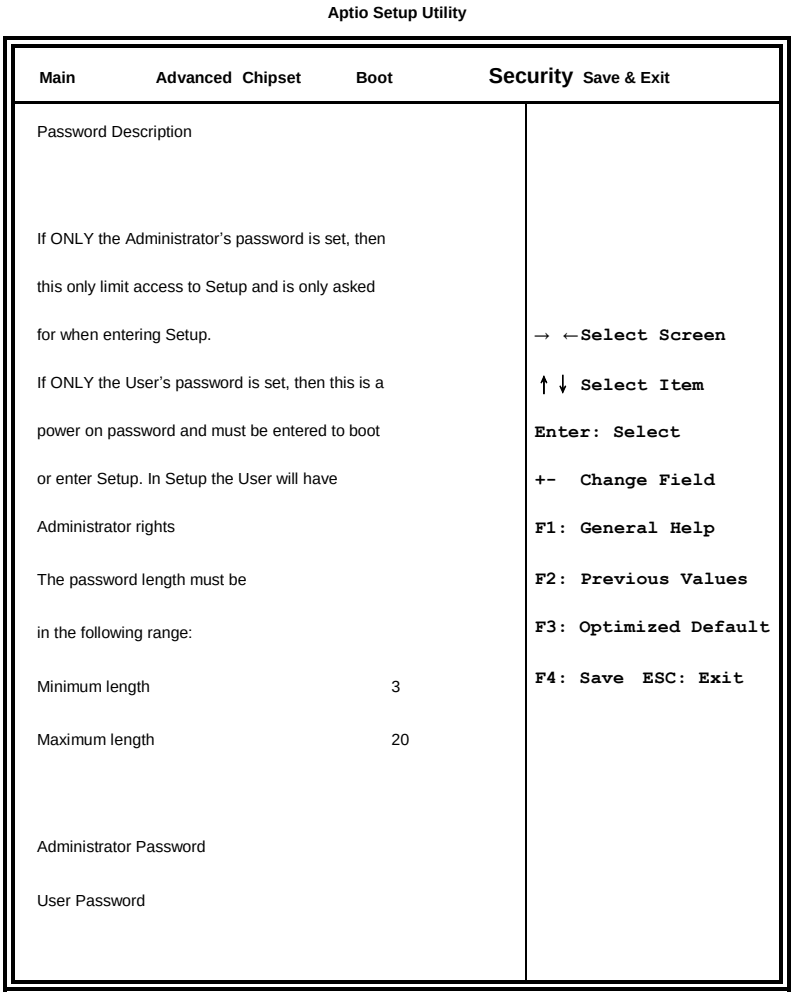
Controls the execution of UEFI and Legacy Video OpROM.

Other PCI device ROM priority

For PCI devices other than Network, Mass storage or Video defines which OpROM to launch.

Security Settings

This section allows you to configure and improve your system and allows you to set up some system features according to your preference.



