USER'S MANUAL

ST-1942

Sharkbay L-type BPC With Intel® 4th Gen. Core i3 / i5 / i7 processors

ST-1942 M4

ST-1942
Sharkbay L-type BPC With Intel®
4th Gen. Core i3 / i5 / i7 processors

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DISCLAIMER

This user's manual is meant to assist you in installing and setting up the system. The information contained in this document is subject to change without any notice.

CE NOTICE

This is a class A product. In a domestic environment this product may cause radio interference in which case the user may be required to take adequate measures.

FCC NOTICE

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

You are cautioned that any change or modifications to the equipment not expressly approve by the party responsible for compliance could void your authority to operate such equipment.

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.
WARNING! The equipment is not intended to be installed and used in a home, school or public area accessible to the general population. And the thumbscrews should be tightened with a tool after both initial installation and subsequent access to the enclosure.
Before removing cover/chassis for service, remember to disconnect the power cord.
Some internal parts of the system may have high electrical voltage. And therefore we strongly recommend that qualified engineers can open and disassemble the system.
Access can only be gained by SERVICE PERSONS or by USERS who have been instructed about the reasons for the restrictions applied to the location and about any precautions that shall be taken.

TABLE OF CONTENTS

APPENDIX A SYSTEM DIAGRAMS

APPENDIX B TECHNICAL SUMMARY

INTRODUCTION

CHAPTER

1

This chapter gives you the information for ST-1942. It also outlines the System specification.

Section includes:

- About This Manual
- System Specifications
- Safety Precautions

Experienced users can skip to chapter 2 on page 2-1 for Quick Start.

1-1. ABOUT THIS MANUAL

Thank you for purchasing our ST-1942 Sharkbay L-type BPC with Intel® 4th Gen. Core i3 / i5 / i7, Pentium® and Celeron® processors and with 2DVI, 1DP, 4COM and 2LAN. ST-1942 provides faster processing speed, greater expandability and can handle more task than before. This manual is designed to assist you how to install and set up the system. It contains four chapters. The user can apply this manual for configuration according to the following chapters:

Chapter 1 Introduction

This chapter introduces you to the background of this manual, and the specifications for this system. The final page of this chapter will indicate how to avoid damaging this board.

Chapter 2 Hardware Configuration

This chapter outlines the component locations and their functions. In the end of this chapter, you will learn how to set jumper and how to configure this card to meet your own needs.

Chapter 3 Software Utilities

This chapter contains helpful information for proper installations of the VGA utility, LAN utility, and Sound utility.

Chapter 4 BIOS Setup

This chapter indicates you how to set up the BIOS configurations.

Appendix A System Diagrams

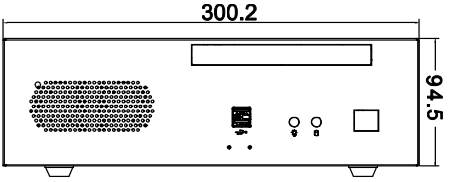
This appendix gives you the exploded diagrams and part numbers of the ST-1942

Appendix B Technical Summary

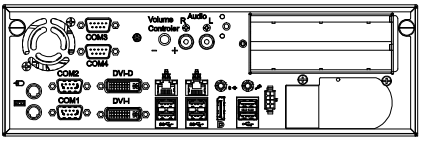
This appendix gives you the information about the Technical maps, Watchdog-timer configuration, and Flash BIOS Update.

1-2. SYSTEM ILLUSTRATION

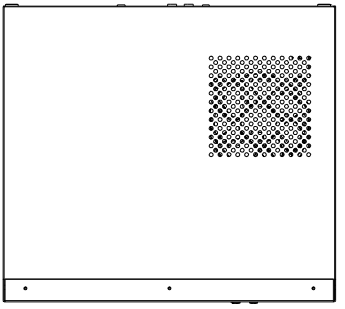
Front View



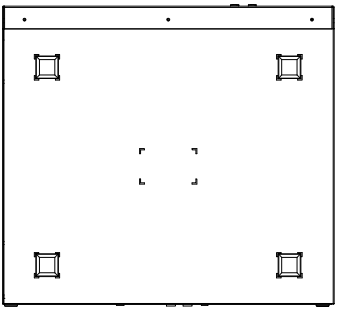
Rear View



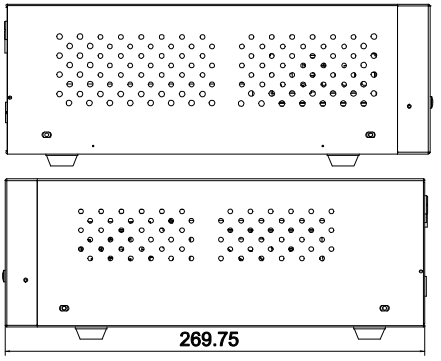
Top View



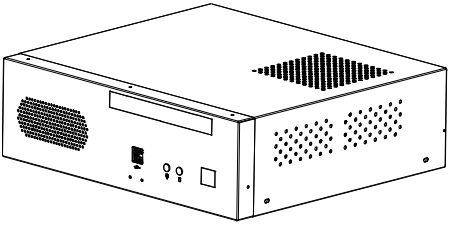
Bottom View



Side View



Quarter View



Unit: mm

1-3. SYSTEM SPECIFICATION

System

CPU	Intel® 4th Gen. Core™ i7/i5/i3, Pentium®, Celeron® (LGA1150) i7-4770S, i3-4340TE, i3-4330TE, Celeron G1820TE
Chipset	Intel® Q87
OS Support	Microsoft Windows 8/7
Memory	2 x SO-DIMM (204 pins), up to 16GB
BIOS	AMI
Watchdog	1~255 seconds
Power Supply	FSP Flex ATX 220W
Dimension	300 x 94 x 270 mm (11.8" x 3.7" x 10.6")
Certificate	CE/FCC
RAID function	RAID 0/1/5/10
Speaker	Internal buzzer
Fan	1 CPU Fan + 1 system Fan + twin Front System Fans
Noise	N/A
PXE	Available (disable in BIOS as default)
Drive Bays	2 x 2.5" SATA HDD & 1 x slim DVD-ROM

I/O Ports

Serial Port	4 COM ports: ▪ COM2 for RS-232/422/485 ▪ COM1/2 are RI/+5V/+12V selectable.
USB Port	▪ 2 x USB 2.0 cable by pin header ▪ 4 x USB 3.0+ 2 x USB 2.0
SATA Interface	▪ 4 x SATA III
LAN	2 x Giga LAN (RJ45), support Wake-on-LAN ▪ LAN1: Intel® I217-LM/V (Clarksville) ▪ LAN2: Intel® I210-AT(Springville)
Audio	Realtek ALC888S-VD2-GR High Definition audio codec, Mic x 1, line out x 1, R channel x 1 + L channel x 1, Volume controller x 1 (Amplifier bypass by jumper setting)
Keyboard/Mouse	2 x PS/2 port (wake up system from S1 to S4)
Expansion Bus	1 x PCIe 16x + 1 x PCI (SR-5076RA-R2N) or 2 x PCI slot

	(SR-5076RA-R3N)
DC out	1x 8p(Molex micro-Fit 3.0) housing DC 5V&12V
Keyboard / Mouse	2 x PS/2 port (wake up system from S1 to S4)
POWER BUTTON	1 x (option)
LED Indicator	2x (Power LED + HDD LED)

Display

Graphics	▪ 1 x DVI-I ▪ 1 x DVI-D ▪ 1 x Display Port Support 3 independent display

Environment

Operating Temp.	0 ~ 40°C (32 ~ 104°F)
Storage Temp.	-20 ~ 60°C (-4 ~ 140°F)
Humidity	20~90%
RoHS	RoHS Version

Accessories

DVI to VGA adapter	DVI to VGA adapter P/N: 10-625-04410123

1-4. SAFETY PRECAUTIONS

Follow the messages below to avoid your systems from damage:

1. Keep your system away from static electricity on all occasions.

2. Prevent electric shock. Don't touch any components of this card when the card is power-on. Always disconnect power when the system is not in use.

3. Disconnect power when you change any hardware devices.
   For instance, when you connect a jumper or install any cards, a surge of power may damage the electronic components or the whole system.

CHAPTER

2

HARDWARE CONFIGURATION

*** QUICK START ***

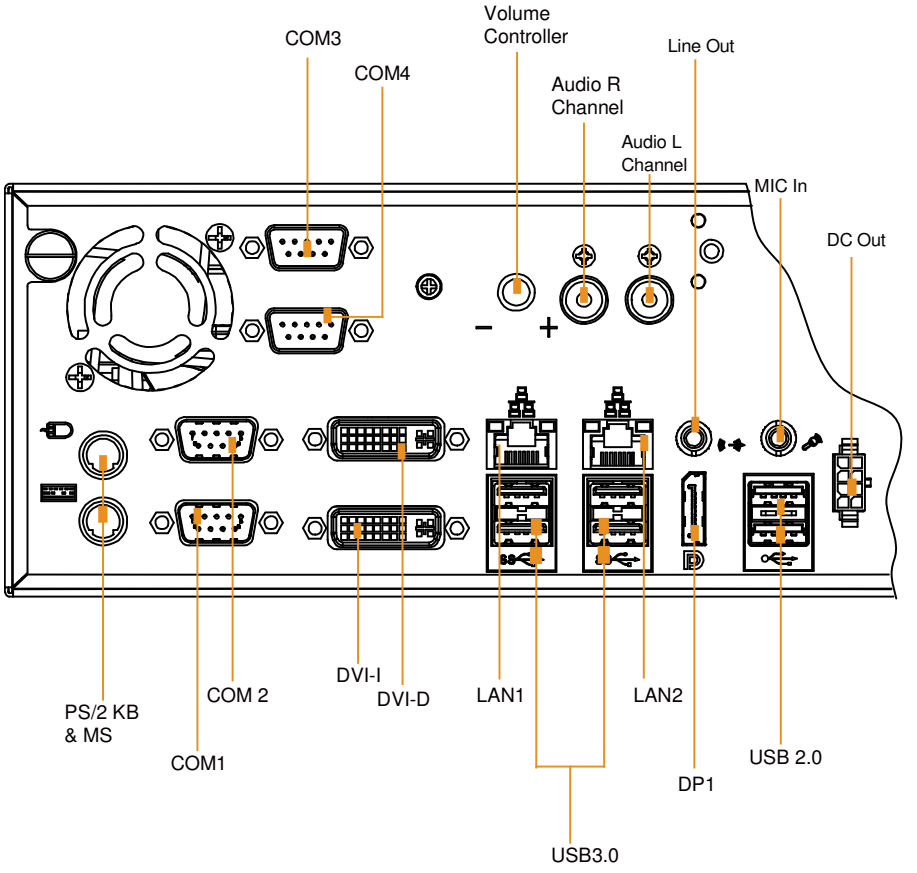
Helpful information describes the jumper & connector settings, and component locations.

Section includes:

- System External I/O Ports & Pin Assignment
- Main board Component Locations & Jumper Settings
- Audio board Component Locations & Jumper Settings

2-1. System External I/O Ports & PIN Assignments

I/O View

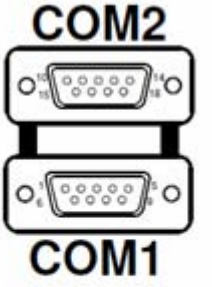


2-1-1. COM Port

COM1: COM1 Connectors

COM1: fixed as RS-232
The pin assignments are as follows:

PIN	ASSIGNMENT
1	COM1_DCD#
2	COM1_RX
3	COM1_TX
4	COM1_DTR#
5	GND
6	COM1_DSR#
7	COM1_RTS#
8	COM1_CTS#
9	COM1_RI#

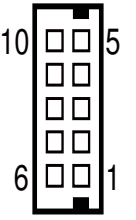


COM2: COM2 Connector
COM2 is fixed as RS-232/422/485..
The pin assignments are as follows:

PIN	ASSIGNMENT		
	RS-232	**RS-422**	**RS-485**
1	DCD#	TX-	RS-485-
2	RX	TX+	RS-485+
3	TX	RX+	X
4	DTR#	RX-	X
5	GND	GND	GND
6	DSR#	X	X
7	RTS#	X	X
8	CTS#	X	X
9	RI#	X	X
10	NC	NC	NC

COM3: COM3 Connector
COM3 is fixed as RS-232.
The pin assignments are as follows:

PIN	ASSIGNMENT
1	COM3_DCD#
2	COM3_RX
3	COM3_TX
4	COM3_DTR#
5	GND
6	COM3_DSR#
7	COM3_RTS#
8	COM3_CTS#
9	COM3_RI#



COM3/ COM4

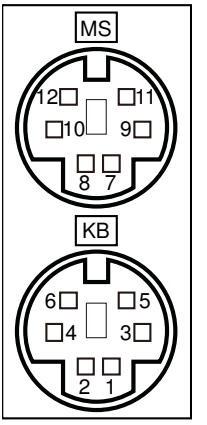
COM4: COM4 Connector
COM4 is fixed as RS-232.
The pin assignments are as follows:

PIN	ASSIGNMENT
10	COM4_DCD#
11	COM4_RX
12	COM4_TX
13	COM4_DTR#
14	GND
15	COM4_DSR#
16	COM4_RTS#
17	COM4_CTS#
18	COM4_RI#

2-1-2. PS/2 Keyboard & Mouse Port

KB_MS1: Keyboard and PS/2 Mouse Connector
The pin assignments are as follows:

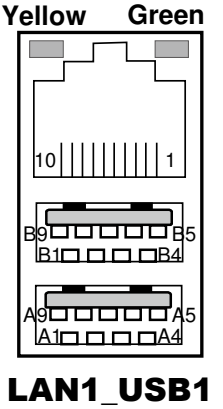
PIN	ASSIGNMENT
1	KBDATA
2	NC
3	GND
4	VCC5
5	KBCLK
6	NC
7	MSDATA
8	NC
9	GND
10	VCC5
11	MSCLK
12	NC



KB_MS1

2-1-3. USB & LAN Connector

LAN1_USB1: USB & LAN Connector
The pin assignments are as follows:



LAN1_USB1

PIN	ASSIGNMENT
1	VCC_LAN1
2	LAN1_MDI_0P
3	LAN1_MDI_0N
4	LAN1_MDI_1P
5	LAN1_MDI_1N
6	LAN1_MDI_2P
7	LAN1_MDI_2N
8	LAN1_MDI_3P
9	LAN1_MDI_3N
10	GND

LAN LED Indicator:
Left Side LED

Red Color On	Giga LAN Speed Indicator
Off	No LAN switch/hub connected.

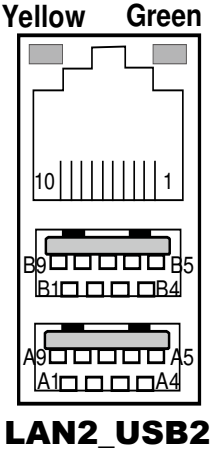
Right Side LED

Orange Color Blinking	LAN Message Active
Off	No LAN Message Active

USB Signal:

PIN	ASSIGNMENT	PIN	ASSIGNMENT
A1	USB_01_VCC5	B1	USB_01_VCC5
A2	USBP0N	B2	USBP1N
A3	USBP0P	B3	USBP1P
A4	GND	B4	GND
A5	USB3_RX1_DN	B5	USB3_RX2_DN
A6	USB3_RX1_DP	B6	USB3_RX2_DP
A7	GND	B7	GND
A8	USB3_TX1_DN	B8	USB3_TX2_DN
A9	USB3_TX1_DP	B9	USB3_TX2_DP

LAN2_USB2: USB & LAN Connector
The pin assignments are as follows：
LAN Signal:



LAN2_USB2

PIN	ASSIGNMENT
1	VCC_LAN2
2	LAN2_MDI_0P
3	LAN2_MDI_0N
4	LAN2_MDI_1P
5	LAN2_MDI_1N
6	LAN2_MDI_2P
7	LAN2_MDI_2N
8	LAN2_MDI_3P
9	LAN2_MDI_3N
10	GND

LAN LED Indicator:
Left Side LED

RED Color On	Giga LAN Speed Indicator
Off	No LAN switch/ hub connected.

Right Side LED

Orange Color Blinking	LAN Message Active
Off	No LAN Message Active

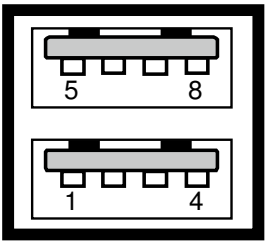
USB Signal:

PIN	ASSIGNMENT	PIN	ASSIGNMENT
A1	USB_45_VCC5	B1	USB_45_VCC5
A2	USBP4N	B2	USBP5N
A3	USBP4P	B3	USBP5P
A4	GND	B4	GND
A5	USB3_RX5_DN	B5	USB3_RX6_DN
A6	USB3_RX5_DP	B6	USB3_RX6_DP
A7	GND	B7	GND
A8	USB3_TX5_DN	B8	USB3_TX6_DN
A9	USB3_TX5_DP	B9	USB3_TX6_DP

2-1-4. USB Ports

USB3: Universal Serial Bus Connector
The pin assignments are as follows:

PIN	ASSIGNMENT
1	USB_89_VCC5
2	USB_89_VCC5
3	USBN8
4	USBN9
5	USBP8
6	USBP9
7	GND
8	GND
9	NC
10	GND

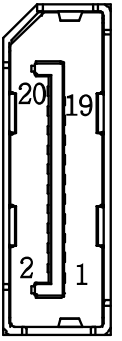


USB3

2-1-5. Display Port

DP1 : Display Port Connector.
The pin assignments are as follows:

PIN	ASSIGNMENT	PIN	ASSIGNMENT
1	DP_C_DATA0+	2	GND
3	DP_C_DATA0-	4	DP_C_DATA1+
5	GND	6	DP_C_DATA1-
7	DP_C_DATA2+	8	GND
9	DP_C_DATA2-	10	DP_C_DATA3+
11	GND	12	DP_C_DATA3-
13	DP_C_AUX_ENJ	14	GND
15	DP_C_AUX+	16	DP_C_HPD
17	DP_C_AUX-	18	DP_VCC3_3
19	DP_VCC5	20	DP_VCC3_3

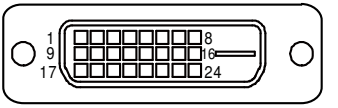


DP1

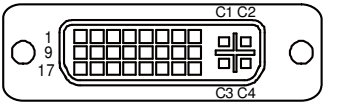
2-1-6. DVI-I & DVI-D CONNECTOR

DVI1 : DVI-I & DVI-D Connector.
The pin assignments are as follows:

PIN	ASSIGNMENT
A1/B1	DP_Data2-
A2/B2	DP_Data2+
A3/B3	Ground
A4/B4	NC
A5/B5	NC
A6/B6	DP_Ctrl_Clock
A7/B7	DP_Ctrl_ Data
A8	CRT_VSYNC
A9/B9	DP_Data1-
A10/B10	DP_Data1+
A11/B11	Ground
A12/B12	NC
A13/B13	NC
A14/B14	+5V Power
A15/B15	Ground
A16/B16	HOT Plug Detect
A17/B17	DP_Data0-
A18/B18	DP_Data0+
A19/B19	Ground
A20/B20	NC
A21/B21	NC
A22/B22	Ground
A23/B23	DP_Clock+
A24/B24	DP_Clock-
AC1	CRT_RED
AC2	CRT_GREE
AC3	CRT_BLUE
AC4	CRT_HSYNC



DVI-D

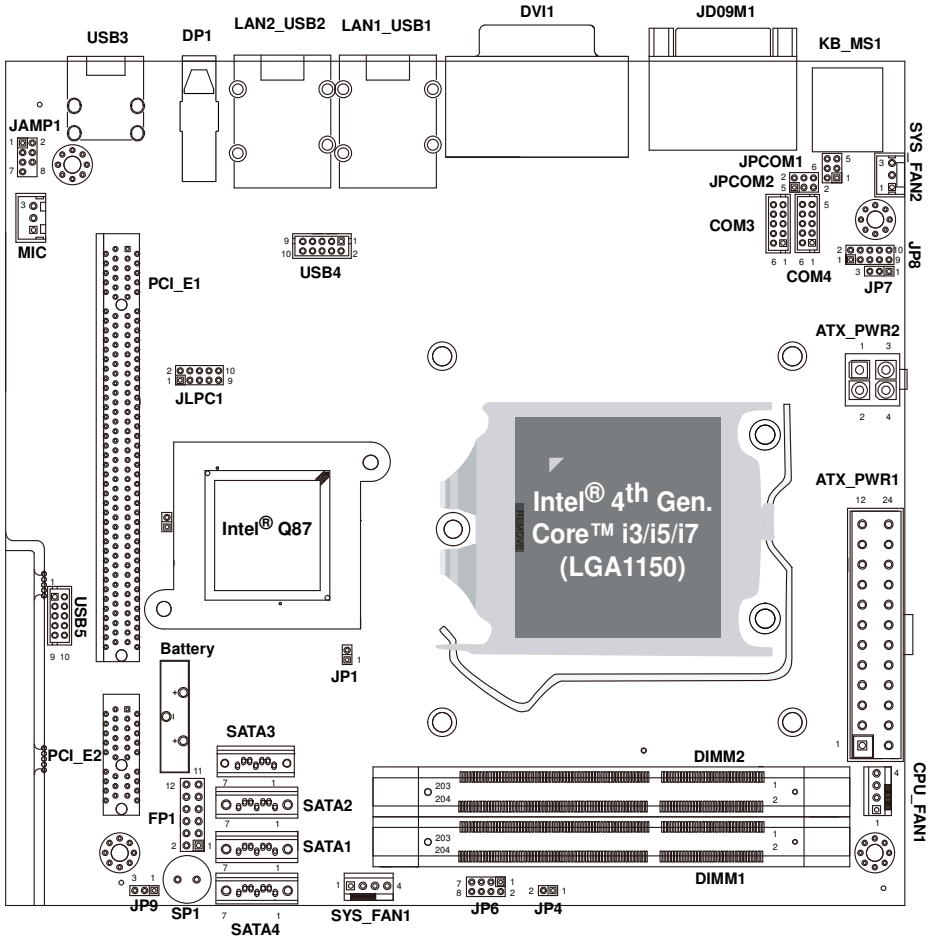


DVI-I

Note: DVI-I can support DVI or VGA Signal.
DVI-D only can support DVI Signal.

