

USER MANUAL

EL 1097

Intel® Core Mobile i7 / i5
/ i3 Processor Compact
and Fanless Embedded
PC

EL 1097

Intel[®] Core Mobile i7/ i5/ i3 Processor Compact and Fanless Embedded PC

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DISCLAIMER

This user's manual is meant to assist users 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 may occur when the battery is incorrectly replaced. Replace the battery only with the same or equivalent type recommended by the manufacturer. Dispose of used batteries according to the manufacturer's instructions.



WARNING: Some internal parts of the system may have high electrical voltage. We strongly recommend that only qualified engineers are allowed to service and disassemble the system. If any damages should occur on the system and are caused by unauthorized servicing, it will not be covered by the product warranty.

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Revision History

The revision history of SE-1097 User Manual is described below:

Version No.	Revision History	Date
M2	<ul style="list-style-type: none">• Remove Backplane Connector (JDock1)• Revised the descriptions of JP6 and JP_EDP1 jumper.• Added SR-1097-GZZ-1 ~ SR-1097-GZZ-10 Daughter Boards connector pin assignment and jumper setting information.• Added Section 4.11 API Package Content.• Updated the BIOS version in Chapter 5 and Appendix B.	2020/07/20
M1	Initial Release	2019/08

1

Introduction

This chapter provides the introduction for the EL 1097 system as well as the framework of the user manual.

The following topic is included:

- About This Manual

1.1 About This Manual

Thank you for purchasing our EL 1097 system. The EL 1097 is an updated system designed to be comparable with the highest performance of IBM AT personal computers. The EL1097 provides faster processing speed, greater expandability and can handle more tasks than before. This manual is designed to assist you how to install and set up the whole system. It contains 5 chapters and 2 appendixes. Users can configure the system according to their own needs. This user manual is intended for service personnel with strong hardware background. It is not intended for general users.

The following section outlines the structure of this user manual.

Chapter 1 Introduction

This chapter provides the introduction for EL 1097 system as well as the framework of the user manual.

Chapter 2 Getting Started

This chapter describes the package contents and outlines the system specifications. Read the safety reminders carefully on how to take care of your system properly.

Chapter 3 System Configuration

This chapter outlines the locations of the motherboard components and their respective functions. You will learn how to set the jumpers and configure the system to meet your own needs.

Chapter 4 Software Utilities

This chapter contains helpful information for proper installations of the Intel Chipset Software Installation Utility, Intel Management Engine Installation Utility, Graphics Driver Utility, LAN Driver Utility, Sound Driver Utility, RAID Driver Utility, Serial IO Driver installation and FINTEK® F81601 PCIE to CANBus Installation Utility.

Chapter 5 AMI BIOS Setup

This chapter indicates you how to change the BIOS configurations.

Appendix A System Assembly Diagram

This appendix provides the exploded diagrams and part numbers of the EL 1097.

Appendix B Technical Summary

This appendix provides the information about the system block diagram, allocation maps for system resources, Watchdog Timer Configuration and Flash BIOS Update.

2

Getting Started

This chapter provides the information for the EL 1097 system. It describes how to set up the system quickly and outlines the system specifications.

The following topics are included:

- Package List
- System Overview
- System Specification
- Safety Precautions

Experienced users can go to Chapter 3 System Configuration on page 3-1 for a quick start.

2.1 Package List

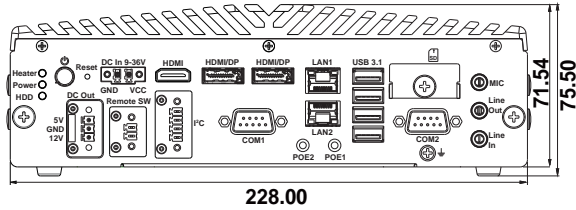
If you discover any of the items listed below are damaged or lost, please contact your local distributor immediately.

Item	Q'ty
EL 1097	1
User Manual	1
Driver DVD	1

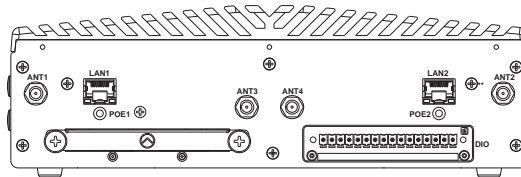
2.2 System Overview

Unit: mm

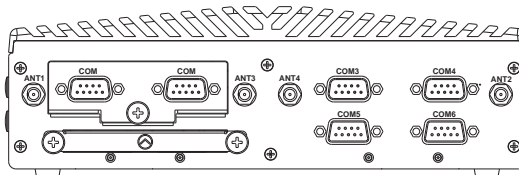
2.2.1 Front View



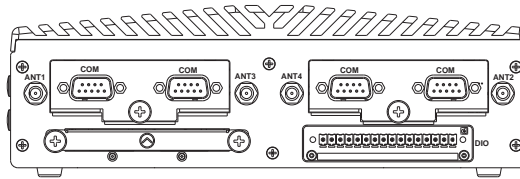
2.2.2 Rear View – PoE LAN



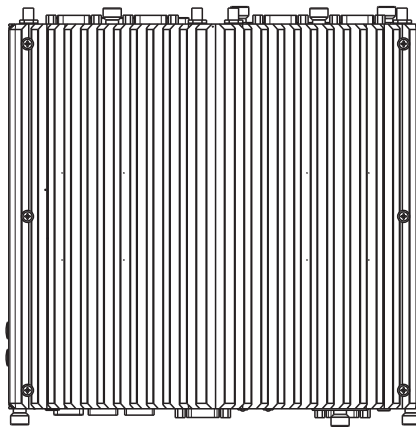
2.2.3 Rear View – COM



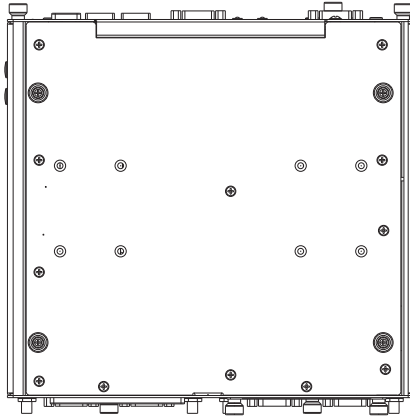
2.2.4 Rear View – I/O Expansion



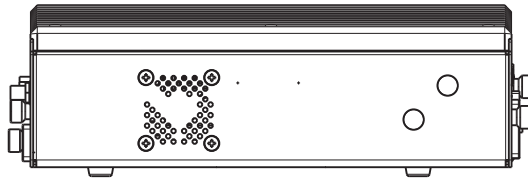
2.2.5 Top View



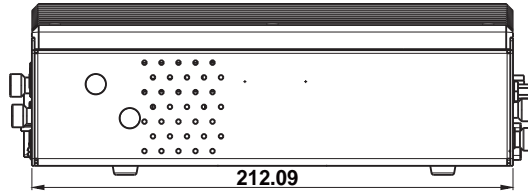
2.2.6 Bottom View



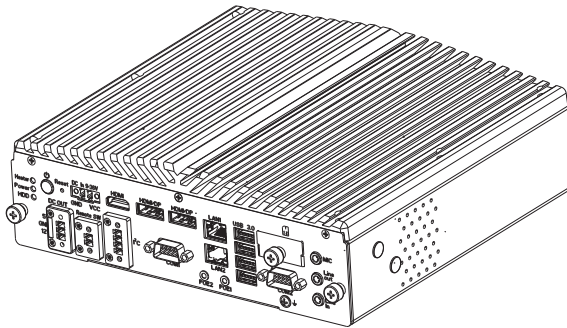
2.2.7 Left Side View



2.2.8 Right Side View

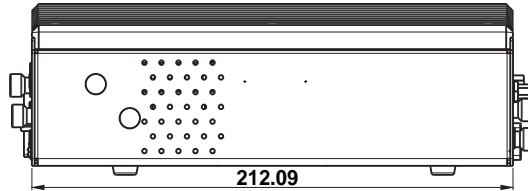


2.2.9 Quarter View

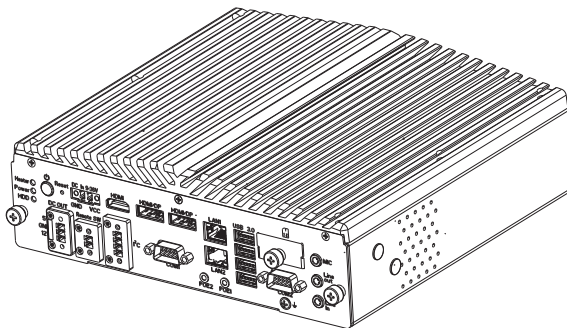


2.2.10 Accessory

Wall Mount



Din Rail

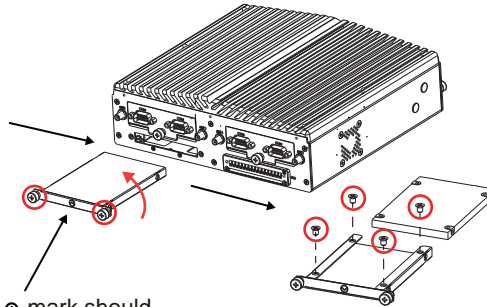


2.2.11 HDD Easy Maintenance

Step 1. Release the two screws of HDD tray.

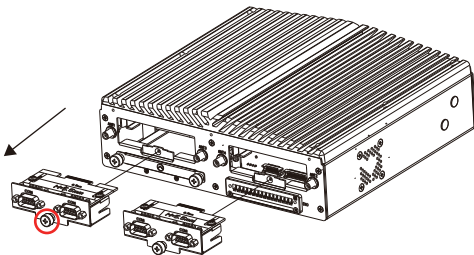
Step 2. Pull out HDD tray.

Heed the  mark should be directed upwards when you push back HDD tray.



Step 3. Release the four screws of HDD tray.

2.2.12 Installing I/O Expansion Board



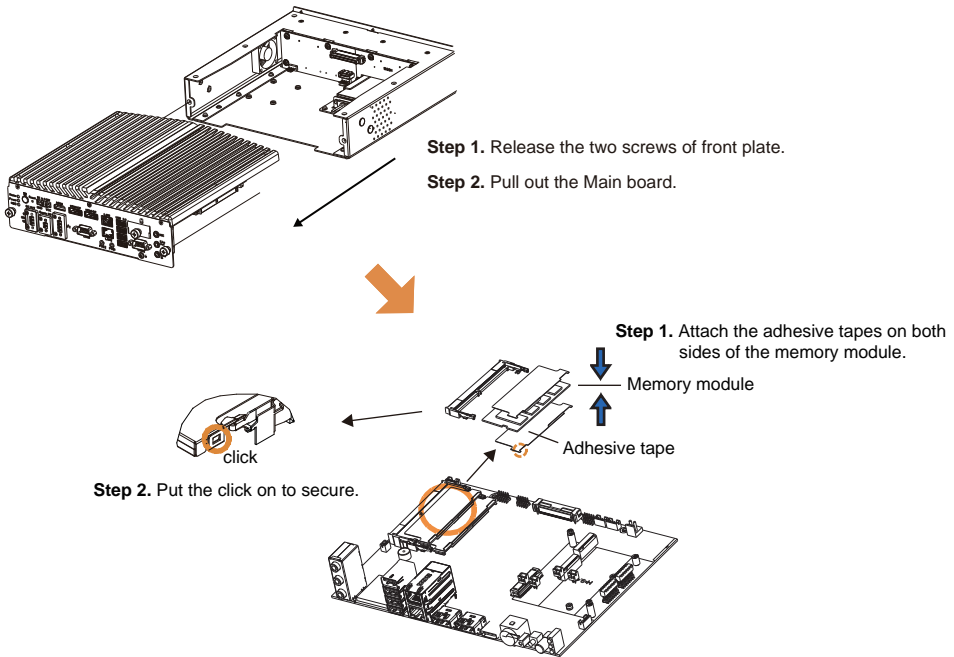
Step 1. Release the screw of I/O board.

Step 2. Pull out the I/O board.

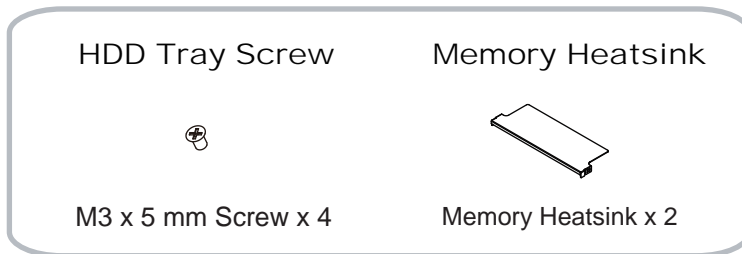
Optional I/O Expansion Port

- => Lan Board
- => COM Board
- => USB Board
- => Parallel Port Board
- => CANBus Board

2.2.13 Installing Memory and Extension Module



2.2.14 HDD & Memory Accessories



2.3 System Specifications

System	
CPU Type	<ul style="list-style-type: none"> ➤ Intel Core™ i7-8665UE (4C) 1.70 GHz ➤ Intel Core™ i5-8365UE (4C) 1.60 GHz ➤ Intel Core™ i3-8145UE (2C) 2.2 GHz ➤ Intel Celeron 4305UE (2C) 2.0GHz
Memory Support	➤ 2 x DDR4 2400 SO-DIMM socket, memory up to 32GB
Operating System	<ul style="list-style-type: none"> ➤ Windows® 10 IoT Enterprise LTSC 2019 64bit ➤ Ubuntu18.04 LTS
BIOS	➤ AMI SPI BIOS
WatchDog Timer	➤ 1~255 seconds
Drive Bay	<ul style="list-style-type: none"> ➤ 1 x 2.5" SATAIII HDD or SSD drive space ➤ 1 x M.2 PCIe or SATAIII drive space
Power Input	➤ DC In 9~36V
Power Output	➤ DC 5V/12V/GND
Expansion Slots	<ul style="list-style-type: none"> ➤ 1 x full-sized Mini PCIe (PCIe+USB2.0) ➤ 1 x M.2 slot (2242-D2-E), PCIe / USB2.0 Support (USB2.0 only for core i) ➤ 1 x M.2 slot (2242-D2-B), PCIe/SATA Support ➤ 1 x SD slot (SD/SDHC/SDXC) ➤ 2 x I/O expansion slot ➤ TPM 2.0 (FW/HW)
Wall Mount	<ul style="list-style-type: none"> ➤ Wall mount ➤ Din-Rail
System Weight	➤ 3kg
Dimensions (W x H x D)	➤ 228.00 x 71.27 x 212.09mm
Certifications	➤ CE / FCC
I/O Ports (Front side)	
USB	➤ 4 x USB3.1 (Gen2)
Serial Ports	<ul style="list-style-type: none"> ➤ 2 x COM1/2 for RS232/422/485 (selectable under BIOS) [COM 1/2 for +5v/+12v/RI selectable by jumper] ➤ 6 x COM1/2/3/4 for RS232/422/485 (selectable under BIOS) [COM1/2 for +5v/+12v/RI selectable by jumper] (optional)

LAN	<ul style="list-style-type: none"> ➤ 2 x RJ45 connector with PSE/PD, support Wake-On-LAN / PXE ➤ 2 x RJ45 connector with PSE + 2 x RJ45 connector with PSE/PD, support Wake-On-LAN / PXE (optional) # PSE: IEEE 802.3 AT 54V/25.5W (each port) (optional) # PD: Input IEEE 802.3 AT 54V/25.5W (each port) (optional)
LED Indicator	<ul style="list-style-type: none"> ➤ 1 x Power On indicator (yellow) ➤ 1 x HDD indicator (green) ➤ 1 x negative temp. indicator (red) ➤ 2 x PoE power indicators (green)
Antenna Holes	➤ 4 x antenna holes
Drive Bay	<ul style="list-style-type: none"> ➤ 1 x 2.5" SATAIII HDD or SSD drive space ➤ 1 x M.2 PCIe or SATAIII drive space
Digital I/O	➤ 8 In / 8 Out (optional)
I ² C	➤ 1 x 4-pin Terminal block (optional)
DC Out	➤ 1 x 3-pin terminal block (DC 5/12V/GND) (optional)
Power remote switch	➤ 1 x 2-pin terminal block (optional)
Audio	<ul style="list-style-type: none"> ➤ 1 x Line Out ➤ 1 x Line In ➤ 1 x Mic In
Display	<ul style="list-style-type: none"> ➤ 1 x 4K HDMI (limitation: no sound signal, no hot plug) ➤ 2 x 4K HDMI/DP (selectable under BIOS)
Ground	➤ 1 x M3 hole
Optional I/O Expansion Port	
LAN	➤ 2 x RJ45 connector, support Wake-On-LAN/ PXE
COM	➤ 2 x COM for RS-232/422/485 (selectable under BIOS)
USB	➤ 3 x USB2.0
Parallel Port	➤ 2 x DSUB 26-pin connector
CANBus	➤ 2 x DSUB 9-pin connector
Environment	
Operating Temperature (with airflow)	<p>Non wide-ranged temp. HDD / SSD</p> <ul style="list-style-type: none"> ➤ HDD: 0°C ~40°C (32°F ~ 113°F) ➤ SSD: 0°C ~50°C (32°F ~ 122°F)

	With wide-ranged temp. SSD
	➤ 0° ~ 60° C (32°F ~ 140°F) @humidity 20~95% (without heater, with PoE)
	➤ 0° ~ 70° C (32°F ~ 158°F) @humidity 20~95% (without heater, PoE)
	➤ -40° ~ 60° C (-40°F ~ 140°F) @humidity 20~95% (with heater, PoE)
	➤ -40° ~ 70° C (-40°F ~ 158°F) @humidity 20~95% (with heater, without PoE)
Storage Temperature	➤ -40°C ~ 85°C (-40°F ~ 185°F)
Humidity	➤ Operating Humidity: 20%~ 90%
	➤ Storage Humidity: 20%~ 95%

2.4 Safety Precautions

Before operating this system, read the following information carefully to protect your systems from damages, and extend the life cycle of the system.

1. Check the Line Voltage
 - The operating voltage for the power supply should be within the range of 100V to 240V AC; otherwise, the system may be damaged.
2. Environmental Conditions
 - Place your EL 1097 on a sturdy, level surface. Be sure to allow enough space around the system to have easy access needs.
 - Avoid installing your EL 1097 system in extremely hot or cold places.
 - Avoid direct sunlight exposure for a long period of time. (For example, in a closed car in summer time, avoid the system from any heating device also.) Or do not use EL 1097 when it has been left outdoors in a cold winter day.
 - Avoid moving the system rapidly from a hot place to a cold place, and vice versa, because condensation may occur inside the system.
 - Protect your EL 1097 from strong vibrations which may cause hard disk failure.
 - Do not place the system too close to any radio-active device. Radio-active device may cause signal interference.
 - Always shut down the operating system before turning off the power.
3. Handling
 - Avoid placing heavy objects on the top of the system.
 - Do not turn the system upside down. This may cause the hard drive to malfunction.
 - Do not allow any objects to fall into this device.
 - If water or other liquid spills into the device, unplug the power cord immediately.
4. Good Care
 - When the outside case gets stained, remove the stains using neutral washing agent with a dry cloth.
 - Never use strong agents such as benzene and thinner to clean the surface of the case.
 - If heavy stains are present, moisten a cloth with diluted neutral washing agent or alcohol and then wipe thoroughly with a dry cloth.
 - If dust is accumulated on the case surface, remove it by using a special vacuum cleaner for computers.

3

System Configuration

This chapter contains helpful information about the jumper & connector settings, and component locations for the main board.

The following topics are included:

- Connector & Jumper Quick Reference Table
- Main Board Component Locations
- How to Set Jumpers
- Setting Main Board Connectors and Jumpers

3.1 Connector & Jumper Quick Reference Table

CONNECTOR Description	NAME
Clear CMOS Data Selection	JCMOS1
Case Open Detection	JP2
SATA / PCIE Mode Selection	JP3
HDMI/DP Mode Selection	JP6
AT / ATX Mode Selection	JP_AT1
COM1 RI/5V/12V Voltage Selection	JP_COM1
COM2 RI/5V/12V Voltage Selection	JP_COM2
DISPLAY 1 HDMI/DP Mode Selection	JP_EDP1
I2C Voltage Selection	JP_I2C1
TPM Selection	JP_TPM1
Flash Descriptor Security Override Selection	J2H1

CONNECTOR Description	NAME
Front I/O Port Connectors	
COM Port	COM1, COM2
HDMI / DP Connector	DISPLAY1, DISPLAY2
HDMI Port Connector	HDMI1
4 x USB 3.1 Connectors	USB1
PoE LAN Connectors	LAN1, LAN2
Remote Power Button Connector	J_PBTN1
Power Input Connectors	PWR_IN1, PWR_IN2
HD Audio Connector	AUDIO1
I2C Wafer	JI2C1, JI2C2, JI2C3
SD Card Connector	SDCARD1
Mainboard Top Side Connectors	
Mini PCI Express Slot	M_PCIE1
PD Connector	JPD1

CONNECTOR Description	NAME
PSE Connector	JPSE1
LPC / TPM Connector	JP1
MCU Update Firmware Connector	JMCU1
DC Power Output Connector	JVOUT1
Heater Connector	JHEAT1
POE Connector	JPOE1
RTC Battery Connector	JBAT1
Update BIOS Connector	JSPI_1
Speaker Connector	JSPK1
PCIe/ mSATA Module Slot	JM1
WIFI / BT Module Slot	JM2

3.2.1 Top View and Jumper Settings of SB-1097

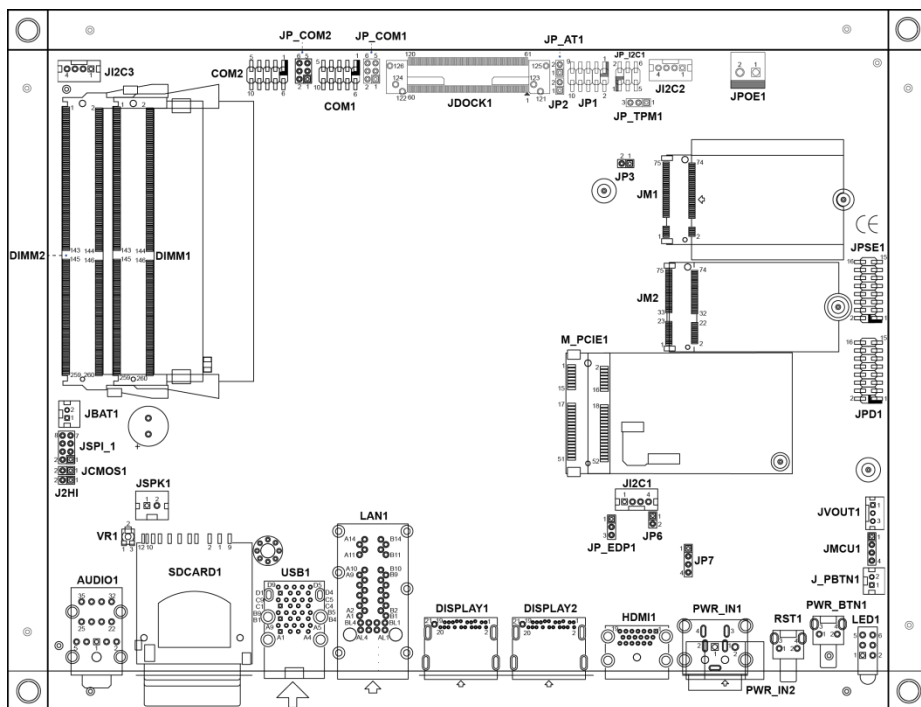





Figure 3-1. Main Board Component Location (Top View)

	<p>WARNING: Always disconnect the power cord when you are working with connectors and jumpers on the main board. Make sure both the system and peripheral devices are turned OFF as sudden surge of power could damage sensitive components. Make sure the main board is properly grounded.</p>
	<p>CAUTION: Observe precautions while handling electrostatic sensitive components. Make sure to ground yourself to prevent static charge while you are working on the connectors and jumpers. Use a grounding wrist strap and place all electronic components in any static-shielded devices.</p>
	<p>CAUTION: Always touch the main board components by the edges. Never touch components such as a processor by its pins. Take special cares while you are holding electronic circuit boards by the edges only. Do not touch the main board components.</p>

3.2.2 Bottom View of SB-1097

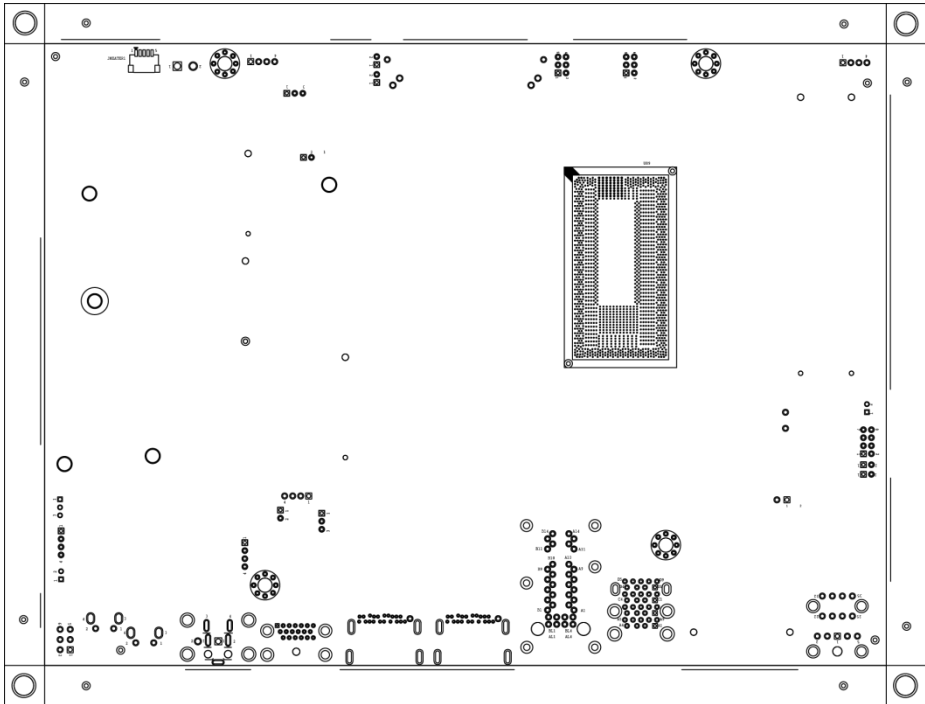


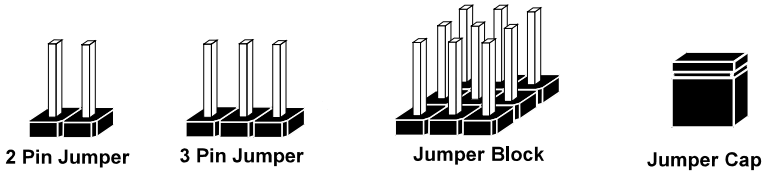
Figure 3-2. Main Board Component Location (Bottom View)

3.3 How to Set Jumpers

You can configure your board by setting the jumpers. A jumper consists of two or three metal pins with a plastic base mounted on the card. 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 configure your hardware settings by "opening" or "closing" jumpers.