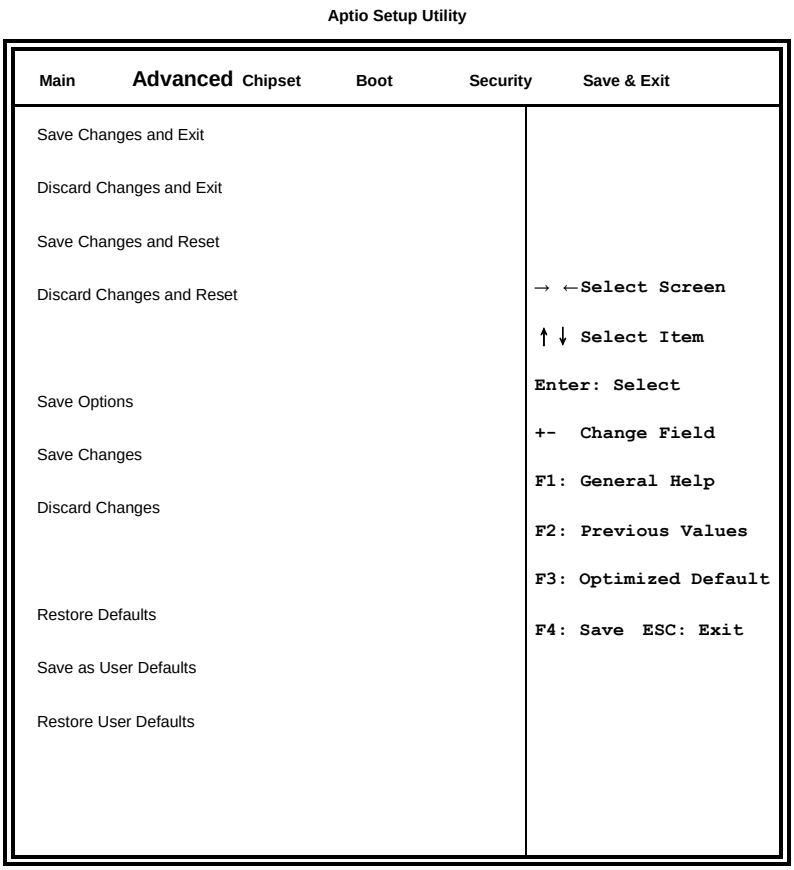
Administrator Password

Set Setup Administrator Password.

User Password

Set User Password.

Save & Exit Settings



Save Changes and Exit

Exit system setup after saving the changes.

Discard Changes and Exit

Exit system setup without saving any changes.

Save Changes and Reset

Reset the system after saving the changes.

Discard Changes and Reset

Reset system setup without saving any changes.

Save Changes

Save Changes done so far to any of the setup options.

Discard Changes

Discard Changes done so far to any of the setup options.

Restore Defaults

Restore/Load Defaults values for all the setup options.

Save as User Defaults

Save the changes done so far as User Defaults.

Restore User Defaults

Restore the User Defaults to all the setup options.

CHAPTER 4 DRIVERS INSTALLATION

This section describes the installation procedures for software and drivers. The software and drivers are included with the motherboard. If you find the items missing, please contact the vendor where you made the purchase.

IMPORTANT NOTE:

After installing your Windows operating system, you must install first the Intel Chipset Software Installation Utility before proceeding with the drivers installation.

4.1 Intel Chipset Software Installation Utility

The Intel Chipset Drivers should be installed first before the software drivers to enable Plug & Play INF support for Intel chipset components. Follow the instructions below to complete the installation.

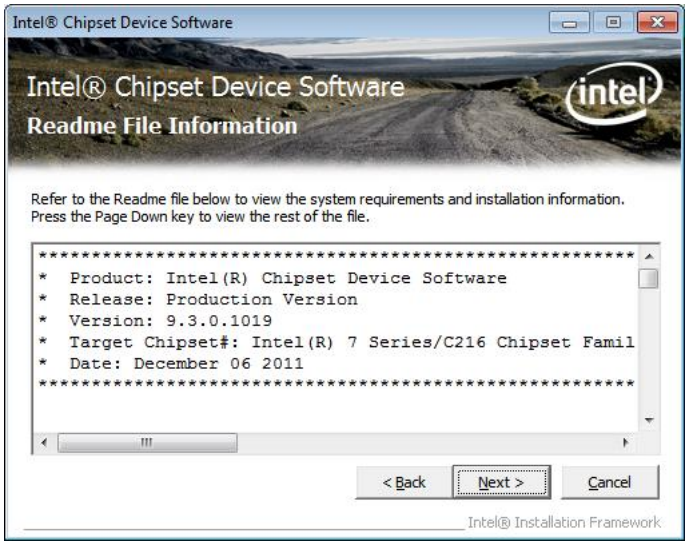
1. Insert the CD that comes with the board. Click ***Intel*** and then ***Intel(R) 7 Series Chipset Drivers***.