2-2. MAIN BOARD COMPONENT LOCATIONS & JUMPER SETTINGS

M/B: SD-1942



Main board Connectors, Jumpers and Component Locations - front

2-2-1. Jumpers & Connectors Quick Reference Table

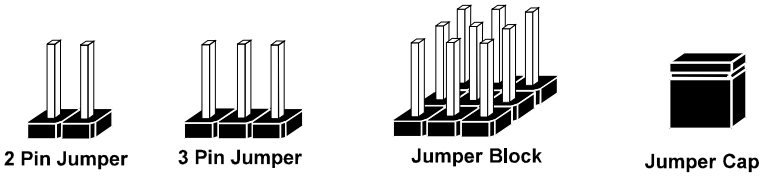
CONNECTOR/JUMPER	NAME
COM Port Connector	COM1, COM2, COM3, COM4
Keyboard & Mouse Connector	KB_MS1
Reset Connector	FP1 (5, 7)
Hard Disk Drive LED Connector	FP1 (1, 3)
ATX Power Button	FP1 (9, 11)
External Speaker Connector	FP1 (6, 8, 10, 12)
PLED Connector	FP1 (2, 4)
Clear CMOS Data Selection	JP4
CPU Fan Connector	CPU_FAN1
System Fan Connector	SYS_FAN1 , SYS_FAN2
Serial ATA Connector	SATA1, SATA2, SATA3, SATA4
Universal Serial Bus Connector	USB3, USB4
USB & LAN Connector	LAN1_USB1, LAN2_USB2
Display Port Connector	DP1
ATX Power Connector	ATX_PWR1, ATX_PWR2
Sound Connector	JAMP1, MIC
DVI-I & DVI-D Connector	DVI1
BIOS Recovery Mode Selection	JP1
Power-loss Selection	JP9

2-2-2. How to Set Jumpers

You can configure your board by setting jumpers. Jumper is consists of two or three metal pins with a plastic base mounted on the card, and by using a small plastic "cap", Also known as the jumper cap (with a metal contact inside), you are able to connect the pins. So you can set-up your hardware configuration by "open" or "close" pins.

The jumper can be combined into sets that called jumper blocks. When the jumpers are all in the block, you have to put them together to set up the hardware configuration. The figure below shows how this looks like.

Jumpers & Caps

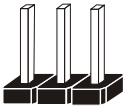


If a jumper has three pins (for examples, labelled PIN1, PIN2, and PIN3), You can connect PIN1 & PIN2 to create one setting by shorting. You can either connect PIN2 & PIN3 to create another setting. The same jumper diagrams are applied all through this manual. The figure below shows what the manual diagrams look and what they represent.

Jumper Diagrams

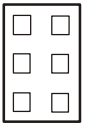
Jumper Cap looks like this

2 pin Jumper looks like this



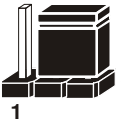
3 pin Jumper looks like this

Jumper Block looks like this

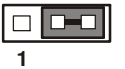


Jumper Settings

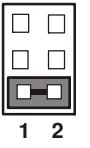
2 pin Jumper close(enabled) Looks like this



3 pin Jumper 2-3 pin close(enabled) Looks like this



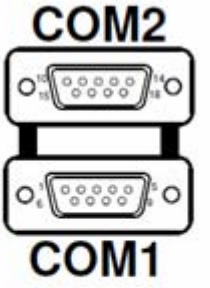
Jumper Block 1-2 pin close(enabled) Looks like this



2-2-3. COM Port

COM1: COM1 Connector
COM1 is fixed as RS-232.
The pin assignments are as follows:

PIN	ASSIGNMENT
1	COM1_DCD#
2	COM1_RX
3	COM1_TX
4	COM1_DTR#
5	GND
6	COM1_DSR#
7	COM1_RTS#
8	COM1_CTS#
9	COM1_RI#



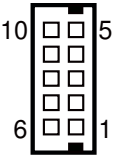
COM2: COM2 Connector
COM2 is fixed as RS-232/422/485.
The pin assignments are as follows:

PIN	ASSIGNMENT		
	RS-232	RS-422	RS-485
1	DCD#	TX-	RS-485-
2	RX	TX+	RS-485+
3	TX	RX+	X
4	DTR#	RX-	X
5	GND	GND	GND
6	DSR#	X	X
7	RTS#	X	X
8	CTS#	X	X
9	RI#	X	X
10	NC	NC	NC

2-2-4. COM Connector

COM3, COM4: COM3 & COM4Connectors, fixed as RS-232

PIN	ASSIGNMENT
1	COM3_DCD#
2	COM3_RX
3	COM3_TX
4	COM3_DTR#
5	GND
6	COM3_DSR#
7	COM3_RTS#
8	COM3_CTS#
9	COM3_RI#

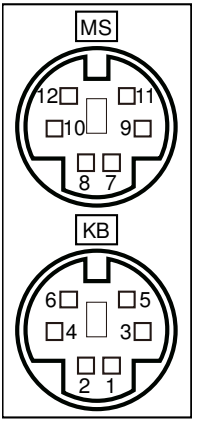


COM3/ COM4

2-2-5. Keyboard & Mouse Connector

KB_MS1: Keyboard and PS/2 Mouse Connector

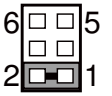
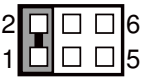
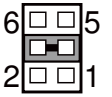
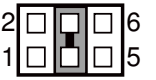
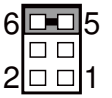
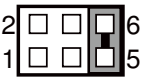
PIN	ASSIGNMENT
1	KBDATA
2	NC
3	GND
4	VCC5
5	KBCLK
6	NC
7	MSDATA
8	NC
9	GND
10	VCC5
11	MSCLK
12	NC



KB_MS1

2-2-6. COM Port RI & Voltage Selection

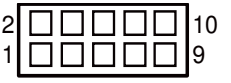
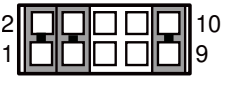
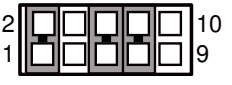
JP_COM1 & JP_COM2: COM1 & COM2 Ports RI & Voltage Selection

SELECTION	JUMPTER SETTING	JUMPER ILLUSTRATION	
RI	1-2	 **JP_COM1**	 **JP_COM2**
12V	3-4	 **JP_COM1**	 **JP_COM2**
5V	5-6	 **JP_COM1**	 **JP_COM2**

Note: Manufacturing default is RI.

2-2-7. COM2 RS-232/422/485 Selection

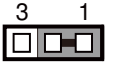
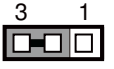
JP8: RS-232/422/485 (COM2) Selection Connector, used to set COM2 function.

SELECTION	JUMPER SETTINGS	JUMPER ILLUSTRATION
RS-232	All Open	 **JP8**
RS-422	1-2, 3-4, 9-10	 **JP8**
RS-485	1-2, 5-6, 7-8	 **JP8**

Note: Manufacturing default is RS-232.

2-2-8. COM2 Auto-Detect Selection

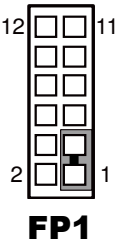
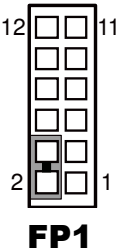
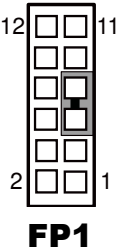
JP7: COM2 Auto-detect Selection

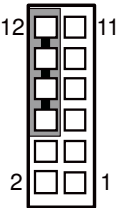
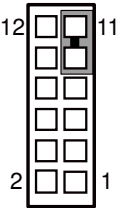
SELECTION	JUMPER SETTINGS	JUMPER ILLUSTRATION
Normal	1-2	 **JP7**
Auto Gating	2-3	 **JP7**

Note: Manufacturing default is Normal.

2-2-9. Front Panel Connector & Selection

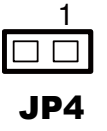
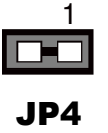
FP1: Front Panel Connector

SELECTION	PIN & ASSIGNMENT	JUMPER SETTINGS	JUMPER ILLUSTRATION
HDD LED	1. HDD_LED+ 3. HDD_LED-	1-3	
Power LED	2. PWR_LED+ 4. PWR_LED-	2-4	
Reset Button	5. GND 7. RST_BTN	5-7	

SELECTION	PIN & ASSIGNMENT	JUMPER SETTINGS	JUMPER ILLUSTRATION
External Speaker	6. SPK_VCC	6-8-10-12	 **FP1**
	8. Speaker signal		
	10. Speaker signal		
	12. Speaker signal		
ATX Power Button	9. GND	9-11	 **FP1**
	11. PWRBTNSW		

2-2-10. Clear CMOS Data Selection

JP4: Clear CMOS Data Selection

SELECTION	JUMPER SETTINGS	JUMPER ILLUSTRATION
Normal	Open	 JP4
Clear CMOS*	Close	 JP4

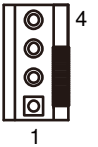
Note: Manufacturing Default is Normal.

*To clear CMOS data, user must power-off the computer and set the jumper to "Clear CMOS" as illustrated above. After five to six seconds, set the jumper back to "Normal" and power-on the computer.

2-2-11. CPU Fan Connector

CPU_FAN1: CPU Fan connector
The pin assignments are as follows:

PIN	ASSIGNMENT
1	GND
2	VCC12
3	CPUFAN_TAC1
4	CPUFAN_CTL1



CPU_FAN1

2-2-12. System Fan Connector

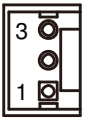
SYS_FAN1: System Fan connector
The pin assignments are as follows:

PIN	ASSIGNMENT
1	GND
2	VCC12
3	SYSFAN_TAC1
4	SYSFAN_CTL1

SYS_FAN1

SYS_FAN2: System Fan connector
The pin assignments are as follows:

PIN	ASSIGNMENT
1	GND
2	VCC12
3	NC



SYS_FAN2

2-2-13. Serial SATA CONNECTOR

SATA1, SATA2, SATA3, SATA4: Four Serial ATA Connectors

The pin assignments are as follows:

SATA1:

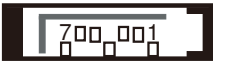
PIN	ASSIGNMENT
1	GND
2	SATA_TXPC0
3	SATA_TXNC0
4	GND
5	SATA_RXNC0
6	SATA_RXPC0
7	GND

SATA4:

PIN	ASSIGNMENT
1	GND
2	SATA_TXPC2
3	SATA_TXNC2
4	GND
5	SATA_RXNC2
6	SATA_RXPC2
7	GND

SATA2:

PIN	ASSIGNMENT
1	GND
2	SATA_TXPC1
3	SATA_TXNC1
4	GND
5	SATA_RXNC1
6	SATA_RXPC1
7	GND



SATA1/
SATA2/
SATA3/
SATA4

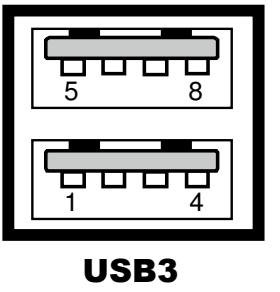
SATA3:

PIN	ASSIGNMENT
1	GND
2	SATA_TXPC4
3	SATA_TXNC4
4	GND
5	SATA_RXNC4
6	SATA_RXPC4
7	GND

2-2-14. Universal Serial Bus Connector

USB3: Universal Serial Bus Connector
The pin assignments are as follows:

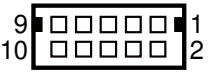
PIN	ASSIGNMENT
1	USB_89_VCC5
2	USB_89_VCC5
3	USBN8
4	USBN9
5	USBP8
6	USBP9
7	GND
8	GND
9	NC
10	GND



USB3

USB4: USB Connectors

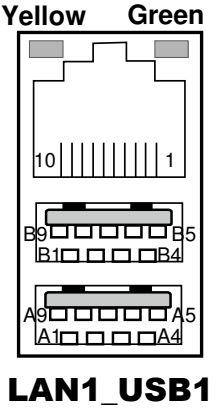
PIN	ASSIGNMENT
1	USB_1011_VCC5
2	USB_1011_VCC5
3	USBN10
4	USBN11
5	USBP10
6	USBP11
7	GND
8	GND
9	NC
10	GND



USB4

2-2-15. USB & LAN CONNECTOR

LAN1_USB1: USB & LAN Connector
The pin assignments are as follows:



LAN1_USB1

PIN	ASSIGNMENT
1	VCC_LAN1
2	LAN1_MDI_0P
3	LAN1_MDI_0N
4	LAN1_MDI_1P
5	LAN1_MDI_1N
6	LAN1_MDI_2P
7	LAN1_MDI_2N
8	LAN1_MDI_3P
9	LAN1_MDI_3N
10	GND

LAN LED Indicator:

Left Side LED

Red Color On	Giga LAN Speed Indicator
Off	No LAN switch/hub connected.

Right Side LED

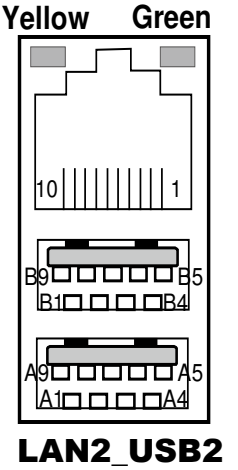
Orange Color Blinking	LAN Message Active
Off	No LAN Message Active

USB Signal:

PIN	ASSIGNMENT	PIN	ASSIGNMENT
A1	USB_01_VCC5	B1	USB_01_VCC5
A2	USBP0N	B2	USBP1N
A3	USBP0P	B3	USBP1P
A4	GND	B4	GND
A5	USB3_RX1_DN	B5	USB3_RX2_DN
A6	USB3_RX1_DP	B6	USB3_RX2_DP
A7	GND	B7	GND
A8	USB3_TX1_DN	B8	USB3_TX2_DN
A9	USB3_TX1_DP	B9	USB3_TX2_DP

LAN2_USB2: USB & LAN Connector
The pin assignments are as follows：
LAN Signal:

PIN	ASSIGNMENT
1	VCC_LAN2
2	LAN2_MDI_0P
3	LAN2_MDI_0N
4	LAN2_MDI_1P
5	LAN2_MDI_1N
6	LAN2_MDI_2P
7	LAN2_MDI_2N
8	LAN2_MDI_3P
9	LAN2_MDI_3N
10	GND



LAN2_USB2

LAN LED Indicator:
Left Side LED

RED Color On	Giga LAN Speed Indicator
Off	No LAN switch/ hub connected.

Right Side LED

Orange Color Blinking	LAN Message Active
Off	No LAN Message Active

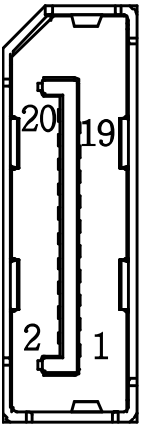
USB Signal:

PIN	ASSIGNMENT	PIN	ASSIGNMENT
A1	USB_45_VCC5	B1	USB_45_VCC5
A2	USBP4N	B2	USBP5N
A3	USBP4P	B3	USBP5P
A4	GND	B4	GND
A5	USB3_RX5_DN	B5	USB3_RX6_DN
A6	USB3_RX5_DP	B6	USB3_RX6_DP
A7	GND	B7	GND
A8	USB3_TX5_DN	B8	USB3_TX6_DN
A9	USB3_TX5_DP	B9	USB3_TX6_DP

2-2-16. Display Connector

DP1: Display Port Connector
The pin assignments are as follows:

PIN	ASSIGNMENT	PIN	ASSIGNMENT
1	DP_C_DATA0+	2	GND
3	DP_C_DATA0-	4	DP_C_DATA1+
5	GND	6	DP_C_DATA1-
7	DP_C_DATA2+	8	GND
9	DP_C_DATA2-	10	DP_C_DATA3+
11	GND	12	DP_C_DATA3-
13	DP_C_AUX_ENJ	14	GND
15	DP_C_AUX+	16	DP_C_HPD
17	DP_C_AUX-	18	DP_VCC3_3
19	DP_VCC5	20	DP_VCC3_3

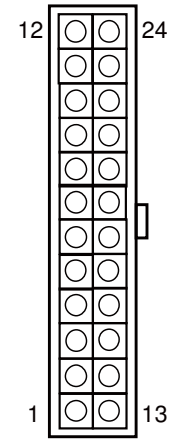


DP1

2-2-17. ATX Power Connector

ATX_PWR1: ATX Power Connector

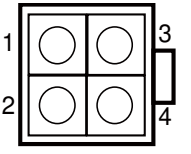
PIN	ASSIGNMENT	PIN	ASSIGNMENT
1	+3.3V	13	+3.3V
2	+3.3V	14	-12V
3	GND	15	GND
4	+5V	16	PSON
5	GND	17	GND
6	+5V	18	GND
7	GND	19	GND
8	POK	20	-5V
9	5VSB	21	+5V
10	+12V	22	+5V
11	+12V	23	+5V
12	+3.3V	24	GND



ATX_PWR1

ATX_PWR2: ATX Power Connector

PIN	ASSIGNMENT
1	GND
2	GND
3	+12V
4	+12V

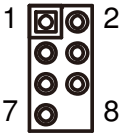


ATX_PWR2

2-2-18. Sound Connector

JAMP1: Line-Out Connector
The pin assignments are as follows:

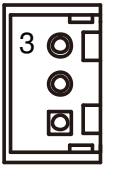
PIN	ASSIGNMENT
1	VCC12
2	VCC12
3	GND
4	GND
5	LINE-OUT-L
6	LINE-OUT-R
7	GND



JAMP1

MIC: Mic Connector
The pin assignments are as follows:

PIN	ASSIGNMENT
1	MIC1-L
2	GND
3	MIC1-R

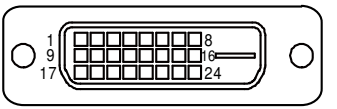


MIC

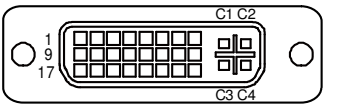
2-2-19. DVI-I & DVI-D CONNECTOR

DVI1 : DVI-I & DVI-D Connector.
The pin assignments are as follows:

PIN	ASSIGNMENT
A1/B1	DP_Data2-
A2/B2	DP_Data2+
A3/B3	Ground
A4/B4	NC
A5/B5	NC
A6/B6	DP_Ctrl_Clock
A7/B7	DP_Ctrl_ Data
A8	CRT_VSYNC
A9/B9	DP_Data1-
A10/B10	DP_Data1+
A11/B11	Ground
A12/B12	NC
A13/B13	NC
A14/B14	+5V Power
A15/B15	Ground
A16/B16	HOT Plug Detect
A17/B17	DP_Data0-
A18/B18	DP_Data0+
A19/B19	Ground
A20/B20	NC
A21/B21	NC
A22/B22	Ground
A23/B23	DP_Clock+
A24/B24	DP_Clock-
AC1	CRT_RED
AC2	CRT_GREE
AC3	CRT_BLUE
AC4	CRT_HSYNC



DVI-D



DVI-I

Note: DVI-I can support DVI or VGA Signal.
DVI-D only can support DVI Signal.

