FWS-2253

Network Appliance

User's Manual 2nd Ed

Last Updated: July 5, 2016

Copyright Notice

Acknowledgement

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Packing List

Before setting up your product, please make sure the following items have been shipped:

Item	Quantity
● FWS-2253	1
● 40 W power adaptor	1
● Rubber feet	4
● Product DVD	1

If any of these items are missing or damaged, please contact your distributor or sales representative immediately.

About this Document

This User's Manual contains all the essential information, such as detailed descriptions and explanations on the product's hardware and software features (if any), its specifications, dimensions, jumper/connector settings/definitions, and driver installation instructions (if any), to facilitate users in setting up their product.

Users may refer to the AAEON.com for the latest version of this document.

Safety Precautions

Please read the following safety instructions carefully. It is advised that you keep this manual for future references

1. All cautions and warnings on the device should be noted.
2. All cables and adapters supplied by AAEON are certified and in accordance with the material safety laws and regulations of the country of sale. Do not use any cables or adapters not supplied by AAEON to prevent system malfunction or fires.
3. Make sure the power source matches the power rating of the device.
4. Position the power cord so that people cannot step on it. Do not place anything over the power cord.
5. Always completely disconnect the power before working on the system's hardware.
6. No connections should be made when the system is powered as a sudden rush of power may damage sensitive electronic components.
7. If the device is not to be used for a long time, disconnect it from the power supply to avoid damage by transient over-voltage.
8. Always disconnect this device from any AC supply before cleaning.
9. While cleaning, use a damp cloth instead of liquid or spray detergents.
10. Make sure the device is installed near a power outlet and is easily accessible.
11. Keep this device away from humidity.
12. Place the device on a solid surface during installation to prevent falls
13. Do not cover the openings on the device to ensure optimal heat dissipation.
14. Watch out for high temperatures when the system is running.
15. Do not touch the heat sink or heat spreader when the system is running
16. Never pour any liquid into the openings. This could cause fire or electric shock.

17. As most electronic components are sensitive to static electrical charge, be sure to ground yourself to prevent static charge when installing the internal components. Use a grounding wrist strap and contain all electronic components in any static-shielded containers.
18. If any of the following situations arises, please the contact our service personnel:
    i. Damaged power cord or plug
    ii. Liquid intrusion to the device
    iii. Exposure to moisture
    iv. Device is not working as expected or in a manner as described in this manual
    v. The device is dropped or damaged
    vi. Any obvious signs of damage displayed on the device
19. DO NOT LEAVE THIS DEVICE IN AN UNCONTROLLED ENVIRONMENT WITH TEMPERATURES BEYOND THE DEVICE'S PERMITTED STORAGE TEMPERATURES (SEE CHAPTER 1) TO PREVENT DAMAGE.
20. This unit is intended for installation in restricted access areas.
21. This equipment must be installed and maintained by trained person.

FCC Statement

This device complies with Part 15 FCC Rules. Operation is subject to the following two conditions: (1) this device may not cause harmful interference, and (2) this device must accept any interference received including interference that may cause undesired operation.

Caution:

There is a danger of explosion if the battery is incorrectly replaced. Replace only with the same or equivalent type recommended by the manufacturer. Dispose of used batteries according to the manufacturer's instructions and your local government's recycling or disposal directives.

Attention:

Il y a un risque d'explosion si la batterie est remplacée de façon incorrecte.
Ne la remplacer qu'avec le même modèle ou équivalent recommandé par le constructeur. Recycler les batteries usées en accord avec les instructions du fabricant et les directives gouvernementales de recyclage.