2. Click ***Intel(R) Chipset Software Installation Utility.***

3. When the Welcome screen to the Intel® Chipset Device Software appears, click ***Next*** to continue.

4. Click ***Yes*** to accept the software license agreement and proceed with the installation process.

5. On the Readme File Information screen, click ***Next*** to continue the installation.



6. The Setup process is now complete. Click ***Finish*** to restart the computer and for changes to take effect.

4.2 VGA Drivers Installation

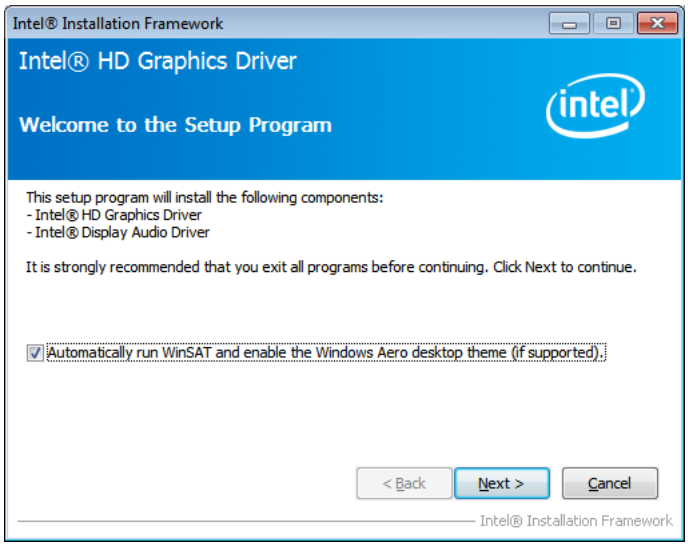
NOTE: Before installing the *Intel(R) Q77 Chipset Family Graphics Driver,* the Microsoft .NET Framework 3.5 SPI should be first installed.

To install the VGA drivers, follow the steps below.

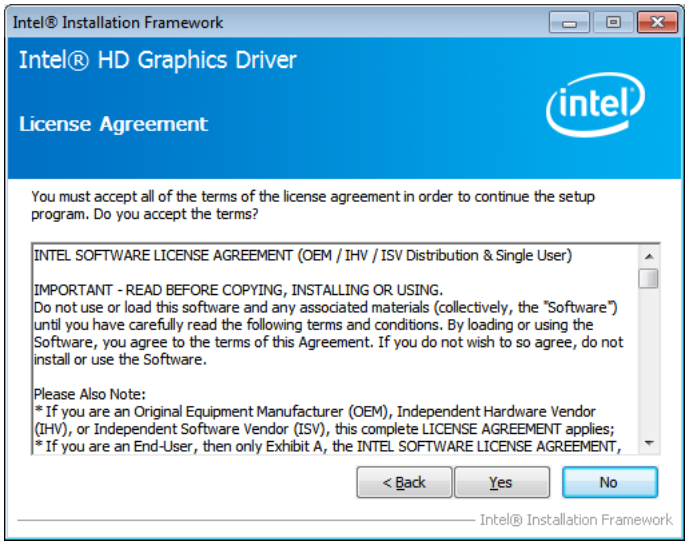
1. Insert the CD that comes with the board. Click ***Intel*** and then ***Intel(R) Q7 Series Chipset Drivers***.

2. Click ***Intel(R) Q77 Chipset Family Graphics Driver.***

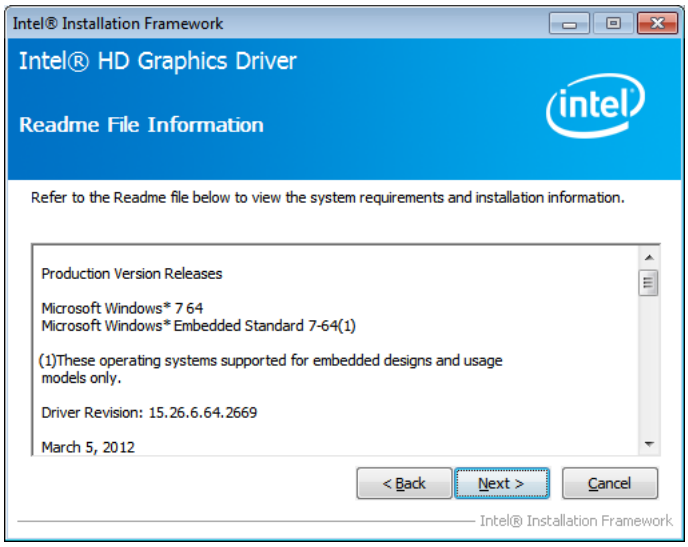
3. When the Welcome screen appears, click ***Next*** to continue.



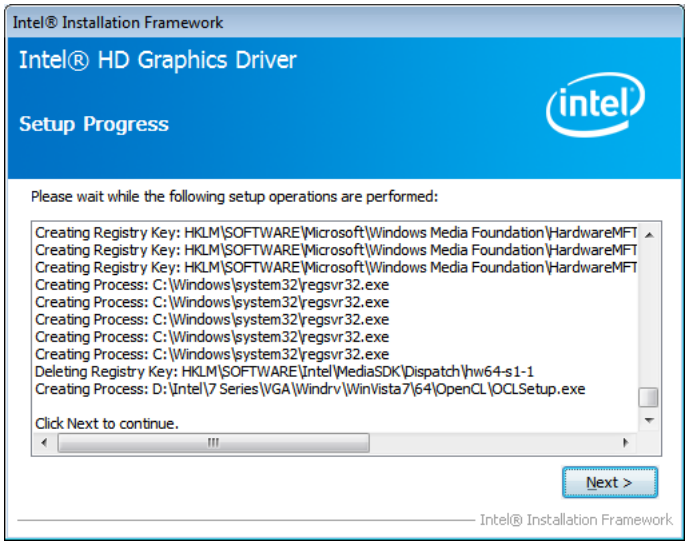
4. Click ***Yes*** to to agree with the license agreement and continue the installation.