2-2-20. BIOS Recovery Mode Selection

JP1: BIOS Recovery Mode Selection

SELECTION	JUMPER SETTINGS	JUMPER ILLUSTRATION
Recovery	Open	 **JP1**
Normal	Close	 **JP1**

Note: Manufacturing Default is Normal.

2-2-21. Power Loss State Connector

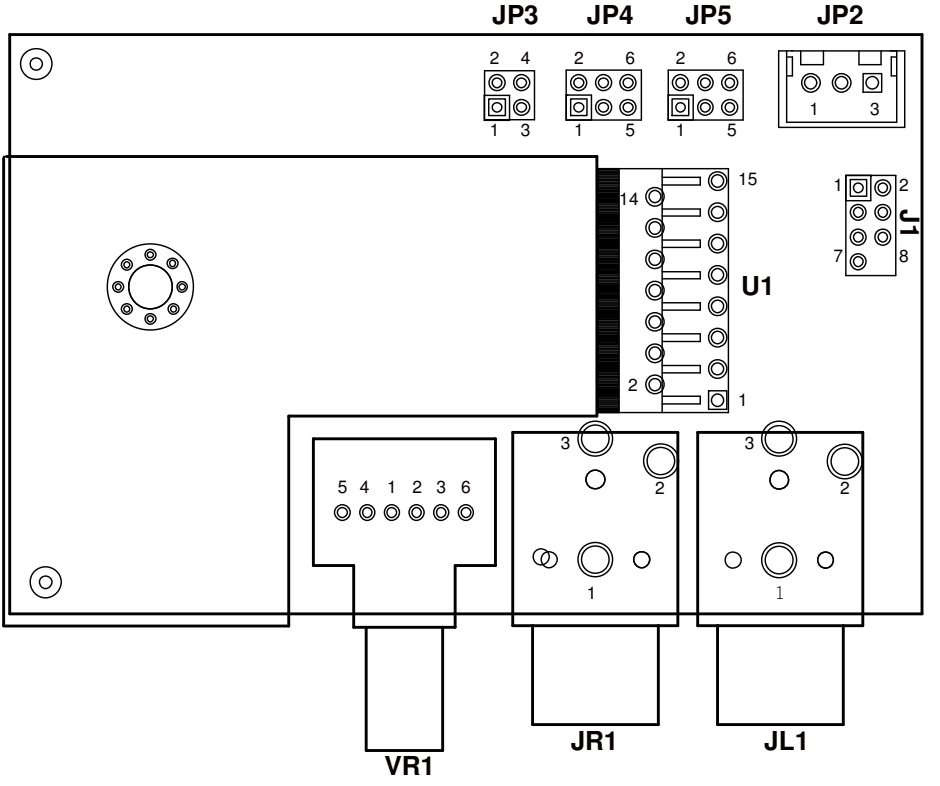
JP9: Power loss setting
The selections are as follows:

FUNCTION	JUMPER SETTING (pin closed)	JUMPER ILLUSTRATION
Power-loss OFF	2-3	 **JP9**
Power-loss ON	1-2	 **JP9**

Note: Manufacturing Default is Power-loss ON

2-3. AUDIO BOARD COMPONENT LOCATIONS & JUMPER SETTINGS

A/B: SR-1942



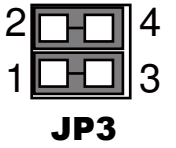
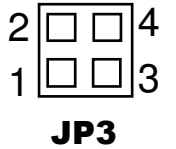
Audio Board Connectors, Jumpers and Component Locations - front

2-3-1. Jumpers & Connectors Quick Reference Table

AUDIO BOARD CONNECTOR/JUMPER	NAME
Audio Amplifier Selection	JP3
Right channel Output Selection	JP4
Left channel Output Selection	JP5
Power and Audio Input	J1
Audio Out	JP2

2-3-2. Audio Amplifier Selection

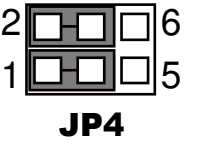
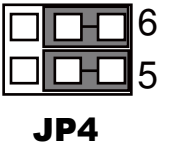
JP3: Audio Amplifier Selection

SELECTION	JUMPER SETTINGS	JUMPER ILLUSTRATION
Amplifier	1-3,2-4	 **JP3**
Bypass Amplifier	NC	 **JP3**

Note: Manufacturing Default is R/L channel signal into Audio Amplifier

2-3-3. Right channel Output Selection

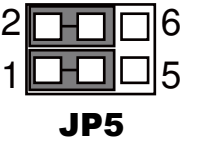
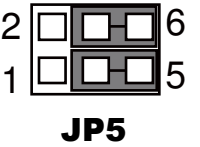
JP4: Right channel Output Selection

SELECTION	JUMPER SETTINGS	JUMPER ILLUSTRATION
Amplifier	1-3,2-4	
Bypass Amplifier	3-5,4-6	

Note: Manufacturing Default is Differential Audio Amplifier Output

2-3-4. Left channel Output Selection

JP5: Left channel Output Selection

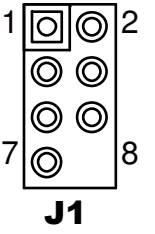
SELECTION	JUMPER SETTINGS	JUMPER ILLUSTRATION
Amplifier	1-3,2-4	
Bypass Amplifier	3-5,4-6	

Note: Manufacturing Default is Differential Audio Amplifier Output

2-3-5. Power and Audio Input

J1: Power and Audio Input
The pin assignments are as follows:

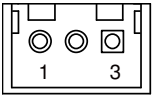
PIN	ASSIGNMENT
1	VCC12
2	VCC12
3	AN_GND
4	AN_GND
5	Left Channel Input
6	Right Channel Input
7	AN_GND
8	NC



2-3-6. Audio Out

JP2: Audio Out
The pin assignments are as follows:

PIN	ASSIGNMENT
1	Right Channel Output
2	AN_GND
3	Left Channel Output



JP2

SOFTWARE UTILITIES

CHAPTER

3

This chapter comprises the detailed information of VGA driver, LAN driver, and Sound driver.

Sections included:

- Introduction.
- Intel® Chipset Software Installation Utility
- Intel® Matrix Storage Manager Utility
- Intel® USB3.0 eXtensible Host Controller Utility
- Intel® Management Engine Components Utility
- VGA Driver Utility
- LAN Driver Utility
- Sound Driver Utility

3-1. INTRODUCTION

Enclosed with our ST-1942 package are our driver utilities, which come in a format of DVD ROM. Refer to the following table for driver locations: and go to the corresponding folder for the chipset Intel® Q87:

3-1-1. For Intel® Q87

FILENAME (Assume that DVD ROM drive is D:)	PURPOSE
D:\Driver\Flash BIOS	For Aptio(EFI) BIOS update utility
D:\Driver\Audio	
▪ D:\Driver\Plaform\Audio\Win7,Win8(32-bit) ▪ D:\Driver\Plaform\Audio\Win7,Win8(64-bit)	Realtek ALC888S for Audio driver installation
D:\Driver\Graphics	
▪ D:\ Driver\Plaform\Graphics\Win7,Win8(32-bit) ▪ D:\ Driver\Plaform\Graphics\Win7,Win8(64-bit)	Intel® HD Graphics Family for VGA driver installation
D:\Driver\LAN	
▪ D:\ Driver\Plaform\LAN\Win7,Win8(32-bit) ▪ D:\ Driver\Plaform\LAN\Win7,Win8(64-bit)	Intel® I217-LM/V & I210-AT for LAN driver installation
D:\ Driver\ ME	
▪ D:\ Driver\Platform\ME\ Production	Intel® Management Engine Interface
D:\Driver\RST	
▪ D:\ Driver\Platform\RST\ f6flpy-x64 ▪ D:\Driver\Plaform\RST\ f6flpy-x86	Intel® Matrix Storage Technology driver installation, Intel F6 Floppy Utility. (RST)
▪ D:\ Driver\Plaform\USB3.0\Win7 (32-bit) ▪ D:\ Driver\Plaform\USB3.0\Win7 (64-bit)	Intel® USB3.0 eXtensible host controller
D:\Driver\UTILITY	Intel(R) Chipset Device Software Installation Utility
D:\Manual	
D:\Manual\Adobe	

Note: Be sure to install the utility right after the OS is fully installed.

3-2. INTEL® CHIPSET SOFTWARE INSTALLATION UTILITY

3-2-1. Introduction

The Intel® Chipset Device Software installs Windows INF files to the target system. These files outline to the operating system how to configure the Intel® chipset components in order to ensure that the following features function properly:

- Core PCI and ISAPNP Services
- PCIe Support
- IDE/ATA33/ATA66/ATA100 Storage Support
- SATA Storage Support
- USB Support
- Identification of Intel® Chipset Components in the Device Manager

3-2-2. Installation of Utility for Windows 7/8

The Utility Pack is to be installed only for Windows 7/8 series, and it should be installed right after the OS installation. Please follow the steps below:

1. Insert the driver disk into a DVD ROM device.
2. Under Windows system, go to the directory where the Utility driver is located.
3. Run the application with administrative privileges.

3-3. INTEL® MATRIX STORAGE TECHNOLOGY UTILITY

This utility is applicable to Intel® Q87 only.

3-3-1. Introduction

The Intel® RST driver utility supports RAID 0, 1, 5 and fully compatible with Windows 7/8 series, and it should be installed after the operating system is installed completely. Perform F6 and RAID BIOS configurations prior to installation of this driver for proper operation.

3-3-2. Installation of RST Driver for Windows 7/8

To install the utility, simply follow the following steps:

1. Insert the driver disk into a DVD ROM device.
2. Under Windows system, go to the directory where the RST driver is located.
3. Run the application with administrative privileges.

3-4. INTEL® USB3.0 EXTENSIBLE HOST CONTROLLER UTILITY

3-4-1. Introduction

Intel® USB 3.0 eXtensible Host Controller Driver supports the following Intel® Chipsets/Processors:

- Intel® 4th Generation Core™ Processor Family
- Intel® 8 Series/C220 Series Chipset Family
- Intel® 4th Generation U-Series Platform I/O

3-4-2. Installation Instructions for Windows 7

To install the utility, simply follow the following steps:

1. Insert the driver disk into a DVD ROM device.
2. Under Windows system, go to the directory where the driver is located.
3. Run the application with administrative privileges.

3-5. INTEL® MANAGEMENT ENGINE COMPONENTS UTILITY

3-5-1. Introduction

The Intel® ME software components that need to be installed depend on the system's specific hardware and firmware features. The installer, compatible with Windows 7/8 series, detects the system's capabilities and installs the relevant drivers and applications.

3-5-2. Installation Instructions for Windows 7/8

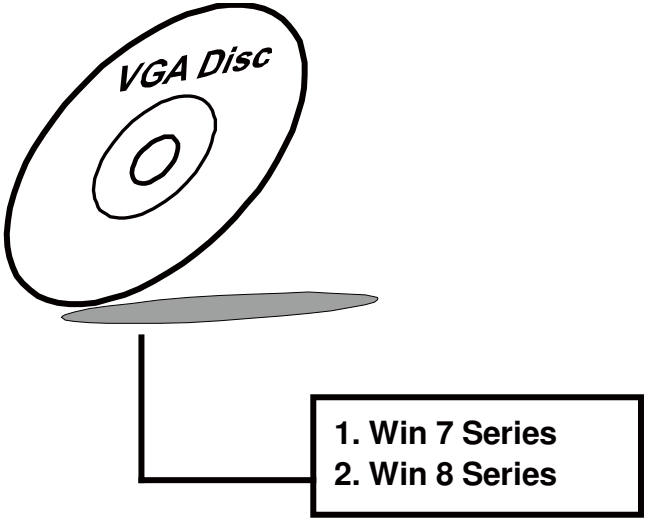
To install the utility, simply follow the following steps:

1. Insert the driver disk into a DVD ROM device.
2. Under Windows system, go to the directory where the driver is located.
3. Run the application with administrative privileges.

3-6. Graphic DRIVER UTILITY

3-6-1. Introduction

The graphic interface embedded with our ST-1942 can support a wide range of display. You can display DVI simultaneously with the same mode.



3-6-2. Installation of Graphic Driver

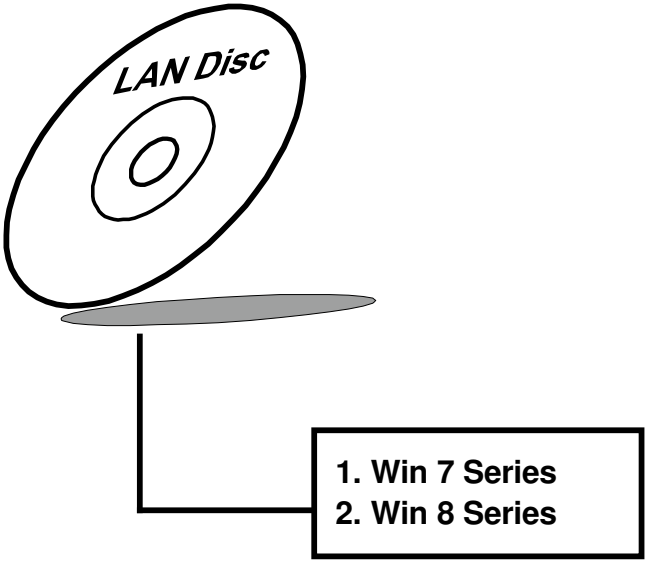
To install the Graphic Driver, simply follow the following steps:

1. Insert the driver disk into a DVD ROM device.
2. Under Windows system, go to the directory where the Graphic driver is located.
3. Run the application with administrative privileges..

3-7. LAN DRIVER UTILITY

3-7-1. Introduction

ST-1942 is enhanced with LAN function that can support various network adapters. Installation programs for LAN drivers are listed as follows:

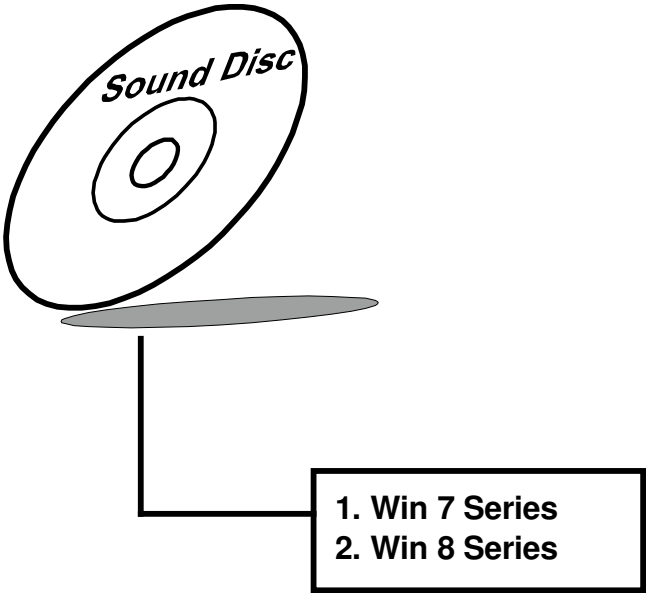


For more details on Installation procedure, please refer to Readme.txt file found on LAN Driver Utility.

3-8. Audio DRIVER UTILITY

3-8-1. Introduction

The Realtek sound function enhanced in this system is fully compatible with Windows 7/8. Below, you will find the content of the Audio driver:



3-8-2. Installation of Audio Driver

1. Insert the driver disk into a DVD ROM device.
2. Under Windows system, go to the directory where the Audio driver is located.
3. Run the application with administrative privileges..
4. Follow the instructions on the screen to complete the installation.
5. Once the installation is completed, shut down the system and restart in order for the changes to take effect.

CHAPTER

4

BIOS SETUP

This chapter shows how to set up the AMI BIOS.

Section includes:

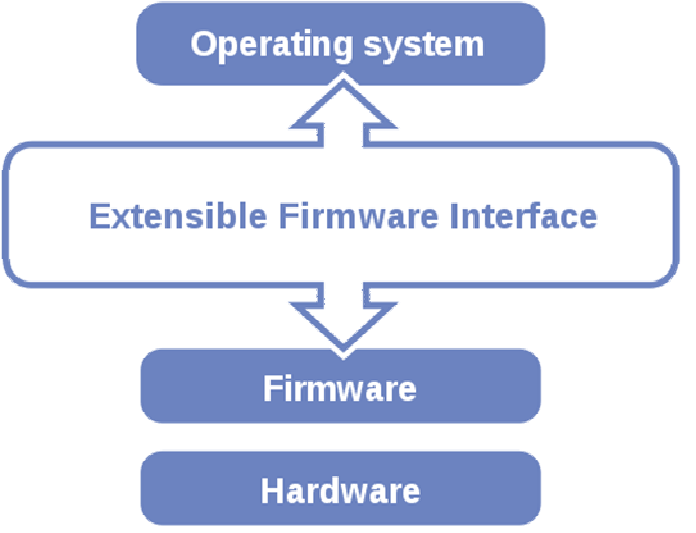
- Introduction
- Entering Setup
- Main
- Advanced
- Chipset
- Boot
- Security
- Save & Exit

4-1. INTRODUCTION

The board ST-1942 uses an AMI (American Megatrends Incorporated) Aptio BIOS that is stored in the Serial Peripheral Interface Flash Memory (16MB SPI flash) and can be updated. The SPI flash contains the BIOS (Basic Input Output System) setup menu, Power-on Self-test (POST), the PCI auto-configuration utility, LAN EEPROM information, and Plug and Play support.

Aptio is AMI's BIOS firmware based on the UEFI (Unified Extensible Firmware Interface) specifications and the Intel Platform Innovation Framework for EFI. The UEFI specification defines an interface between an operating system and platform firmware. The interface consists of data tables that contain platform-related information, boot service calls, and runtime service calls that are available to the operating system and its loader. These provide standard environment for booting an operating system and running pre-boot applications.

Following illustration shows Extensible Firmware Interface's position in the software stack.



EFI BIOS provides an user interface allow users the ability to modify hardware configuration, e.g. change system date and time, enable or disable a system component, decide bootable device priorities, setup personal password, etc., which is convenient for modifications and customization of the computer system and allows technicians another method for finding solutions if hardware has any problems.