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

Jumpers & Caps

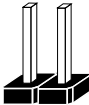


If a jumper has three pins, for example, labeled 1, 2 and 3. You can connect pins 1 and 2 to create one setting and shorting. You can also select to connect pins 2 and 3 to create another setting. The format of the jumper picture will be illustrated throughout this manual. The figure below shows different types of jumpers and jumper settings.

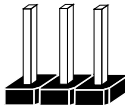
Jumper diagrams



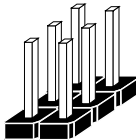
Jumper Cap looks like this



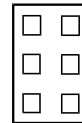
2 pin Jumper looks like this



3 pin Jumper looks like this



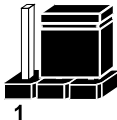
Jumper Block looks like this



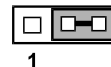
Jumper settings



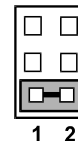
2 pin Jumper closed(enabled)
looks like this



3 pin Jumper
2-3 pin closed(enabled)
looks like this



Jumper Block
1-2 pin closed(enabled)
looks like this

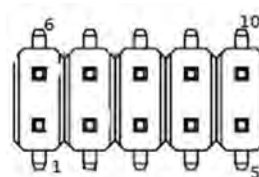


3.4 Setting Connectors and Jumpers

3.4.1 COM Port (COM1, COM2)

COM1 (RS-232/RS422/RS485) Connector Pin Assignment:

PIN	ASSIGNMENT		
	RS232 <i>(Default Setting)</i>	RS422	RS485
1	COM1_DCD_R	TX-	RS-485-
2	COM1_RXD_R	TX+	RS-485+
3	COM1_TXD_R	RX+	X
4	COM1_DTR_R	RX-	X
5	GND	GND	GND
6	COM1_DSR_R	X	X
7	COM1_RTS_R	X	X
8	COM1_CTS_R	X	X
9	COM1_RI_SEL	X	X

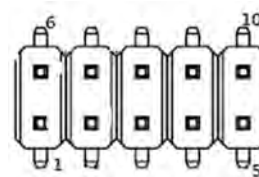


COM1

Notes: COM1_RI_SEL. Through the jumper you can choose signal RI/12V/5V on JP_COM1

COM2 (RS-232/RS422/RS485) Connector Pin Assignment:

PIN	ASSIGNMENT		
	RS232 <i>(Default Setting)</i>	RS422	RS485
1	COM2_DCD_R	TX-	RS-485-
2	COM2_RXD_R	TX+	RS-485+
3	COM2_TXD_R	RX+	X
4	COM2_DTR_R	RX-	X
5	GND	GND	GND
6	COM2_DSR_R	X	X
7	COM2_RTS_R	X	X
8	COM2_CTS_R	X	X
9	COM2_RI_SEL	X	X



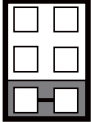
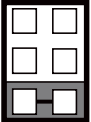
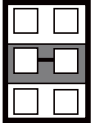
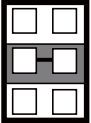
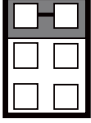
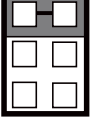
COM2

Notes: COM2_RI_SEL. Through the jumper you can choose signal RI/12V/5V on JP_COM2

3.4.2 COM1 Pin9 and COM2 PIN9 Definition Selection Guide (JP_COM1, JP_COM2)

Jumper Location: JP_COM1, JP_COM2

Description: COM1 pin9 (JP_COM1) and COM2 pin9 (JP_COM2) RI/5V/12V Selection

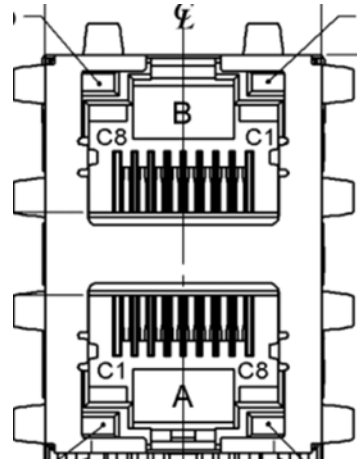
SELECTION	JUMPER SETTING	JUMPER ILLUSTRATION	
RI	1-2 (Default Setting)	 JP_COM1	 JP_COM2
+12V	3-4	 JP_COM1	 JP_COM2
+5V	5-6	 JP_COM1	 JP_COM2

3.4.3 LAN1, LAN2 Ports (LAN1, LAN2)

Port Name: LAN1, LAN2

Description: 2 x LAN RJ45 Port

PIN	ASSIGNMENT
A1	LAN1_MDI0_DN
A2	LAN1_MDI0_DP
A3	LAN1_MDI1_DN
A4	LAN1_MDI1_DP
A5	LAN1_MDI2_DN
A6	LAN1_MDI2_DP
A7	LAN1_MDI3_DN
A8	LAN1_MDI3_DP
A9	LAN1_VCT
A10	GND
A11	TXCT(N56962126)
A12	RXCT(N56962106)
A13	SPR1(N56965977)
A14	SPR2(N56965974)
AL1	LAN1_LED_LINK_N_R
AL2	LAN1_LED_ACT
AL3	LAN1_LED_100_N_R
AL4	LAN1_LED_1000_N_R
P1	GND
P2	GND
P3	GND
P7	SHLD7(NC)
B1	LAN1_MDI0_DN
B2	LAN1_MDI0_DP
B3	LAN1_MDI1_DN
B4	LAN1_MDI1_DP
B5	LAN1_MDI2_DN
B6	LAN1_MDI2_DP
B7	LAN1_MDI3_DN
B8	LAN1_MDI3_DP
B9	LAN1_VCT
B10	GND
B11	TXCT(N56966943)
B12	RXCT(N56966944)
B13	SPR1(N56965890)
B14	SPR2(N56965874)
BL1	LAN2_LED_LINK_N_R
BL2	LAN2_LED_ACT
BL3	LAN2_LED_100_N_R
BL4	LAN2_LED_1000_N_R



LAN1 / LAN2

PIN	ASSIGNMENT
P4	GND
P5	GND
P6	GND
P8	SHLD7(NC)

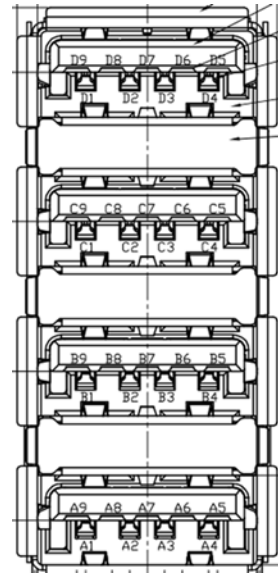
3.4.4 4 x USB 3.1 Connectors (USB1)

Port Name: USB1

Description: USB 3.1 Ports x 4 (including 4 x USB 2.0 Ports)

USB 3.0 signals:

PIN	ASSIGNMENT	PIN	ASSIGNMENT
A1	USB_12_VCC5	A9	USB3_TX_P1_L
A2	USB2_N1_L	A8	USB3_TX_N1_L
A3	USB2_P1_L	A7	GND
A4	GND	A6	USB3_RX_P1_L
-	-	A5	USB3_RX_N1_L
B1	USB_12_VCC5	B9	USB3_TX_P2_L
B2	USB2_N2_L	B8	USB3_TX_N2_L
B3	USB2_P2_L	B7	GND
B4	GND	B6	USB3_RX_P2_L
-	-	B5	USB3_RX_N2_L
C1	USB_34_VCC5	C9	USB3_TX_P3_L
C2	USB2_N3_L	C8	USB3_TX_N3_L
C3	USB2_P3_L	C7	GND
C4	GND	C6	USB3_RX_P3_L
-	-	C5	USB3_RX_N3_L
D1	USB_34_VCC5	D9	USB3_TX_P4_L
D2	USB2_N4_L	D8	USB3_TX_N4_L
D3	USB2_P4_L	D7	GND
D4	GND	D6	USB3_RX_P4_L
-	-	D5	USB3_RX_N4_L

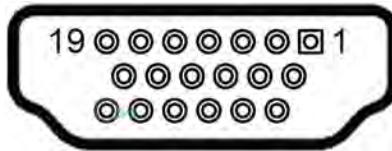


USB1

3.4.5 HDMI Port Connector (HDMI1)

Port Location: HDMI1

Description: Display Port Connector



HDMI1

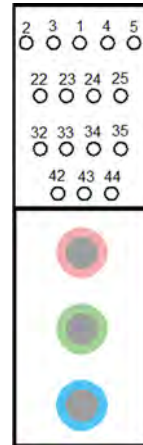
PIN	ASSIGNMENT	PIN	ASSIGNMENT
1	HDMI_D2+	2	GND
3	HDMI_D2-	4	HDMI_D1+
5	GND	6	HDMI_D1-
7	HDMI_D0+	8	GND
9	HDMI_D0-	10	HDMI_D3+
11	GND	12	HDMI_D3-
13	CEC	14	RSVD
15	HDMI_CLK	16	HDMI_DATA
17	GND	18	+5V
19	HDMI_HPD	20	-

3.4.6 HD Audio Connector (AUDIO1)

Connector Location: AUDIO1

Description: HD Audio Connector for Line In/Line Out/Mic In

PIN	ASSIGNMENT
2	HD_MIC1-L
3	HD_GND
1	HD_GND
4	MIC1-JD
5	HD_MIC1-R
22	LINE-OUT-L
23	HD_GND
24	Jack_Sense
25	LINE-OUT-R
32	HD_LINE-IN-L_L
33	HD_GND
34	LINE_IN_SEN
35	HD_LINE-IN-R_L
42	NC
43	NC
44	NC



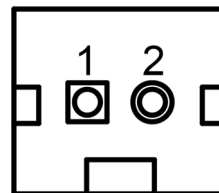
AUDIO1

3.4.7 Speaker Connector (JSPK1)

Connector Location: JSPK1

Description: Speaker Connector

PIN	ASSIGNMENT
1	ROUTP
2	ROUTN



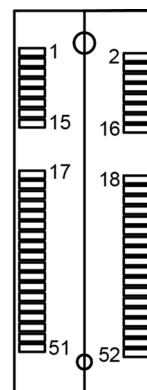
JSPK1

3.4.8 Mini PCI Express Slot (M_PCIE1)

Connector Location: M_PCIE1

Description: Mini-PCI Express Slot

PIN	ASSIGNMENT	PIN	ASSIGNMENT
1	4G_WAKE_N	2	V3P3A_4G
3	NC	4	GND
5	NC	6	VCC1_5_M_PCIE
7	NC	8	NC
9	GND	10	NC
11	CLK_DN_MINIPCI	12	NC
13	CLK_DP_MINIPCI	14	NC
15	GND	16	NC
17	NC	18	GND
19	NC	20	W_4G_DISABLE_N
21	GND	22	mPCIE1_RSTN
23	PCIE_RXDN_MINIPCI	24	V3P3A_4G
25	PCIE_RXDP_MINIPCI	26	GND
27	GND	28	VCC1_5_M_PCIE
29	GND	30	SMB_DATA
31	PCIE_TXDN_MINIPCI	32	SMB_CLK
33	PCIE_TXDP_MINIPCI	34	GND
35	GND	36	USB2_P2_DN
37	GND	38	USB2_P2_DP
39	V3P3A_4G	40	GND
41	V3P3A_4G	42	NC
43	NC	44	NC
45	NC	46	NC
47	NC	48	VCC1_5_M_PCIE
49	NC	50	GND
51	NC	52	V3P3A_4G



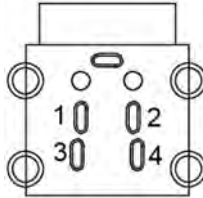
M_PCIE1

Mini PCI Express is the successor of the Mini PCI card and provides an increased data throughput. The cards have a detached network interface and are equipped with one lane. They are used in particular in embedded designs or compact box PCs.

3.4.9 DC Power Input Connector (PWR_IN1)

Connector Location: PWR_IN1

Description: DC Power Input Connector



PWR_IN1

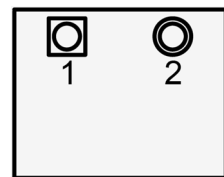
PIN	ASSIGNMENT	PIN	ASSIGNMENT
1	GND	2	GND
3	WIDE_POWERIN(N55844851)	4	WIDE_POWERIN(N55844851)

3.4.10 Power Input Connector (PWR_IN2)

Connector Location: PWR1_IN2

Description: Power Input Connector

PIN	ASSIGNMENT
1	WIDE_POWERIN(N55844851)
2	GND

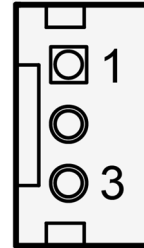


PWR1_IN2

Note: PWR_IN1 & PWR_IN2 are co-lay. (Default: PWR_IN2)

3.4.11 DC Power Output Connector (JVOUT1)**Port Location:** JVOUT1**Description:** 3-pin Power Output Connector

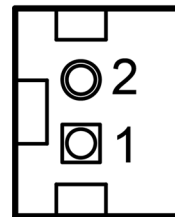
PIN	ASSIGNMENT
1	V5P0
2	GND
3	V12P0



JVOUT1

3.4.12 Remote Power Button Connector (J_PBTN1)**Connector Location:** J_PBTN1**Description:** Remote Power Button Connector

PIN	ASSIGNMENT
1	PWRBTN#
2	GND



J_PBTN1

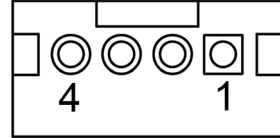
3.4.13 I2C Wafer (JI2C2, JI2C1, JI2C3)

Connector Location: JI2C2, JI2C1, JI2C3 (for SW Debug)

Description: I2C Wafer

JI2C1 Connector Pin Assignment:

PIN	ASSIGNMENT
1	GND
2	JI2C2_V
3	GPPC_C19_I2C1_SCL
4	GPPC_C18_I2C1_SDA



I2C1/ I2C2/ I2C3

Note: I2C1_V. Through the jumper you can choose 12V or 5V on JP_I2C1.

JI2C2 Connector Pin Assignment:

PIN	ASSIGNMENT
1	GND
2	JI2C2_V
3	GPPC_C17_I2C0_SCL
4	GPPC_C16_I2C0_SDA

Note: JI2C2_V. Through the jumper you can choose 12V or 5V on JP_I2C1.

JI2C3 Connector Pin Assignment:

PIN	ASSIGNMENT
1	GPPC_C13_UART1_TXD_UART1
2	GPPC_C12_UART1_RXD_UART1
3	NC
4	GND

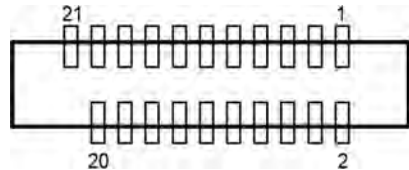
3.4.14 HDMI / DP Connector (DISPLAY1, DISPLAY2)

Connector Location: DISPLAY1, DISPLAY2

Description: HDMI / DP Connector

DISPLAY1 Connector Pin Assignment:

PIN	ASSIGNMENT
1	DP0_TX0_DP_C_A
2	GND
3	DP0_TX0_DN_C_A
4	DP0_TX1_DP_C_A
5	GND
6	DP0_TX1_DN_C_A
7	DP0_TX2_DP_C_A
8	GND
9	DP0_TX2_DN_C_A
10	DP0_TX3_DP_C_A
11	GND
12	DP0_TX3_DN_C_A
13	G_CEC_A
14	G_NC_A
15	AUXP_SCL_A
16	G_SDA_A
17	AUXN_G_A
18	DPHPD_HDMI5V_A
19	RE_HDMIHPD_A
20	DP_VCC3_A
21	DETECT(N56078490)



DISPLAY1 / DISPLAY2

DISPLAY2 Connector Pin Assignment:

PIN	ASSIGNMENT
1	DP0_TX0_DP_C_C
2	GND
3	DP0_TX0_DN_C_C
4	DP0_TX1_DP_C_C
5	GND
6	DP0_TX1_DN_C_C
7	DP0_TX2_DP_C_C
8	GND
9	DP0_TX2_DN_C_C
10	DP0_TX3_DP_C_C
11	GND
12	DP0_TX3_DN_C_C
13	G_CEC
14	G_NC
15	AUXP_SCL
16	G_SDA
17	AUXN_G
18	DHPD_HDMI5V_A
19	RE_HDMIHPD
20	DP_VCC3
21	DETECT(N55402789)

3.4.15 SD Card Connector (SDCARD1)

Connector Location: SDCARD1

Description: SD Card Connector

PIN	ASSIGNMENT
1	GPPC_G2_SD3_D3_R
2	GPPC_G0_SD3_CMD_R
3	GND
4	+V3P3S_SD_SW
5	GPPC_G6_SD3_CLK_R
6	GND
7	GPPC_G1_SD3_D0_R
8	GPPC_G2_SD3_D1_R
9	GPPC_G3_SD3_D2_R
10	GPPC_G5_SD3_CD_N
11	WP_SW2(N29095979)
12	GND



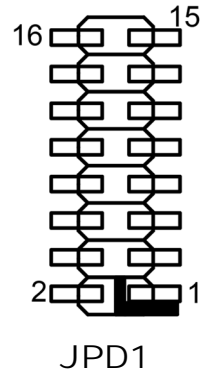
SDCARD1

3.4.16 PD Connector (JPD1)

Connector Location: JPD1

Description: PD Connector

PIN	ASSIGNMENT	PIN	ASSIGNMENT
1	PD_I2C_SCL	2	PD_I2C_SDA
3	SPAER1_A	4	TXCT_A
5	SPAER2_A	6	RXCT_A
7	SPAER1_B	8	TXCT_B
9	SPAER2_B	10	RXCT_B
11	GND	12	V12P0A_L
13	GND	14	V12P0A_L
15	GND	16	V12P0A_L

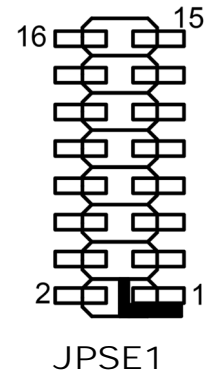


3.4.17 PSE Connector (JPSE1)

Connector Location: JPSE1

Description: PSE Connector

PIN	ASSIGNMENT	PIN	ASSIGNMENT
1	GND	2	GND
3	GND	4	GND
5	V3P3	6	GND
7	V3P3A	8	V12P0A_L
9	VOUT_54	10	V12P0A_L
11	VOUT_54	12	V12P0A_L
13	OUT2	14	V12P0A_L
15	OUT1	16	V12P0A_L

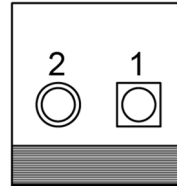


3.4.18 POE Connector (JPOE1)

Connector Location: JPOE1

Description: POE Connector

PIN	ASSIGNMENT
1	VIN
2	GND



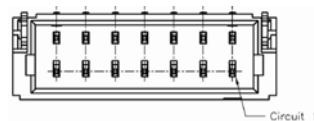
JPOE1

3.4.19 Heater Connector (JHEAT1)

Connector Location: JHEAT1

Description: Heater Connector

PIN	ASSIGNMENT
1	V12P0_HEATER
2	V12P0_HEATER
3	THERMAL_MCU
4	GND
5	GND



JHEAT1

Note: Heater module function is enabled. Please see JMCU1 jumper setting for details.

3.4.20 RTC Battery Connector (JBAT1)

Connector Location: JBAT1

Description: RTC Battery Connector

PIN	ASSIGNMENT
1	VBAT
2	GND



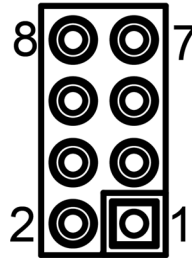
JBAT1

3.4.21 Update BIOS Connector (JSPI_1)

Connector Location: JSPI_1

Description: Update BIOS Connector

PIN	ASSIGNMENT	PIN	ASSIGNMENT
1	V3P3A_SPI	2	GND
3	SPI_CSJ_0_SW	4	SPI_CLK_SW
5	SPI_MISO_SW	6	SPI_MOSI_SW
7	SPI_HOLDJ0	8	SPI_WPJ0



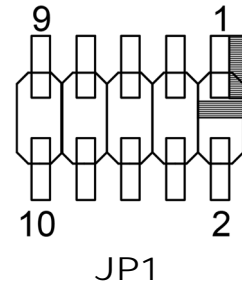
JSPI_1

3.4.22 LPC / TPM Connector (JP1)

Connector Location: JP1

Description: LPC/TPM Connector

PIN	ASSIGNMENT	PIN	ASSIGNMENT
1	LPC_CLKOUT1_D	2	GND
3	LPC_LFRAMEJ_D	4	LPC_SER_IRQ_D
5	PMU_PLTRST_N	6	LPC_AD0_D
7	LPC_AD3_D	8	LPC_AD2_D
9	V3P3	10	LPC_AD1_D



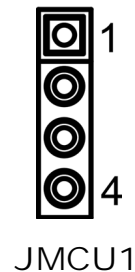
Note: Through the jumper you can choose Debug or TPM on JP_TPM1

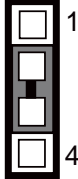
3.4.23 MCU Update Firmware Connector (JMCU1)

Connector Location: JMCU1

Description: MCU Update Firmware Connector

PIN	ASSIGNMENT
1	MCU_5VSB(N56134297)
2	GND
3	MCU_SPD
4	MCU_SPC

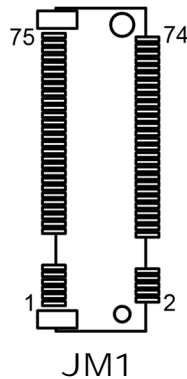


SELECTION	JUMPER SETTING	JUMPER ILLUSTRATION
Without Heater	2-3 (Default Setting)	 <p>JMCU1</p>

3.4.24 PCIE/ mSATA Module Slot (JM1)

Connector Location: JM1

Description: PCIE/ mSATA Module Slot



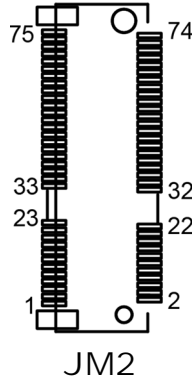
PIN	ASSIGNMENT	PIN	ASSIGNMENT
1	GND	2	VCC3_3_WLAN
3	GND	4	VCC3_3_WLAN
5	GND	6	GPPC_D13_WWAN_FCP_OFF_N
7	NC	8	WWAN_DISABLE_N
9	GND	10	NC
11	GND	12	NC
13	NC	14	NC
15	NC	16	NC
17	NC	18	NC

PIN	ASSIGNMENT	PIN	ASSIGNMENT
19	NC	20	M.2_WWAN_I2S1_BCLK
21	GND	22	M.2_WWAN_I2S1_OUT
23	NC	24	M.2_WWAN_I2S1_IN
25	NC	26	NC
27	GND	28	M.2_WWAN_I2S1_LRCLK
29	MINI_PCIE1_TXN	30	NC
31	MINI_PCIE1_TXP	32	NC
33	GND	34	NC
35	MINI_PCIE1_RXN	36	NC
37	MINI_PCIE1_RXP	38	NC
39	GND	40	NC
41	M2_PCIE12_SATA1A_RX_DN	42	NC
43	M2_PCIE12_SATA1A_RX_DP	44	NC
45	GND	46	NC
47	M2_PCIE12_SATA1A_TX_DN	48	NC
49	M2_PCIE12_SATA1A_TX_DP	50	GPPC_B13_PLTRST_N
51	GND	52	GPPC_B9_SRCCLKREQ4_N
53	CLK_SRC4_DN	54	NC
55	CLK_SRC4_DP	56	NC
57	GND	58	NC
59	NC	60	NC
61	NC	62	NC
63	NC	64	NC
65	NC	66	NC
67	NC	68	SUS_CLK
69	GPP_F1_CNV_GNSS_FTA	70	VCC3_3_WLAN
71	GND	72	VCC3_3_WLAN
73	GND	74	VCC3_3_WLAN
75	GND	-	-