5. On the Readme File Information screen, click ***Next*** to continue the installation of the Intel® Graphics Media Accelerator Driver.



6. On Setup Progress screen, click ***Next*** to continue.

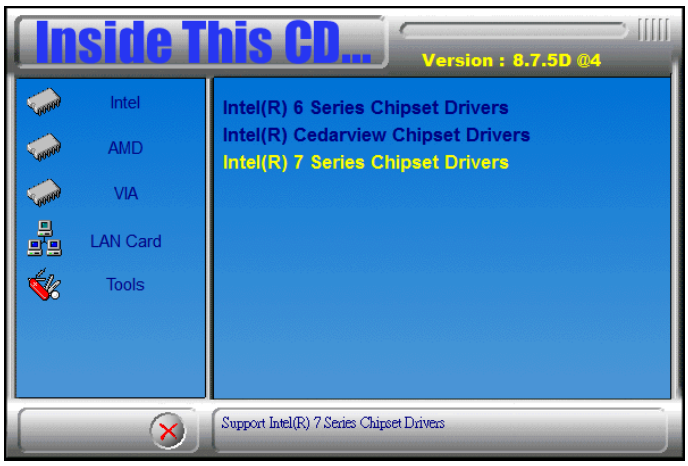


7. Setup complete. Click ***Finish*** to restart the computer and for changes to take effect.

4.3 Realtek HD Audio Driver Installation

Follow the steps below to install the Realtek HD Audio Drivers.

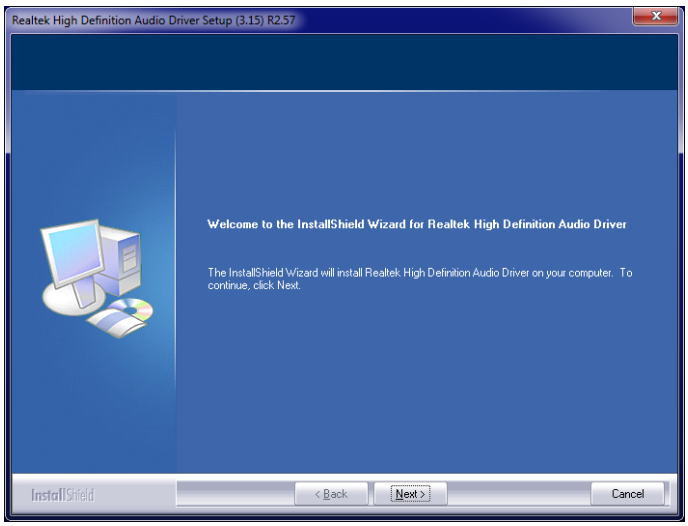
1. Insert the CD that comes with the board. Click ***Intel*** and then ***Intel(R) Q7 Series Chipset Drivers***.



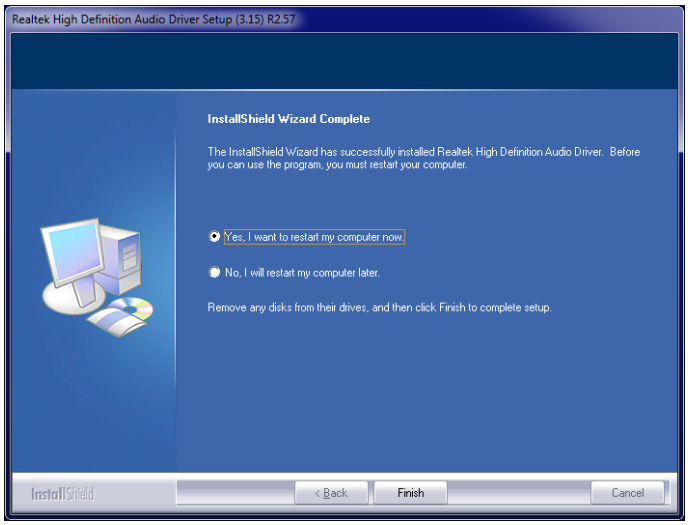
2. Click ***Realtek High Definition Audio Driver.***

3. 