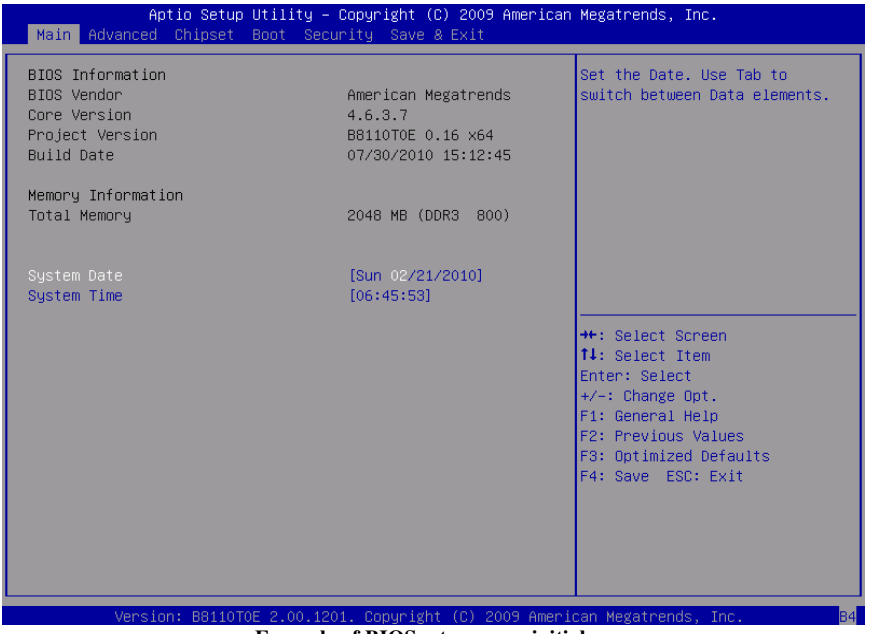
The BIOS setup menu can be used to view and change the BIOS settings for the computer. The BIOS setup menu is accessible by pressing the <Del> or <Esc> key on keyboard during the POST stage, right before the operating system is loading. All the settings are described in chapter to be followed.

4-2. ENTERING SETUP

When the system is powered on, the BIOS will enter the Power-on Self-test (POST) routines and the following message will appear on the lower screen:

First POST screen with AMI logo

As long as this message is present on the screen before the operating system boot begins, you may press the <ESC> or <Del> key (the one that shares the decimal point at the bottom of the number keypad) to access the setup menu. In a moment, the main menu of the Aptio Setup Utility will appear on the screen:



Example of BIOS setup menu initial screen

The BIOS setup menu interface and help messages are shown in US English. You may move the cursor by up/down keys to highlight the individual menu items. As you highlight each item, a brief description of the highlighted selection will appear at the bottom of the screen. The following table provides the list of keys available for BIOS setup menu.

4-2-1. BIOS Setup Menu Keys

The following table provides list of keys available for BIOS setup menu.

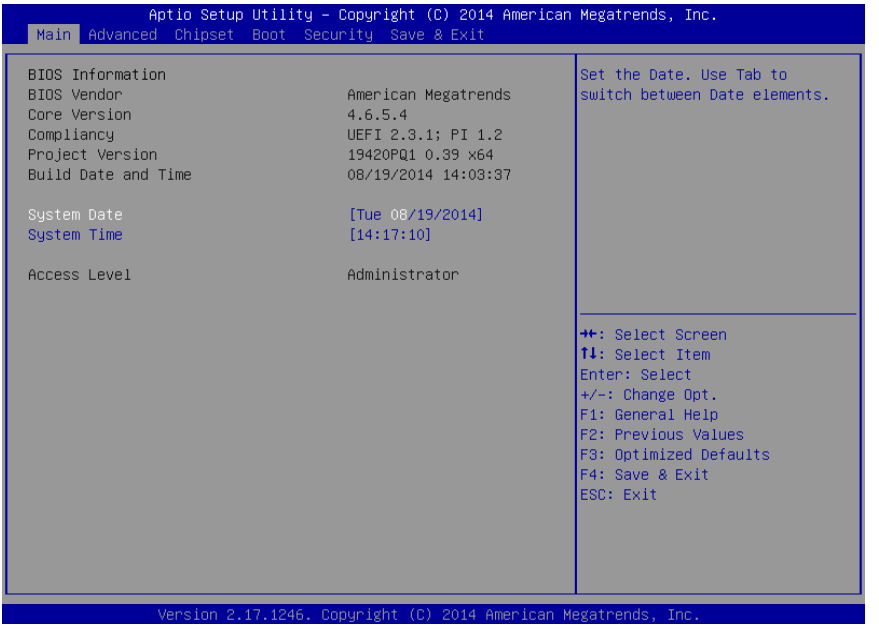
BIOS Setup menu key	Description
<←> and <→>	Selects a different menu screen (moves the selection left or right).
< ↑ > and < ↓ >	Selects an item (moves the selection up or down).
<Enter>	Executes command or selects the sub-menu.
<F2>	Load the previous configuration values.
<F3>	Load the default configuration values.
<F4>	Save the current values and exits the BIOS setup menu.
<Esc>	Leaves the sub-menu. Triggers confirmation to exit BIOS setup menu.

4-2-2. BIOS Messages

This section describes error messages generated by the board's BIOS. These messages would be displayed on the monitor when certain recoverable error/event occurs during POST stage. The table bellow gives an explanation of the BIOS messages.

BIOS Setup menu key	Explanation
A first boot or NVRAM reset condition has been detected.	BIOS has been updated or the battery was replaced.
The CMOS defaults were loaded.	Default values have been loaded after the BIOS was updated or the battery was replaced.
The CMOS battery is bad or was recently replaced.	The battery may be losing power, replace the battery soon. Also, this message is displayed once the new battery was placed.

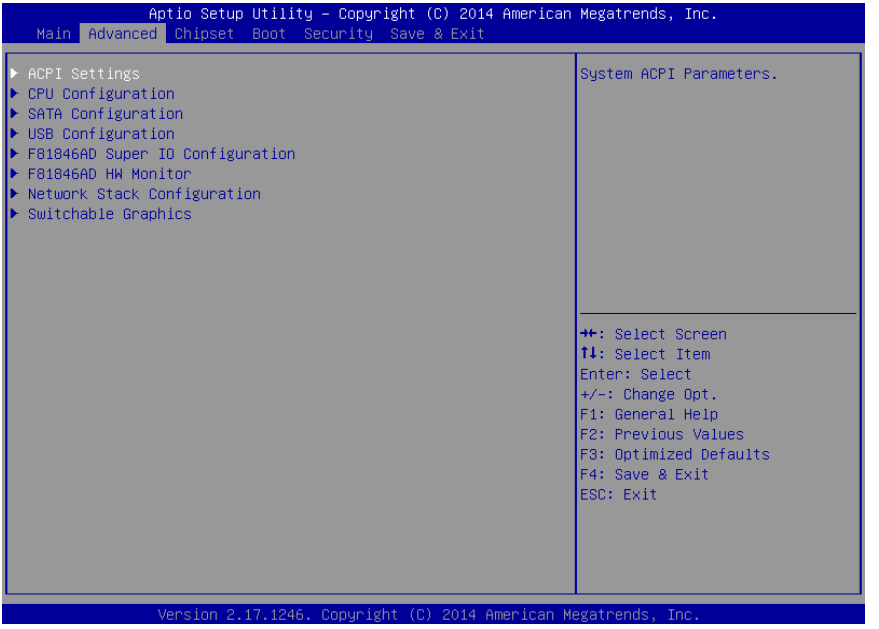
4-3. MAIN



Main screen

BIOS Setting	Options	Description/Purpose
BIOS Vendor	*no changeable options*	Displays the BIOS vendor.
Core Version	*no changeable options*	Displays the current BIOS core version.
Compliancy	*no changeable options*	Displays the current UEFI version.
Project Version	*no changeable options*	Displays the version of the board and its BIOS.
Build Date and Time	*no changeable options*	Displays the date of current BIOS version.
System Date	month, day, year	Specifies the current date.
System Time	hour, minute, second	Specifies the current time.
Access Level	*no changeable options*	Displays security levels currently in use.

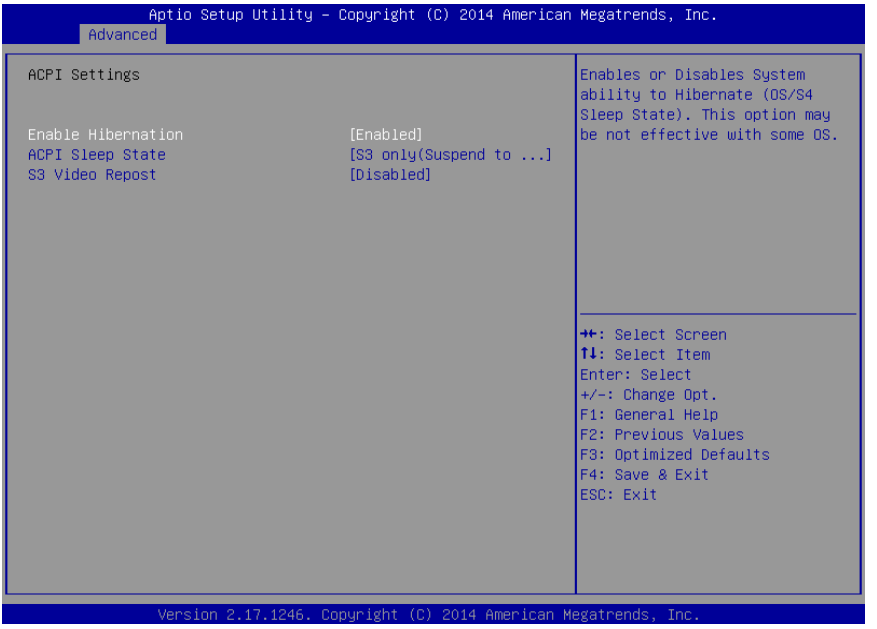
4-4. ADVANCED



Advanced screen

BIOS Setting	Options	Description/Purpose
ACPI Settings	*sub-menu*	Enters menu to set ACPI option.
CPU Configuration	*sub-menu*	All processor basic options menu.
SATA Configuration	*sub-menu*	SATA device(s) configuration section.
USB Configuration	*sub-menu*	Enters menu to configure USB options.
F81846A Super IO Configuration	*sub-menu*	Serial ports & watchdog at Super I O configuration section.
F81846A HW Monitor	*sub-menu*	Exposes values gathered by hardware monitor.
Network Stack Configuration	*sub-menu*	Enters menu to enable/disable network during DXE stage and UEFI shell environment.
Switchable Graphics	*sub-menu*	Switchable graphics options menu.

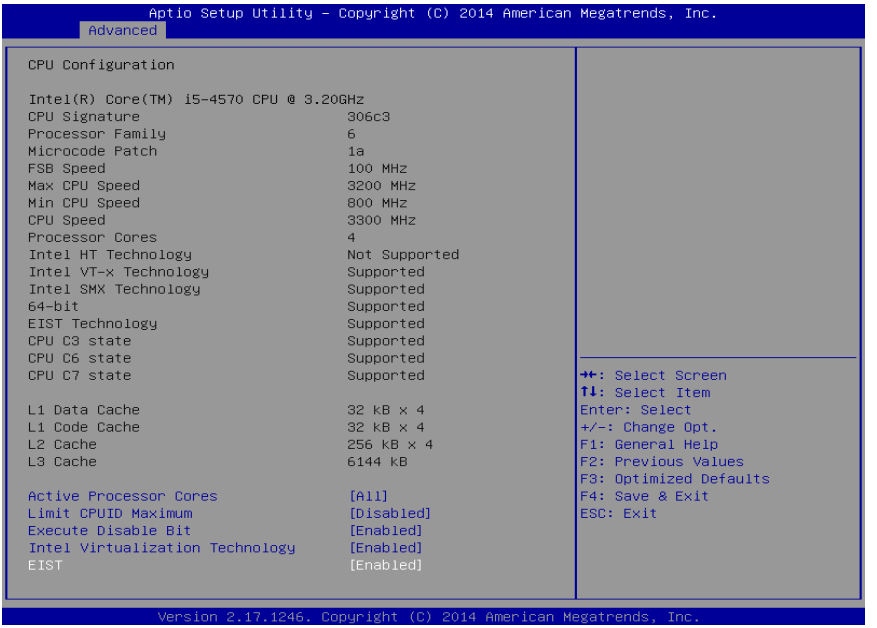
4-4-1. Advanced – APCI Settings



APCI Settings screen

BIOS Setting	Options	Description/Purpose
Enable Hibernation	-disabled -enabled	Enables ability to enter **S4** state (to be able to hibernate in Windows operating system).
ACPI Sleep State	-Suspend Disabled -S1 only -S3 only -Both S1 and S3 available for OS	Specifies the ACPI sleep state. **Disabled** option disables ACPI sleep feature. **S3** allows the platform to enter Sleep mode (also known as Standby or Suspend to RAM). **S1** is less common state in which the CPU is stopped.
S3 Video Repost	-disabled -enabled	If enabled re-initializes the VBIOS after waking up from an S3 sleep.

4-4-2. Advanced – CPU Configuration

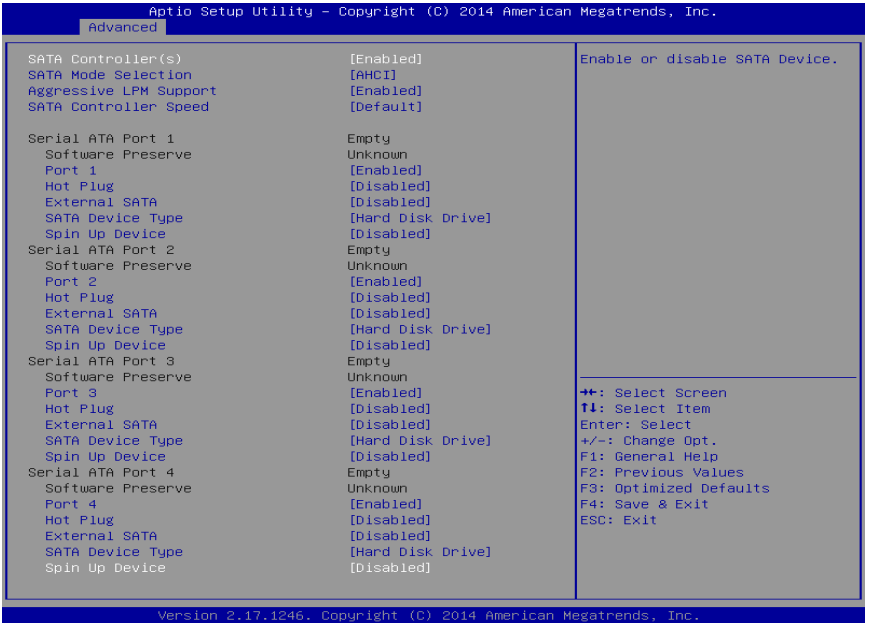


CPU Configuration screen

BIOS Setting	Options	Description/Purpose
Processor Type	*no changeable options*	Displays the current processor model number and its frequency.
CPU Signature	*no changeable options*	Displays processor's stepping.
Processor Family	*no changeable options*	Displays processor's family model.
Microcode Patch	*no changeable options*	Displays processor's microcode update revision.
FSB Speed	*no changeable options*	Displays FSB frequency.
Max CPU Speed	*no changeable options*	Shows maximal supported processor frequency with Turbo mode enabled.
Min CPU Speed	*no changeable options*	Shows minimal supported processor frequency.
CPU Speed	*no changeable options*	Displays the current processor frequency.
Processor Cores	*no changeable options*	Displays information about number of physical cores in processor.
Intel HT Technology	*no changeable options*	Reports if Intel Hyper-Threading Technology is supported by processor.
Intel VT-x Technology	*no changeable options*	Displays hardware support for virtualization Intel Virtualization Technology (VT-x) status.
Intel SMX Technology	*no changeable options*	Shows processor ability for Safer Mode Extensions (SMX), enhanced version of Intel (Trusted Execution Technology) TXT.
64-bit	*no changeable options*	Reports if processor supports Intel x86-64 (amd64) implementation.
EIST Technology	*no changeable options*	Checks Intel Enhanced SpeedStep feature status.
CPU C3 State	*no changeable options*	Reports processor support for C3 state.
CPU C6 State	*no changeable options*	Reports processor support for C6

BIOS Setting	Options	Description/Purpose
		state.
CPU C7 State	*no changeable options*	Reports processor support for C7 state.
L1 Data Cache	*no changeable options*	Displays amount of Level 1 cache for data.
L1 Code Cache	*no changeable options*	Displays amount of Level 1 cache for instructions.
L2 Cache	*no changeable options*	Displays amount of Level 2 cache.
L3 Cache	*no changeable options*	Displays amount of Level 3 cache.
Active Processor Cores	-all -1	Controls number of active physical cores in processor.
Limit CPUID Maximum	-disabled -enabled	Enables for legacy operating systems to boot processors with extended CPUID (CPU Identification) functions.
Execute Disable Bit	-disabled -enabled	Enables the NX bit (No eXecute) security feature (if supported by operating system).
Intel Virtualization Technology	-disabled -enabled	Enables or disables Intel Virtualization Technology (VT-x). Takes affect only after power cycling.
EIST	-disabled -enabled	Enables Intel Enhanced SpeedStep feature for dynamic scaling processor frequency.

4-4-3. Advanced - SATA Configuration



SATA Configuration screen

BIOS Setting	Options	Description/Purpose
SATA Controller(s)	-disabled -enabled	Enables SATA controller.
SATA Mode Selection	-AHCI -RAID -IDE	Configures SATA devices for AHCI, RAID and IDE modes respectively. It is not advised to change this option once the operating system is installed.
Aggressive LPM Support	-disabled -enabled	Aggressive Link Power Management (LPM) feature adds ability to enter low-power states during inactivity periods (with a drawback in form of increased latency).
SATA Controller Speed	-Default -Gen1 -Gen2	Configures SATA (only when set as AHCI) interface: **Gen1** mode sets the device to 1.5

BIOS Setting	Options	Description/Purpose
	-Gen3	Gbit/s speed. **Gen2** mode sets the device to 3 Gbit/s speed (in case it is compatible). **Gen3** mode sets the device to 6 Gbit/s speed (in case it is compatible).
Serial ATA Port 1	*no changeable options*	Displays device ID plugged in SATA port 1 (if any).
Software Preserve	*no changeable options*	Indicates whether SATA device supports SSP (Software Settings Preservation) or not.
Port 1	-disabled -enabled	Allows controlling specific SATA port.
Hot Plug	-disabled -enabled	Enables Hot Plug feature on SATA port 1 (if supported by the device).
External SATA	-disabled -enabled	To be enabled for external SATA devices only (if supported by the device).
SATA Device Type	-Hard Disk Drive -Solid State Drive	Option to select appropriate type of SATA device.
Spin Up Device	-disabled -enabled	For hard disk SATA devices, it is possible to enable to spin up the drive in advance.
Serial ATA Port 2	*no changeable options*	Displays device ID plugged in SATA port 2 (if any).
Software Preserve	*no changeable options*	Indicates whether SATA device supports SSP (Software Settings Preservation) or not.
Port 3	-disabled -enabled	Allows controlling specific SATA port.
External SATA	-disabled -enabled	To be enabled for external SATA devices only (if supported by the device).
Hot Plug	-disabled -enabled	Enables Hot Plug feature on SATA port 3 (if supported by the device).
SATA Device Type	-Hard Disk Drive -Solid State Drive	Option to select appropriate type of SATA device.
Spin Up Device	-disabled	For hard disk SATA devices, it is

BIOS Setting	Options	Description/Purpose
	-enabled	possible to enable to spin up the drive in advance.
Serial ATA Port 4	*no changeable options*	Displays device ID plugged in SATA port 4 (if any).
Software Preserve	*no changeable options*	Indicates whether SATA device supports SSP (Software Settings Preservation) or not.
Port 4	-disabled -enabled	Allows controlling specific SATA port.
External SATA	-disabled -enabled	To be enabled for external SATA devices only (if supported by the device).
Hot Plug	-disabled -enabled	Enables Hot Plug feature on SATA port 4 (if supported by the device).
SATA Device Type	-Hard Disk Drive -Solid State Drive	Option to select appropriate type of SATA device.
Spin Up Device	-disabled -enabled	For hard disk SATA devices, it is possible to enable to spin up the drive in advance.