China RoHS Requirements (CN)

产品中有毒有害物质或元素名称及含量

AAEON Embedded Box PC/ Industrial System

部件名称	有毒有害物质或元素					
	铅 (Pb)	汞 (Hg)	镉 (Cd)	六价铬 (Cr(VI))	多溴联苯 (PBB)	多溴二苯醚 (PBDE)
印刷电路板及其电子组件	O	O	O	O	O	O
外部信号连接器及线材	O	O	O	O	O	O
外壳	O	O	O	O	O	O
中央处理器与内存	O	O	O	O	O	O
硬盘	O	O	O	O	O	O
电源	O	O	O	O	O	O

O：表示该有毒有害物质在该部件所有均质材料中的含量均在 SJ/T 11363-2006 标准规定的限量要求以下。

X：表示该有毒有害物质至少在该部件的某一均质材料中的含量超出 SJ/T 11363-2006 标准规定的限量要求。

备注：

一、此产品所标示之环保使用期限，系指在一般正常使用状况下。

二、上述部件物质中央处理器、内存、硬盘、光驱、触控模块为选购品。

China RoHS Requirement (EN)

Poisonous or Hazardous Substances or Elements in Products

AAEON Embedded Box PC/ Industrial System

Component	Poisonous or Hazardous Substances or Elements					
	Lead (Pb)	Mercury (Hg)	Cadmium (Cd)	Hexavalent Chromium (Cr(VI))	Polybrominated Biphenyls (PBB)	Polybrominated Diphenyl Ethers (PBDE)
PCB & Other Components	O	O	O	O	O	O
Wires & Connectors for External Connections	O	O	O	O	O	O
Chassis	O	O	O	O	O	O
CPU & RAM	O	O	O	O	O	O
Hard Disk	O	O	O	O	O	O
PSU	O	O	O	O	O	O

O：The quantity of poisonous or hazardous substances or elements found in each of the component's parts is below the SJ/T 11363-2006-stipulated requirement.

X: The quantity of poisonous or hazardous substances or elements found in at least one of the component's parts is beyond the SJ/T 11363-2006-stipulated requirement.

Note: The Environment Friendly Use Period as labeled on this product is applicable under normal usage only

Table of Contents

Chapter 1

Product Specifications

1.1 Specifications

System	
Processor	Onboard Intel® Atom™ N2807 2.16 GHz SoC
System Memory	204-pin single channel DDR3L 1333MHz SODIMM slot x 1, up to 8GB
Chipset	-
Ethernet	Intel® Ethernet Controller I211-AT Gigabit Ethernet x 4
BIOS	AMI BIOS
Serial ATA	Onboard SATA 6.0 Gb/s port x 1
SSD	-
Expansion Interface	-
Watchdog Timer	System reset: 1~255 steps by software programming
RTC	Internal RTC
Storage	CompactFlash™ socket x 1
Front Panel I/O	Power LED x 1 Status LED x 1 HDD Active LED x 1 LAN LED x 8
Rear Panel I/O	USB 3.0 x 1 USB 2.0 x 2 RJ-45 x 4 RJ-45 console x 1

	12V DC power input x 1 Software Reset Switch x 1
● Color	Black
● Power Supply	12V DC power in connector/ 40W power adapter x 1 4-pin DC power out connector for HDD (optional)
● Dimension (W x D x H)	160 x 35 x 105 mm (6.3 x 1.37 x 4.13")

Graphics

● Chipset	SoC integrated
● Graphic Engine	Gen 7 with 4 Eus
● Resolution	2560 x 1600
● Output Interface	VGA internal box header

I/O

● Serial Port	RJ-45 console x 1
● Keyboard and Mouse	Reserved pin header
● USB	USB 3.0 Type A on I/O side x 1 USB 2.0 Type A on I/O side x 2

Environmental

● Operating Temperature	-20 ~70°C (-4 ~ 157°F)
● Storage Temperature	-40 ~85°C (-40 ~185°F)
● Operating Humidity	10%~80% relative humidity, non-condensing