3.4.25 WIFI / BT Module Slot (JM2)

Connector Location: JM2

Description: WIFI / BT Module Slot



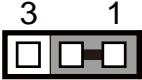
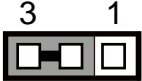
PIN	ASSIGNMENT	PIN	ASSIGNMENT
1	GND	2	VCC3_3_WLAN
3	USB2_P10_M.2_BT_R_DP	4	VCC3_3_WLAN
5	USB2_P10_M.2_BT_R_DN	6	M.2_WLAN_LED1_N
7	GND	8	M.2_BT_PCMCLK
9	CNV_WR_LANE1_R_DN	10	M.2_BT_PCMFRM_CRF_RST_N
11	CNV_WR_LANE1_R_DP	12	M.2_BT_PCMIN
13	NC	14	M.2_BT_PCMOUT_CLKREQ0
15	CNV_WR_LANE0_R_DN	16	NC
17	CNV_WR_LANE0_R_DP	18	GND
19	NC	20	GPPC_B2_UART_BT_WAKE_N
21	CNV_WR_CLK_R_DN	22	M.2_CNV_BRI_RSP_BT_UART0_RX
23	CNV_WR_CLK_R_DP	24	NC
25	NC	26	NC
27	NC	28	NC
29	NC	30	NC
31	NC	32	M.2_CNV_RGI_DT_BT_UART0_TX
33	GND	34	M.2_CNV_RGI_RSP_BT_UART0_CTS
35	PCIE_TXDP_M2_E	36	M.2_CNV_BRI_DT_UART0_RTS
37	PCIE_TXDN_M2_E	38	M.2_WLAN_CL_RST_N
39	GND	40	M.2_WLAN_CL_DATA
41	PCIE_RXDP_M2_E	42	M.2_WLAN_CL_CLK

PIN	ASSIGNMENT	PIN	ASSIGNMENT
43	PCIE_RXDN_M2_E	44	DISC_WLAN_WWAN_COEX3
45	GND	46	DISC_WLAN_WWAN_COEX2
47	CLK_SRC3_M.2_WLAN_DP	48	DISC_WLAN_WWAN_COEX1
49	CLK_SRC3_M.2_WLAN_DN	50	M.2_BTWIFI_SUS_CLK
51	GND	52	PE_RST_OUT_82
53	GPPC_B8_CLKREQ3_WLAN_R_N	54	GPPC_B4_BT_RF_KILL_N
55	M.2_WLAN_PE_WAKE_N	56	GPPC_C2_WIFI_RF_KILL_N
57	GND	58	NC
59	CNV_WT_LANE1_DP	60	NC
61	CNV_WT_LANE1_DN	62	NC
63	GND	64	PULSAR_38P4M_REFCLK_MODULE
65	CNV_WT_LANE0_DP	66	BUF_PLT_RST_N
67	CNV_WT_LANE0_DN	68	GPPC_B10_CLKREQ5_WIGIG_R_N
69	GND	70	M.2_WIGIG_PE_WAKE_N
71	CNV_WT_CLK_DN	72	VCC3_3_WLAN
73	CNV_WT_CLK_DP	74	VCC3_3_WLAN
75	GND	-	-

3.4.26 TPM Selection (JP_TPM1)

Jumper Location: JP_TPM1



Description: TPM Selection

SELECTION	JUMPER SETTING	JUMPER ILLUSTRATION
Normal	<i>1-2</i> (Default Setting)	 JP_TPM1
TPM Enable	2-3	 JP_TPM1



3.4.27 Flash Descriptor Security Override Selection (J2H1)

Jumper Location: J2H1



Description: Flash Descriptor Security Override Selection

SELECTION	JUMPER SETTING	JUMPER ILLUSTRATION
Normal	<i>Open</i> (Default Setting)	 J2H1
Disable	1-2	 J2H1

3.4.28 AT / ATX Mode Selection (JP_AT1)**Jumper Location:** JP_AT1**Description:** AT / ATX Mode Selection

SELECTION	JUMPER SETTING	JUMPER ILLUSTRATION
ATX Mode	<i>Open</i> (Default Setting)	 JP_AT1
AT Mode	1-2	 JP_AT1



3.4.29 Case Open Selection (JP2)**Jumper Location:** JP2**Description:** Case Open Selection

SELECTION	JUMPER SETTING	JUMPER ILLUSTRATION
Normal	<i>Open</i> (Default Setting)	 JP2
Open	1-2	 JP2

3.4.30 SATA / PCIE Mode Selection (JP3)

Jumper Location: JP3


Description: SATA / PCIE Mode selection

SELECTION	JUMPER SETTING	JUMPER ILLUSTRATION
SATA	<i>Open</i> (Default Setting)	 JP3
PCIE	1-2	 JP3

3.4.31 HDMI/DP Mode Selection (JP6)

Jumper Location: JP6


Description: HDMI/DP Hot Plug Detection for HDMI1

SELECTION	JUMPER SETTING	JUMPER ILLUSTRATION
HDMI/DP	<i>1-2</i> (Default Setting)	 JP6
Reserved	Open	

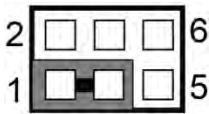
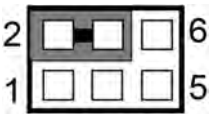
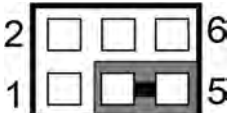
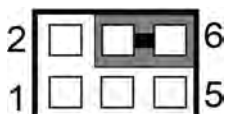
3.4.32 HDMI / DP Mode Selection for DISPLAY 1 (JP_EDP1)

Jumper Location: JP_EDP1

Description: HDMI/DP Selection

SELECTION	JUMPER SETTING	JUMPER ILLUSTRATION
HDMI	1-2 (Default Setting)	 JP_EDP1
Reserved	2-3	

3.4.33 I2C Voltage Selection (JP_I2C1)**Jumper Location:** JP_I2C1**Description:** I2C Voltage Selection



SELECTION	JUMPER SETTING	JUMPER ILLUSTRATION
JI2C1 launch V3P3	<i>1-3 (Default Setting)</i>	 <p>JP_I2C1</p>
JI2C2 launch V3P3	2-4	 <p>JP_I2C1</p>
JI2C1 launch V5P0	3-5	 <p>JP_I2C1</p>
JI2C2 launch V5P0	4-6	 <p>JP_I2C1</p>

3.4.34 Clear CMOS Data Selection (JCMOS1)

Jumper Location: JCMOS1

Description: Clear CMOS Data Selection

- Step 1. Remove the main power of the PC.
- Step 2. Close **JCMOS1** (pins 1-2) for 6 seconds by a cap.
- Step 3. Remove the cap which is just used on **JCMOS1** (1-2), so that **JCMOS1** returns to "OPEN".
- Step 4. Power on the PC and the PC will then auto-reboot for once in order to set SoC's register.
- Step 5. Done!

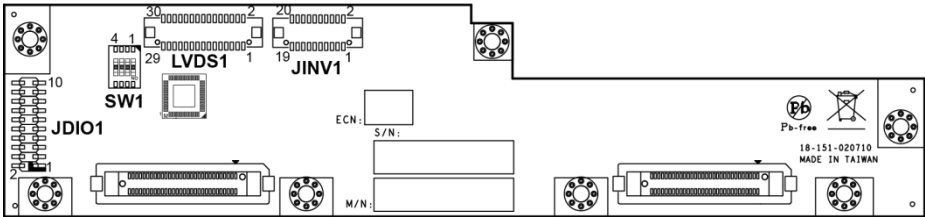
SELECTION	JUMPER SETTING	JUMPER ILLUSTRATION
Normal	<i>Open (Default Setting)</i>	 1 JCMOS1
Clear CMOS	1-2	 1 JCMOS1

3.5 Daughter Board Connectors & Jumpers Quick Reference Table

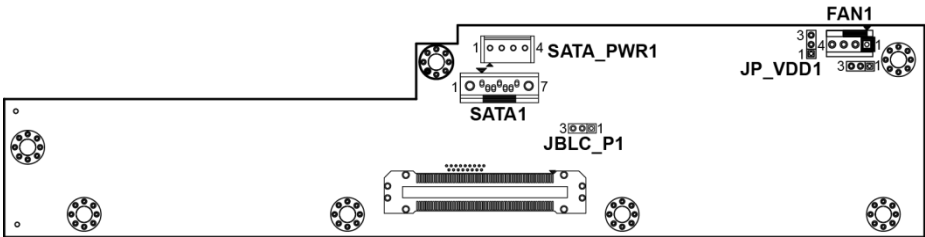
Daughter Board List

Daughter Board Description	NAME
SR-1097-GXX-1	Signal Integrated Backplane
SR-1097-GXX-2	I/O Add-On board with 2 x LAN non-POE ports
SR-1097-GXX-3	I/O Add-On board with 2 x COM ports
SR-1097-GXX-4	I/O Add-On board with 4 x COM ports
SR-1097-GXX-5	I/O Add-On board with 3 x USB ports
SR-1097-GXX-6	I/O Add-On board with 1 x Parallel port
SR-1097-GXX-7	I/O Add-On board with 2 x CANBus function
SR-1097-GXX-8	PSE board with PoE voltage boost function
SR-1097-GXX-9	PD board with PoE voltage buck function
SR-1097-GXX-10	I/O Add-On board with 2 x LAN POE function

3.5.1 SR-1097-GZZ-1 Board Top View



3.5.2 SR-1097-GZZ-1 Board Bottom View



3.5.3 SR-1097-GZZ-1 Backplane Connector & Jumper List

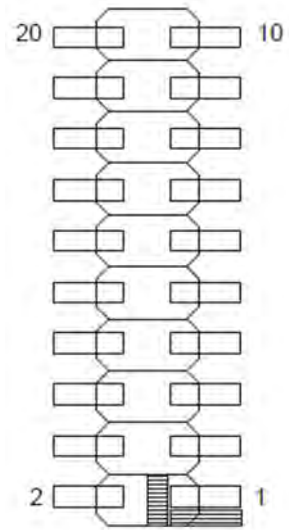
Connector Description	NAME
Digital Input / Output Connector	JDIO1

Digital Input / Output Connector (JDIO1)

Connector Location: JDIO1

Description: Digital 8-Input / 8-Output

PIN	ASSIGNMENT	PIN	ASSIGNMENT
1	Reserved	2	Reserved
3	GND	4	GND
5	DIN_0	6	DOUT_0
7	DIN_1	8	DOUT_1
9	DIN_2	10	DOUT_2
11	DIN_3	12	DOUT_3
13	DIN_4	14	DOUT_4
15	DIN_5	16	DOUT_5
17	DIN_6	18	DOUT_6
19	DIN_7	20	DOUT_7

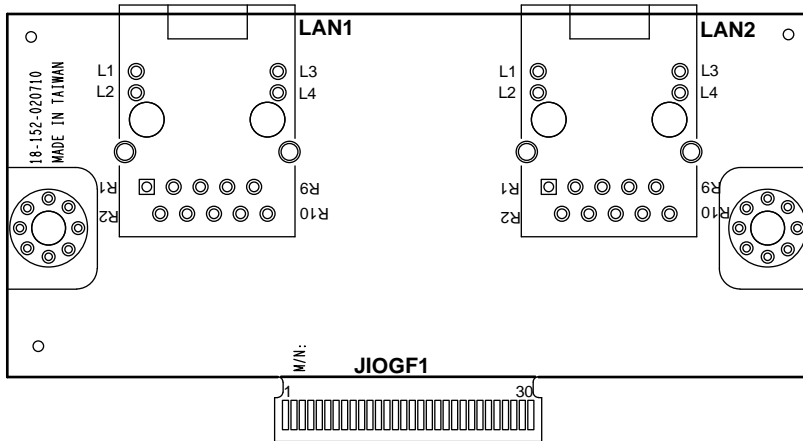


JDIO1

DIO Connector

PIN	ASSIGNMENT
1	DIN0
2	DIN1
3	DIN2
4	DIN3
5	DIN4
6	DIN5
7	DIN6
8	DIN7
9	DOUT0
10	DOUT1
11	DOUT2
12	DOUT3
13	DOUT4
14	DOUT5
15	DOUT6
16	DOUT7

3.5.4 SR-N1097 GZZ-2 I/O Add-On Board Top View



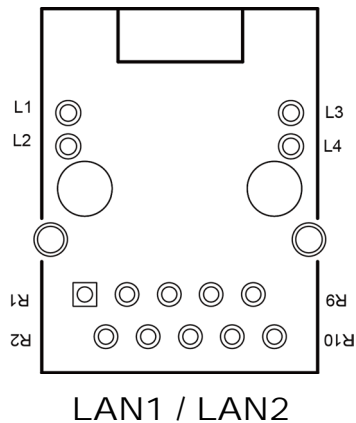
3.5.5 SR-1097-GZZ-2 I/O Add-On Board Connectors

LAN Ports (LAN1, LAN2)

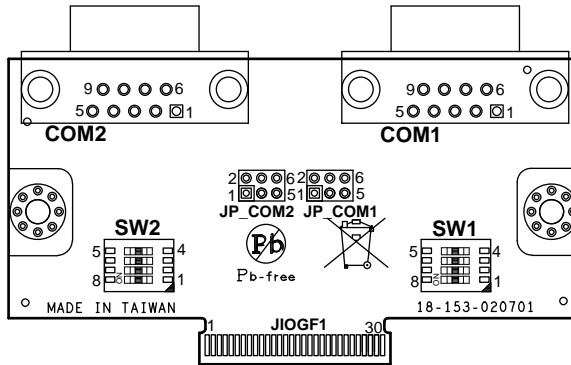
Port Location: LAN1, LAN2

Description: LAN1, LAN2 ports

PIN	ASSIGNMENT
R1	LAN_MDI0_DP
R2	LAN_MDI0_DN
R3	LAN_MDI1_DP
R4	LAN_MDI1_DN
R7	LAN_MDI2_DP
R8	LAN_MDI2_DN
R9	LAN_MDI3_DP
R10	LAN_MDI3_DN
L1	LAN_LED_100_N
L2	LAN_LED_1000_N
L3	LAN_LED_LINK_N
L4	V3P3A_RTL



3.5.6 SR-N1097-GZZ-3 I/O Add-On Board Top View



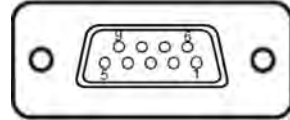
3.5.7 SR-1097-GZZ-3 I/O Add-On Board Connector and Jumpers List

Jumper Description	NAME
COM Port Connector	COM1, COM2

Jumper Description	NAME
COM1 and COM2 PIN9 Definition Selection Guide	JP_COM1, JP_COM2
COM1 and COM2 RS-232/422/485 Mode Selection Guide	SW1, SW2

COM Port Connector (COM1, COM2)**Port Location: COM1, COM2****Description:** COM1/COM2 (RS-232/RS-422/RS-485) Connector

PIN	ASSIGNMENT		
	RS232 <i>(Default Setting)</i>	RS422	RS485
1	COM_DCDJ_I	TX-	RS-485-
2	COM_RX_I	TX+	RS-485+
3	COM_TX_I	RX+	X
4	COM_DTJ_I	RX-	X
5	GND	GND	GND
6	COM_DSRJ_I	X	X
7	COM_RTSJ_I	X	X
8	COM_CTSJ_I	X	X
9	COM_RI_SEL	X	X

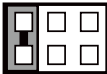
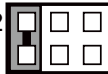


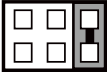
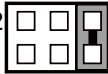


COM1 / COM2

COM1 and COM2 PIN9 Definition Selection Guide (JP_COM1, JP_COM2)

Jumper Location: JP_COM1, JP_COM2

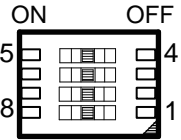
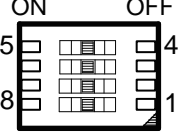
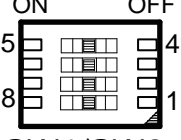
Description: COM1 pin9 (JP_COM1) and COM2 pin9 (JP_COM2) RI/5V/12V Selection

SELECTION	JUMPER SETTING	JUMPER ILLUSTRATION	
RI	1-2 (Default Setting)	 JP_COM1	 JP_COM2
+12V	3-4	 JP_COM1	 JP_COM2
+5V	5-6	 JP_COM1	 JP_COM2

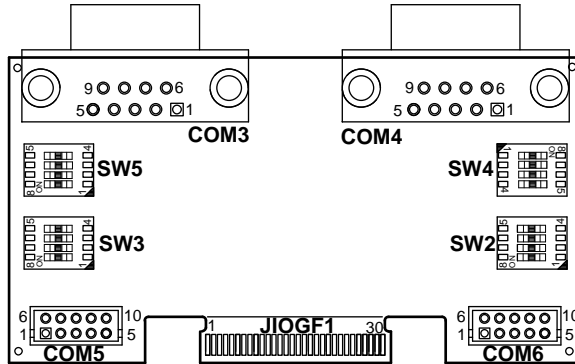
COM1 and COM2 RS-232/422/485 Mode Selection (SW1, SW2)

Jumper Location: SW1, SW2

Description: COM1, COM2 RS-232/422/485 mode selection

SELECTION	SW1 / SW2	PIN	SETTING
RS-232 <i>(Default Setting)</i>	 SW1/SW2	1	OFF
		2	OFF
		3	ON
		4	OFF
RS-422	 SW1/SW2	1	ON
		2	OFF
		3	OFF
		4	OFF
RS-485	 SW1/SW2	1	ON
		2	ON
		3	OFF
		4	OFF

3.5.8 SR-N1097-GZZ-4 I/O Add-On Board Top View



3.5.9 SR-1097-GZZ-4 I/O Add-On Board Connectors and Jumper List

Connector Description	NAME
COM Port Connector	COM3, COM4, COM5, COM6

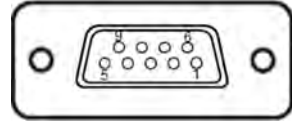
Jumper Description	NAME
COM3, COM4, COM5 and COM6 RS-232/422/485 Mode Selection Guide	SW2, SW3, SW4, SW5

COM Port Connector (COM3, COM4)

Port Location: COM3, COM4

Description: COM3/COM4 (RS-232/RS-422/RS-485) Connector

PIN	ASSIGNMENT		
	RS-232 (Default Setting)	RS-422	RS-485
1	COM_DCDJ_I	TX-	RS-485-
2	COM_RX_I	TX+	RS-485+
3	COM_TX_I	RX+	X
4	COM_DTJ_I	RX-	X
5	GND	GND	GND
6	COM_DSRJ_I	X	X
7	COM_RTSJ_I	X	X
8	COM_CTSJ_I	X	X
9	COM_RI_R	X	X



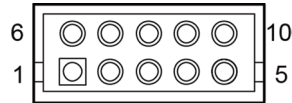
COM3 / COM4

COM Port Connector (COM5, COM6)

Port Location: COM5, COM6

Description: COM5/COM6 (RS-232/RS-422/RS-485) Connector

PIN	ASSIGNMENT		
	RS232 (Default Setting)	RS422	RS485
1	COM_DCDJ_I	TX-	RS-485-
2	COM_RX_I	TX+	RS-485+
3	COM_TX_I	RX+	X
4	COM_DTJ_I	RX-	X
5	GND	GND	GND
6	COM_DSRJ_I	X	X
7	COM_RTSJ_I	X	X
8	COM_CTSJ_I	X	X
9	COM_RI_R	X	X
10	X	X	X

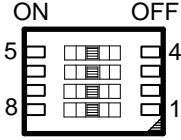
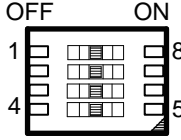
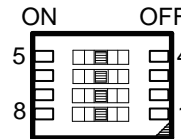

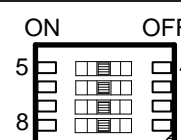
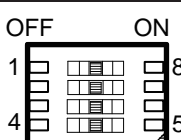


COM5 / COM6

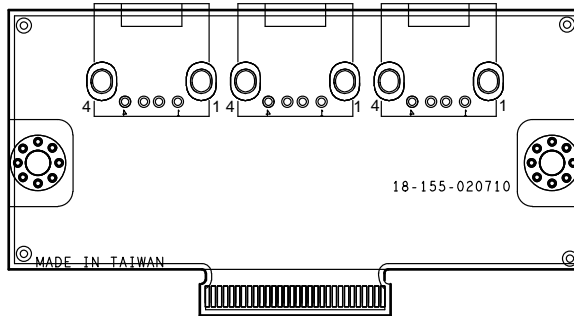
Slide Switch for COM3, COM4, COM5 and COM6 RS-232/422/485 Mode Selection (SW2, SW3, SW4, SW5)

Jumper Location: SW2, SW3, SW4, SW5

Description: Slide Switch for COM3, COM4, COM5, COM6 RS-232/422/485 selection

SELECTION	SW2, SW3, SW5	SW4	PIN	SETTING
RS-232 <i>(Default Setting)</i>	 SW2, SW3, SW5	 SW4	1	OFF
			2	OFF
			3	ON
			4	OFF
RS-422	 SW2, SW3, SW5	 SW4	1	ON
			2	OFF
			3	OFF
			4	OFF
RS-485	 SW2, SW3, SW5	 SW4	1	ON
			2	ON
			3	OFF
			4	OFF

3.5.10 SR-1097-GZZ-5 I/O Add-On Board Top View



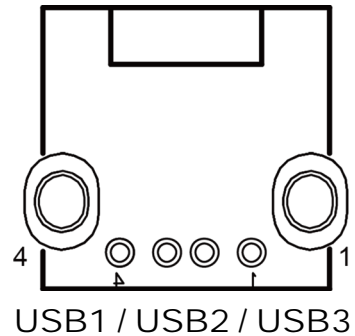
3.5.11 SR-1097-GZZ-5 I/O Add-On Board Connector

USB 2.0 Connectors (USB1, USB2, USB3)

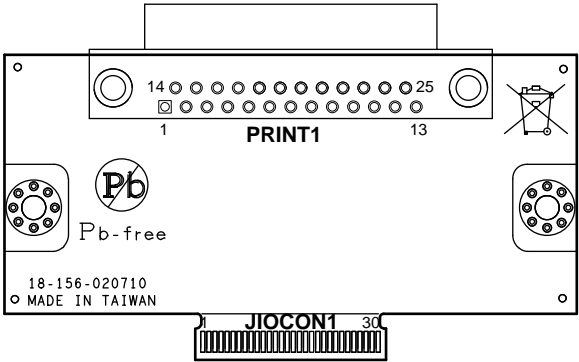
Port Location: USB1, USB2, USB3

Description: USB1, USB2, USB3 Connector

PIN	ASSIGNMENT
1	V5P0S_USB1
2	USB_DN
3	USB_DP
4	GND



3.5.12 SR-1097-GZZ-6 I/O Add-On Board Top View

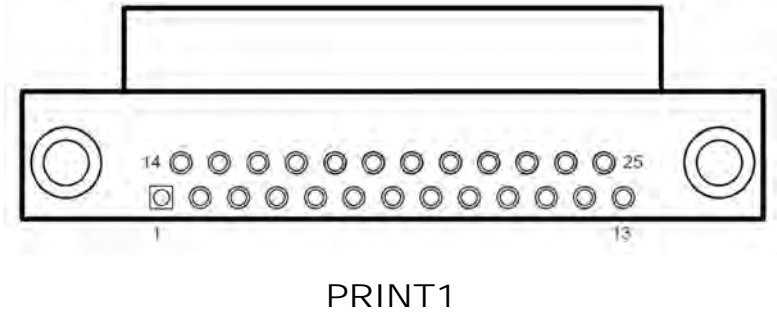


3.5.13 SR-1097-GZZ-6 I/O Add-On Board Connector

Printer Port Connector

Port Location: PRINT1

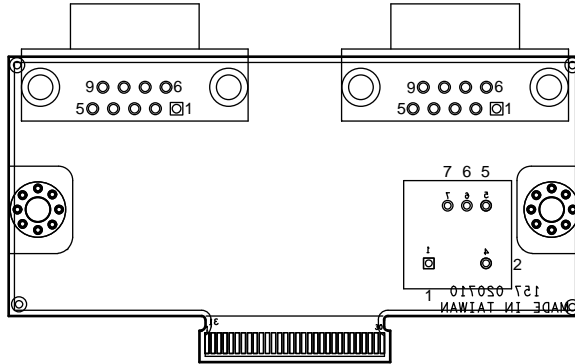
Description: Printer Port Connector



PIN	ASSIGNMENT	PIN	ASSIGNMENT
1	STRBJ	14	AFDJ
2	PD0	15	ERRJ
3	PD1	16	INITJ
4	PD2	17	SLCTINJ
5	PD3	18	GND

PIN	ASSIGNMENT	PIN	ASSIGNMENT
6	PD4	19	GND
7	PD5	20	GND
8	PD6	21	GND
9	PD7	22	GND
10	ACKJ	23	GND
11	BUSY	24	GND
12	PE	25	GND
13	SLCTJ	-	-