4-4-4. Advanced – USB Configuration

USB configuration screen

BIOS Setting	Options	Description/Purpose
USB Module Version	*no changeable options*	Indicates USB module version number.
USB Devices	*no changeable options*	Reports number and type of connected USB device(s) (if any).
Legacy USB Support	-enabled -disabled -auto	Enables support for USB in legacy operating systems (e.g. MS-DOS, Windows NT, …).
EHCI Hand-off	-disabled -enabled	When enabled it allows BIOS support control of the EHCI controller and the OS hand-off synchronization capability.
USB transfer time-out	-1 sec -5 sec -10 sec -20 sec	Specifies time-out value for Control, Bulk and Interrupt transfers.

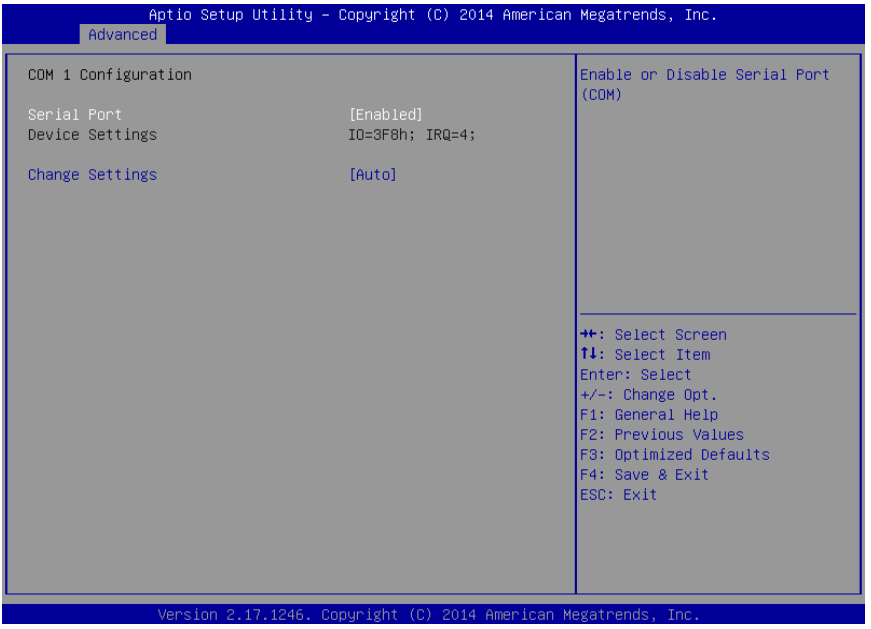
BIOS Setting	Options	Description/Purpose
Device reset time-out	-10 sec -20 sec -30 sec -40 sec	Specifies the value for device reset timeout.
Device power-up delay	-auto -manual	Specifies maximum time it would take for USB device to report itself to the controller. If set to auto, it would use default values (100 ms for root port) and value read from hub descriptor in case of hub port.
Mass Storage Devices: [drive(s)]	-Auto -Floppy -Forced FDD -Hard Disk -CD-ROM	Appears only when USB flash drive is plugged in. Allows selecting which emulation to use on available drive(s). Please note that the sector size of your USB drive should be emulated device native sector size.

4-4-5. Advanced – F81846A Super IO Configuration

F81846A Super IO Configuration screen

BIOS Setting	Options	Description/Purpose
F81846A Super IO Chip	*no changeable options*	Shows Super IO manufacturer and model.
COM 1 Configuration	*sub-menu*	Enters menu to configure serial port 1.
COM 2 Configuration	*sub-menu*	Enters menu to configure serial port 2.
COM 3 Configuration	*sub-menu*	Enters menu to configure serial port 3.
COM 4 Configuration	*sub-menu*	Enters menu to configure serial port 4.
F81846A Watchdog	*sub-menu*	Opens section to configure Watchdog timer.

4-4-5-1. F81846A Super IO Configuration – COM1 Configuration



COM1 Configuration screen

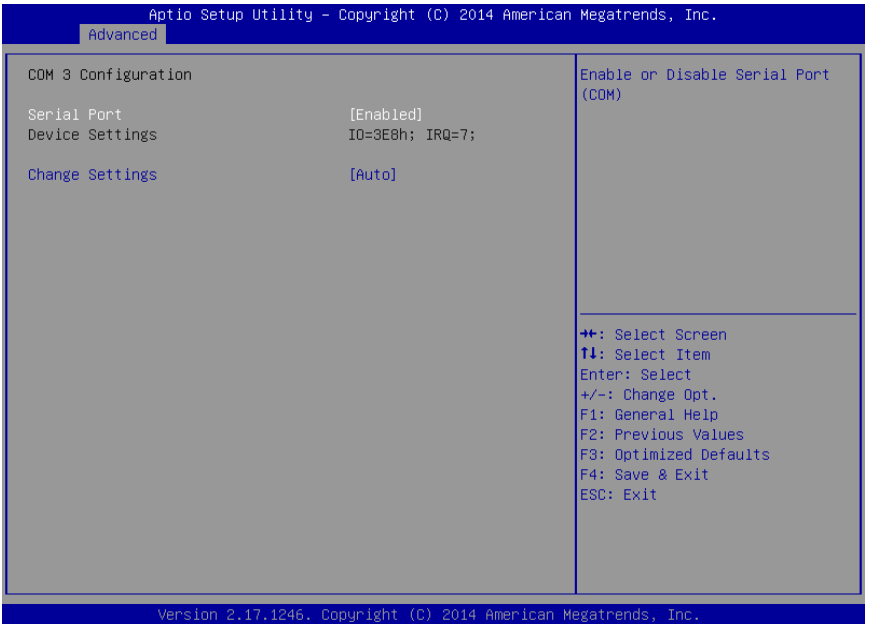
BIOS Setting	Options	Description/Purpose
Serial Port	- Disabled - Enabled	Configures the serial port 1.
Device Settings	No changeable options	Shows current settings applied to the serial port.
Change Settings	-Auto -IO=3F8h; IRQ=4; -IO=3F8h; IRQ=3,4,5,6,7,10,11,12; -IO=2F8h; IRQ=3,4,5,6,7,10,11,12; -IO=3E8h; IRQ=3,4,5,6,7,10,11,12; -IO=2E8h; IRQ=3,4,5,6,7,10,11,12;	Specifies the base I/O address and interrupt request for the serial port 1 if enabled.

4-4-5-2. F81846A Super IO Configuration - COM 2 Configuration

COM 2 configuration screen

BIOS Setting	Options	Description/Purpose
Serial Port	- Disabled - Enabled	Configures the serial port 2.
Device Settings	No changeable options	Shows current settings applied to the serial port.
Change Settings	-Auto -IO=3F8h; IRQ=4; -IO=3F8h; IRQ=3,4,5,6,7,10,11,12; -IO=2F8h; IRQ=3,4,5,6,7,10,11,12; -IO=3E8h; IRQ=3,4,5,6,7,10,11,12; -IO=2E8h; IRQ=3,4,5,6,7,10,11,12;	Specifies the base I/O address and interrupt request for the serial port 2 if enabled.

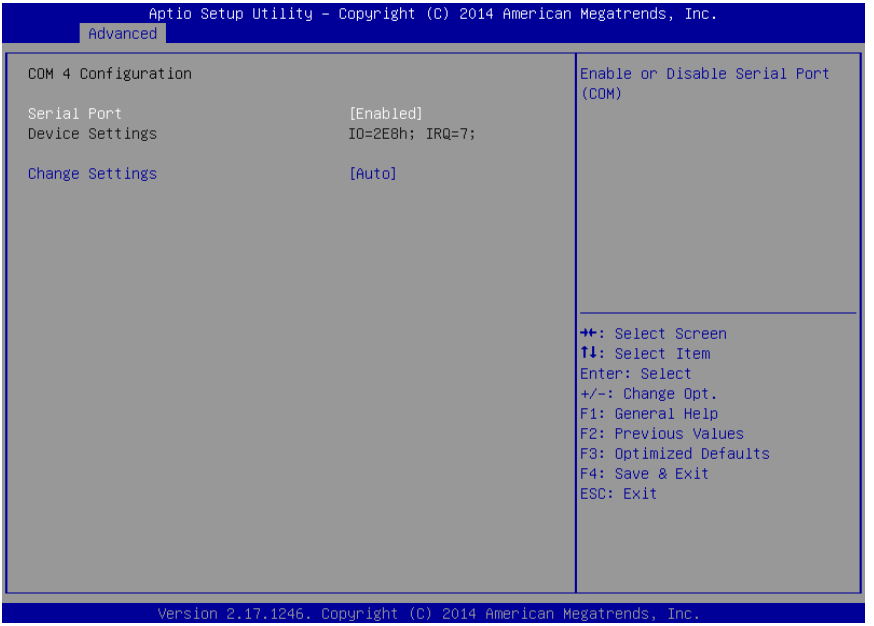
4-4-5-3. F81846A Super IO Configuration - COM 3 Configuration



COM 3 configuration screen

BIOS Setting	Options	Description/Purpose
Serial Port	- Disabled - Enabled	Configures the serial port 3.
Device Settings	No changeable options	Shows current settings applied to the serial port.
Change Settings	-Auto -IO=3F8h; IRQ=4; -IO=3F8h; IRQ=3,4,5,6,7,10,11,12; -IO=2F8h; IRQ=3,4,5,6,7,10,11,12; -IO=3E8h; IRQ=3,4,5,6,7,10,11,12; -IO=2E8h; IRQ=3,4,5,6,7,10,11,12;	Specifies the base I/O address and interrupt request for the serial port 3 if enabled.

4-4-5-4. F81846A Super IO Configuration - COM 4 Configuration



COM 4 configuration screen

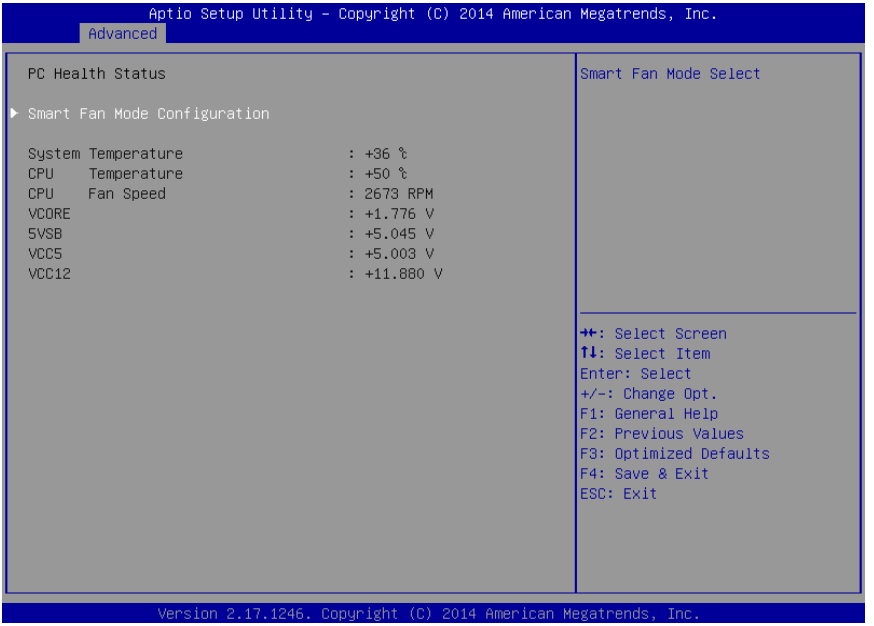
BIOS Setting	Options	Description/Purpose
Serial Port	- Disabled - Enabled	Configures the serial port 4.
Device Settings	No changeable options	Shows current settings applied to the serial port.
Change Settings	-Auto -IO=3F8h; IRQ=4; -IO=3F8h; IRQ=3,4,5,6,7,10,11,12; -IO=2F8h; IRQ=3,4,5,6,7,10,11,12; -IO=3E8h; IRQ=3,4,5,6,7,10,11,12; -IO=2E8h; IRQ=3,4,5,6,7,10,11,12;	Specifies the base I/O address and interrupt request for the serial port 4 if enabled.

4-4-6. F81846A Super IO Configuration - WatchDog Configuration

Watchdog configuration screen

BIOS Setting	Options	Description/Purpose
Enable Watchdog	-disabled -enabled	Selects for watchdog t imer to be enabled or disabled.
Count for Time (Seconds)	*multiple options ranging from 1 to 255*	If enabled, sets the desired value (in seconds) for watchdog timeout.
Enable Watchdog	-disabled -enabled	Selects for watchdog t imer to be enabled or disabled.

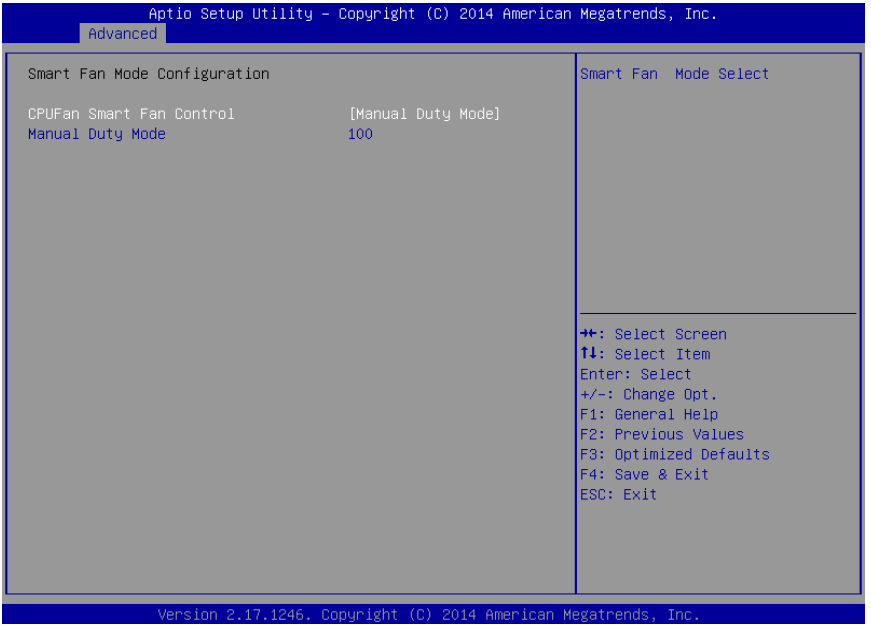
4-4-7.Advanced – F81846A Hardware Monitor



F81846A HW monitor screen

BIOS Setting	Options	Description/Purpose
Smart Fan Mode Configuration	*sub-menu*	Enters menu to select mode in which CPU fan operates.
System Temperature	*no changeable options*	Shows system temperature in degree Celsius.
CPU Temperature	*no changeable options*	Monitors CPU temperature via PECI interface.
CPU Fan Speed	*no changeable options*	Monitors processor fan's RPM.
VCORE	*no changeable options*	Monitors core voltage rail (in volt).
5VSB	*no changeable options*	Monitors stand-by 5V (in volt).
VCC5	*no changeable options*	Monitors 5V section (in volt).
VCC12	*no changeable options*	Reports on 12V section (in volt).

4-4-7-1. Smart Fan Mode Configuration



Smart Fan Mode Configuration screen

BIOS Setting	Options	Description/Purpose
CPU Fan Smart Fan Control	-Auto Duty-Cycle Mode -Manual Duty Mode	Selects mode in which CPU fan operates.
Manual Duty Mode	*multiple options ranging from 1 to 100*	If selected, takes over fan speed setting using PWM (legal input values are from 1 to 100).

4-4-8. Advanced – Network Stack

Network Stack Settings screen

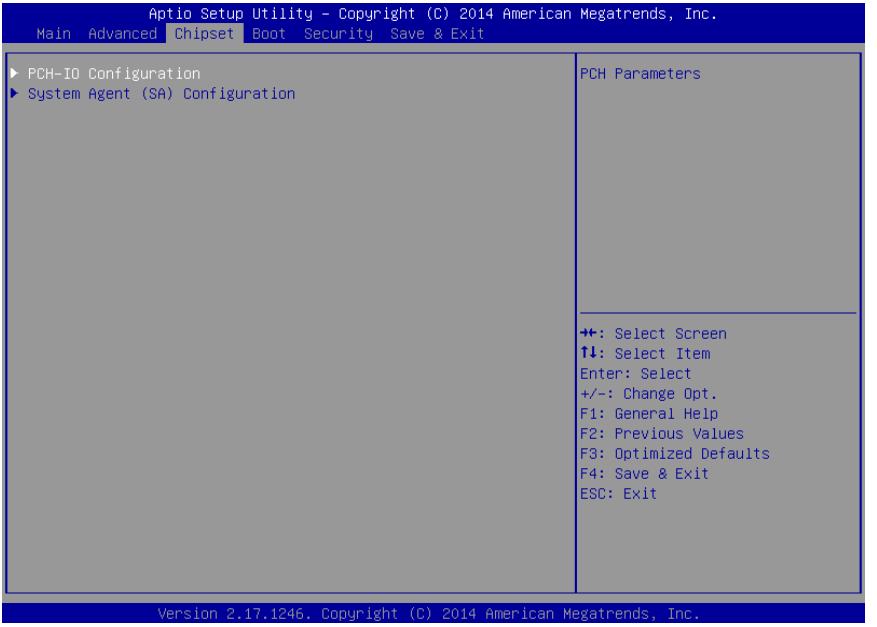
BIOS Setting	Options	Description/Purpose
Network stack	- Disabled - Enabled	Allows for enabling network capability during DXE stage and in UEFI shell

4-4-9. Advanced – Switchable Graphics

Switchable graphics screen

BIOS Setting	Options	Description/Purpose
SG Mode Select	*no changeable options*	Displays current state of graphics system configuration, for instance whether external PCIe graphics card is inserted or not.

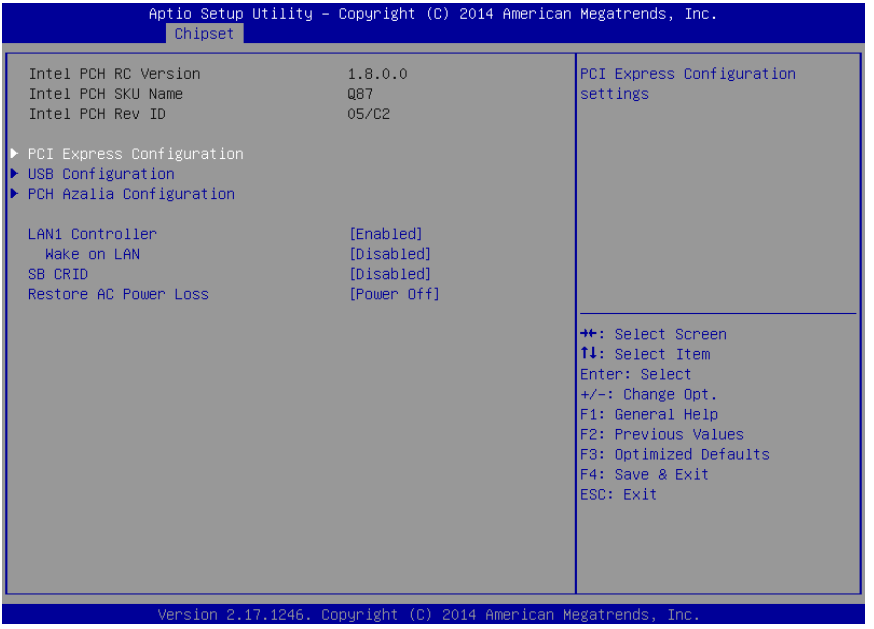
4-5. Chipset



Chipset screen

BIOS Setting	Options	Description/Purpose
PCH-IO Configuration	Sub-menu	Enters menu to configure integrated graphics & memory related items.
System Agent (SA) Configuration	Sub-menu	Enters menu to configure audio, USB and other items.