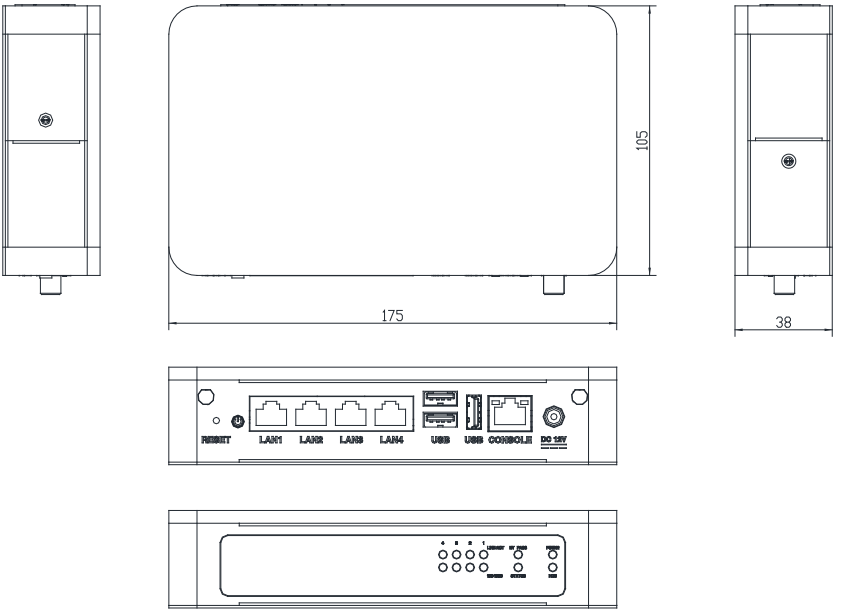
- **Storage Humidity** 10%~80% @ 40°C, non-condensing
- **Anti-Vibration** 0.5 Grms/5~500Hz/ operation
  1.5 Grms/5~500Hz/ non-operation
- **Anti-Shock** 10G peak acceleration (11m sec. duration), operation
  20G peak acceleration (11m sec. duration), non operation