3.5.14 SR-1097-GZZ-7 I/O Add-On Board Top View



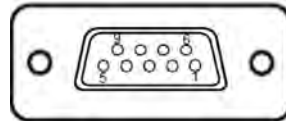
3.5.15 SR-1097-GZZ-7 I/O Add-On Board Connectors

CANBus Connectors (CAN1, CAN2)

Port Location: CAN1, CAN2

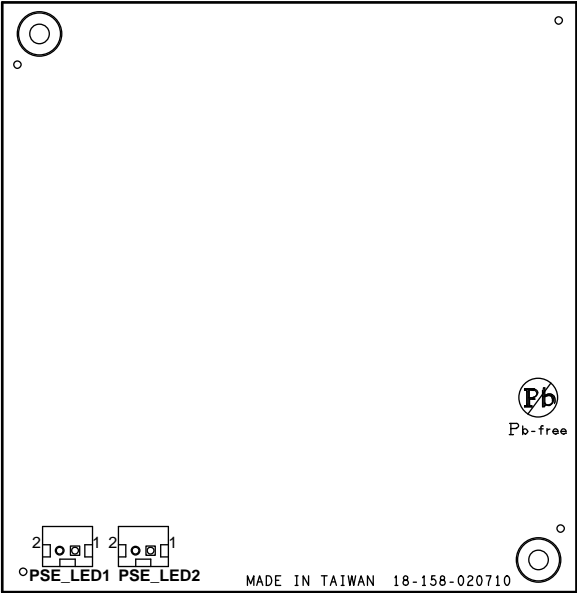
Description: CAN1, CAN2 Connector

PIN	ASSIGNMENT
1	X
2	CANL
3	GND
4	X
5	X
6	X
7	CANH
8	X
9	V5POS_ISO

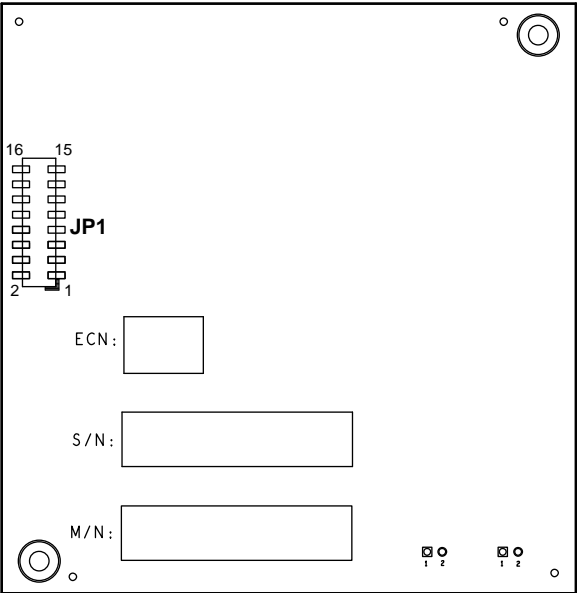


CAN1 / CAN2

3.5.16 SR-1097-GZZ-8 PSE Board Top View



3.5.17 SR-1097-GZZ-8 PSE Board Bottom View



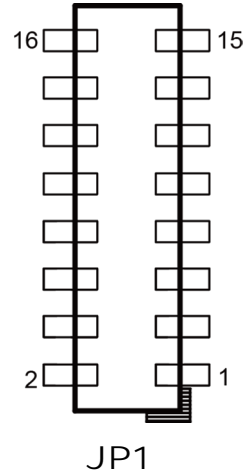
3.5.18 SR-1097-GZZ-8 PSE Board Connectors

PSE Connector (JP1)

Connector Location: JP1

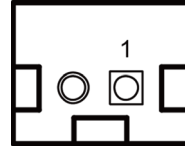
Description: JP1 Connector (rear side)

PIN	ASSIGNMENT	PIN	ASSIGNMENT
2	GND	1	GND
4	GND	3	GND
6	V3P3S	5	GND
8	V3P3A	7	V12P0A_L
10	V54P0A	9	V12P0A_L
12	V54P0A	11	V12P0A_L
14	OUT2	13	V12P0A_L
16	OUT1	15	V12P0A_L



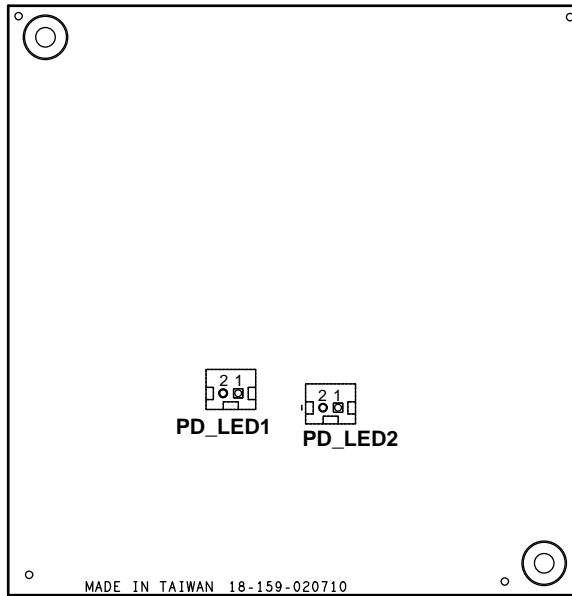
PSE Link LED Connectors (PSE_LED1, PSE_LED2)**Connector Location:** PSE_LED1, PSE_LED2**Description:** PSE link LED Connector (top side)

PIN	ASSIGNMENT
1	Power
2	GND

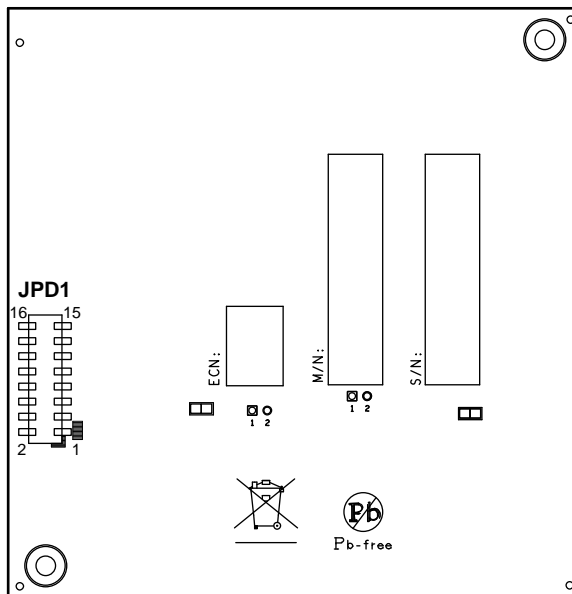


PSE_LED1/
PSE_LED2

3.5.19 SR-1097-GZZ-9 PSE Board Top View



3.5.20 SR-1097-GZZ-9 PSE Board Bottom View



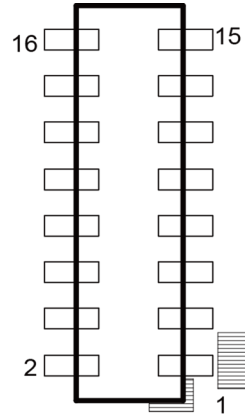
3.5.21 SR-1097-GZZ-9 PD Board Connectors

PD Connector (JPD1)

Connector Location: JPD1

Description: JPD1 Connector (rear side)

PIN	ASSIGNMENT	PIN	ASSIGNMENT
2	MCU_T2P_A	1	MCU_T2P_B
4	SPAER1_A	3	TXCT_A
6	SPAER2_A	5	RXCT_A
8	SPAER1_B	7	TXCT_B
10	SPAER2_B	9	RXCT_B
12	GND	11	(+V12P0A_L)
14	GND	13	(+V12P0A_L)
16	GND	15	(+V12P0A_L)



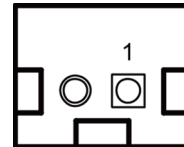
JPD1

PD LED Connectors (PD_LED1, PD_LED2)

Connector Location: PD_LED1, PD_LED2

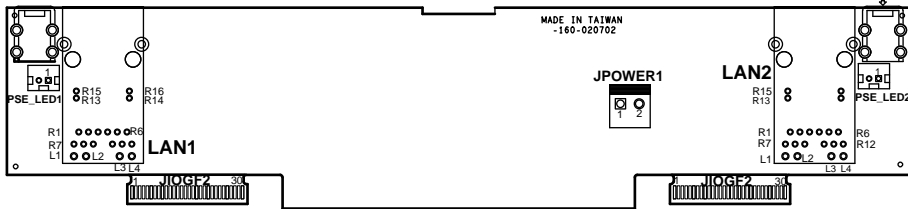
Description: PD LED Connector (top side)

PIN	ASSIGNMENT
1	Power
2	GND



PD_LED1/ PD_LED2

3.5.22 SR-1097-GZZ-10 PD Board Top View



3.5.23 SR-1097-GZZ-10 PD Board Connectors List

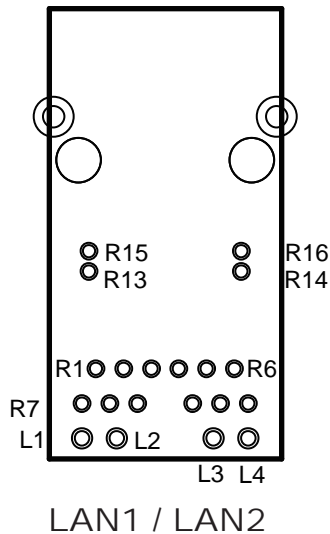
Connector Description	NAME
LAN with PSE Connectors	LAN1, LAN2
POE Power Connector	JPOWER1
PSE Link LED Connectors	PSE_LED1, PSE_LED2

LAN with PSE Connectors (LAN1, LAN2)

Connector Location: LAN1, LAN2

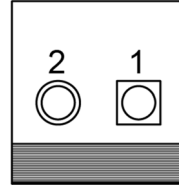
Description: LAN1/LAN2 Connectors with PSE

PIN	ASSIGNMENT
R11	LAN_MDIO_DP
R10	LAN_MDIO_DN
R4	LAN_MDII_DP
R5	LAN_MDII_DN
R3	LAN_MDI2_DP
R2	LAN_MDI2_DN
R8	LAN_MDI3_DP
R9	LAN_MDI3_DN
R13	GND
R14	V54P0A
L1	LAN1_LED_LINK_N
L2	V3P3A_RTL1
L3	LAN1_LED_100_N
L4	LAN1_LED_1000_N

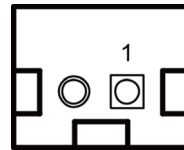


POE Power Connector (JPOWER1)**Connector Location: JPOWER1****Description:** POE Power Connector

PIN	ASSIGNMENT
1	VIN
2	GND

**JPOWER1****PSE Link LED Connectors (PSE_LED1, PSE_LED2)****Connector Location: PSE_LED1, PSE_LED2****Description:** PSE link LED Connector

PIN	ASSIGNMENT
1	Power
2	GND

**PSE_LED1/
PSE_LED2**

4

Software Utilities

This chapter provides the detailed information that guides users to install driver utilities for the system. The following topics are included:

- Installing Intel® Chipset Software Installation Utility
- Installing Intel® Management Engine Components Driver Utility
- Installing RAID Driver Utility
- Installing Graphics Driver Utility
- Installing LAN Driver Utility
- Installing Sound Driver Utility
- Installing Intel® Serial IO Driver Utility
- Installing FTDI® USB to Serial Driver Utility
- Installing FINTEK® F81601 PCIE to CANBus Driver Utility

4.1 Introduction

Enclosed with the EL 1097 Series package is our driver utilities contained in a DVD-ROM disk. Refer to the following table for driver locations:

Filename (Assume that DVD ROM drive is D :)	Purpose	OS Win10
D:\Driver\Flash BIOS	For BIOS update utility	X
D:\Driver\Platform\Win10 (64-bit)\1_Main Chip\Win10(64Bit)	Intel® Chipset Software Installation Utility	✓
D:\Driver\Platform\ Win10 (64-bit)\4_ME\ Win10(64Bit)	Intel® Management Engine Driver installation	✓
D:\Driver\Platform\ Win10 (64-bit)\7_RAID\ Win10(64Bit)	Intel® Rapid Storage Technology Tool installation	✓
D:\Driver\Platform\ Win10 (64-bit)\2_Graphics\ Win10(64Bit)	Intel® HD Graphics Driver installation	✓
D:\Driver\Platform\ Win10 (64-bit)\5_LAN Chip\ Win10(64Bit)\I219-LM	Intel® Ethernet connection I219-LM for LAN Driver installation	✓
D:\Driver\Platform\ Win10 (64-bit)\5_LAN Chip\ RTL8111H	Realtek® RTL8111H for LAN Driver installation	✓
D:\Driver\Platform\ Win10 (64-bit)\3_Sound\ Win10(64Bit)	Realtek® ALC888S for Sound Driver installation	✓
D:\Driver\Platform\ Win10 (64-bit)\6_Serial IO\ Win10(64Bit)	Intel® Serial IO Driver installation	✓
D:\Driver\Daughter board\ SR-1097-41N	FTDI® USB to Serial Driver installation	✓
D:\Driver\Daughter board\ SR-1097-71N\driver	FINTEK® F81601 PCIE to CANBus Driver installation	✓

X : Not supported

✓: Supported

Note: Install the driver utilities immediately after the OS installation is completed.

4.2 Installing Intel® Chipset Software Installation Utility

Introduction

The Intel® Chipset Software Installation Utility installs the 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 functions work properly:

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

Intel® Chipset Software Installation Utility

The utility pack is to be installed only for Windows 10 series, and it should be installed immediately after the OS installation is finished. Please follow the steps below:

- 1** Connect the USB DVD-ROM device to EL 1097 and insert the driver disk.
- 2** Open the **1_Main Chip** folder.
- 3** Enter the **Win10(64Bit)** folder where the Chipset driver is located.
- 4** Click the **Setup.exe** file for driver installation.
- 5** Follow the on-screen instructions to install the driver.
- 6** Once the installation is completed, shut down the system and restart EL 1097 for the changes to take effect.

4.3 Intel® Management Engine Components Installer Installation

To install the Management Engine Components driver utility, follow the steps below:

- 1** Connect the USB DVD-ROM device to EL 1097 and insert the driver disk.
- 2** Open the **4_ME** folder.
- 3** Enter the **Win10(64Bit)** folder where the ME driver is located.
- 4** Click **Setup.exe** file for ME driver installation.
- 5** Follow the on-screen instructions to complete the installation.
- 6** Once the installation is completed, shut down the system and restart EL 1097 for the changes to take effect.

4.4 Installing RAID Driver Utility

To install the RAID driver utility, follow the steps below:

- 1** Connect the USB DVD-ROM device to EL 1097 and insert the driver disk.
- 2** Open the **7_RAID** folder.
- 3** Enter the **Win10(64Bit)** folder where the RAID driver is located.
- 4** Click **Setup.exe** file for driver installation.
- 5** Follow the on-screen instructions to complete the installation.
- 6** Once the installation is completed, shut down the system and restart EL 1097 for the changes to take effect.

4.5 Installing Graphics Driver Utility

The graphics interface embedded in EL 1097 can support a wide range of display types. You can have dual displays via HDMI / DVI-I ports and make the system work simultaneously.

To install the Graphics driver utility, follow the steps below:

- 1** Connect the USB DVD-ROM device to EL 1097 and insert the driver disk.
- 2** Open the **2_Graphics** folder.
- 3** Enter the **Win10(64Bit)** folder where the Graphics driver is located.
- 4** Click the **Setup.exe** file for driver installation.
- 5** Follow the on-screen instructions to complete the installation.
- 6** Once the installation is completed, shut down the system and restart EL 1097 for the changes to take effect.

4.6 Installing LAN Driver Utility

Intel® Ethernet connection I219-LM for LAN Driver installation

To install the Intel® Ethernet connection I219-LM for LAN driver, follow the steps below:

- 1** Connect the USB DVD-ROM device to EL 1097 and insert the driver disk.
- 2** Open the **5_LAN Chip** folder.
- 3** Enter the **I219-LM** folder where the driver is located.
- 4** Click the **PROWinx64.exe** file for driver installation.
- 5** Follow the on-screen instructions to complete the installation.
- 6** Once the installation is completed, shut down the system and restart EL 1097 for the changes to take effect.

Realtek® RTL8111H for LAN Driver installation

To install the Realtek® RTL8111H for LAN for LAN driver, follow the steps below:

- 1** Connect the USB DVD-ROM device to EL 1097 and insert the driver disk.
- 2** Open the **5_LAN Chip** folder.
- 3** Enter the **RTL8111H** folder where the driver is located.
- 4** Click the **Setup.exe** file for driver installation.
- 5** Follow the on-screen instructions to complete the installation.
- 6** Once the installation is completed, shut down the system and restart EL 1097 for the changes to take effect.

For more details on the installation procedure, refer to the README.txt file that you can find on LAN Driver Utility.

4.7 Installing Sound Driver Utility

The sound function enhanced in this system is fully compatible. To install the Sound driver, follow the steps below:

- 1** Connect the USB DVD-ROM device to EL 1097 and insert the driver disk.
- 2** Open the **3_Sound** folder.
- 3** Enter the **Win10(64Bit)** folder where the driver is located.
- 4** Click the **Setup.exe** file for driver installation.
- 5** Follow the on-screen instructions to complete the installation.
- 6** Once the installation is completed, shut down the system and restart EL 1097 for the changes to take effect.

4.8 Installing Intel® Serial I/O Driver Utility

To install the Serial I/O driver, follow the steps below:

- 1** Connect the USB DVD-ROM device to EL 1097 and insert the driver disk.
- 2** Open the **6_Serial IO** folder.
- 3** Enter the **Win10(64Bit)** folder where the driver is located.
- 4** Click the Setup.exe file for driver installation.
- 5** Follow the on-screen instructions to complete the installation.
- 6** Once the installation is completed, shut down the system and restart EL 1097 for the changes to take effect.

4.9 Installing FTDI® USB to Serial Driver

To install the FTDI® USB to Serial driver, follow the steps below:

- 1** Connect the USB DVD-ROM device to EL 1097 and insert the driver disk.
- 2** Open the **Daughter board** folder.
- 3** Enter the **SR-1097-41N** folder where the driver is located.
- 4** Click the **CDM21228_Setup.exe** file for driver installation.
- 5** Follow the on-screen instructions to complete the installation.
- 6** Once the installation is completed, shut down the system and restart EL 1097 for the changes to take effect.

4.10 Installing FINTEK® F81601 PCIE to CANBus Driver

To install the FINTEK® F81601 PCIE to CANBus driver, follow the steps below:

- 1** Connect the USB DVD-ROM device to EL 1097 and insert the driver disk.
- 2** Open the **Daughter board** folder
- 3** Enter the **SR-1097-71N** folder where the driver is located.
- 4** Click the **Setup.exe** file for driver installation.
- 5** Follow the on-screen instructions to complete the installation.
- 6** Once the installation is completed, shut down the system and restart EL 1097 for the changes to take effect.

4.11 API Package Content

You can find the enclosed API Package files in the Manual / Driver DVD. Depending on the machine types, the API Package may include the following files:

Operation System	Windows 32 bit + .NET Framework 2.0 or above		
Directory	Contents / File Name		Description
Document\	API Package User Guide A01-0000-000-02-xxxxxx_en.pdf		User Manual in English
	API Package User Guide A01-0000-000-02-xxxxxx_ch.pdf		User Manual in Chinese
Function DLL			
Directory	Function	File Name	Description
	Digital	Digital.dll	Driver to control Digital I/O
	WDT	Watchdog.dll	Driver to control Watchdog
	I2C	I2C.dll	Driver to Control I2C.
	multilangXML.dll		Driver to open XML file
	Initial.xml		XML file to initiate the API Package
	ProxAP.exe		API program executable file
	XML Files\Model Name*\Initial.xml		XML file for each model
	Version.ini		Version information

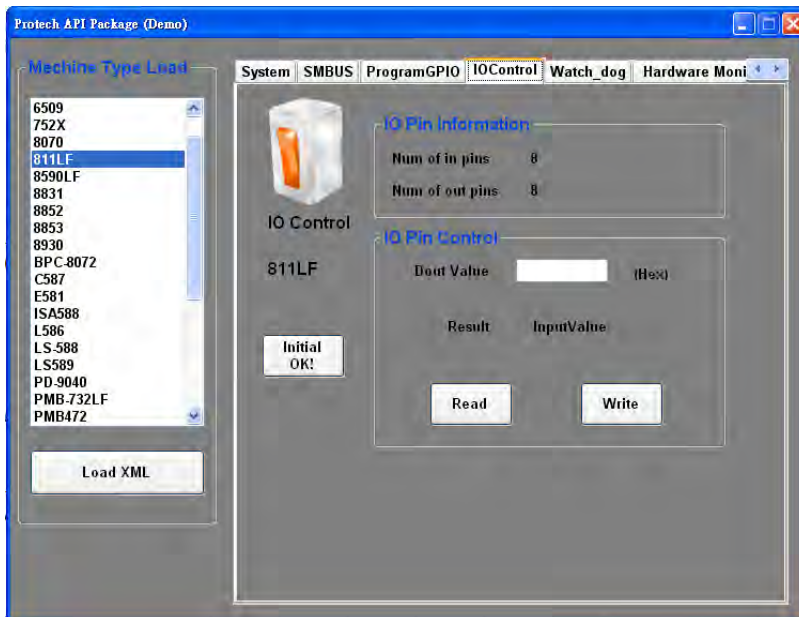
📖 Model Name is depending on your machine type:

Sample Program		
Directory	Contents / File Name	Description
DEMO PROJECT\	DEMO PROJECT\GPIO Sample Code	C# VB6 VB.net Source Code
	DEMO PROJECT\Digital Sample Code	C# VB6 VB.net Source Code
	DEMO PROJECT\Watchdog Sample Code	C# VB6 VB.net MFC Source Code

4.11.1 I/O Control

The API Package program demonstrates how to use the API Library in a user's application.


📖 This program developed by VB.NET requires Microsoft .NET Framework version 2.0 or above.



[Initial]

Initialize I/O Function, and if successful the button will become **[Initial OK!]** as shown right.



 If **[Initial OK!]** is not displayed, the execution continued may fail.


I/O Pin Information

The input and output pin numbers on this machine type will be displayed.

I/O Pin Control

► **Dout Value** Input the hex value to send to the I/O Port.

Take 1097 for example, by default there are 8 output pins in total. If you want to set all the output pins as “High”, fill “0x00FF” in the **Dout Value** text field.

 The “FF” indicates the 8-bit binary value (11111111) as shown below:

Bit7 (IO7)	Bit6 (IO6)	Bit5 (IO5)	Bit4 (IO4)	Bit3 (IO3)	Bit2 (IO2)	Bit1 (IO1)	Bit0 (IO0)
1	1	1	1	1	1	1	1

Likewise, if you want to set all the output pins as “Low”, fill “0x0000” in the **Dout Value** text field.

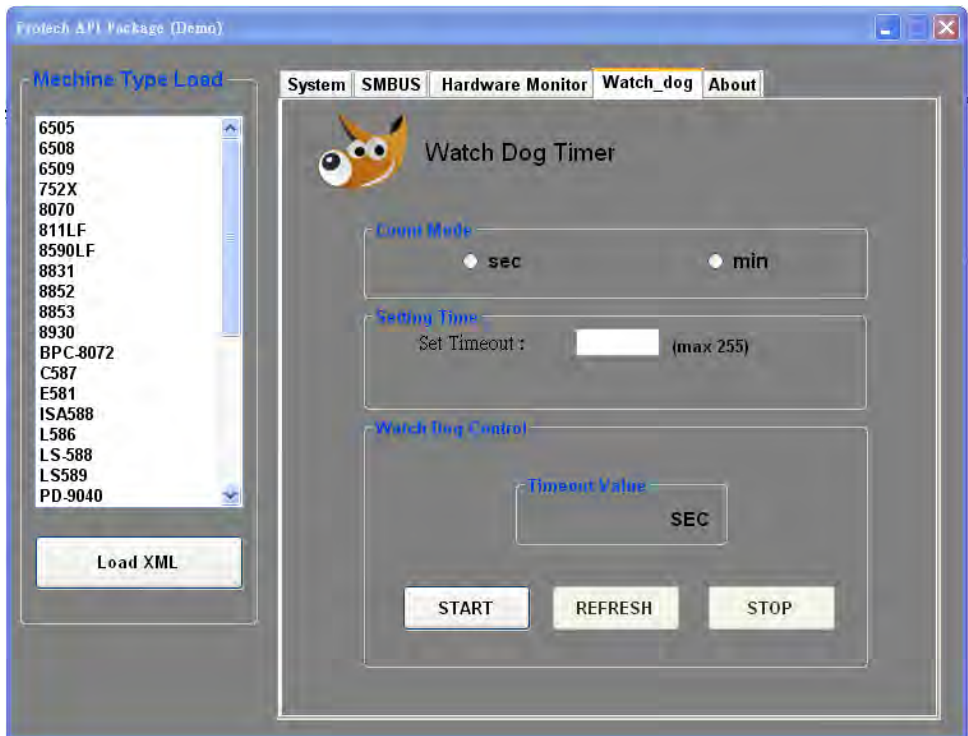
When working with a 4in/ 4out type, fill in “0F”.
(i.e. the later 4 bits indicate the I/O pin positions to be controlled)

N/A	N/A	N/A	N/A	Bit3(IO3)	Bit2(IO2)	Bit1(IO1)	Bit0(IO0)
0	0	0	0	1	1	1	1

► **[Write]** Tap to output the value of **Dout Value** to the hardware.