3. On the Welcome to the InstallShield Wizard screen, click ***Next*** to proceed with and complete the installation process.



4. The InstallShield Wizard Complete. Click ***Finish*** to restart the computer and for changes to take effect.

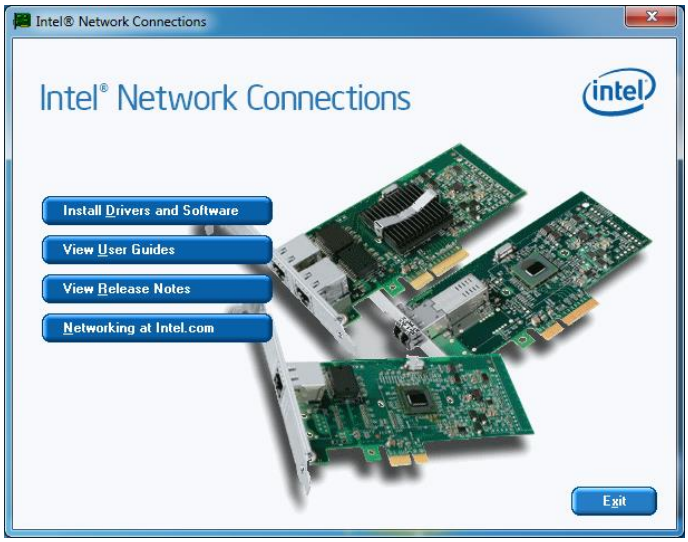


4.4 LAN Driver Installation

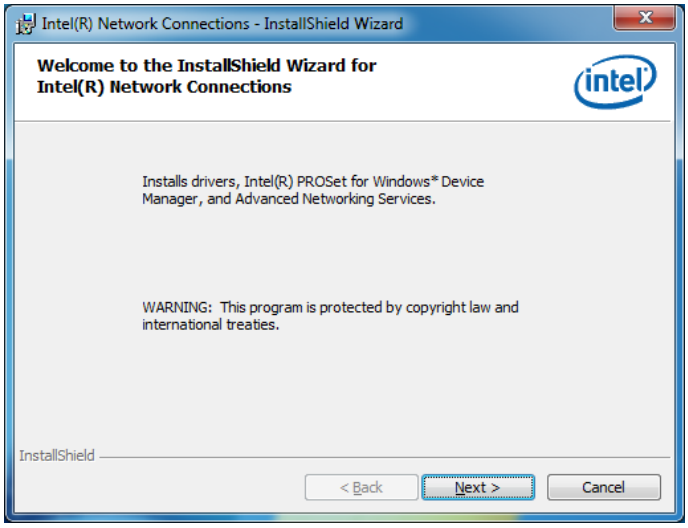
1. Insert the CD that comes with the board. Click ***Intel*** and then ***Intel(R) Q7 Series Chipset Drivers***.

2. Click ***Intel(R) PRO LAN Network Driver.***

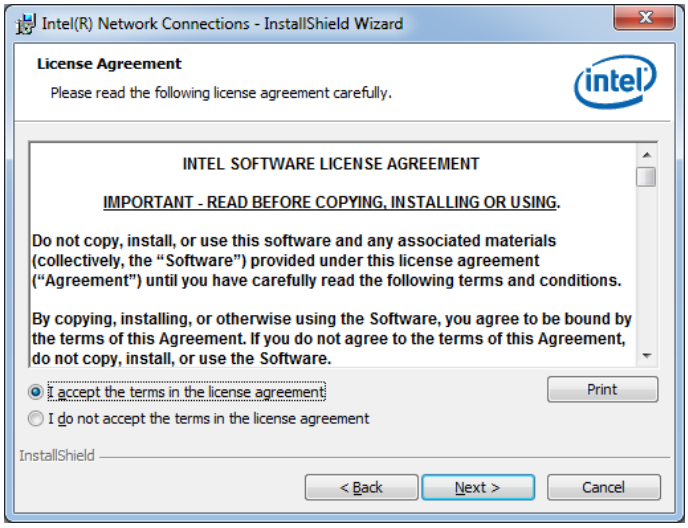
3. Click ***Install Drivers and Software.***