Chapter 2

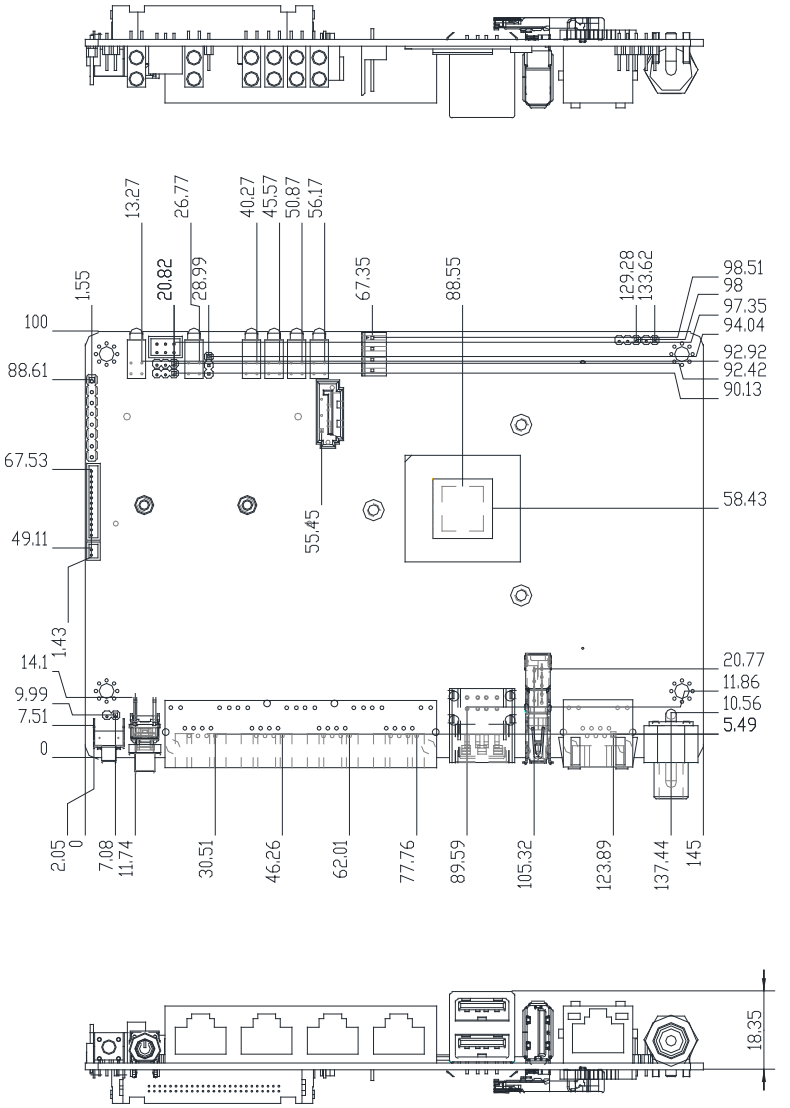
Hardware Information

2.1 Dimensions

System



Board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98
97.35
94.04
92.92
92.42
90.13
100
88.61
67.53
49.11
55.45
58.43
14.1
1.43
9.99
7.51
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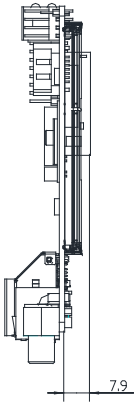
18.35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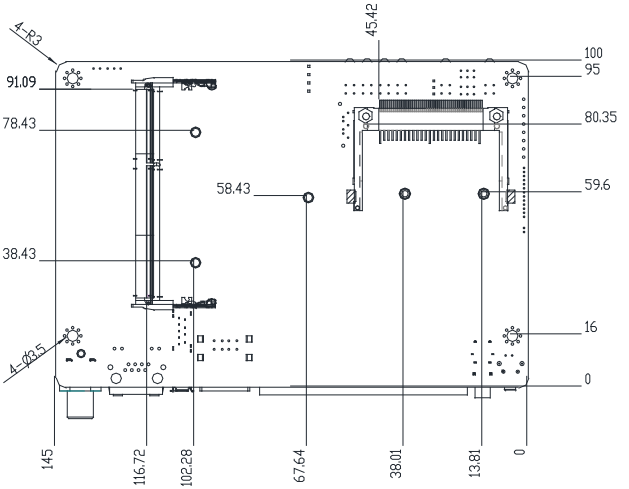
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100
95
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16
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145
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102.28
67.64
38.01
13.81
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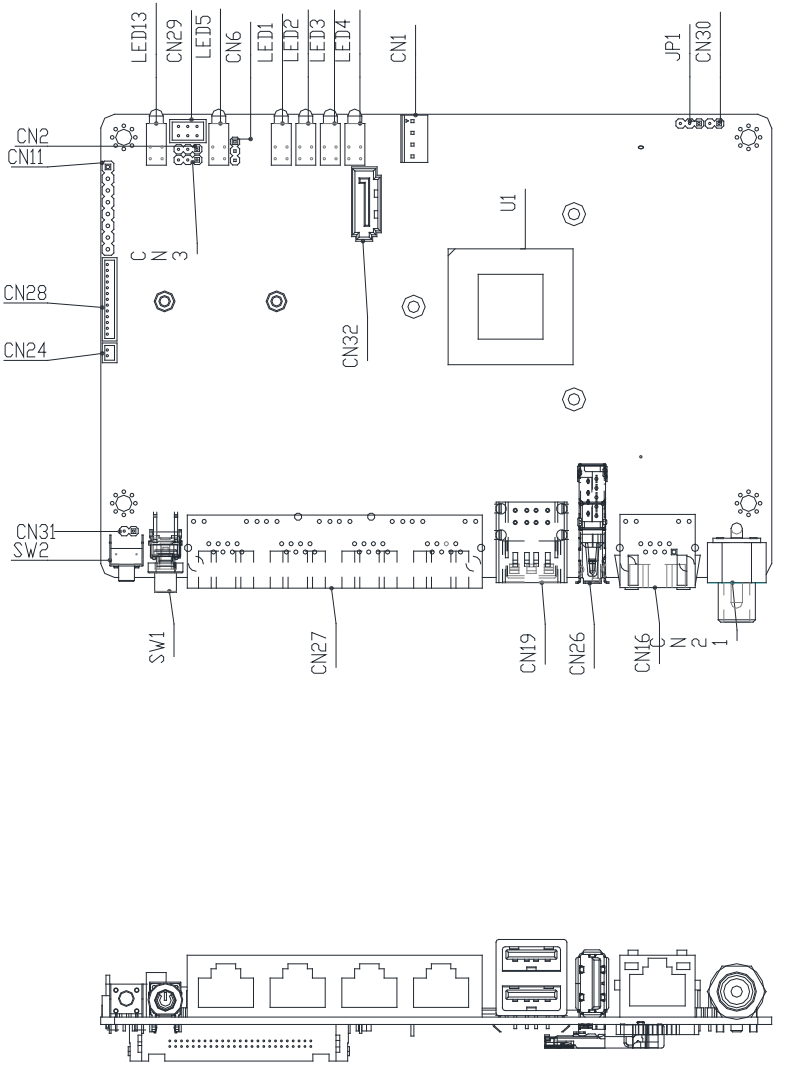
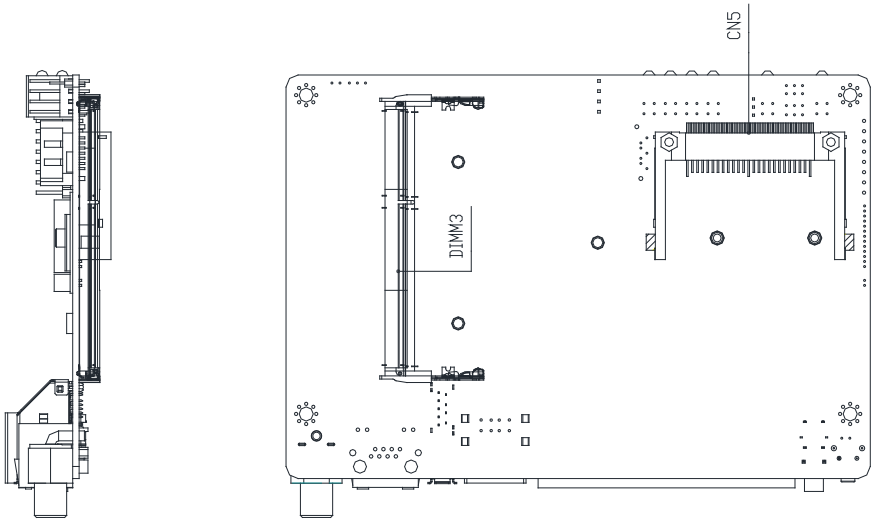
2.2 Jumpers and Connectors