- | | |
|-----------------|---|
| ► [Read] | Tap to read the input signal value and show the value to the Result field. |
| ► Result | The input signal value will be displayed in hex after [Read] is tapped. |

4.11.2 Watch Dog



Count Mode

Select the unit of time, second or minute, for the watchdog timer.

Setting Time

- ▶ **Set Timeout** Set the timeout for the watchdog. The maximum timeout value is 255 seconds or minutes.

Watch Dog Control

- ▶ **Timeout Value** Simulation timer of the API program, the running watchdog timeout will be displayed (in seconds). It is not as accurate as a hardware watchdog clock.
- ▶ **[START]** Tap to start the watchdog timer. Meanwhile the **[REFRESH]** and **[STOP]** buttons will be enabled.
- ▶ **[STOP]** Tap to stop the watchdog timer.
- ▶ **[REFRESH]** Tap to restart the watchdog timer.

4.11.3 Digital I/O Function


Digital_Initial

bool Digital_Initial () ;

Purpose Initialize Digital API Package.

Value None

Return True (1) on success, False (0) on failure

 Before using the API Package, this function should be called to pass XML variables to the DLL.

Digital_Set

bool Digital_Set (short hex_value);

Purpose Set the digital logic state.
 Value hex_value
 Return True (1) on success, False (0) on failure
 Example Digital_Set(0x01); // Set DOUT0 as High
 Digital_Set(0x09); // 1001, DOUT3 and DOUT0 are High; DOUT2 and DOUT1 are low

I2C_WriteByte

bool I2C_WriteByte(int SalveID, int Index, int Data)

Purpose Write data into the I2C
 Value SlaveID Device Slave address to be read
 Index Device data index to be read
 Data (Data to be written)
 Return True (1) on success, False (0) on failure

Digital_Get

short Digital_Get (void);

Purpose Get the digital input signal.
 Value None
 Return Digital input pin logic state
 Example Short data;
 data = Digital_Get(); // DIN data, High/ Low input status

Value value = 0 ~ 255

Return True (1) on success, False (0) on failure

Value kind = 1 (Measured in unit of

2 (Measured in unit of minute)

Return True (1) on success, False (0) on failure

Value	None
-------	------

Return True (1) on success, False (0) on failure

Value	None
-------	------

Return True (1) on success, False (0) on failure

4.11.5 I2C Function

I2C_Initialize

bool I2C_Initialize()

Purpose The I2C Controller Initialize Function.
Return True (1) on success, False (0) on failure

I2C_ReadByte

Int I2C_ReadByte(int SalveID, int Index)

Purpose Read the I2C data.
Value SlaveID Device Slave address to be read
 Index Device data index to be read
Return A byte Array representing the data

I2C_WriteByte

bool I2C_WriteByte(int SalveID, int Index, int Data)

Purpose Write data into the I2C
Value SlaveID Device Slave address to be read
 Index Device data index to be read
 Data (Data to be written)
Return True (1) on success, False (0) on failure

5 BIOS SETUP

This chapter guides users how to configure the basic system configurations via the BIOS Setup Utilities. The information of the system configuration is saved in battery-backed CMOS RAM and BIOS NVRAM so that the Setup information is retained when the system is powered off. The BIOS Setup Utilities consist of the following menu items:

- Accessing Setup Utilities
- Main Menu
- Advanced Menu
- Chipset Menu
- Security Menu
- Boot Menu
- Save & Exit Menu

5.1 Introduction

The EL 1097 System uses an AMI (American Megatrends Incorporated) Aptio BIOS that is stored in the Serial Peripheral Interface Flash Memory (SPI Flash) and can be updated. The SPI Flash contains the built-in BIOS setup program, Power-On Self-Test (POST), 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 the 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 elements have combined to provide a standard environment for booting the operating system and running pre-boot applications.

The diagram below shows the Extensible Firmware Interface's location in the software stack.

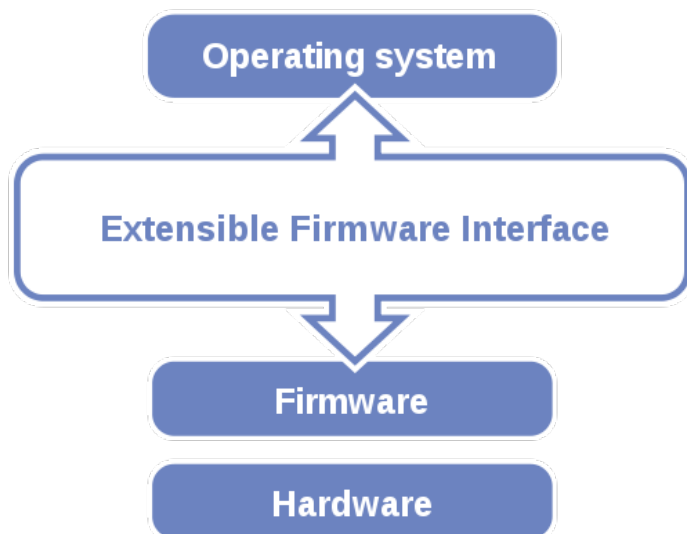


Figure 5-1. Extensible Firmware Interface Diagram

EFI BIOS provides an user interface that allows you to modify hardware configuration, e.g. change the system date and time, enable/disable a system component, determine bootable device priority, set up personal password, etc., which is convenient for engineers to perform modifications and customize the computer system and allows technicians to troubleshoot the occurred errors when the hardware is faulty.

The BIOS setup menu allows users to view and modify the BIOS settings for the computer. After the system is powered on, users can access the BIOS setup menu by pressing or <Esc> immediately while the POST message is running before the operating system is loading.

All the menu settings are described in details in this chapter.

5.2 Accessing Setup Utility

After the system is powered on, BIOS will enter the Power-On Self-Test (POST) routines and the POST message will be displayed:



Figure 5-2. POST Screen with AMI Logo

Press **** or **<Esc>** to access the Setup Utility program and the **Main** menu of the Aptio Setup Utility will appear on the screen as below:



BIOS Setup Menu Initialization Screen

You may move the cursor by <↑> and <↓> keys to highlight the individual menu items. As you highlight each item, a brief description of the highlighted selection will appear on the right side of the screen.

The language of the BIOS setup menu interface and help messages are shown in US English. You may use <↑> or <↓> key to select among the items and press <Enter> to confirm and enter the sub-menu. The following table provides the list of the navigation keys that you can use while operating the BIOS setup menu.

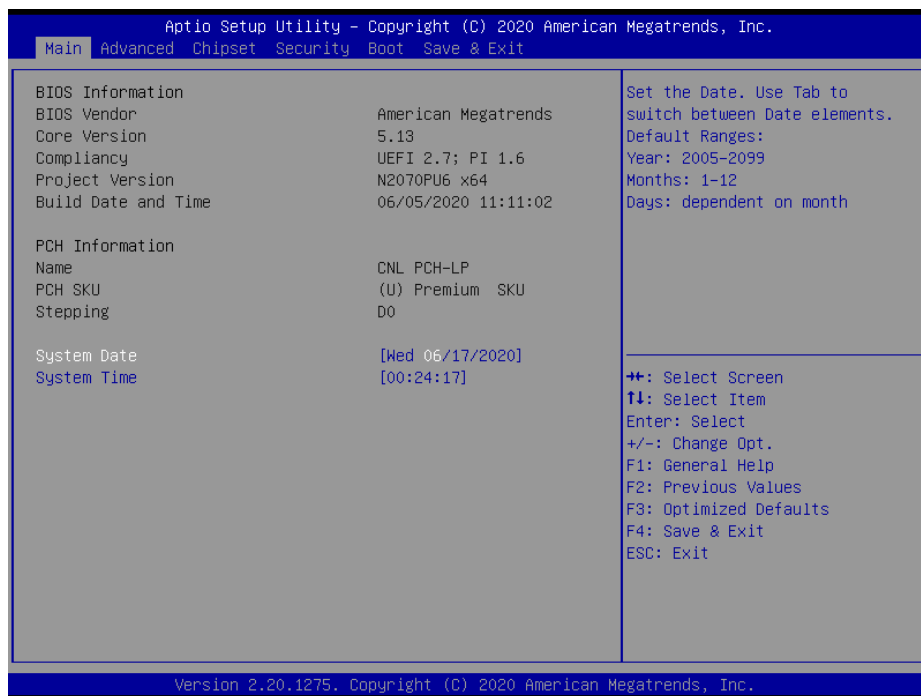
BIOS Setup Navigation Key	Description
<←> and <→>	Select a different menu screen (move the cursor from the selected menu to the left or right).
<↑> and <↓>	Select a different item (move the cursor from

BIOS Setup Navigation Key	Description
	the selected item upwards or downwards)
<Enter>	Execute the command or select the sub-menu.
<F2>	Load the previous configuration values.
<F3>	Load the default configuration values.
<F4>	Save the current values and exit the BIOS setup menu.
<Esc>	Close the sub-menu. Trigger the confirmation to exit BIOS setup menu.

5.3 Main

Menu Path *Main*

The **Main** menu allows you to view the BIOS Information, change the system date and time, and view the user access privilege level. Use tab to switch between date elements. Use <↑> or <↓> arrow keys to highlight the item and enter the value you want in each item. This screen also displays the BIOS version (project) and BIOS Build Date and Time.



Main Screen

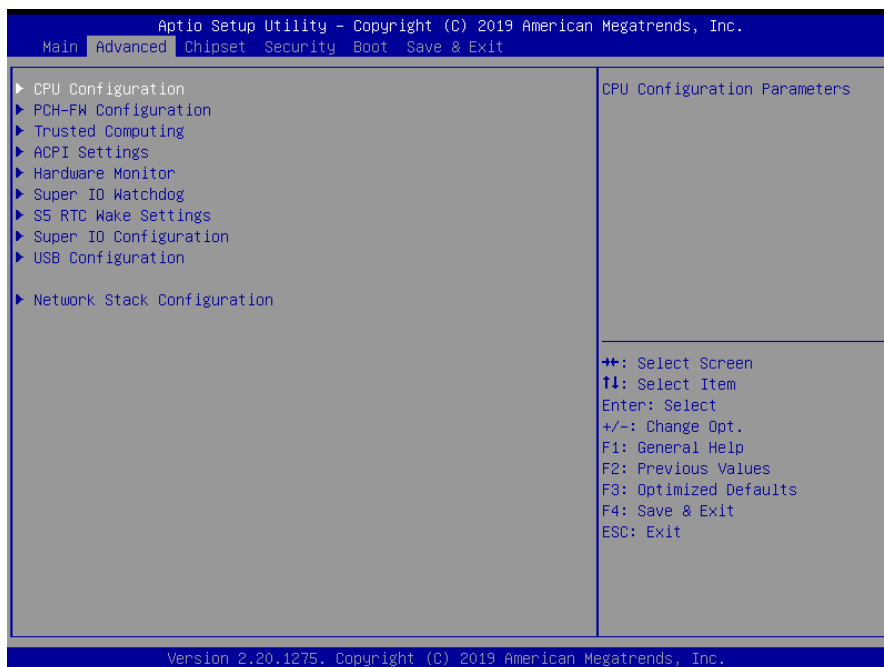
BIOS Setting	Options	Description/Purpose
BIOS Vendor	No changeable options	Displays the BIOS vendor.
Core Version	No changeable options	Displays the current BIOS core version.
Compliancy	No changeable options	Displays the current UEFI version.
Project Version	No changeable options	Displays the version of the BIOS currently installed on the platform.
Build Date and Time	No changeable options	Displays the date of current BIOS version.
Name	No changeable options	Displays the name of the PCH.
PCH SKU	No changeable options	Displays the SKU for the PCH.
Stepping	No changeable options	Displays the stepping of the PCH

BIOS Setting	Options	Description/Purpose
System Date	Month, day, year	Sets the system date. The format is [Day Month/ Date/ Year]. Users can directly enter values or use <+> or <-> arrow keys to increase/decrease it. The “Day” is automatically changed.
System Time	Hour, minute, second	Sets the system time. The format is [Hour: Minute: Second]. Users can directly enter values or use <+> or <-> arrow keys to increase/decrease it.

5.4 Advanced

Menu Path *Advanced*

This menu provides advanced configurations such as CPU Configuration, PCH-FW Configuration, Trusted Computing, ACPI Settings, Hardware Monitor, Super IO Watchdog, S5 RTC Wake Settings, Super IO Configuration, USB Configuration and Network Stack Configuration.



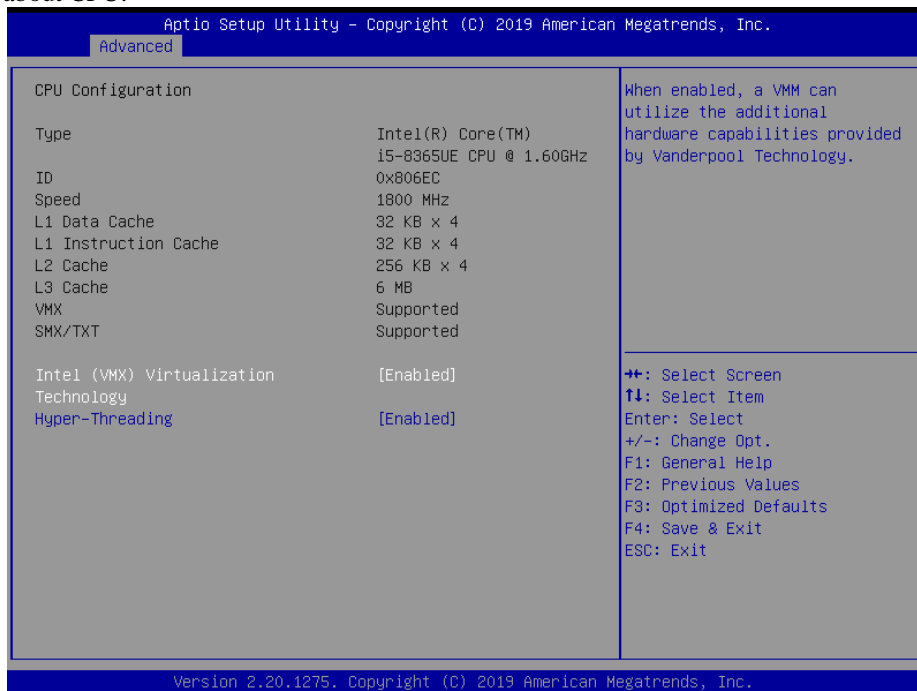
Advanced Menu Screen

BIOS Setting	Options	Description/Purpose
CPU Configuration	Sub-Menu	CPU Configuration Parameters.
PCH-FW Configuration	Sub-Menu	Management Engine Technology Parameters.
Trusted Computing	Sub-Menu	Trusted Computing Settings.
ACPI Settings	Sub-Menu	System ACPI Parameters.
Hardware Monitor	Sub-Menu	Monitor hardware status
Super IO Watchdog	Sub-Menu	Super IO Watchdog Parameters.
S5 RTC Wake Settings	Sub-Menu	S5 RTC Wake Parameters.
Super IO Configuration	Sub-Menu	System Super IO Chip Parameters
USB Configuration	Sub-Menu	USB Configuration Parameters.
Network Stack Configuration	Sub-Menu	Network Stack Settings.

5.4.1 Advanced - CPU Configuration

Menu Path *Advanced > CPU Configuration*

The **CPU Configuration** provides advanced CPU settings and some information about CPU.



CPU Configuration Screen

BIOS Setting	Options	Description/Purpose
Type	No changeable options	Displays CPU Core.
ID	No changeable options	Displays CPU ID number.
Speed	No changeable options	Displays the CPU speed.
L1 Data Cache	No changeable options	Displays L1 Data Cache size.
L1 Instruction Cache	No changeable options	Displays L1 Instruction Cache size.
L2 Cache	No changeable options	Displays L2 Cache size.
L3 Cache	No changeable options	Displays L3 Cache size.
VMX	No changeable options	Supports Intel VMX Technology.
SMX/TXT	No changeable options	Reports if Intel Secure Mode Extensions Technology (SMX) /Trusted Execution Technology (TXT) is supported by the processor.
Intel (VMX) Virtualization	- Disabled - Enabled	When enabled, a VMM can utilize the additional hardware capabilities

BIOS Setting	Options	Description/Purpose
Technology		provided by Vanderpool Technology. Previously codenamed "Vanderpool", VT-x represents Intel's technology for virtualization on the x86 platform.
Hyper-Threading	<ul style="list-style-type: none"> - Disabled - Enabled 	When disabled, only one thread per enabled core is enabled. Hyper Threading is Intel's term for its simultaneous multithreading implementation in their CPUs. Enable this function will improve parallelization of computation performed on PC microprocessor. For each processor core that is physically present, the operating system addresses two virtual processors, and shares the workload between them when possible.

5.4.2 Advanced - PCH-FW Configuration

Menu Path Advanced > PCH-FW Configuration

The **PCH-FW** allows users to view the information about ME (Management Engine) firmware information, such as ME firmware version, firmware mode, firmware SKU and PTT Configuration.



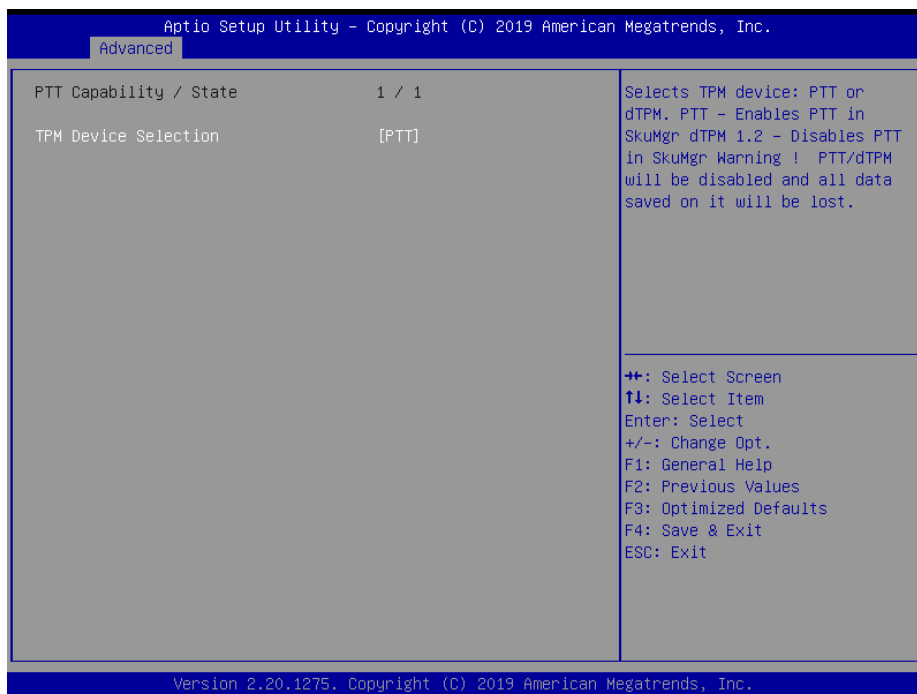
PCH-FW Configuration Screen

BIOS Setting	Options	Description/Purpose
ME Firmware Version	No changeable options	Displays the ME Firmware Version.
ME Firmware Mode	No changeable options	Displays the ME Firmware Mode.
ME Firmware SKU	No changeable options	Displays the ME Firmware SKU.
PTT Configuration	Sub-Menu	PTT Configuration Parameters.

Advanced – PCH-FW Configuration – PTT Configuration

Menu Path Advanced > PCH-FW Configuration > PTT Configuration

The **PTT Configuration** allows users to configure the TPM Device Selection.



PTT Configuration Screen

BIOS Setting	Options	Description/Purpose
TPM Device Selection	- dTPM - PTT	- Enables PTT in SkuMgr dTPM 1.2 - Disables PTT in SkuMgr Warning ! PTT/dTPM will be disabled and all data saved on it will be lost.

5.4.3 Advanced – Trusted Computing

Menu Path *Advanced > Trusted Computing*

The **Trusted Computing** allows users to enable/disable BIOS support for security device. The operating system will not show Security Device. The TCG EFI protocol and INT1A interface will not be available.



Trusted Computing Settings Screen

BIOS Setting	Options	Description/Purpose
Security Device Support	- Disable - Enable	Enables or Disables BIOS support for security device. O.S. will not show Security Device. TCG EFI Protocol and INT1A interface will not be available.

5.4.4 Advanced – ACPI Settings

Menu Path *Advanced > ACPI Settings*

The **ACPI Settings** allows users to configure relevant ACPI (Advanced Configuration and Power Management Interface) settings such as Enable/Disable Hibernation, ACPI sleep state, Lock legacy resources and S3 Video Repost..



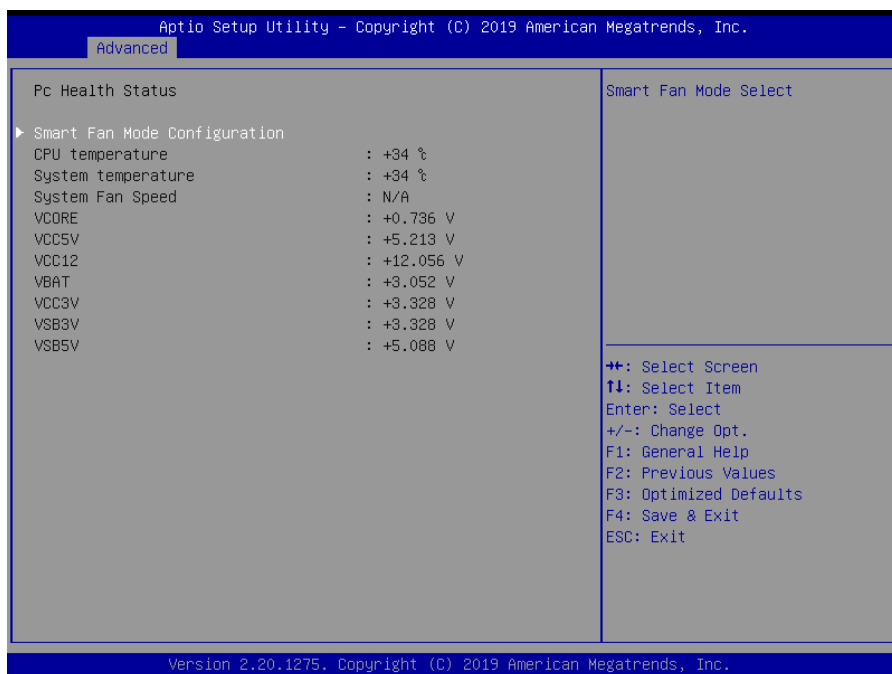
ACPI Settings Screen

BIOS Setting	Options	Description/Purpose
Enable Hibernation	- Disabled - Enabled	Enables or Disables System ability to Hibernate (OS/S4 Sleep State). This option may be not effective with some OS.
ACPI Sleep State	- Suspend Disabled - S3 (Suspend to RAM)	Selects the ACPI sleep state the system will enter when the SUSPEND button is pressed.
Lock Legacy Resources	- Disabled - Enabled	Enables or Disables Lock of Legacy Resources.
S3 Video Repost	- Disabled - Enabled	Enables or Disables S3 Video Repost.

5.4.5 Advanced – Hardware Monitor

Menu Path *Advanced > Hardware Monitor*

The **Hardware Monitor** allows users to monitor the health and status of the system such as CPU temperature, system temperature and voltage levels in supply.