4-5-1. Chipset – PCH IO Configuration

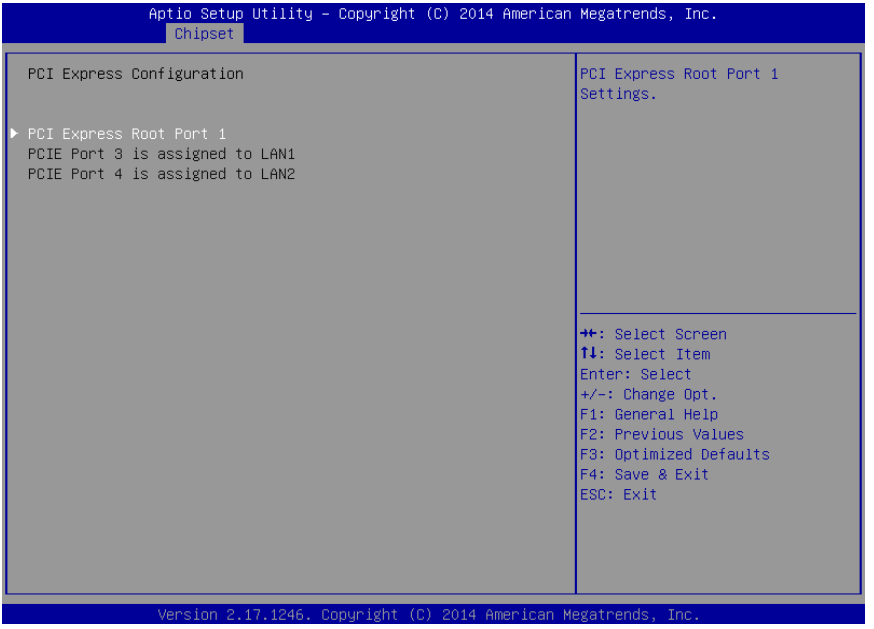


PCH IO Configuration screen

BIOS Setting	Options	Description/Purpose
Intel PCH RC Version	*no changeable options*	Displays UEFI module version for chipset.
Intel PCH SKU Name	*no changeable options*	Shows chipset model name.
Intel PCH Rev ID	*no changeable options*	Displays chipset's stepping version.
PCI Express Configuration	*sub-menu*	Controls options for PCIe devices.
USB Configuration	*sub-menu*	Enters menu to configure USB devices.
PCH Azalia Configuration	*sub-menu*	Enters menu to configure audio device.
LAN1 Controller	-disabled -enabled	Controls chipset internal PHY GbE device.
Wake on LAN	-disabled	Controls Wake on LAN (WoL) feature

BIOS Setting	Options	Description/Purpose
	-enabled	on internal PHY GbE device.
SB CRID	-disabled -enabled	Compatible Revision Identification (CRID) for chipset intended for forward compatibility. OS image built on the earlier stepping to be used on any new stepping(s) (if marked by Intel as compatible).
Power-Loss State	-Power Off -Power On	Section to configure the board behaviour if sudden loss of power should occur.

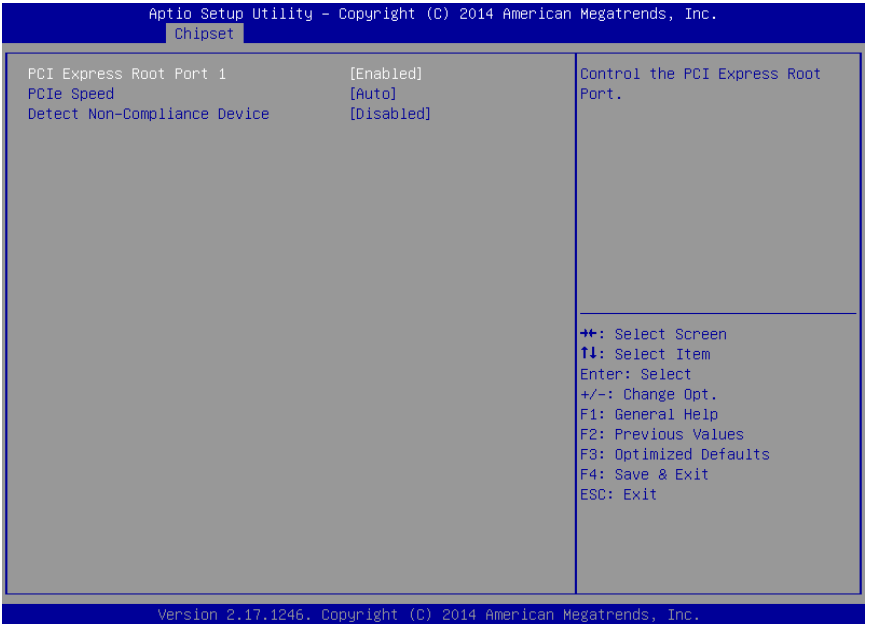
4-5-1-1. PCH IO Configuration - PCI Express Configuration



PCI Express Configuration screen

BIOS Setting	Options	Description/Purpose
PCI Express Root Port 1	*sub-menu*	Enters menu to control additional configuration for PCIe port 1.
PCIE Port 3 is assigned to LAN	*no changeable options*	Informs about GbE LAN 1 device location (hardwired by hardware design decision).
PCIE Port 4 is assigned to LAN	*no changeable options*	Informs about GbE LAN 2 device location (hardwired by hardware design decision).

4-5-1-1-1. PCI Express Configuration - PCI Express Root Port 1



PCI express root port 1 screen

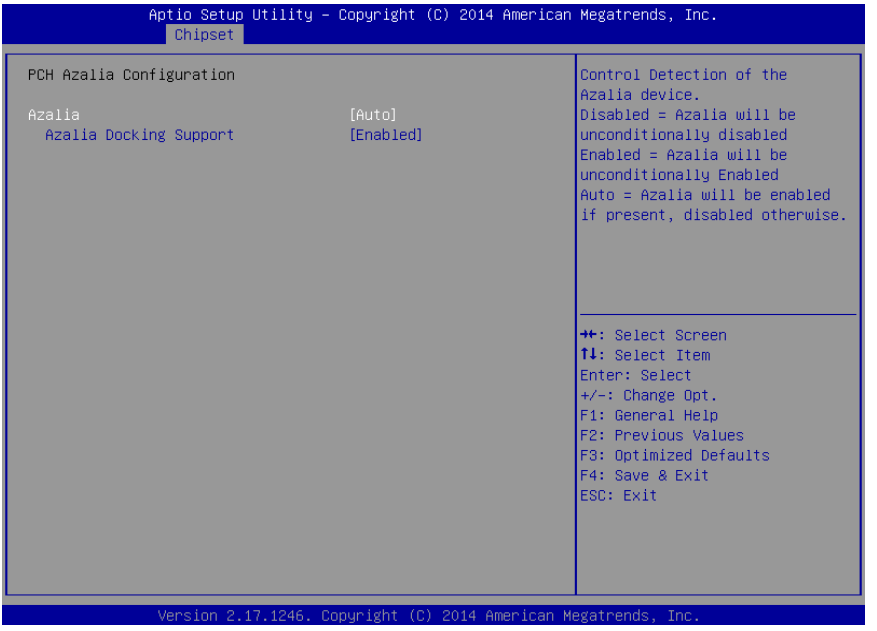
BIOS Setting	Options	Description/Purpose
PCI Express Root Port 1	-disabled -enabled	Controls PCIe x1 port number 1 (if card inserted).
PCIe Speed	-Auto -Gen1 -Gen2	Options to manually select PCIe card speed according to PCI Express Base 1.1 and PCI Express Base 2.0 specifications.
Detect Non-Compliance Device	-disabled -enabled	Enables or disables detection of non-compliance devices. This could resolve potential compatibility issues.

4-5-1-2. PCH IO Configuration - USB Configuration

USB Configuration screen

BIOS Setting	Options	Description/Purpose
USB Ports Per-Port Disable Control	-disabled -enabled	Allowing control USB precisely by each port.

4-5-1-3. PCH IO Configuration – PCH Azalia Configuration



PCH Azalia Configuration screen

BIOS Setting	Options	Description/Purpose
Azalia	- Enabled - Disabled - Auto	Controls Intel HD Audio controller (Realtek audio chip itself is located on the carrier board).
Azalia Docking Support	- Enabled - Disabled	Sets preference for docking feature on audio device.

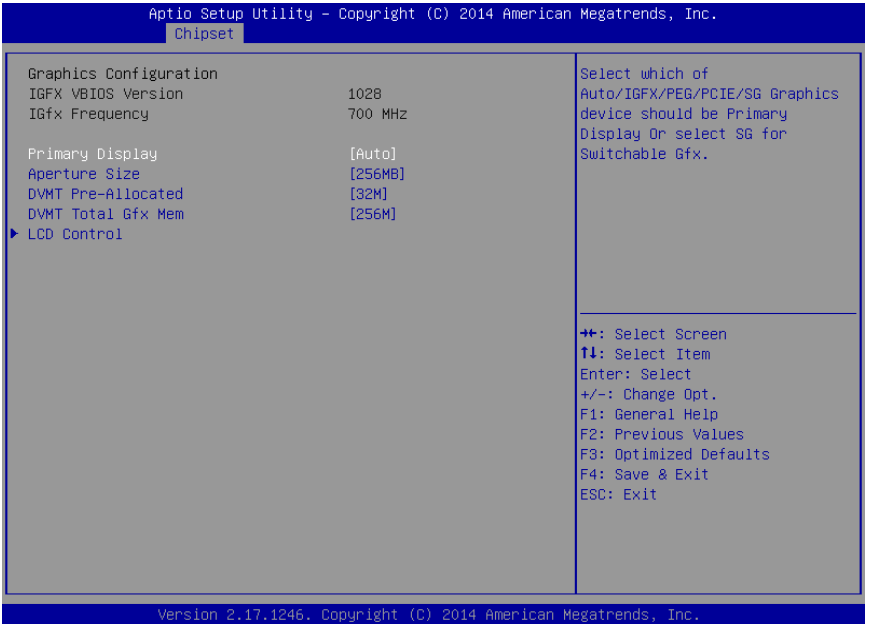
4-5-2. Chipset – System Agent (SA) Configuration

System Agent (SA) Configuration screen

BIOS Setting	Options	Description/Purpose
System RC Version	*no changeable options*	Displays current Intel Reference Code version.
VT-d Capability	*no changeable options*	Displays chipset's support for Intel VT-d.
VT-d	-disabled -enabled	Enables Intel Virtualization Technology for Directed I/O (Intel VT-x must be enabled first; see CPU menu).
Enable NB CRID	-disabled -enabled	Revision Identification (RID) for processor intended for forward compatibility.
Graphics Configuration	*sub-menu*	Enters menu to deal with graphics configuration settings.
NB PCIe	*sub-menu*	Menu to control additional settings

BIOS Setting	Options	Description/Purpose
Configuration		for PCIe add-on cards.
Memory Configuration	*sub-menu*	Allows controlling memory controller related options.

4-5-2-1. System Agent (SA) Configuration – Graphics Configuration

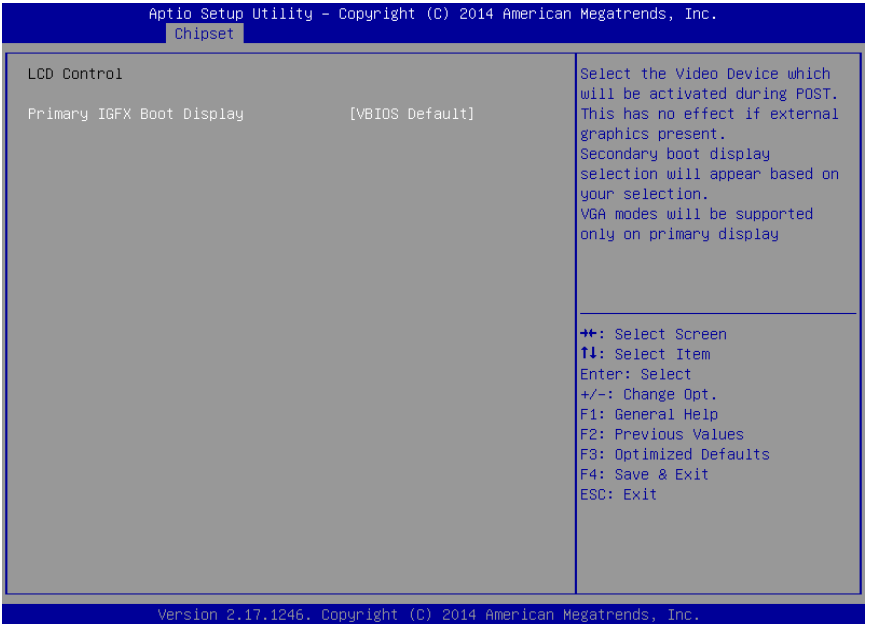


Graphics Configuration screen

BIOS Setting	Options	Description/Purpose
IGFX VBIOS Version	*no changeable options*	Displays Intel VBIOS version.
IGfx Frequency	*no changeable options*	Reports about graphics engine current frequency.
Primary Display	-Auto -IGFX -PEG -PCIE	Allows controlling which device (if applicable) is going to be used for graphical output initially.
Aperture Size	-128M -256M -512M	Specifies the size of the graphics memory aperture in function.
DVMT Pre-Allocated	-32M -64M …	Selects how big portion of main memory is going to be allocated for Intel Dynamic Video Memory

BIOS Setting	Options	Description/Purpose
	-1024M	Technology (DVMT).
DVMT Total Gfx Mem	-128M -256M -MAX	Controls amount of Dynamic Video Memory Technology (DVMT) total memory size for graphics engine.
LCD Control	*sub-menu*	Enters menu to configure active graphics output during boot.

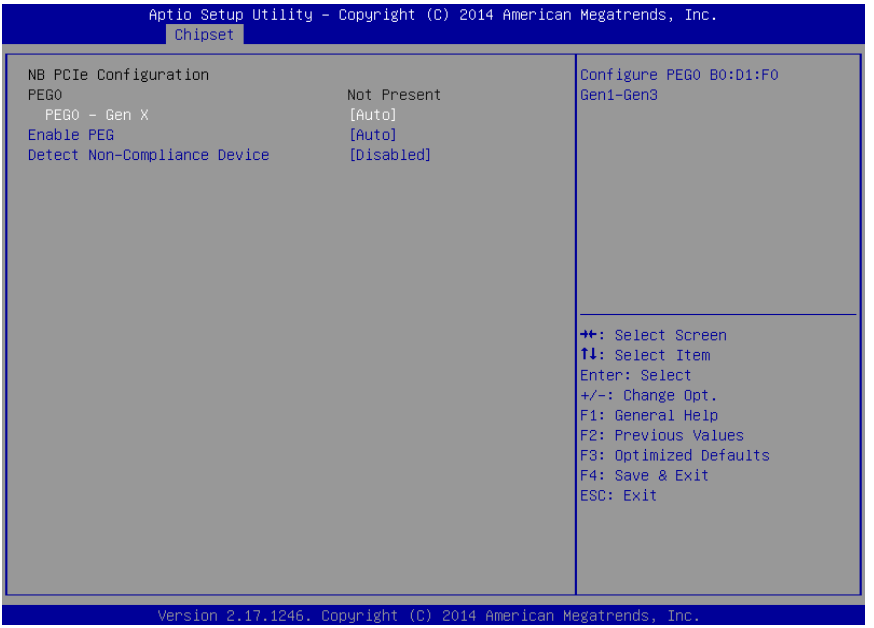
4-5-2-1-1. Graphics Configuration - LCD Control



LCD Control screen

BIOS Setting	Options	Description/Purpose
Primary IGFX Boot Display	-VBIOS Default -VGA (via DVI-I) -DVI-I -DVI-D -DisplayPort	Selects which screen is going to be active on power on.

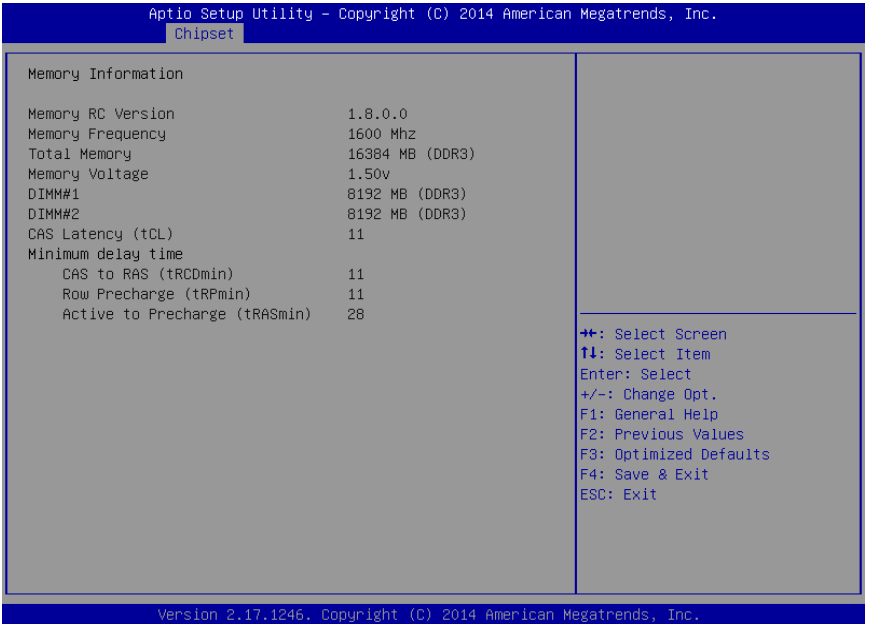
4-5-2-2. System Agent (SA) Configuration – NB PCIe Configuration



NB PCIe Configuration screen

BIOS Setting	Options	Description/Purpose
PEG0	No changeable options	Displays detected PCIe graphical card device.
PEG0 – Gen X	- Auto - Gen1 - Gen2 - Gen3	Allows controlling which mode is used for PCIe device (if inserted). This could resolve potential compatibility issues.
Enable PEG	- Disabled - Enabled - Auto	Controls PCIe Graphics port (if graphics card inserted).
Detect Non-Compliance Device	- Disabled - Enabled	Enables or disables detection of non-compliance devices. This could resolve potential compatibility issues.

4-5-2-3. System Agent (SA) Configuration – Memory Configuration

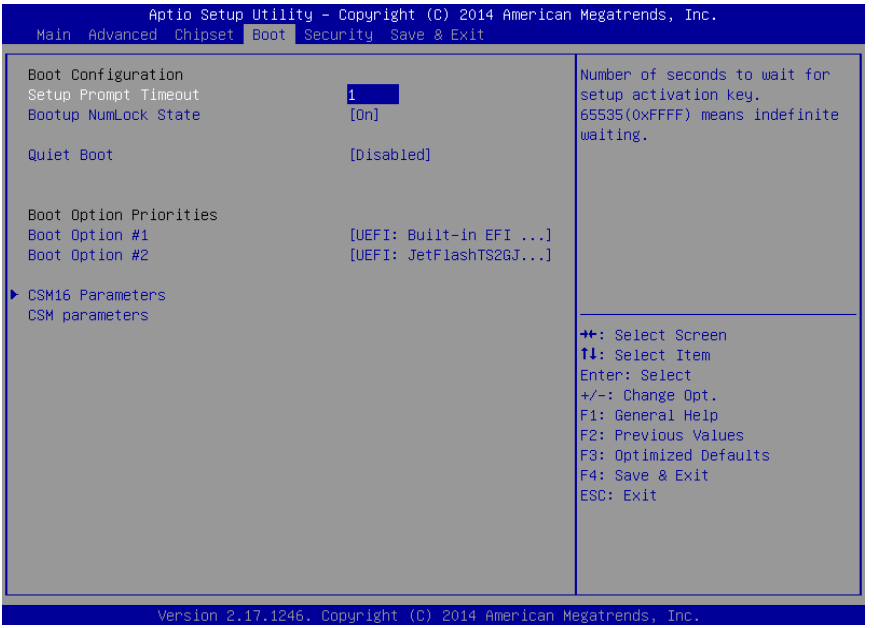


Memory Configuration screen

BIOS Setting	Options	Description/Purpose
Memory RC Version	*no changeable options*	Reports Intel Memory Reference Code (MRC) version.
Memory Frequency	*no changeable options*	Displays operating memory current speed in MHz.
Total Memory	*no changeable options*	Reports current total memory size, e.g. '2048 MB.'
Memory Voltage	*no changeable options*	Indicates memory modules voltage information as stored in SPD chip.
DIMM#1	*no changeable options*	Displays current amount of memory in DIMM slot number 1, e.g. '1024 MB.'
DIMM#2	*no changeable options*	Displays current amount of memory in DIMM slot number 2, e.g. '1024 MB.'
CAS Latency (tCL)	*no changeable options*	Displays specific value for memory module.