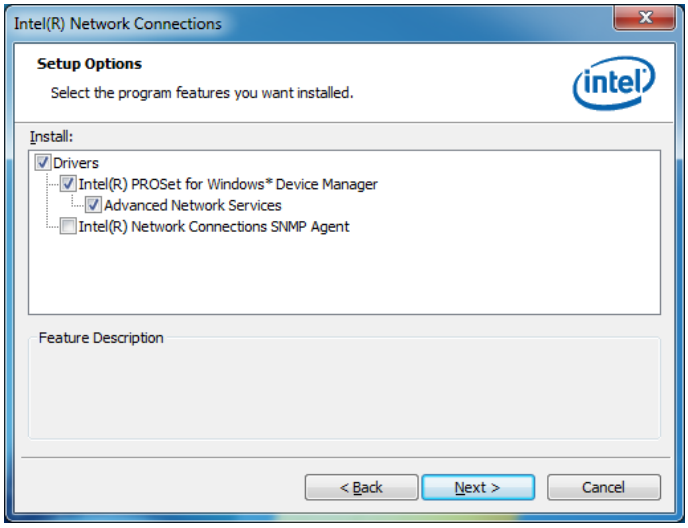
4. When the Welcome screen appears, click ***Next***.



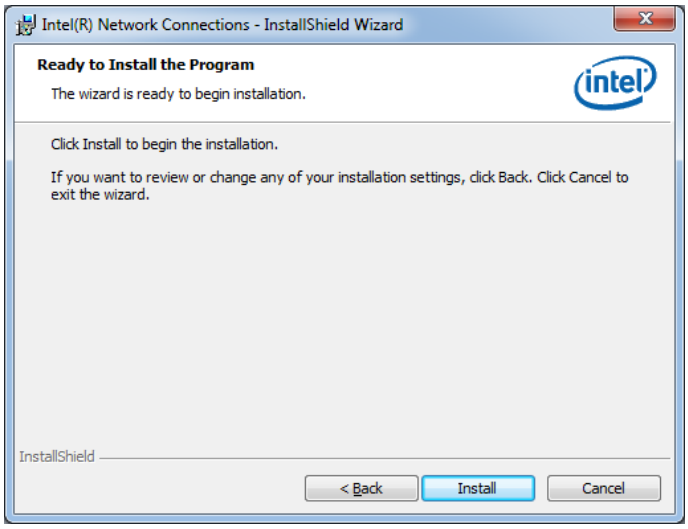
5. Click ***Next*** to to agree with the license agreement.



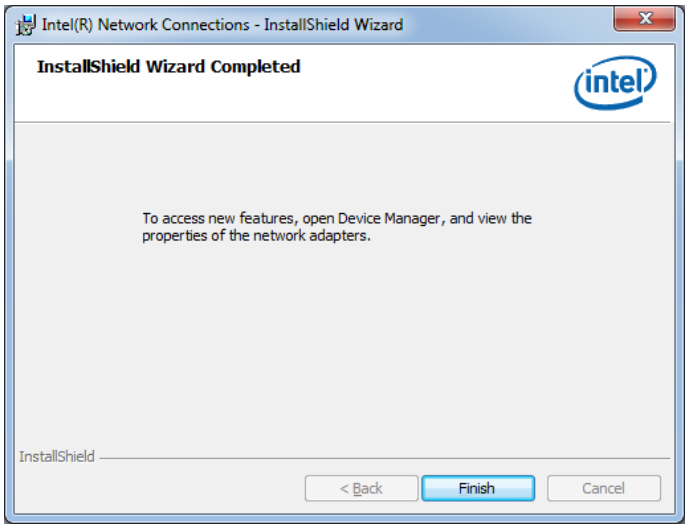
6. Click the checkbox for **Drivers** in the Setup Options screen to select it and click **Next** to continue.