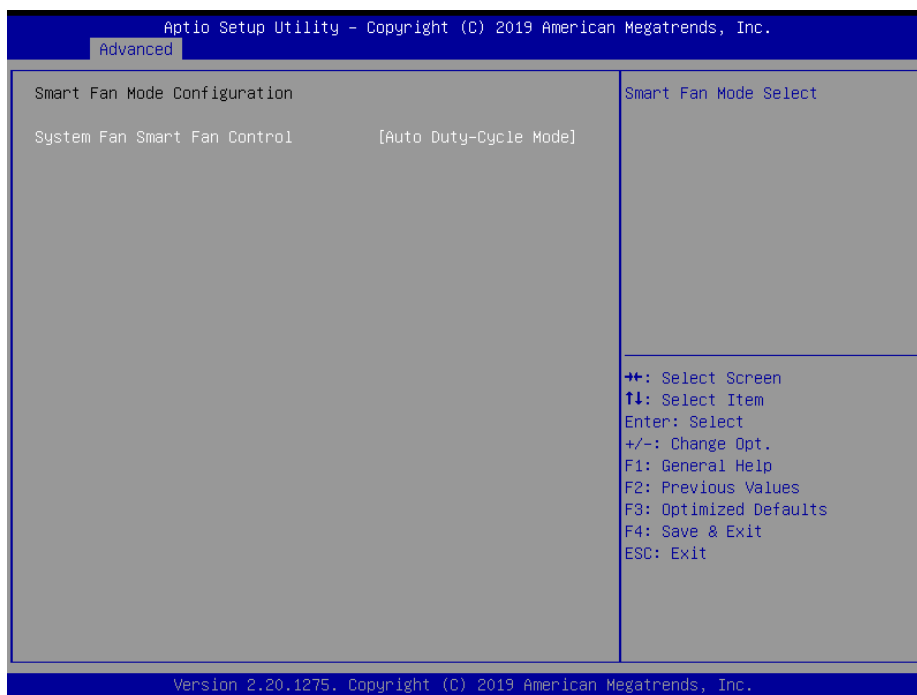
Hardware Monitor Screen

BIOS Setting	Options	Description/Purpose
Smart Fan Mode Configuration	Sub-Menu	Smart Fan Mode Selection
CPU Temperature	No changeable options	Displays the processor's temperature.
System Temperature	No changeable options	Displays the system's temperature.
System Fan Speed	No changeable options	Displays CPU Fan speed.
VCore	No changeable options	Detects and displays the VCore CPU voltage.
VCC5	No changeable options	Detects and displays 5V voltage.
VCC12	No changeable options	Detects and displays 12V voltage.
VBAT	No changeable options	Detects and displays the battery voltage.
VCC3V	No changeable options	Detects and displays 3V voltage.
VS3V	No changeable options	Detects and displays VS3V voltage.
VS5V	No changeable options	Detects and displays the voltage level of the VS5V in supply.

5.4.6 Smart Fan Mode Configuration

Menu Path *Advanced > Hardware Monitor> Smart Fan Mode Configuration*

The **Smart Fan Mode Configuration** allows users to configure smart fan mode.



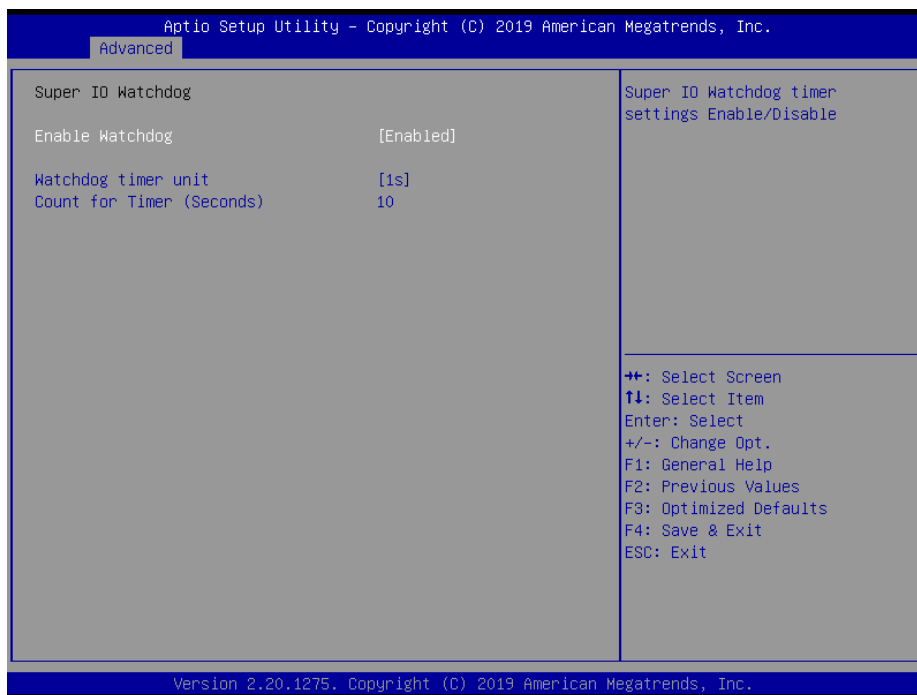
Smart Fan Mode Configuration Screen

BIOS Setting	Options	Description/Purpose
System Fan Smart Fan Control	- Manual Duty Mode - Auto Duty-Cycle Mode	Configure Smart Fan Mode for CPU Fan.
Manual Duty Mode	Numeric (from 1 to 100)	Manual mode fan control, user can write expected duty cycle (PWM fan type) 1-100.

5.4.7 Advanced –Super IO Watchdog

Menu Path *Advanced > Super IO Watchdog*

If the system hangs or fails to respond, enable the F81866 Watchdog function to trigger a system reset via the 255-level watchdog timer.



Super IO Watchdog Screen

BIOS Setting	Options	Description/Purpose
Enable Watchdog	- Enabled - Disabled	Enables/Disables F81866 Watchdog timer settings.
Watchdog timer unit	- 1s - 60s	Selects 1s (second) or 60s (minute) as the time unit of Watchdog timer.
Count for Timer (Seconds)	Numeric (from 1 to 255)	Sets the timeout for Watchdog timer. (Max. value: 255 seconds or minutes)

5.4.8 Advanced –S5 RTC Wake Settings

Menu Path *Advanced > S5 RTC wake Settings*

The **S5 RTC Wake Settings** enables/disables the system to wake up at a preset time of a day from S5 State using RTC alarm.



S5 RTC Wake Settings Screen

BIOS Setting	Options	Description/Purpose
Wake system from S5	<ul style="list-style-type: none"> - Disabled - Fixed Time - Dynamic Time 	<p>Allows enabling scheduled S5 to S0 (option enabled).</p> <ul style="list-style-type: none"> • Fixed Time: System will wake on the hr::min::sec specified. • Dynamic Time: System will wake on the current time + Increase minute(s).

Menu Path

Advanced > S5 RTC wake Settings (Fixed Time)

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Advanced

Wake system from S5	[Fixed Time]	Enable or disable System wake on alarm event. Select FixedTime, system will wake on the hr::min::sec specified. Select DynamicTime , System will wake on the current time + Increase minute(s)
Wake up hour	0	
Wake up minute	0	
Wake up second	0	

++: Select Screen
 ↑↓: Select Item
 Enter: Select
 +/-: Change Opt.
 F1: General Help
 F2: Previous Values
 F3: Optimized Defaults
 F4: Save & Exit
 ESC: Exit

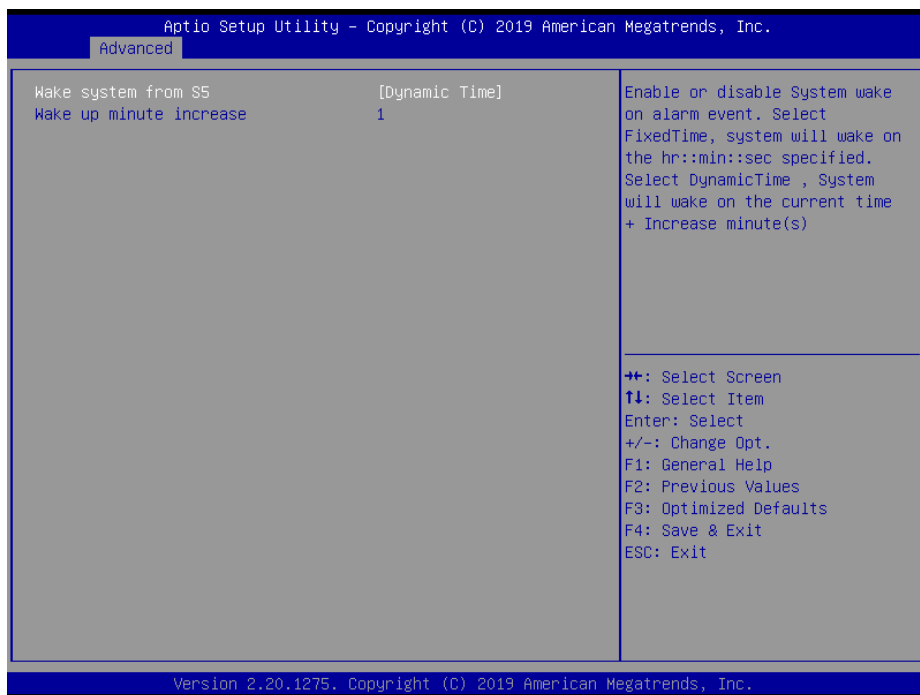
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S5 RTC Wake Settings Screen (Fixed Time)

BIOS Setting	Options	Description/Purpose
Wake system from S5	- Disabled - Fixed Time - Dynamic Time	Allows enabling scheduled S5 to S0 (option: enabled). <ul style="list-style-type: none"> • Fixed Time: System will wake on the hr::min::sec specified. • Dynamic Time: System will wake on the current time + Increase minute(s).
Wake up hour	Multiple options ranging from 0 to 23	Sets an hour for schedule power on event.
Wake up minute	Multiple options ranging from 0 to 59	Sets a minute for schedule power on event.
Wake up second	Multiple options ranging from 0 to 59	Sets a second for schedule power on event.

Menu Path

Advanced > S5 RTC Wake Settings (Dynamic Time)



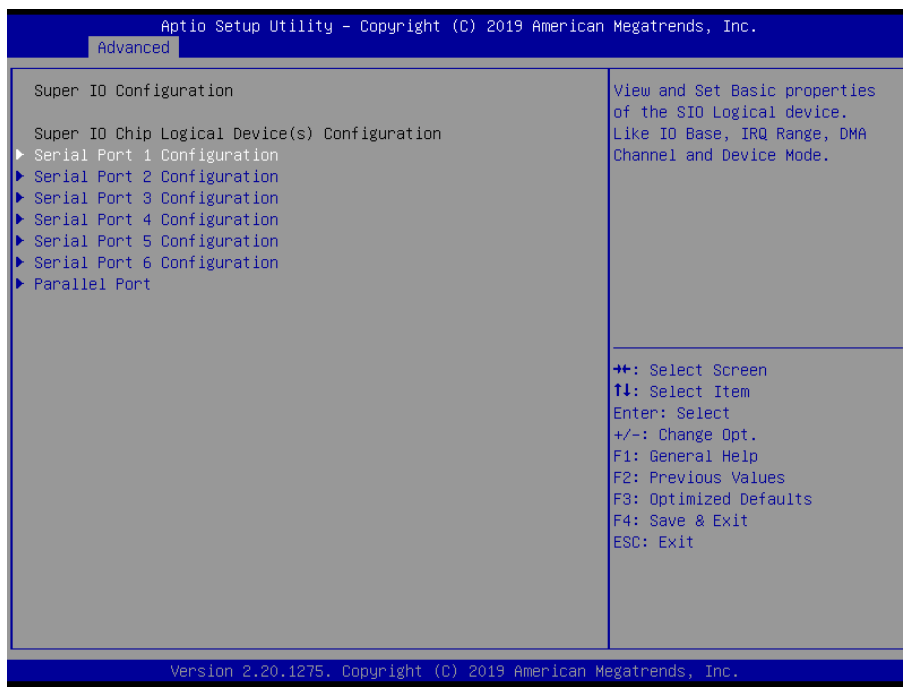
S5 RTC Wake Settings Screen (Dynamic Time)

BIOS Setting	Options	Description/Purpose
Wake system from S5	<ul style="list-style-type: none"> - Disabled - Fixed Time - Dynamic Time 	<p>Allows enabling scheduled S5 to S0 (option: enabled).</p> <ul style="list-style-type: none"> • Fixed Time: System will wake on the hr::min::sec specified. • Dynamic Time: System will wake on the current time + Increase minute(s).
Wake up minute increase	Multiple options ranging from 1 to 5	Sets a period of time (in minutes) after which the board wakes up from S5 state.

5.4.9 Advanced –Super Configuration

Menu Path *Advanced > Super IO Configuration*

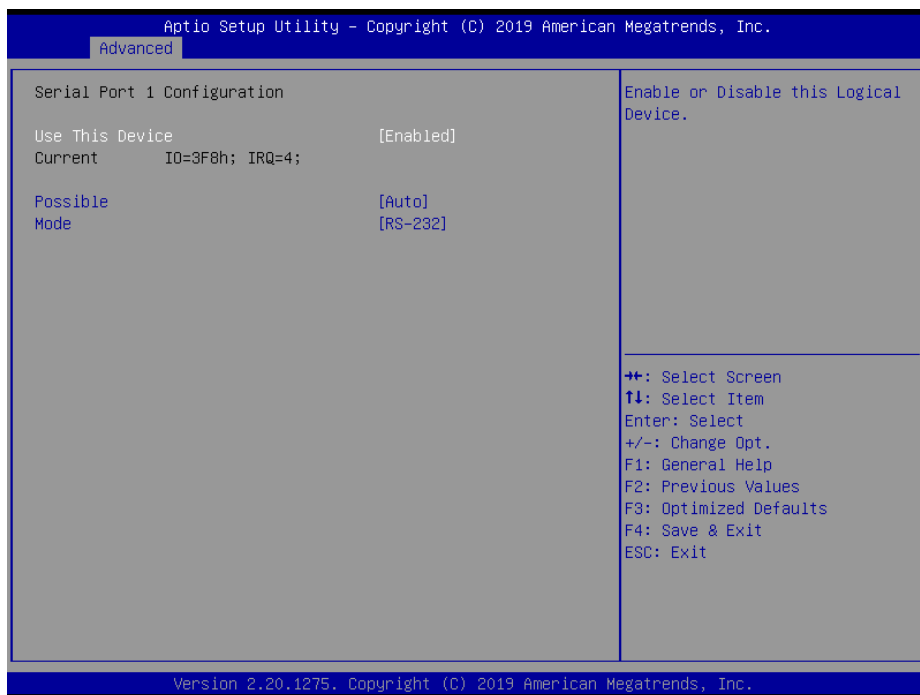
The **Super IO Configuration** allows users to configure the serial ports 1-6 and Parallel Port.



F81866 Super IO Configuration Screen

BIOS Setting	Options	Description/Purpose
Serial Port 1 Configuration	Sub-menu	Configures Parameters of Serial Port 1 (COMA).
Serial Port 2 Configuration	Sub-menu	Configures Parameters of Serial Port 2 (COMB).
Serial Port 3 Configuration	Sub-menu	Set Parameters of Serial Port 3 (COMC)
Serial Port 4 Configuration	Sub-menu	Set Parameters of Serial Port 4 (COMD)
Serial Port 5 Configuration	Sub-menu	Set Parameters of Serial Port 5 (COME)
Serial Port 6 Configuration	Sub-menu	Set Parameters of Serial Port 6 (COMF)
Parallel Port	Sub-menu	Set Parameters of Parallel Port (LPT)

Menu Path *Advanced > Super IO Configuration >
Serial Port 1 Configuration*



Serial Port 1 Configuration Screen

BIOS Setting	Options	Description/Purpose
Use This Device	- Disabled - Enabled	Enables or Disables Serial Port 1.
Current	No changeable options	Displays the current settings of Serial Port 1.
Possible	- Auto - IO=3F8h; IRQ=4; - IO=3F8h; IRQ=3,4,5,7,10,11; - IO=2F8h; IRQ=3,4,5,7,10,11; - IO=3E8h; IRQ=3,4,5,7,10,11; - IO=2E8h; IRQ=3,4,5,7,10,11;	Allows you to select specific IO address and IRQ for Serial Port 1.
Mode	- RS-232 - RS-422 - RS-485	Select COM mode

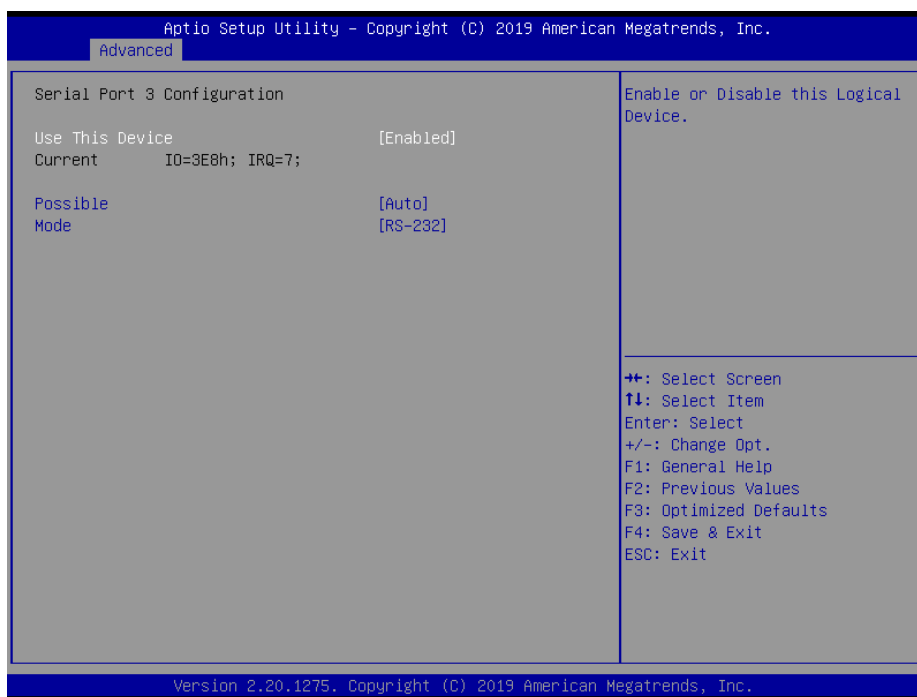
Menu Path *Advanced > Super IO Configuration >
Serial Port 2 Configuration*



Serial Port 2 Configuration Screen

BIOS Setting	Options	Description/Purpose
Use This Device	- Disabled - Enabled	Enables or Disables Serial Port 2.
Current	No changeable options	Displays the current settings of Serial Port 2.
Possible	- Auto - IO=2F8h; IRQ=3; - IO=3F8h; IRQ=3,4,5,7,10,11; - IO=2F8h; IRQ=3,4,5,7,10,11; - IO=3E8h; IRQ=3,4,5,7,10,11; - IO=2E8h; IRQ=3,4,5,7,10,11;	Allows you to select specific IO address and IRQ for Serial Port 2.
Mode	- RS-232 - RS-422 - RS-485	Select COM mode

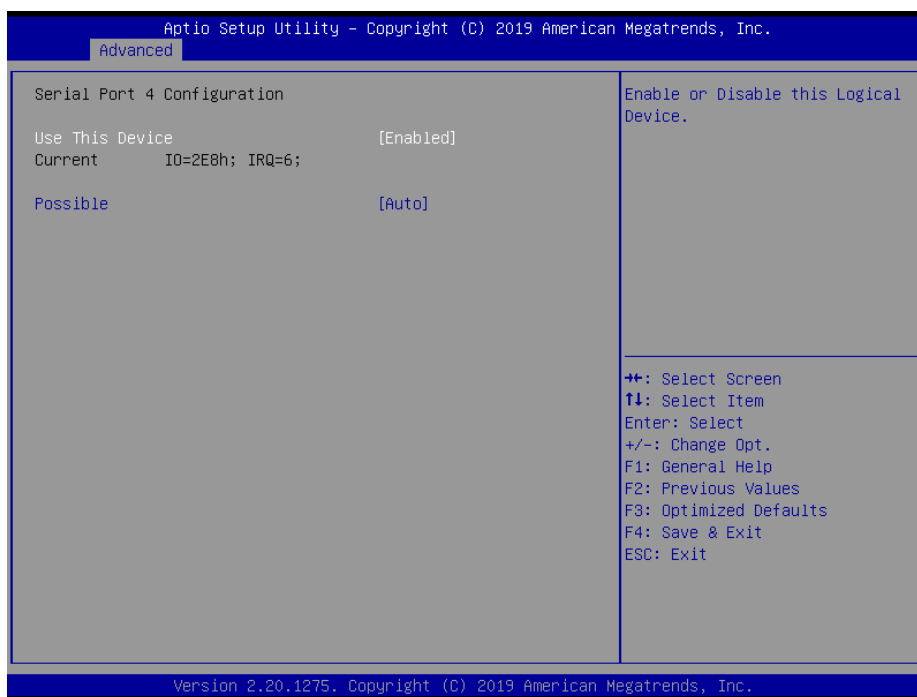
Menu Path *Advanced > Super IO Configuration >
Serial Port 3 Configuration*



Serial Port 3 Configuration Screen

BIOS Setting	Options	Description/Purpose
Use This Device	- Disabled - Enabled	Enables or Disables Serial Port 3.
Current	No changeable options	Displays the current settings of Serial Port 3.
Possible	- Auto - IO=3E8h; IRQ=7; - IO=3F8h; IRQ=3,4,5,7,10,11; - IO=2E8h; IRQ=3,4,5,7,10,11; - IO=2F0h; IRQ=3,4,5,7,10,11; - IO=2E0h; IRQ=3,4,5,7,10,11;	Allows you to select specific IO address and IRQ for Serial Port 3.
Mode	- RS-232 - RS-422 - RS-485	Select COM mode

Menu Path *Advanced > Super IO Configuration >
Serial Port 4 Configuration*



Serial Port 4 Configuration Screen

BIOS Setting	Options	Description/Purpose
Use This Device	- Disabled - Enabled	Enables or Disables Serial Port 4.
Current	No changeable options	Displays the current settings of Serial Port 4.
Possible	- Auto - IO=2E8h; IRQ=6; - IO=3E8h; IRQ=3,4,5,7,10,11; - IO=2E8h; IRQ=3,4,5,7,10,11; - IO=2F0h; IRQ=3,4,5,7,10,11; - IO=2E0h; IRQ=3,4,5,7,10,11;	Allows you to select specific IO address and IRQ for Serial Port 4.

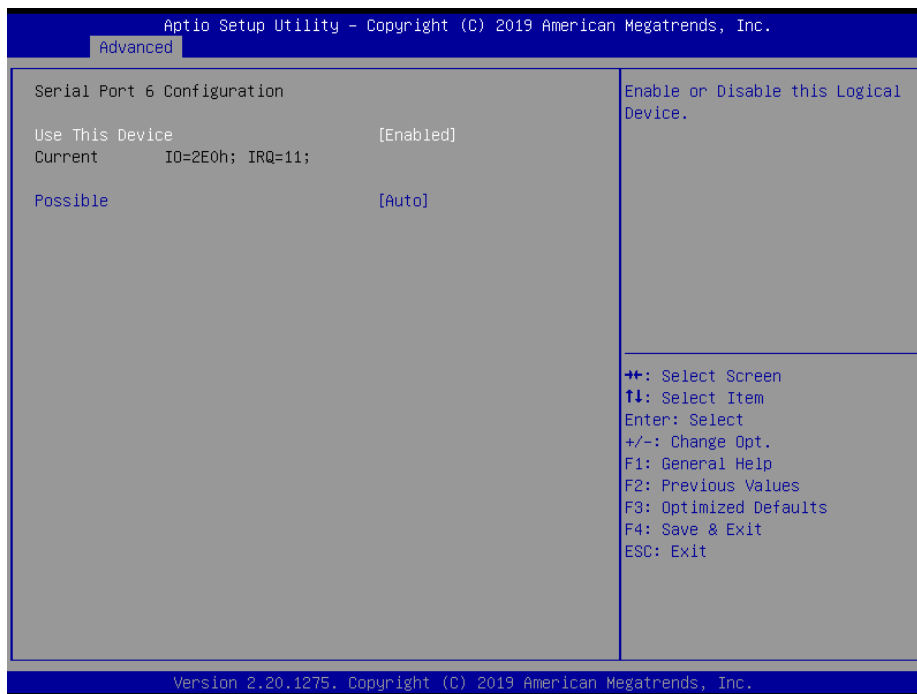
Menu Path *Advanced > Super IO Configuration >
Serial Port 5 Configuration*



Serial Port 5 Configuration Screen

BIOS Setting	Options	Description/Purpose
Use This Device	- Disabled - Enabled	Enables or Disables Serial Port 5.
Current	No changeable options	Displays the current settings of Serial Port 5.
Possible	- Auto - IO=2F0h; IRQ=10; - IO=3F8h; IRQ=3,4,5,7,10,11; - IO=2E8h; IRQ=3,4,5,7,10,11; - IO=2F0h; IRQ=3,4,5,7,10,11; - IO=2E0h; IRQ=3,4,5,7,10,11;	Allows you to select specific IO address and IRQ for Serial Port 5.

Menu Path *Advanced > Super IO Configuration >
Serial Port 6 Configuration*



Serial Port 6 Configuration Screen

BIOS Setting	Options	Description/Purpose
Use This Device	- Disabled - Enabled	Enables or Disables Serial Port 6.
Current	No changeable options	Displays the current settings of Serial Port 6.
Possible	- Auto - IO=2E0h; IRQ=11; - IO=3F8h; IRQ=3,4,5,7,10,11; - IO=2E8h; IRQ=3,4,5,7,10,11; - IO=2F0h; IRQ=3,4,5,7,10,11; - IO=2E0h; IRQ=3,4,5,7,10,11;	Allows you to select specific IO address and IRQ for Serial Port 6.

Menu Path *Advanced > Super IO Configuration >
Parallel Port Configuration*

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Advanced

Parallel Port Configuration

Use This Device [Enabled]

Current IO=378h; IRQ=5;

Possible [Auto]

Mode [STD Printer Mode]

Enable or Disable this Logical Device.