BIOS Setting	Options	Description/Purpose
CAS to RAS (tRCDmin)	*no changeable options*	Displays specific value for memory module.
Row Precharge (tRPmin)	*no changeable options*	Displays specific value for memory module.
Active to Precharge (tRASmin)	*no changeable options*	Displays specific value for memory module.

4-6. Boot



Boot screen

BIOS Setting	Options	Description/Purpose
Setup Prompt Timeout	*multiple options up to 65535 value*	Specifies number of seconds to wait for setup activation key (value 65535 results in indefinite waiting).
Bootup NumLock Status	-on -off	Specifies the power-on state of the numlock feature on the numeric keypad of keyboard.
Quiet Boot	-disabled -enabled	When quiet boot is enabled, it displays AMI or OEM logo (if implemented) instead of POST messages during the boot flow.
Boot Option #1	-[USB/DVD/ hard drive(s)] -built-in EFI shell -disabled	Allows setting up boot option(s) from menu listed.

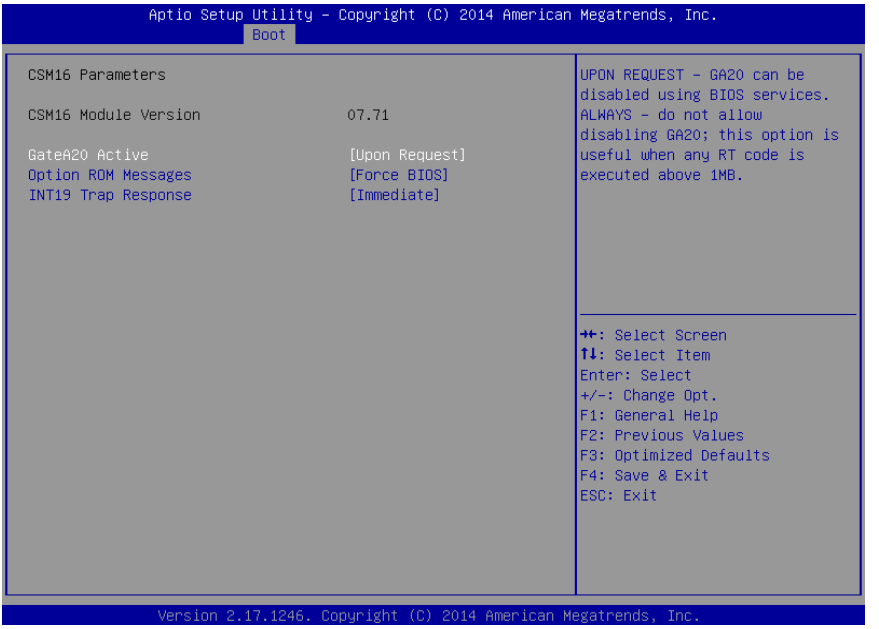
BIOS Setting	Options	Description/Purpose
CSM16 Parameters	*sub-menu*	Enters menu to configure CSM16 s peficic items.
CSM Parameters	*sub-menu*	Configures Compatibility Support M odule (CSM) related settings.

4-6-1. Boot – Hard Drive BBS Priorities

Hard drive BBS Priorities screen

BIOS Setting	Options	Description/Purpose
Boot Option #1	- [Drive(s)] - Disabled	Allows setting the boot order of available drive(s).

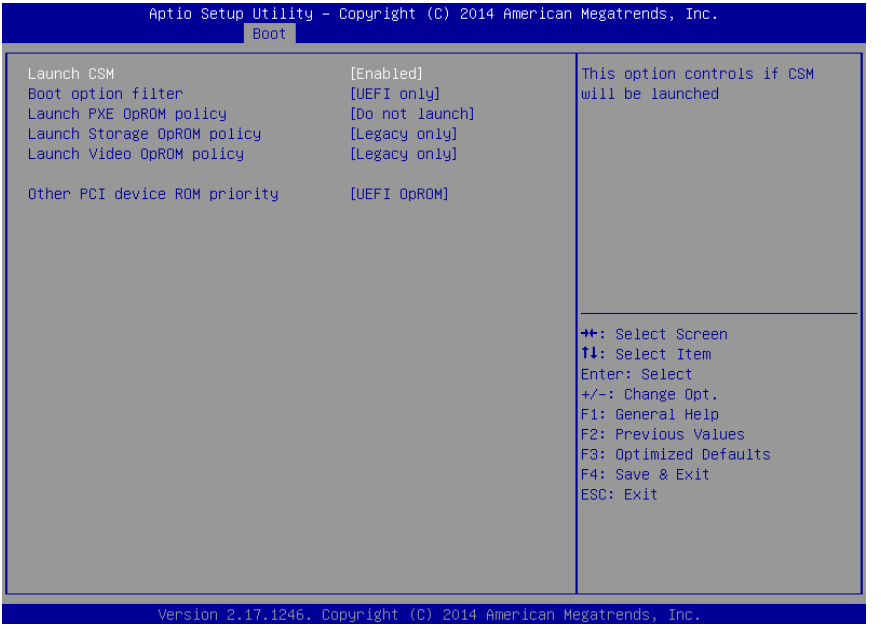
4-6-2. Boot – CSM16 Parameters



CSM16 Parameters screen

BIOS Setting	Options	Description/Purpose
GateA20 Active	-Upon Request -Always	Specifies Gate-A20 logic gate status. At boot time, Gate-A20 is enabled when counting and testing of all the system's memory and disabled before transferring control to OS.
Option ROM Messages	-Force BIOS -Keep Current	When set to **Force BIOS** it allows the POST screen to display Option ROM messages.
INT19 Trap Response	-Immediate -Postponed	When set to **immediate** the trap is executed right away in contrast to **postponed** which delays execution to legacy boot.

4-6-3. Boot – CSM Parameters

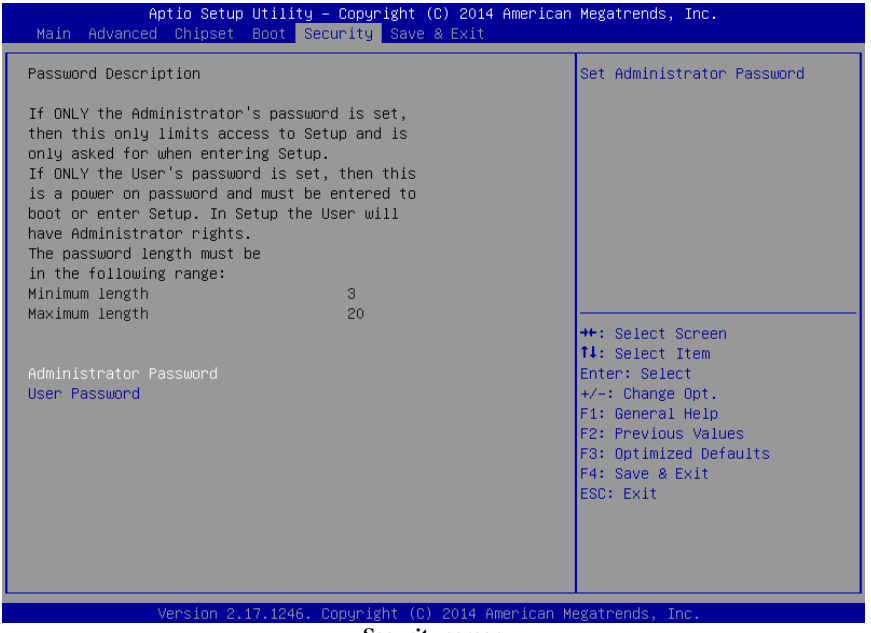


CSM Parameters screen

BIOS Setting	Options	Description/Purpose
Launch CSM	-disabled -enabled	Enables or disables Compatibility System Module (depends on operating system in use).
Boot option filter	-UEFI and Legacy -Legacy only -UEFI only	Set this option according to your operating systems installed.
Launch PXE OpROM policy	-Do not launch -UEFI only -Legacy only	Selection to control which Option ROM to use for PXE boot method.
Launch Storage OpROM policy	-Do not launch -UEFI only -Legacy only	Selection to control which Option ROM to use for storage system.
Launch Video OpROM policy	-Do not launch -UEFI only	Allows to select between GOP (UEFI) and VBIOS (legacy) to handle

BIOS Setting	Options	Description/Purpose
	-Legacy only	graphics output.
Other PCI device ROM priority	-UEFI OpROM -Legacy OpROM	Selection to control which Option ROM to use on PCI device(s) (if inserted).

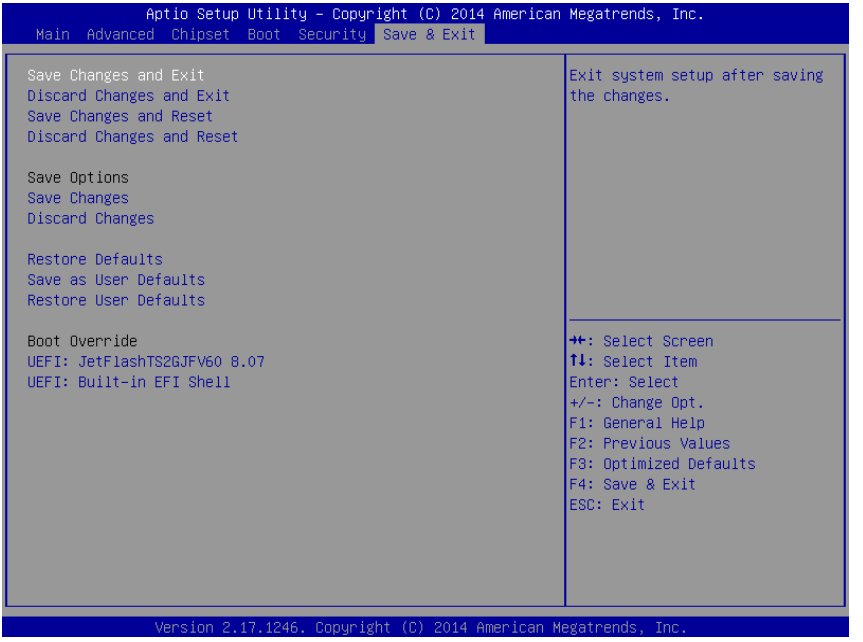
4-7. Security



Security screen

BIOS Setting	Options	Description/Purpose
Administrator Password	*password can be up to 20 alphanumeric characters*	Specifies the administrator password.
User Password	*password can be up to 20 alphanumeric characters*	Specifies the user password.
HDD Security Configuration	*sub-menu*	Enters sub-menu with option to enabled password protected HDD/SSD (if supported by connected SATA device).

4-8. Save & Exit



Save & Exit screen

BIOS Setting	Options	Description/Purpose
Save Changes and Exit	*no changeable options*	Exits and saves the changes in CMOS memory.
Discard Changes and Exit	*no changeable options*	Exits without saving any changes made in BIOS settings.
Save Changes and Reset	*no changeable options*	Saves the changes in CMOS memory and resets.
Discard Changes and Reset	*no changeable options*	Resets without saving any changes made in BIOS settings.
Save Changes	*no changeable options*	Saves the changes done in BIOS settings so far.
Discard Changes	*no changeable options*	Discards the changes done in BIOS settings so far.

BIOS Setting	Options	Description/Purpose
Restore Defaults	*no changeable options*	Loads the optimized defaults for BIOS settings.
Save as User Defaults	*no changeable options*	Saves the current values as user defaults.
Restore User Defaults	*no changeable options*	Loads the user defaults for BIOS settings.
Boot Override	-[drive(s)]	Forces to boot from selected [drive(s)] or UEFI shell

s

APPENDIX

A

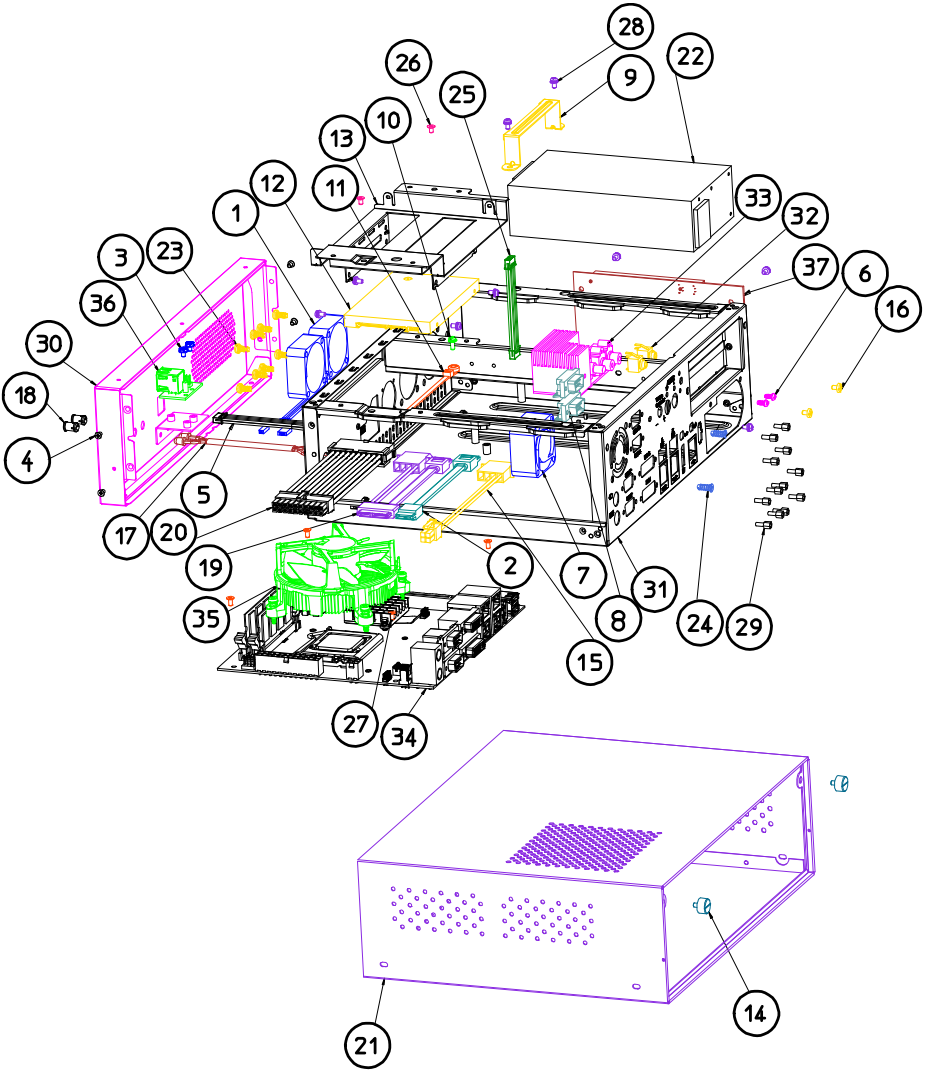
SYSTEM ASSEMBLY

This appendix contains the exploded diagram of the system.

Section includes:

- Exploded Diagram for Whole System of ST-1942

EXPLODED DIAGRAM FOR WHOLE SYSTEM OF ST-1942



NO.	COMPONENT NAME	PART NO.	Q'TY
1	SYSTEM FAN	21-004-04040382	1
2	SATA LOCK CABLE	27-008-31305031	1
3	HEX WASHER HEAD SCREW	22-252-30004011	2
4	FLAT HEAD SCREW	22-215-30005011	4
5	USB CABLE	27-006-32405111	1
6	PAN HEAD SCREW	22-132-30060011	2
7	SYSTEM FAN	21-004-04040008	1
8	COM PORT CABLE	27-024-23702031	2
9	POWER SUPPLY HOLDER	20-029-03001082	1
10	ROUND HEAD SPRING WASHER SCREW	22-232-30060211	1
11	CABLE TIE	90-015-04100000	1
12	HDD	SEE ORDER	1
13	DRIVER BAY	20-006-03001324	1
14	HANDEL HEAD SCREW	22-382-06005031	2
15	POWER CABLE	27-012-27203071	1
16	PAN HEAD SCREW	22-622-60005011	2
17	LED CABLE	27-018-08204071	1
18	LED CAP	90-014-02100000	2
19	SLIM SATA & POWER LOCK CABLE	27-008-15004081	1
20	POWER CABLE(20M to 20F)	27-012-27204071	1
21	TOP CHASSIS	20-015-03061324	1
22	POWER SUPPLY	52-001-23220601	1
23	PAN HEAD SCREW	22-122-40080011	8
24	FLAT HEAD SCREW	82-712-47011018	2
25	AUDIO CABLE	27-023-23302071	1
26	FLAT HEAD SCREW	22-212-30005311	2
27	FLAT HEAD SCREW	22-215-30060011	4
28	SPRING WASHER SCREW	22-232-30060211	9
29	HEX CU BOSS	22-692-40048051	12
30	FRONT COVER	20-004-03061324	1
31	INNER CHASSIS	20-015-03001324	1
32	SOUND CABLE	27-028-32402112	2
33	AUDIO BOARD	SR-1942RA-A0N	1
34	MAIN BOARD	SD-1942	1
35	CPU COOLER	81-003-09999001	1
36	USB BOARD	52-152-00861000	1
37	RISER CARD	SR-5076RA-R2N	1

TECHNICAL SUMMARY

APPENDIX

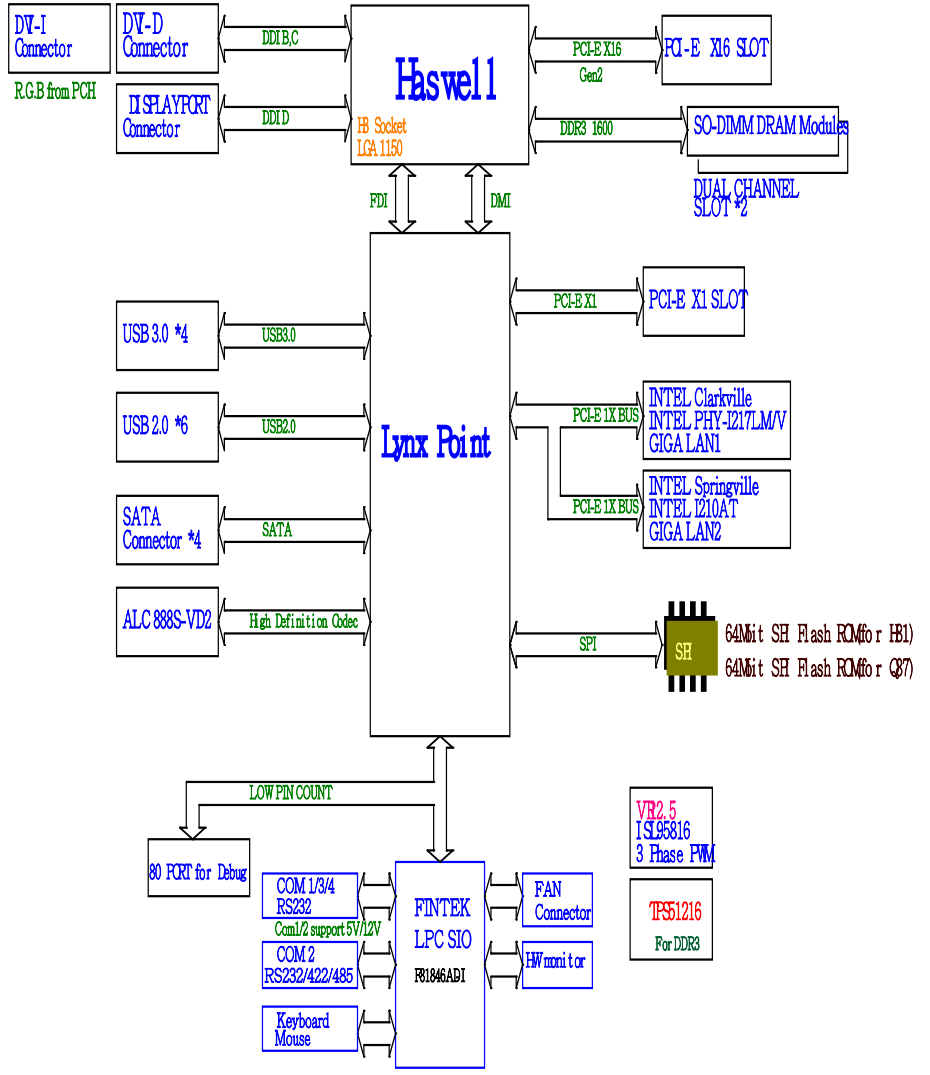
B

This section introduces you the maps concisely.