Component Side



Solder side



2.3 List of Jumpers

Please refer to the table below for all of the board's jumpers that you can configure for your application

Label	Function
JP1	Auto PWRBTN Selection
CN2	Clear CMOS
CN3	RTCTEST Setting Selection
CN6	CF Power Selection
CN30	Power Button
CN31	Software Reset

2.3.1 Auto PWRBTN Selection (JP1)

Pin	Function
1-2	Disable Auto PWRBTM (default)
2-3	Enable Auto PWRBTN

2.3.2 RTCTEST Setting Selection (CN3)

Pin	Function
1-2	RTCTEST
2-3	Normal (Default)

2.4 List of Connectors

Please refer to the table below for all of the board's connectors that you can configure for your application

Label	Function
CN1	HDD POWER
CN4	HDD POWER
CN5	CF SOCKET
CN16	COM1
CN19	2*USB2.0
CN21	+12V POWER IN
CN22	Mini-card socket
CN24	Battery
CN26	USB3.0+USB2.0
CN27	LAN1~4
CN28	VGA Connector
CN29	PS2
CN32, CN33	SATA Connector
DIMM2	DDR3L SODIMM
DIMM3	DDR3L SODIMM
SW1	Power Button
SW2	Software Reset
SATA1	SATA Connector
LED13	POWER+HDD LED Instruction
LED5	BYPASS+STATE LED Instruction
LED1	LAN1 LED Instruction
LED2	LAN2 LED Instruction
LED3	LAN3 LED Instruction

LED4	LAN4 LED Instruction
CPU_FAN	FAN

2.4.1 HDD Power (CN1/ CN4)

Pin	Signal	Pin	Signal
1	+12V	2	GND
3	GND	4	+5V

2.4.2 CMOS Setting Selection (CN2)

Pin	Function
1-2	Clear CMOS
2-3	Normal (Default)