++: Select Screen
 ↑↓: Select Item
 Enter: Select
 +/-: Change Opt.
 F1: General Help
 F2: Previous Values
 F3: Optimized Defaults
 F4: Save & Exit
 ESC: Exit

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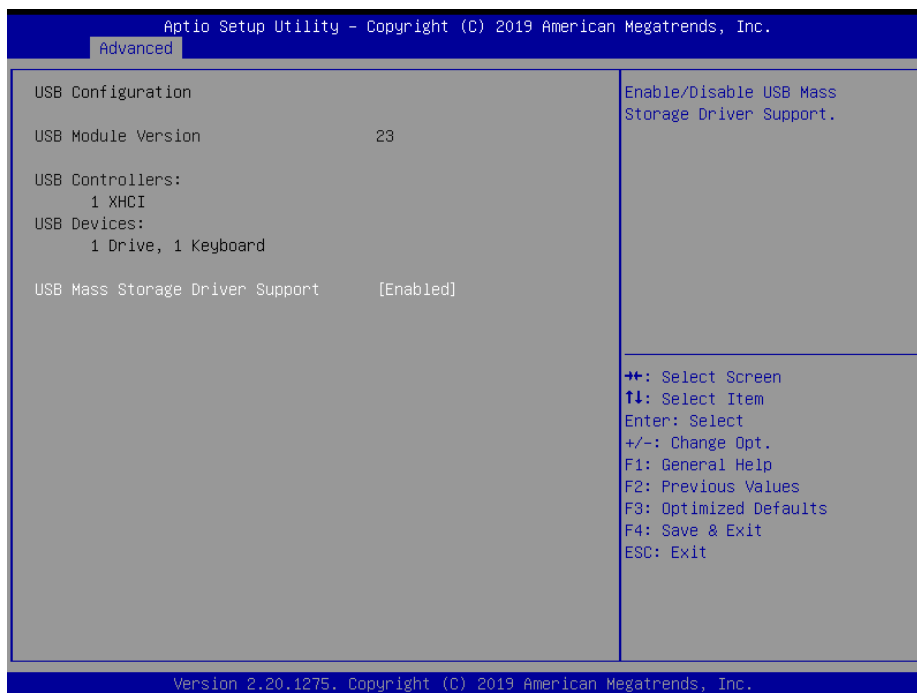
Parallel Port Configuration Screen

BIOS Setting	Options	Description/Purpose
Use This Device	<ul style="list-style-type: none"> - Disabled - Enabled 	Enables or Disables Serial Port 6.
Current	No changeable options	Displays the current settings of Serial Port 6.
Possible	<ul style="list-style-type: none"> - Auto - IO=378h; IRQ=5; - IO=378h; IRQ=5,6,7,9,10,11,12; - IO=278h; IRQ=5,6,7,9,10,11,12; - IO=3BCh; IRQ=5,6,7,9,10,11,12; 	Allows you to select specific IO address and IRQ for Serial Port 6.
Mode	<ul style="list-style-type: none"> - STD Printer Mode - SPP Mode - EPP-1.9 and SPP Mode - EPP-1.7 and SPP Mode - ECP Mode - ECP and EPP 1.9 Mode - ECP and EPP 1.7 Mode 	Change Parallel Port mode. Some of the Modes required a DMA resource. After Mode changing, Reset the System to reflect actual device settings.

5.4.10 Advanced – USB Configuration

Menu Path *Advanced > USB Configuration*

The **USB Configuration** allows users to configure advanced USB settings such as USB mass storage driver support.



USB Configuration Screen

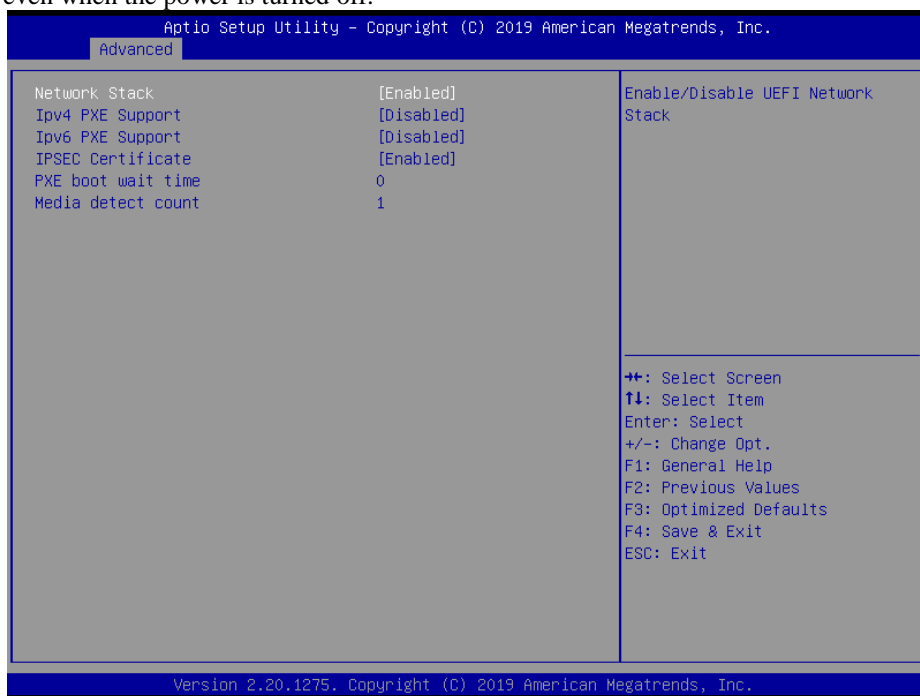
BIOS Setting	Options	Description/Purpose
USB Mass Storage Driver Support	- Disabled - Enabled	Enable/Disable USB Mass Storage Driver Support.

5.4.11 Advanced - Network Stack Configuration

Menu Path *Advanced > Network Stack Configuration*

The **Network Stack Configuration** allows users to enable/disable UEFI Network Stack, IPv4/IPv6 PXE (Pre-Boot eXecution Environment) and configure PXE boot wait time and detects the media presence.

PXE allows a workstation to boot from a server on a network prior to booting the operating system on the local hard drive. A PXE-enabled workstation connects its NIC to the LAN via a jumper, which keeps the workstation connected to the network even when the power is turned off.



Network Stack Configuration Screen

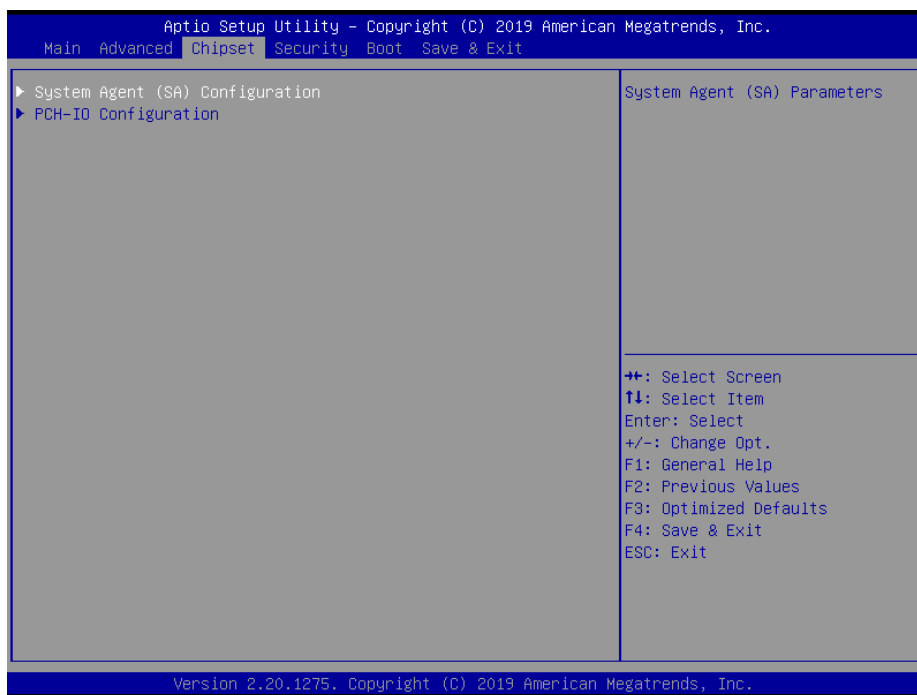
BIOS Setting	Options	Description/Purpose
Network Stack	- Disabled - Enabled	Enables or Disables UEFI Network Stack.
Ipv4 PXE Support	- Disabled - Enabled	Enables IPv4 PXE Boot Support. If disabled, IPv4 PXE boot option will not be created.
Ipv6 PXE Support	- Disabled - Enabled	Enables IPv6 PXE Boot Support. If disabled, IPv6 PXE boot option will not be created.
IPSEC Certificate	- Disabled	Support to Enable/Disable IPSEC

BIOS Setting	Options	Description/Purpose
	- Enabled	certificate for Ikev.
PXE boot wait time	Numeric (from 0 to 5)	Number of seconds to wait for PXE boot to abort after the Esc key is pressed.
Media detect count	Numeric (from 1 to 50)	Number of times that the media presence will be checked.

5.5 Chipset

Menu Path *Chipset*

This menu allows users to configure advanced Chipset settings such as System Agent (SA) and PCH-IO configuration parameters.



Chipset Screen

BIOS Setting	Options	Description/Purpose
System Agent (SA) Configuration	Sub-menu	System Agent (SA) parameters.
PCH-IO Configuration	Sub-menu	PCH parameters.

5.5.1 Chipset – System Agent (SA) Configuration

Menu Path *Chipset > System Agent (SA) Configuration*

The **System Agent Configuration** allows users to display DRAM information on the platform as well as configure graphics settings.



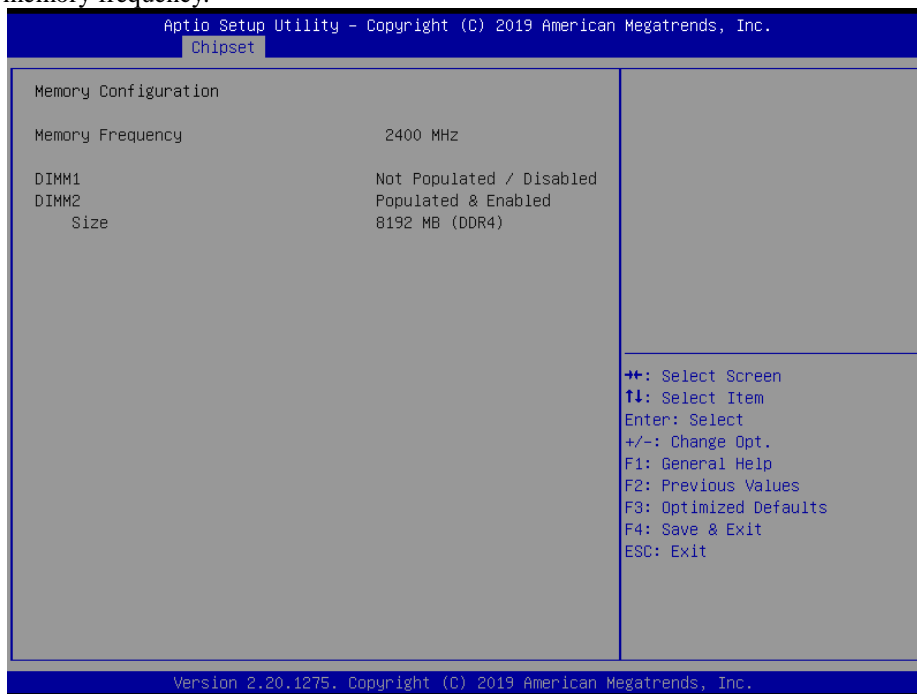
System Agent (SA) Configuration Screen

BIOS Setting	Options	Description/Purpose
Memory Configuration	Sub-menu	Displays the DRAM information on the platform.
DISPLAY port 1 type selection	- HDMI - DP	Select the video device which will be activated during post.
DISPLAY port 2 type selection	- HDMI - DP	Select the video device which will be activated during post.
VT-d	- Disabled - Enabled	Enables or Disables VT-d function.

Chipset – SA Configuration – Memory Configuration

Menu Path *Chipset > System Agent (SA) Configuration >
Memory Configuration*

The **Memory Configuration** allows users to check for the information about the memory frequency.



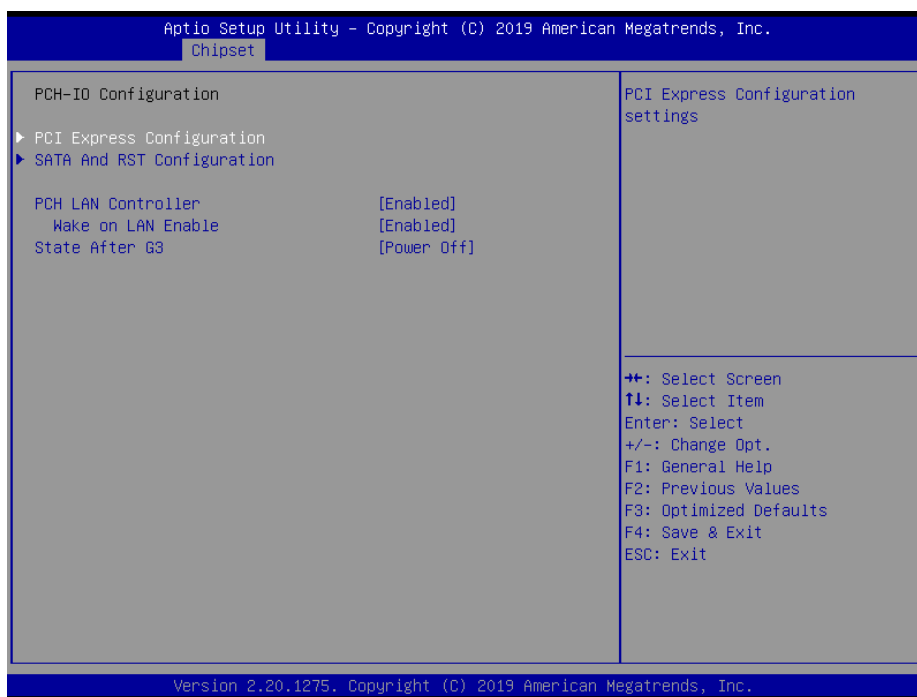
Memory Configuration Screen

BIOS Setting	Options	Description/Purpose
Memory Frequency	No changeable options	Displays the Frequency of Memory.
DIMM1	No changeable options	Displays the size of DIMM1.
DIMM2	No changeable options	Displays the size of DIMM2.

5.5.2 Chipset – PCH-IO Configuration

Menu Path *Chipset > PCH-IO Configuration*

The **PCH-IO Configuration** allows users to set PCI Express configuration parameters, SATA And RST Configuration, enable/disable PCH LAN Controller, Wake-On-LAN function and determine the power on/off state that the system will go into following a power failure (G3 state).



PCH-IO Configuration Screen

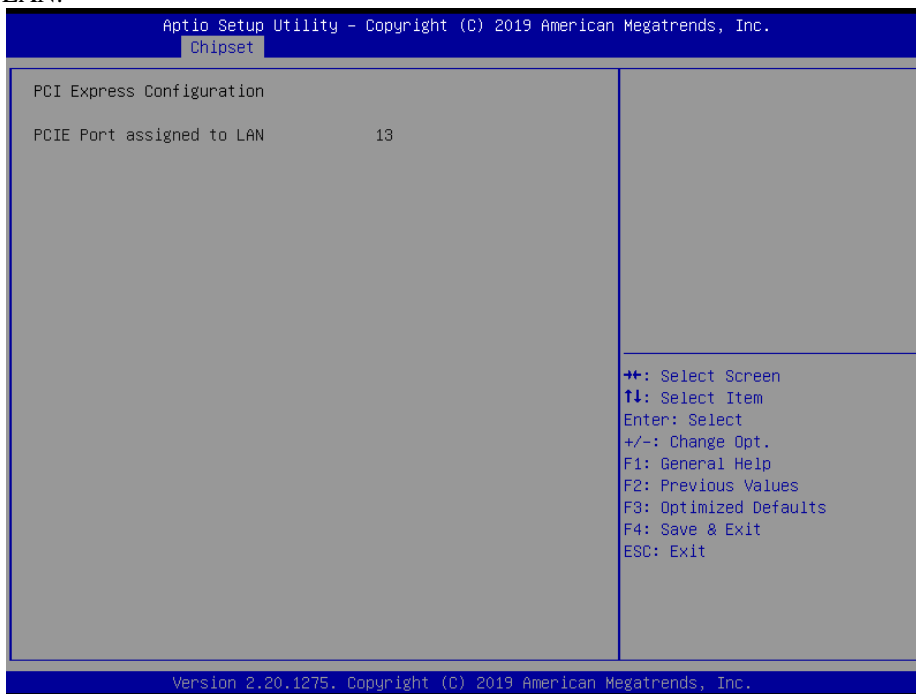
BIOS Setting	Options	Description/Purpose
PCI Express Configuration	Sub-menu	Configures PCI Express Configuration settings.
SATA and RST Configuration	Sub-menu	SATA Configuration settings.
PCH LAN Controller	- Disabled - Enabled	Enables or Disables onboard NIC.
Wake on LAN Enable	- Disabled - Enabled	Enables or Disables integrated LAN to wake up the system. Default: Enabled.

BIOS Setting	Options	Description/Purpose
State After G3	<ul style="list-style-type: none">- Power On- Power Off	Specifies the Power On/Off state that the system will go into when the power is re-applied following a power failure (G3 state).

Chipset – PCH-IO Configuration – PCI Express Configuration

Menu Path *Chipset > PCH-IO Configuration >
PCI Express Configuration*

The **PCI Express Configuration** allows users to configure PCI Port assigned to LAN.



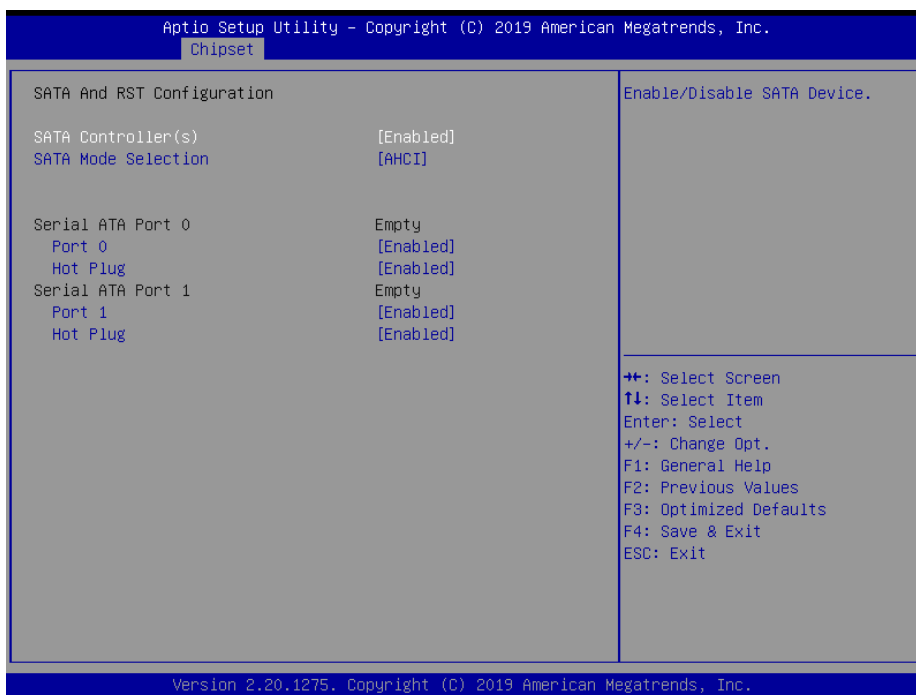
PCI Express Configuration Screen

BIOS Setting	Options	Description/Purpose
PCIE Port assigned to LAN	No changeable options	Displays the LAN assigned PCIE Port.

Chipset – PCH-IO Configuration – SATA Configuration

Menu Path *Chipset > PCH-IO Configuration > SATA Configuration*

The **SATA Configuration** allows users to enable / disable the SATA controller as well as the operational mode after the SATA controller is enabled. The following screen indicates the functions available when the SATA controller is enabled and the AHCI mode is selected.



PCI Express Configuration Screen

BIOS Setting	Options	Description/Purpose
SATA Controller(s)	- Disabled - Enabled	Enables or Disables SATA Device.
SATA Mode Selection	- AHCI - RST	Determines how SATA controller(s) operate.
Serial ATA Port 0 – 1	No changeable options	Displays the SATA device's name.
Port 0 - 1	- Disabled - Enabled	Enables or Disables SATA Port Device.

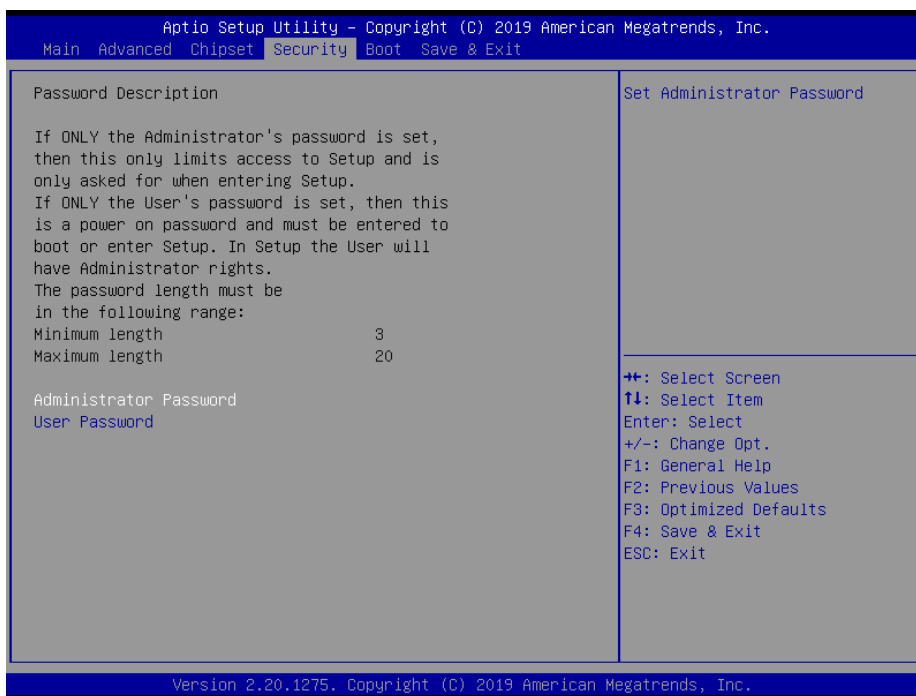
BIOS Setting	Options	Description/Purpose
HotPlug	<ul style="list-style-type: none">- Disabled- Enabled	Enables or Disables Hot Plug function to designate a SATA port device as hot-pluggable.

5.6 Security

Menu Path *Security*

From the **Security** menu, you are allowed to create, change or clear the administrator password. You will be asked to enter the configured administrator password before you can access the Setup Utility.

By setting an administrator password, you will prevent other users from changing your BIOS settings. You can configure an Administrator password and then configure a user password. An administrator has much more privileges over the settings in the Setup utility than a user. Heed that a user password does not provide access to most of the features in the Setup utility.



Security Screen

BIOS Setting	Options	Description/Purpose
Administrator Password	Password can be 3-20 alphanumeric characters.	Specifies the administrator password.
User Password	Password can be 3-20 alphanumeric characters.	Specifies the user password.

Create an Administrator or User Password

1. Select the **Administrator Password / User Password** option from the Security menu and press <Enter>, and the password dialog entry box appears.
2. Enter the password you want to create. A password can be 3-20 alphanumeric characters. After you have configured the password, press <Enter> to confirm.
3. Type the new password again and press <Enter>.

Change an Administrator or User Password

1. Select the **Administrator Password / User Password** option from the Security menu and press <Enter>, and the password dialog entry box appears.
2. Select the Administrator Password or User Password that you want to change. A password can be 3-20 alphanumeric characters. After you have changed the password, press <Enter> to confirm.
3. Type the changed password again and press <Enter>.