Section includes:

- Block Diagram
- Interrupt Map
- DMA Channels Map
- I/O Map
- Watchdog Timer Configuration
- Flash BIOS Update

BLOCK DIAGRAM



INTERRUPT MAP

IRQ	ASSIGNMENT
IRQ 0	System timer
IRQ 1	Standard PS/2 Keyboard
IRQ 3	Communications Port (COM2)
IRQ 4	Communications Port (COM1)
IRQ 8	System CMOS/real time clock
IRQ 10	Intel(R) 8 Series/C220 Series SMBus Controller
IRQ 10	PCI Serial Port
IRQ 11	Ethernet Controller
IRQ 11	PCI Simple Communications Controller
IRQ 12	Microsoft PS/2 Mouse
IRQ 13	Numeric data processor
IRQ 16	Intel(R) 8 Series/C220 Series USB Enhanced Host Controller #2
IRQ 16	High Definition Audio Controller
IRQ 19	Intel(R) 8 Series SATA AHCI Controller
IRQ 23	Intel(R) 8 Series/C220 Series USB Enhanced Host Controller #1
IRQ 81 - 190	Microsoft ACPI-Compliant System
IRQ	Intel(R) Ethernet Connection I217-LM
IRQ	Intel(R) HD Graphics 4600
IRQ	Intel(R) 8 Series/C220 Series PCI Express Root Port
IRQ	Intel(R) USB 3.0 eXtensible Host Controller
IRQ	Intel(R) 8 Series/C220 Series PCI Express Root Port

Note: The resource information were gathered on Windows 7. (The IRQ could be assigned differently depending on your OS.)

DMA CHANNELS MAP

TIMER CHANNEL	ASSIGNMENT
Channel 4	Direct memory access controller

I/O MAP

I/O MAP	ASSIGNMENT
0x000002F8-0x000002FF	Communications Port (COM2)
0x00001854-0x00001857	Motherboard resources
0x0000E000-0x0000E01F	Ethernet Controller
0x0000E000-0x0000E01F	Intel(R) 8 Series/C220 Series PCI Express Root Port
0x00000060-0x00000060	Standard PS/2 Keyboard
0x00000064-0x00000064	Standard PS/2 Keyboard
0x00000000-0x00000CF7	PCI bus
0x00000000-0x00000CF7	Direct memory access controller
0x00000D00-0x0000FFFF	PCI bus
0x00000070-0x00000077	System CMOS/real time clock
0x00000070-0x00000077	Motherboard resources
0x0000F040-0x0000F05F	Intel(R) 8 Series/C220 Series SMBus Controller
0x00000010-0x0000001F	Motherboard resources
0x00000022-0x0000003F	Motherboard resources
0x00000044-0x0000005F	Motherboard resources
0x00000072-0x0000007F	Motherboard resources
0x00000080-0x00000080	Motherboard resources
0x00000080-0x00000080	Motherboard resources
0x00000084-0x00000086	Motherboard resources
0x00000088-0x00000088	Motherboard resources
0x0000008C-0x0000008E	Motherboard resources
0x00000090-0x0000009F	Motherboard resources
0x000000A2-0x000000BF	Motherboard resources
0x000000E0-0x000000EF	Motherboard resources
0x000004D0-0x000004D1	Motherboard resources
0x000004D0-0x000004D1	Programmable interrupt controller
0x0000F0E0-0x0000F0E7	PCI Serial Port
0x00000020-0x00000021	Programmable interrupt controller
0x00000024-0x00000025	Programmable interrupt controller
0x00000028-0x00000029	Programmable interrupt controller
0x0000002C-0x0000002D	Programmable interrupt controller
0x00000030-0x00000031	Programmable interrupt controller

I/O MAP	ASSIGNMENT
0x00000034-0x00000035	Programmable interrupt controller
0x00000038-0x00000039	Programmable interrupt controller
0x0000003C-0x0000003D	Programmable interrupt controller
0x000000A0-0x000000A1	Programmable interrupt controller
0x000000A4-0x000000A5	Programmable interrupt controller
0x000000A8-0x000000A9	Programmable interrupt controller
0x000000AC-0x000000AD	Programmable interrupt controller
0x000000B0-0x000000B1	Programmable interrupt controller
0x000000B4-0x000000B5	Programmable interrupt controller
0x000000B8-0x000000B9	Programmable interrupt controller
0x000000BC-0x000000BD	Programmable interrupt controller
0x00000290-0x0000029F	Motherboard resources
0x000002A0-0x000002AF	Motherboard resources
0x0000F000-0x0000F03F	Intel(R) HD Graphics 4600
0x000003B0-0x000003BB	Intel(R) HD Graphics 4600
0x000003C0-0x000003DF	Intel(R) HD Graphics 4600
0x0000002E-0x0000002F	Motherboard resources
0x0000004E-0x0000004F	Motherboard resources
0x00000061-0x00000061	Motherboard resources
0x00000063-0x00000063	Motherboard resources
0x00000065-0x00000065	Motherboard resources
0x00000067-0x00000067	Motherboard resources
0x00000092-0x00000092	Motherboard resources
0x000000B2-0x000000B3	Motherboard resources
0x00000680-0x0000069F	Motherboard resources
0x0000FFFF-0x0000FFFF	Motherboard resources
0x0000FFFF-0x0000FFFF	Motherboard resources
0x0000FFFF-0x0000FFFF	Motherboard resources
0x00001C00-0x00001CFE	Motherboard resources
0x00001D00-0x00001DFE	Motherboard resources
0x00001E00-0x00001EFE	Motherboard resources
0x00001F00-0x00001FFE	Motherboard resources
0x00001800-0x000018FE	Motherboard resources
0x0000164E-0x0000164F	Motherboard resources

I/O MAP	ASSIGNMENT
0x00000040-0x00000043	System timer
0x00000050-0x00000053	System timer
0x000000F0-0x000000F0	Numeric data processor
0x0000F0D0-0x0000F0D7	Intel(R) 8 Series SATA AHCI Controller - 8C03
0x0000F0C0-0x0000F0C3	Intel(R) 8 Series SATA AHCI Controller - 8C03
0x0000F0B0-0x0000F0B7	Intel(R) 8 Series SATA AHCI Controller - 8C03
0x0000F0A0-0x0000F0A3	Intel(R) 8 Series SATA AHCI Controller - 8C03
0x0000F060-0x0000F07F	Intel(R) 8 Series SATA AHCI Controller - 8C03
0x00000081-0x00000091	Direct memory access controller
0x00000093-0x0000009F	Direct memory access controller
0x000000C0-0x000000DF	Direct memory access controller
0x000003F8-0x000003FF	Communications Port (COM1)

WATCHDOG TIMER CONFIGURATION

The I/O port address of the watchdog timer is 2Eh (in hex) and 2Fh. Address 2Eh is the address port, while 2Fh is the data port. User must first assign the address of register by writing address value into address port 2Eh, then write/read data to/from the assigned register through data port 2Fh.

Configuration Sequence

To program F81846A configuration registers, the following configuration sequence must be followed:

1. enter the extended function mode
2. configure the configuration registers
3. exit the extended function mode

Enter the extended function mode

To place the chip into the Extended Function Mode, two successive writes of 0x87 must be applied to *Extended Function Enable Registers* (EFERs, i.e. 2Eh or 4Eh).

Configure the configuration registers

The chip selects the Logical Device and activates the desired Logical Devices through *Extended Function Index Register* (EFIR) and *Extended Function Data Register* (EFDR). The EFIR is located at the same address as the EFER, and the EFDR is located at address (EFIR+1). First, write the Logical Device Number (i.e. 0x07) to the EFIR and then write the number of the desired Logical Device to the EFDR. If accessing the Chip (Global) Control Registers, this step is not required. Secondly, write the address of the desired configuration register within the Logical Device to the EFIR and then write (or read) the desired configuration register through the EFDR.

Exit the extended function mode

To exit the Extended Function Mode, writing 0xAA to the EFER is required. Once the chip exits the Extended Function Mode, it is in the normal running mode and is ready to enter the configuration mode.

Step by step Example

Enable and start watchdog timer, while set 30 seconds as timeout interval:

Step 1 Enter to extended function mode

```
Mov     dx,     2eh
Mov     al,     87h
Out     dx,     al
Out     dx,     al
```

Step 2 Select Logical Device 7 of watchdog timer

```
Mov     al,     07h
Out     dx,     al
Inc     dx
Mov     al,     07h
Out     dx,     al
```

Step 3 Enable watchdog feature

```
Mov     al,     30h
Out     dx,     al
Inc     dx
Mov     al,     01h
Out     dx,     al
```

Step 4 Enable watchdog PME

```
Dec     dx
Mov     al,     fah
Out     dx,     al
Inc     dx
In      al,     dx
And     al,     51h
Out     dx,     al
```

Step 5 Set seconds as counting unit

```
Dec     dx
Mov     al,     f5h
Out     dx,     al
Inc     dx
In      al,     dx
And     al,     20h
Out     dx,     al
```

Step 6 Set timeout interval as 30 seconds and start counting

```
Dec     dx
Mov     al,     f6h
Out     dx,     al
Inc     dx
Mov     al,     1eh
Out     dx,     al
```

Step 7 Exit the extended function mode

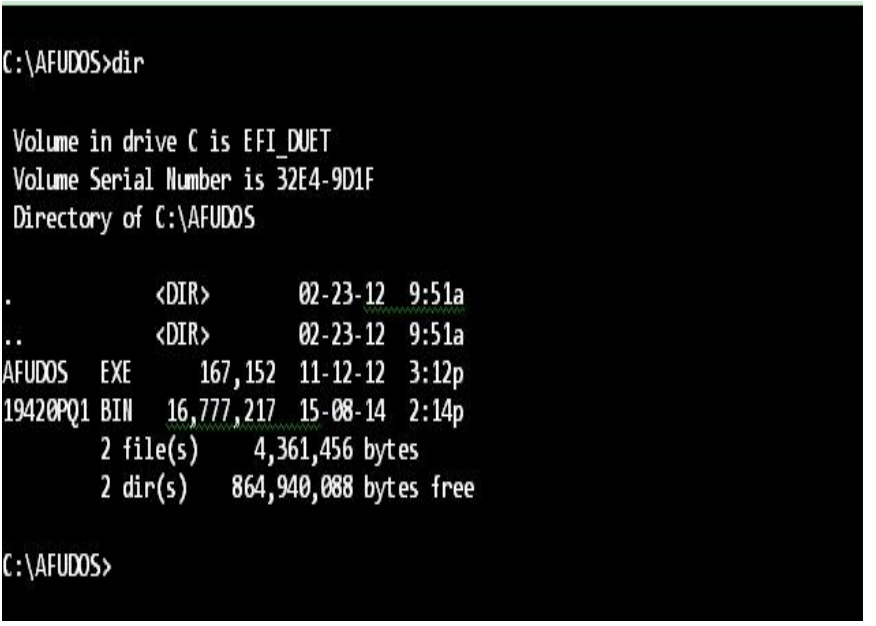
```
Dec     dx
Mov     al,     aah
Out     dx,     al
```

FLASH BIOS UPDATE

I. Before system BIOS update

With the afudos (AMI Firmware Update for MS-DOS) 3.05.02 BIOS update utility you can update the BIOS from bootable USB flash drive or other bootable USB media.

1. Prepare a bootable media (e.g. USB storage device) which can boot system to DOS prompt.
2. Download and save the BIOS file (e.g. 59420PH1.bin) to the bootable device.
3. Copy AMI flash utility – AFUDOS.exe (V3.05.02) into the bootable device



All required files for the BIOS update is shown as in Figure 1

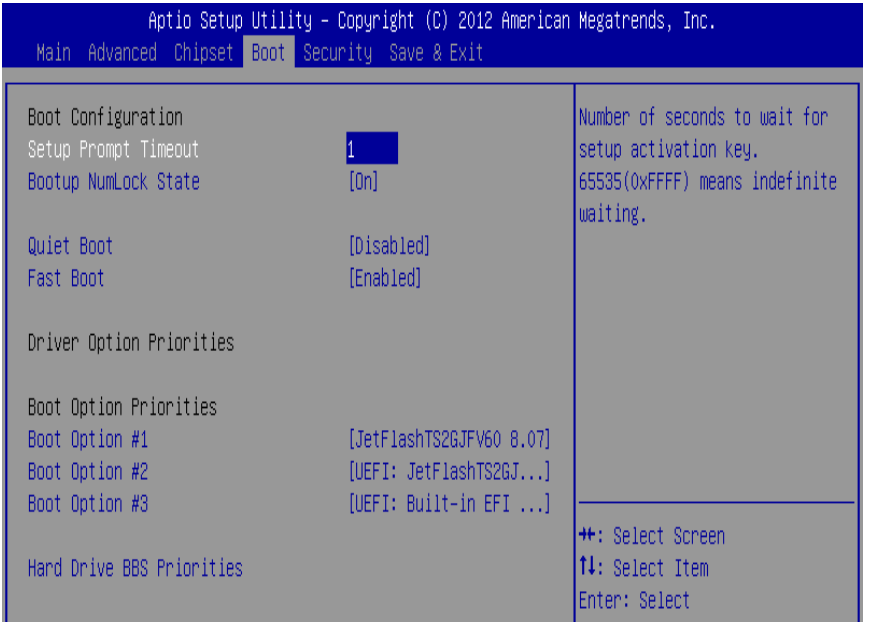
4. Make sure the target system can first boot to the bootable device.
   a.) Connect the bootable USB device.
   b.) Turn on the computer and press <Del> or <F2l> key during boot to enter BIOS setup menu.

c.) System will go into the BIOS setup menu.

d.) Select [Boot] menu as the picture shows below.

e.) Select [Hard Drive BBS Priorities], set the USB bootable device as the 1st boot device.

f.) Press <F4> key to save configuration and exit the BIOS setup menu



BIOS option to boot from the USB device illustrated as in Figure 2

II. AFUDOS command for system BIOS update

AFUDOS.exe is aforementioned AMI firmware update utility; the command line is shown as below:

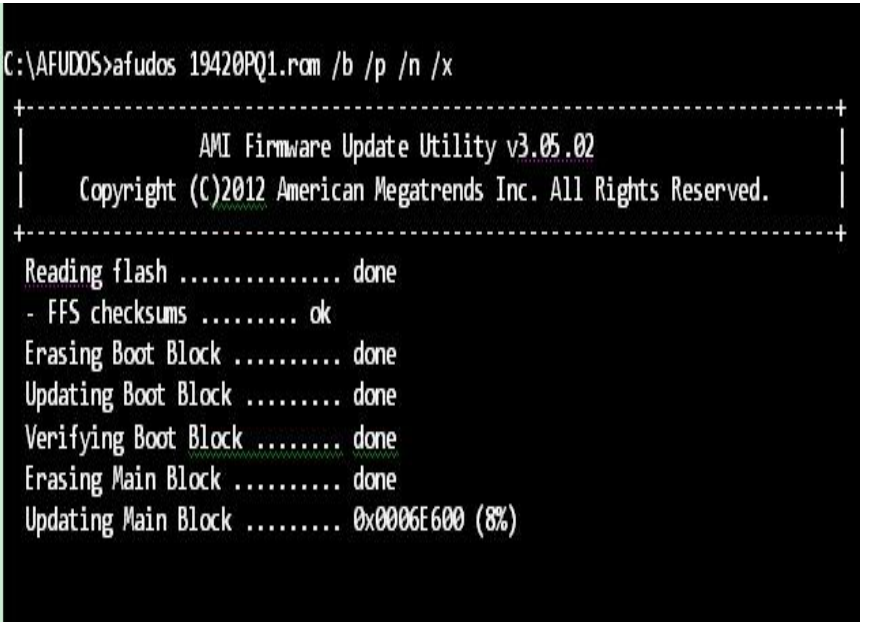
AFUDOS <ROM File Name> [option1] [option2]…

You can type AFUDOS /? to see all the definition of each control options. The recommended options for BIOS ROM update consist of following parameters:

/P: program main BIOS image
/B: program Boot Block
/N: program NVRAM
/X: don't check ROM ID

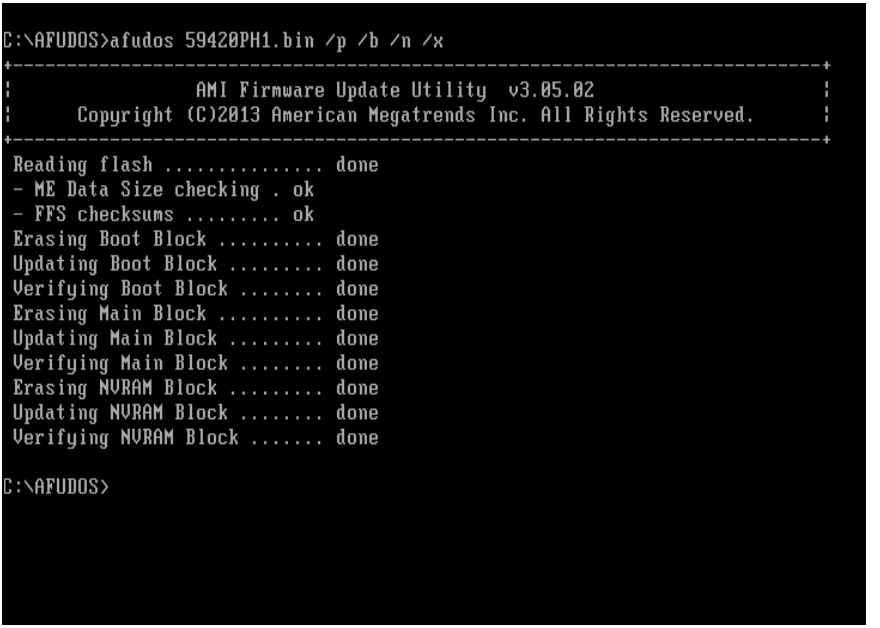
III. BIOS update procedure

1. Use the bootable USB device to boot up system into the MS-DOS command prompt
2. Type in AFUDOS 19420PQx.bin /p /b /n /x and press enter to to launch BIOS update process where 19420PQx.rom is the filename of intended bin file (in this example 19420PQ1.bin).
3. During the update procedure, you will see the BIOS update process status and its percentage. Beware! Do not turn off or reset your computer before the update is complete, or it may crash the BIOS ROM and make the system unable to boot up next time. The whole update process may take up to 3 minutes.



Update in progress shown as in Figure 3

4. After the BIOS update is complete, the messages from AFUDOS utility should be like the figure shown below.



Already finished BIOS update process is displayed as in Figure 4

5. You can restart the system and boot up with new BIOS now
6. Update is complete after restart
7. Verify during the following boot that BIOS version displayed at the initialization screen has changed.

New BIOS version displayed during boot is shown as in Figure 5

Important Notes:

- Downgrading the BIOS to an earlier version is not recommended and may not be supported. An earlier BIOS version may not contain the support for the latest processors, bug fixes, critical security updates, or support the latest board revisions currently being manufactured.

- Before initiating a BIOS update, be sure to read and precisely follow the instructions included in this document. You may wish to print the instructions for easy reference.

- If a BIOS update process is interrupted, your computer may not function properly. We recommend the process be done in an environment with a steady power supply (preferably with UPS).

- If desired, before updating the BIOS manually record all BIOS settings that have been changed (from default) so they can be restored after completing the BIOS update.

- All images and instructions in this example are specific to the ST-1942 product and are for illustration purposes only.