7. The wizard is ready to begin installation. Click ***Install*** to begin the installation.

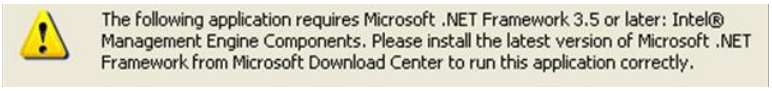


8. When InstallShield Wizard is complete, click ***Finish***.



Intel® Management Engine Interface

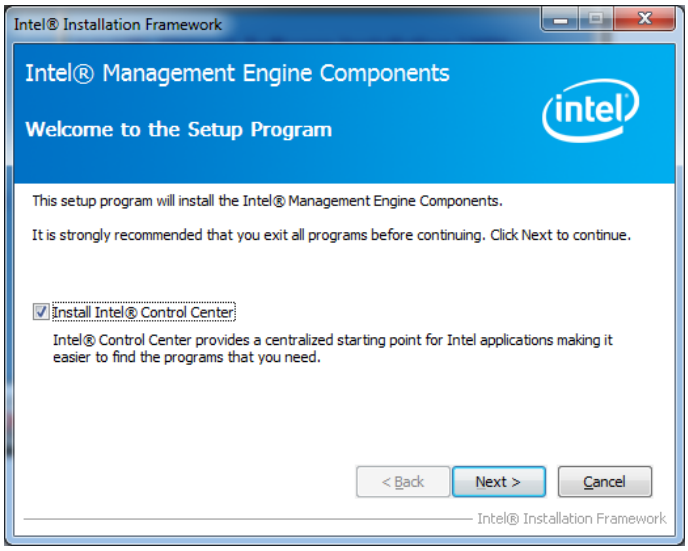
REMARKS: The Intel iAMT 8.0 Drivers can be installed on MI970VF, not MI970F.



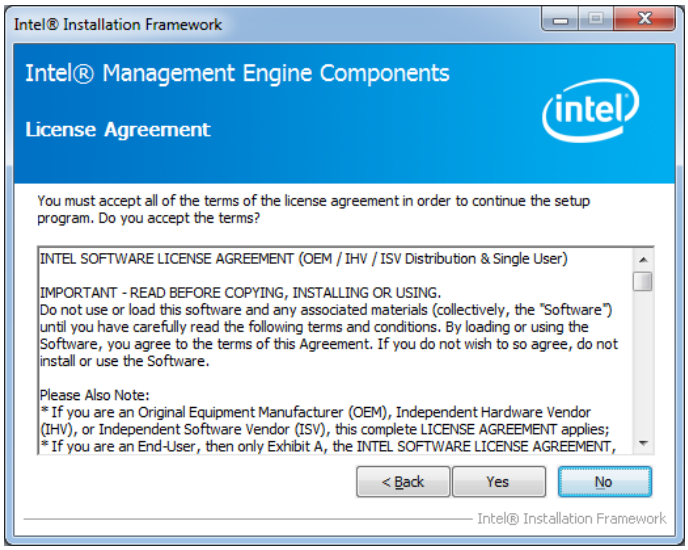
Follow the steps below to install the Intel Management Engine.

1. Insert the CD that comes with the board. Click ***Intel*** and then ***Intel(R) AMT 8.0 Drivers***.

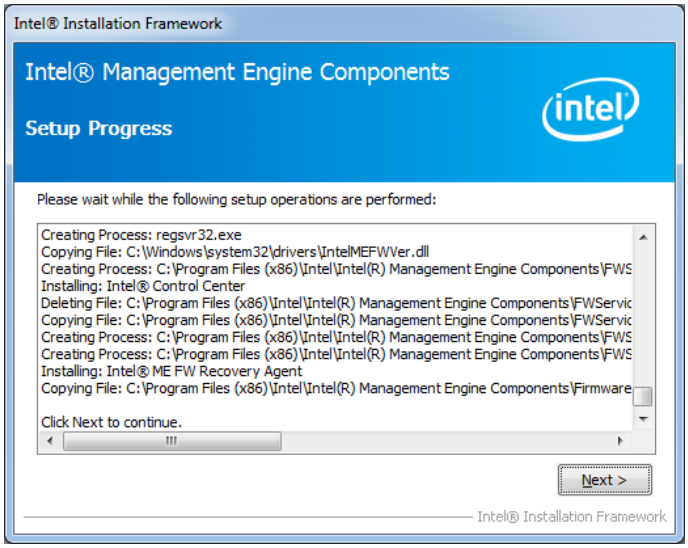
2. When the Welcome screen to the InstallShield Wizard for Intel® Management Engine Components, click the checkbox for **Install Intel® Control Center** & click ***Next***.

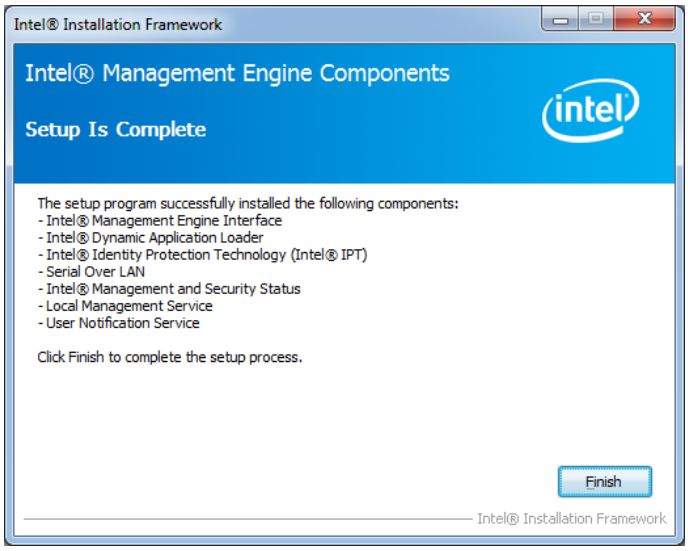


3. Click ***Yes*** to to agree with the license agreement.



4. When the Setup Progress screen appears, click ***Next***. Then, click ***Finish*** when the setup progress has been successfully installed.