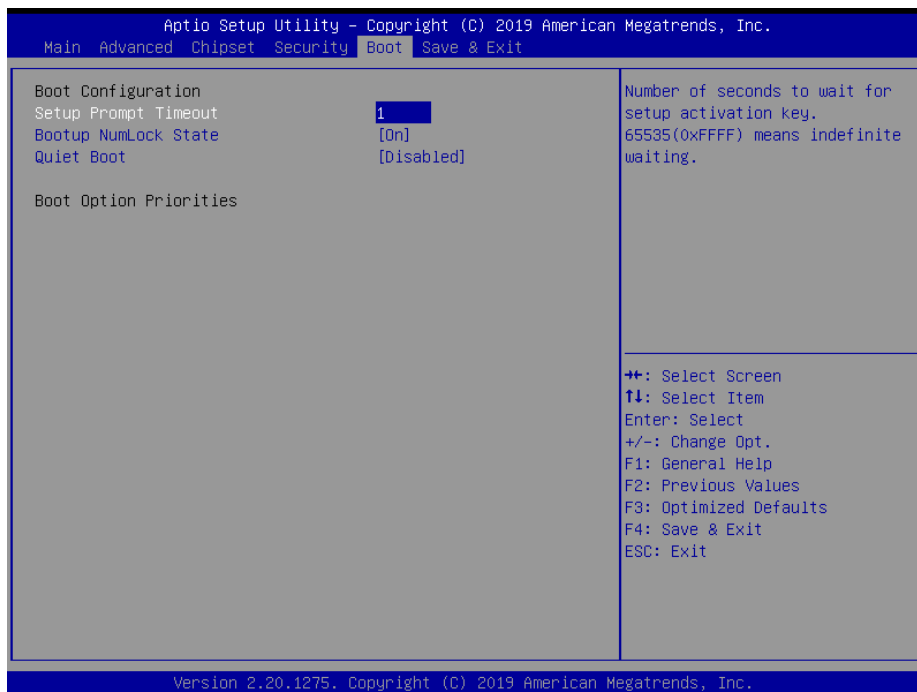
Remove an Administrator or User Password

1. Select the **Administrator Password / User Password** option from the Security menu and press <Enter>, and the password dialog entry box appears.
2. Select the configured Administrator Password or User Password that you want to delete. Leave the dialog box blank and press <Enter>.
3. Press <Enter> again when the password confirmation box appears.

5.7 Boot

Menu Path Boot

This menu provides control items for system boot configuration such as setting setup prompt timeout, enabling/disabling quiet boot, enabling/disabling Bootup NumLock State and changing the boot order from the available bootable device(s)



Boot Screen

BIOS Setting	Options	Description/Purpose
Setup Prompt Timeout	Numeric (from 1 to 65535)	Number of seconds to wait for setup activation key.
Bootup NumLock State	- On - Off	Selects the NumLock state after the system is powered on. <ul style="list-style-type: none"> On: Enables the NumLock function automatically after the system is powered on. Off: Disables the NumLock function after the system is powered on.

BIOS Setting	Options	Description/Purpose
Quiet Boot	<ul style="list-style-type: none">- Disabled- Enabled	Enables or Disables Quiet Boot options. When this option is set to “Disabled”, BIOS will display normal POST messages.
Boot Option #1~#n	<ul style="list-style-type: none">- [Drive(s)]- Disabled	Allows users to change the boot order from the available device(s). Note that in the menu displayed, you will only see the device with the highest priority for a specific boot device type.

5.8 Save & Exit

Menu Path	Save & Exit
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The **Save & Exit** allows users to save or discard changed BIOS settings as well as load factory default settings.

Save Changed BIOS Settings

To save and validate the changed BIOS settings, select **Save Changes** from the **Save & Exit** menu, or you can select **Save Changes and Exit** (or press **F4**) to validate the changes and then exit the system. Select **Save Changes and Reset** to validate the changed BIOS settings and then restart the system

Discard Changed BIOS Settings

To cancel the BIOS settings you have previously configured, select **Discard Changes and Exit** from this menu, or simply press **Esc** to exit the BIOS setup. You can also select **Discard Changes and Reset** to discard any changes you have made and restore the factory BIOS defaults.

Restore Defaults

You may simply press **F3** at any time to load the optimized values which resets all BIOS settings to the factory defaults.



Save & Exit Screen

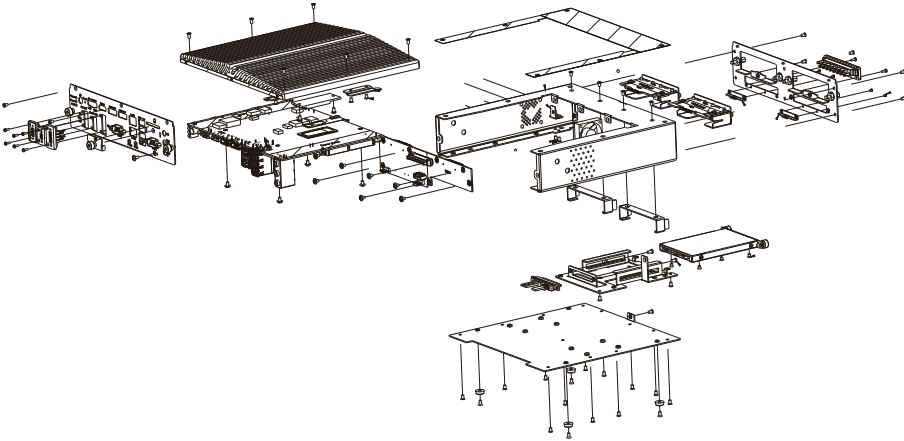
BIOS Setting	Options	Description/Purpose
Save Changes and Exit	No changeable options	Exits the system and saves the changes in NVRAM.
Discard Changes and Exit	No changeable options	Exits the system without saving any changes configured in BIOS settings.
Save Changes and Reset	No changeable options	Saves the changes in NVRAM and resets the system.
Discard Changes and Reset	No changeable options	Resets the system without saving any changes configured in BIOS settings.
Save Changes	No changeable options	Saves Changes done so far to any of the setup options.
Discard Changes	No changeable options	Discards Changes done so far to any of the setup options.
Restore Defaults	No changeable options	Loads the optimized defaults for BIOS settings.
Save as User Defaults	No changeable options	Saves the changes done so far as User Defaults.
Restore Defaults	No changeable options	Loads the optimized defaults for BIOS settings.
Boot Override	- [Drive(s)]	Forces to boot the system from selected [drive(s)].

Appendix A System Diagram

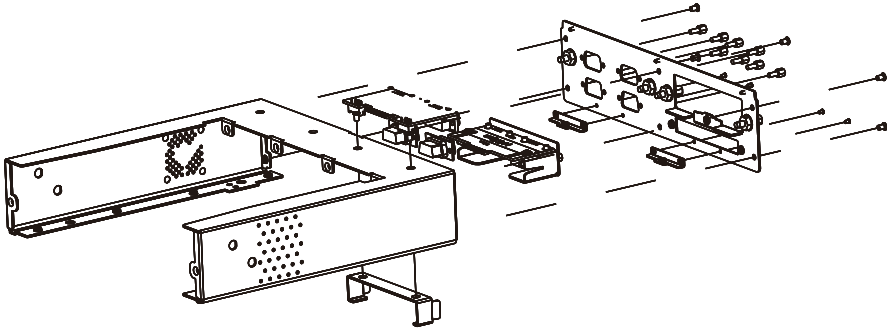
This appendix includes the exploded diagrams of the system and the parts list as well as the part numbers of the EL 1097 system.

- EL 1097 System Exploded Diagram
- EL 1097 Rear View (For 4 x COM sku)
- EL 1097 Rear View (For 2 x PoE LAN sku)

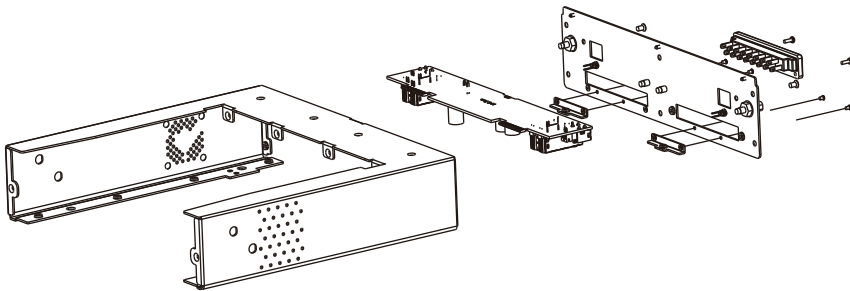
EL 1097 System Exploded Diagram (with rear view 2 x I/O Slot SKU)



EL 1097 Rear View (For 4 x COM sku)



EL 1097 Rear View (For 2 x PoE LAN sku)



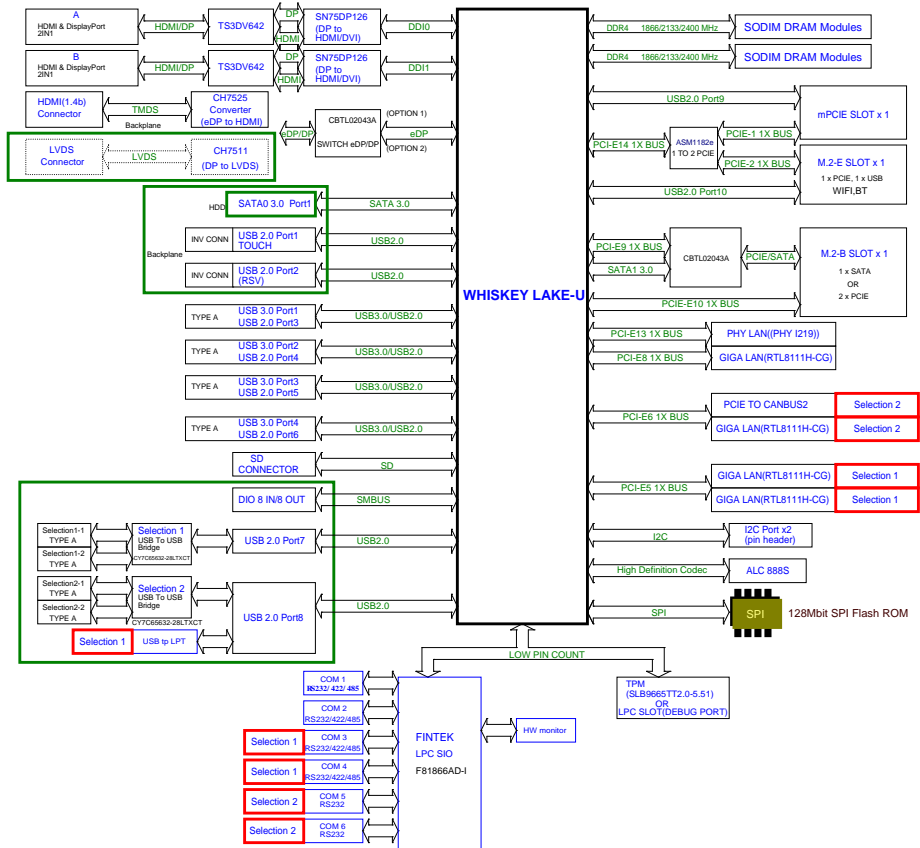
Appendix B Technical Summary

This appendix will give you a brief introduction of the allocation maps for the system resources.

The following topics are included:

- System Block Diagram
- Interrupt Map
- I/O Map
- Memory Map
- Configuring WatchDog Timer
- Flash BIOS Update

System Block Diagram



Interrupt Map

IRQ	ASSIGNMENT
IRQ 0	System timer
IRQ 3	Communications Port (COM2)
IRQ 4	Communications Port (COM1)
IRQ 6	Communications Port (COM4)
IRQ 7	Communications Port (COM3)
IRQ 10	Communications Port (COM5)
IRQ 11	Communications Port (COM6)
IRQ 14	Intel(R) Serial IO GPIO Host Controller - INT34BB
IRQ 16	Intel(R) Serial IO I2C Host Controller - 9DE8
IRQ 16	Realtek PCIe GBE Family Controller
IRQ 16	High Definition Audio Controller
IRQ 17	Intel(R) Serial IO I2C Host Controller - 9DE9
IRQ 18	Intel(R) Serial IO I2C Host Controller - 9DEA
IRQ 19	Intel(R) Active Management Technology - SOL (COM7)
IRQ 19	Intel(R) Serial IO I2C Host Controller - 9DEB
IRQ 19	Intel SD Host Controller
IRQ 32	Intel(R) Serial IO I2C Host Controller - 9DC5
IRQ 54	Microsoft ACPI-Compliant System
IRQ 55	Microsoft ACPI-Compliant System
IRQ 56	Microsoft ACPI-Compliant System
IRQ 57	Microsoft ACPI-Compliant System
IRQ 58	Microsoft ACPI-Compliant System
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IRQ	ASSIGNMENT
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IRQ	ASSIGNMENT
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IRQ	ASSIGNMENT
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IRQ 511	Microsoft ACPI-Compliant System
IRQ 1024	Intel SD Host Controller
IRQ 4294967290	Intel(R) Ethernet Connection (6) I219-LM
IRQ 4294967291	Intel(R) Management Engine Interface
IRQ 4294967292	Intel(R) USB 3.1 eXtensible Host Controller - 1.10 (Microsoft)
IRQ 4294967293	Intel(R) UHD Graphics 620
IRQ 4294967294	Standard SATA AHCI Controller

I/O Map

I/O	ASSIGNMENT
0x00000000-0x00000CF7	PCI Express Root Complex
0x00000020-0x00000021	Programmable interrupt controller
0x00000024-0x00000025	Programmable interrupt controller
0x00000028-0x00000029	Programmable interrupt controller
0x0000002C-0x0000002D	Programmable interrupt controller
0x0000002E-0x0000002F	Motherboard resources
0x00000030-0x00000031	Programmable interrupt controller
0x00000034-0x00000035	Programmable interrupt controller
0x00000038-0x00000039	Programmable interrupt controller
0x0000003C-0x0000003D	Programmable interrupt controller
0x00000040-0x00000043	System timer
0x0000004E-0x0000004F	Motherboard resources
0x00000050-0x00000053	System timer
0x00000061-0x00000061	Motherboard resources
0x00000063-0x00000063	Motherboard resources
0x00000065-0x00000065	Motherboard resources
0x00000067-0x00000067	Motherboard resources
0x00000070-0x00000070	Motherboard resources
0x00000080-0x00000080	Motherboard resources
0x00000092-0x00000092	Motherboard resources
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
0x000000B2-0x000000B3	Motherboard resources
0x000000B4-0x000000B5	Programmable interrupt controller
0x000000B8-0x000000B9	Programmable interrupt controller
0x000000BC-0x000000BD	Programmable interrupt controller

I/O	ASSIGNMENT
0x000002E0-0x000002E7	Communications Port (COM6)
0x000002E8-0x000002EF	Communications Port (COM4)
0x000002F0-0x000002F7	Communications Port (COM5)
0x000002F8-0x000002FF	Communications Port (COM2)
0x00000378-0x0000037F	Printer Port (LPT1)
0x000003E8-0x000003EF	Communications Port (COM3)
0x000003F8-0x000003FF	Communications Port (COM1)
0x000004D0-0x000004D1	Programmable interrupt controller
0x00000680-0x0000069F	Motherboard resources
0x00000A00-0x00000A0F	Motherboard resources
0x00000A10-0x00000A1F	Motherboard resources
0x00000A20-0x00000A2F	Motherboard resources
0x00000D00-0x0000FFFF	PCI Express Root Complex
0x0000164E-0x0000164F	Motherboard resources
0x00001800-0x000018FE	Motherboard resources
0x00001854-0x00001857	Motherboard resources
0x00002000-0x000020FE	Motherboard resources
0x00003000-0x00003FFF	Intel(R) PCI Express Root Port #9 - 9DB0
0x00003F00-0x00003FFF	Realtek PCIe GBE Family Controller
0x00004000-0x0000403F	Intel(R) UHD Graphics 620
0x00004060-0x0000407F	Standard SATA AHCI Controller
0x00004080-0x00004083	Standard SATA AHCI Controller
0x00004090-0x00004097	Standard SATA AHCI Controller
0x0000EFA0-0x0000EFBF	Intel(R) SMBus - 9DA3
0x0000FFF8-0x0000FFFF	Intel(R) Active Management Technology - SOL (COM7)

Memory Map

MEMORY MAP	ASSIGNMENT
0xFED10000-0xFED17FFF	Motherboard resources
0xFED18000-0xFED18FFF	Motherboard resources
0xFED19000-0xFED19FFF	Motherboard resources
0xE0000000-0xFFFFFFFF	Motherboard resources
0xFED20000-0xFED3FFFF	Motherboard resources
0xFED90000-0xFED93FFF	Motherboard resources
0xFED45000-0xFED8FFFF	Motherboard resources
0xFEE00000-0xFEEFFFFFFF	Motherboard resources
0xFE1C0000-0xFE1DFFFF	Intel(R) Ethernet Connection (6) I219-LM
0xFE010000-0xFE010FFF	Intel(R) SPI (flash) Controller - 9DA4
0xFE1FF000-0xFE1FFFFFFF	Intel(R) Active Management Technology - SOL (COM7)
0xFED00000-0xFED003FF	High precision event timer
0xFE1F4000-0xFE1F4FFF	Intel(R) Management Engine Interface
0xFE1FC000-0xFE1FCFFF	Intel(R) Serial IO I2C Host Controller - 9DE8
0xFD000000-0xFD69FFFF	Motherboard resources
0xFD6B0000-0xFD6CFFFF	Motherboard resources
0xFD6F0000-0xFDFFFFFFF	Motherboard resources
0xFE000000-0xFE01FFFF	Motherboard resources
0xFE200000-0xFE7FFFFFFF	Motherboard resources
0xFF000000-0xFFFFFFFF	Motherboard resources
0xA0000000-0xA0FFFFFFF	Intel(R) UHD Graphics 620
0x90000000-0x9FFFFFFF	Intel(R) UHD Graphics 620
0x90000000-0x9FFFFFFF	PCI Express Root Complex
0xA11FB000-0xA11FBFFF	Realtek PCIe GBE Family Controller
0xA11FC000-0xA11FFFFFFF	Realtek PCIe GBE Family Controller
0xFE1F8000-0xFE1FBFFF	High Definition Audio Controller
0xFCF00000-0xFCFFFFFFF	High Definition Audio Controller

MEMORY MAP	ASSIGNMENT
0xFC800000-0xFE7FFFFF	PCI Express Root Complex
0xA1240000-0xA12400FF	Intel(R) SMBus - 9DA3
0xFE1FE000-0xFE1FEFFF	Intel(R) Serial IO I2C Host Controller - 9DC5
0xFE1F5000-0xFE1F5FFF	Intel(R) Serial IO I2C Host Controller - 9DEB
0xA1100000-0xA11FFFFF	Intel(R) PCI Express Root Port #9 - 9DB0
0xA123C000-0xA123DFFF	Standard SATA AHCI Controller
0xA1243000-0xA12430FF	Standard SATA AHCI Controller
0xA1242000-0xA12427FF	Standard SATA AHCI Controller
0xFE1FD000-0xFE1FDFFF	Intel SD Host Controller
0xA1220000-0xA122FFFF	Intel(R) USB 3.1 eXtensible Host Controller - 1.10 (Microsoft)
0xFE1F7000-0xFE1F7FFF	Intel(R) Serial IO I2C Host Controller - 9DE9
0xFD6E0000-0xFD6EFFFF	Intel(R) Serial IO GPIO Host Controller - INT34BB
0xFD6D0000-0xFD6DFFFF	Intel(R) Serial IO GPIO Host Controller - INT34BB
0xFD6A0000-0xFD6AFFFF	Intel(R) Serial IO GPIO Host Controller - INT34BB
0xFE1F6000-0xFE1F6FFF	Intel(R) Serial IO I2C Host Controller - 9DEA
0xA0000-0xBFFFF	PCI Express Root Complex
0xE0000-0xE3FFF	PCI Express Root Complex
0xE4000-0xE7FFF	PCI Express Root Complex
0xE4000-0xE7FFF	PCI Express Root Complex
0xE8000-0xEBFFF	PCI Express Root Complex
0xEC000-0xEFFFF	PCI Express Root Complex
0xF0000-0xFFFFF	PCI Express Root Complex
0x40000000-0x403FFFFF	Motherboard resources

Configuring WatchDog Timer

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

Configuration Sequence

To program F81866 configuration registers, the following configuration sequence must be followed:

(1) 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).

(2) 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.

(3) 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.

Code example for watch dog timer

Enable watchdog timer and set timeout interval to 30 seconds.

```

;----- Enter to extended function mode -----
mov     dx,     2eh
mov     al,     87h
out     dx,     al
out     dx,     al

;----- Select Logical Device 7 of watchdog timer -----
mov     al,     07h
out     dx,     al
inc     dx
mov     al,     07h
out     dx,     al

;----- Enable Watch dog feature -----
mov     al,     030h
out     dx,     al
inc     dx
mov     al,     01h
out     dx,     al

;----- Enable Watch PME-----
dec     dx
mov     al,     0FAh
out     dx,     al
inc     dx
in      al,     dx
and     al,     51h
out     dx,     al

;----- Set timeout interval to 30 -----
dec     dx
mov     al,     0F6h
out     dx,     al
inc     dx
mov     al,     1Eh
out     dx,     al

;----- Set second as counting unit and start counting -----
dec     dx
mov     al,     0F5h
out     dx,     al
inc     dx
in      al,     dx
and     al,     30h
out     dx,     al

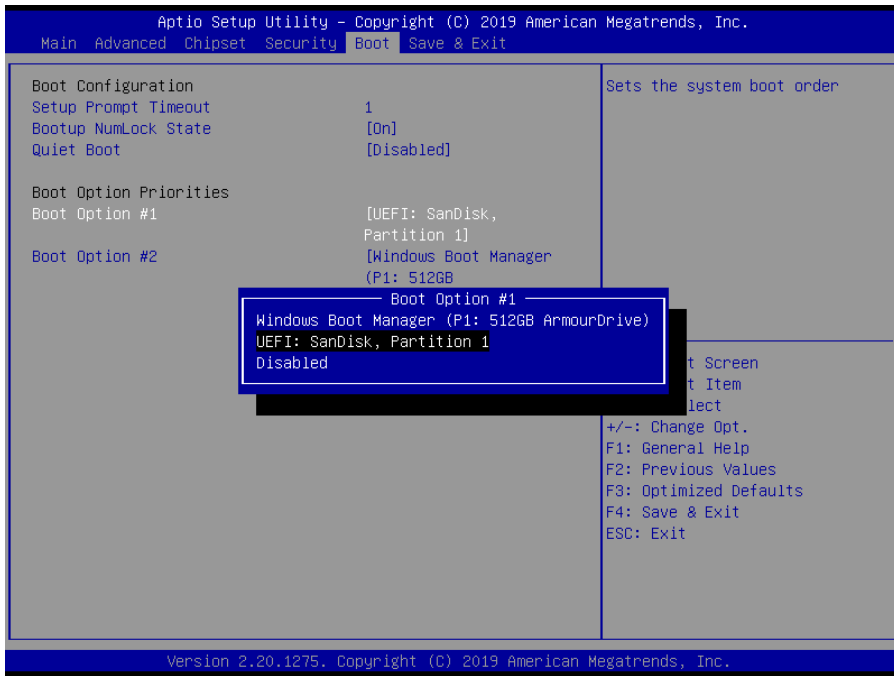
;----- Exit the extended function mode -----
dec     dx
mov     al,     0AAh
out     dx,     al

```

Flash BIOS Update

I. Prerequisites

- 1** Prepare a bootable media (e.g. USB storage device) which can boot the system.
- 2** Download and save the BIOS file (e.g. N2070PU6.bin) to the bootable device.
- 3** Copy AMI flash utility – AFUEFIx64.exe (v5.12.02) into the bootable device. The utility and BIOS file should be saved to the same path.
- 4** Copy UEFI Shell into the storage device under specific directory path. (/efi/boot/bootx64.efi)
- 5** Make sure the target system can first boot to the bootable device.
 - (1) Connect the bootable USB device.
 - (2) Turn on the computer and press **<ESC>** or **** during boot to enter BIOS Setup.
 - (3) The system will go into the BIOS setup menu.
 - (4) Select **[Boot]** and set the USB bootable device as the 1st boot device.
 - (5) Press **F4** to save the configuration and exit the BIOS setup menu.



II. AFUEFIx64 Command for System BIOS Update

AFUEFIx64.efi is the AMI firmware update utility; the command line is shown as below:

AFUEFIx64 <ROM File Name> [option1] [option2]....

Users can type “AFUEFIx64 /?” to see all the definition of each control options. The recommended options for BIOS ROM update include 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 storage to boot up the system into the EFI Shell command prompt.

```
Shell> fs0:  
fs0:\> cd afuefix64
```

- 2** Type "**AFUEFIx64 N207xxxx.bin /p /b /n /x**" and press **Enter** to start the flash procedure.
(Note: that xxxx means the BIOS revision part, e.g. 0PU1...)
- 3** During the BIOS update procedure, you will see the BIOS update process status and its percentage. Beware! Do not turn off the system power or reset your computer when the entire update procedure are not complete; otherwise, the BIOS ROM may be crashed and the system will be unable to boot up next time.
- 4** After the BIOS update procedure is completed, the following messages will be shown:

```
fs0:\afuefix64> AfuEfix64 N2070PU6.bin /p /b /n /x
+-----+
|               AMI Firmware Update Utility  v5.12.02.2028               |
|   Copyright (C) 2018 American Megatrends Inc. All Rights Reserved.   |
+-----+
Reading flash ..... done
- ME Data Size Checking . ok
- FFS checksums ..... ok
- Check RomLayout ..... Ok.
Erasing Boot Block ..... done
Updating Boot Block ..... done
Verifying Boot Block ..... done
Erasing Main Block ..... done
Updating Main Block ..... done
Verifying Main Block ..... done
Erasing NVRAM Block ..... done
Updating NVRAM Block ..... done
Verifying NVRAM Block ..... done

Process completed.

fs0:\afuefix64> _
```

- 5 Restart the system and boot up with the new BIOS configurations.
- 6 The BIOS Update is completed after the system is restarted.
- 7 Reboot the system and verify if the BIOS version shown on the initialization screen has been updated.