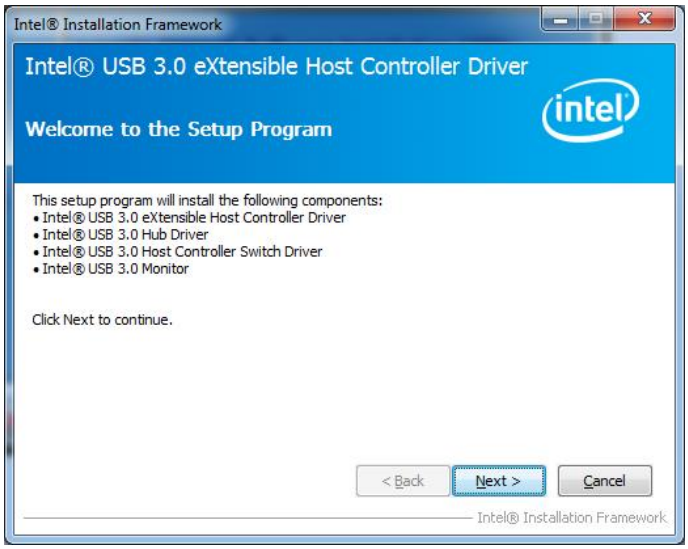


Intel® USB 3.0 Drivers

1. Insert the CD that comes with the board. Click ***Intel*** and then ***Intel(R) Q7 Series Chipset Drivers***.

2. Click ***Intel(R) USB 3.0 Drivers.***

3. When the Welcome screen to the InstallShield Wizard for Intel® USB 3.0 eXtensible Host Controller Driver, click ***Next***.



4. Click ***Yes*** to to agree with the license agreement and continue the installation.

5. On the Readme File Information screen, click ***Next*** to continue the installation of the Intel® USB 3.0 eXtensible Host Controller Driver.

6. Setup complete. Click ***Finish*** to restart the computer and for changes to take effect.

Appendix

Mounting AMI311-970 to the Wall

You can install AMI311-970 on plastic (LCD monitor), wood, drywall surface over studs, or a solid concrete or metal plane directly. Ensure the installer uses at least four M3 length 6mm screws to secure the system on wall. ***Four M3 length 6mm screws [Four M3 length 4.4mm for VESA mounting] are recommended to secure the system on wall.***

Fasteners are not included with the unit, and must be supplied by the installer. The types of fasteners required are dependent on the type of wall construction. Choose fasteners that are rated either ”Medium Duty“ or ”Heavy Duty.“ To assure proper fastener selection and installation, follow the fastener manufacturer’s recommendations.

Wall Mounting Requirements

Note: *Before mounting the system on wall, ensure that you are following all applicable building and electric codes.*

When mounting, ensure that you have enough room for power and signal cable routing. And have good ventilation for power adapter. The method of mounting must be able to support weight of the CSB110-902 plus the suspend weight of all the cables to be attached to the system. Use the following methods for mounting your system:

Mounting to hollow walls

- **Method 1: Wood surface** – A minimum wood thickness – 38mm (1.5in.) by 25.4 cm (10in.) – of high, construction – grade wood is recommended.
  Note: This method provides the most reliable attachment of the unit with little risk that the unit will come loose or require ongoing maintenance.
- **Method 2: Drywall walls** - Drywall over wood studs is acceptable.

Mounting to a solid concrete or brick wall - Mounts on a flat smooth surface.

Selecting the Location

Plan the mounting location thoroughly. Locations such as walkway areas, hallways, and crowded areas are not recommended. Mount the unit to a flat, sturdy, structurally sound column or wall surface.

The best mounting surface is a standard countertop, cabinet, table, or other structure that is minimally the width and length of the unit. This recommendation reduces the risk that someone may accidentally walk into and damage the device. Local laws governing the safety of individuals might require this type of consideration.