2.4.3 CF Power Selection (CN6)

Pin	Function
1-2	5V
2-3	3.3V (Default)

2.4.4 VGA Connector (CN28)

Pin	Signal	Pin	Signal
1	VS	2	HS
3	GND	4	SCL
5	SDA	6	GND
7	BLUE	8	GND
9	GREEN	10	GND
11	RED	12	GND
13	5V		

2.4.5 PS2 Header (CN29)

Pin	Signal	Pin	Signal
1	KDAT	2	KCLK
3	GND	4	+5V
5	MDAT	6	KCLK

2.4.6 CPU FAN (CPU FAN)

Pin	Signal	Pin	Signal
1	GND	2	+12V
3	FANTAC	4	FANCONTROL

Chapter 3

AMI BIOS Setup

3.1 System Test and Initialization

The system uses certain routines to perform testing and initialization. If an error, fatal or non-fatal, is encountered, a few short beeps or an error message will be outputted. The board can usually continue the boot up sequence with non-fatal errors.

The system configuration verification routines check the current system configuration against the values stored in the CMOS memory. If they do not match, an error message will be outputted, in which case you will need to run the BIOS setup program to set the configuration information in memory.

There are three situations in which you will need to change the CMOS settings:

- You are starting your system for the first time
- You have changed your system's hardware
- The CMOS memory has lost power and the configuration information is erased

The system's CMOS memory uses a backup battery for data retention, which is to be replaced once emptied.

3.2 AMI BIOS Setup

The AMI BIOS ROM has a pre-installed Setup program that allows users to modify basic system configurations, which is stored in the battery-backed CMOS RAM and BIOS NVRAM so that the information is retained when the power is turned off.

To enter BIOS Setup, press <Del> immediately while your computer is powering up.

The function for each interface can be found below.

Main – Date and time can be set here. Press <Tab> to switch between date elements

Advanced – Enable/ Disable boot option for legacy network devices

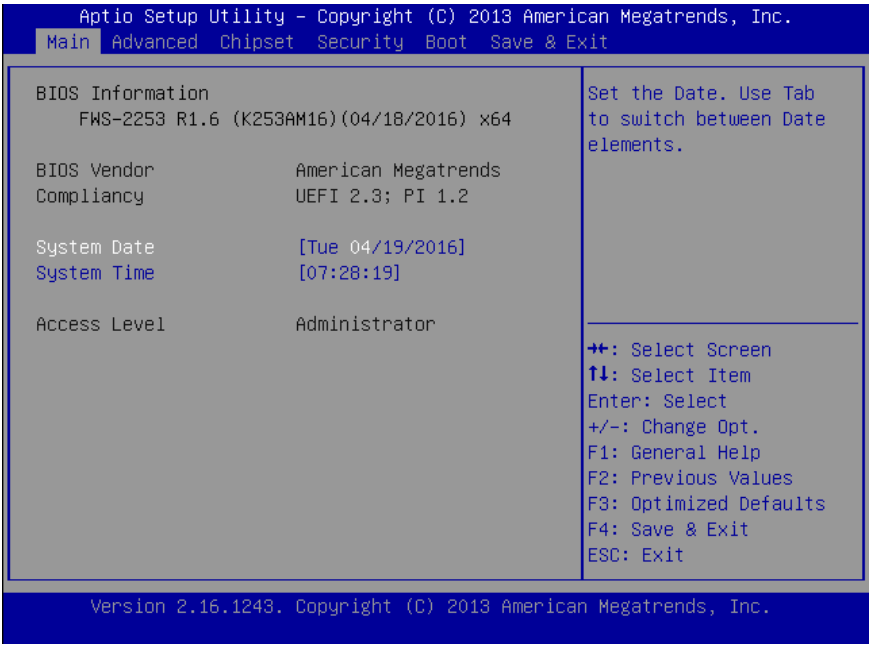
Chipset – For hosting bridge parameters

Boot – Enable/ Disable quiet Boot Option

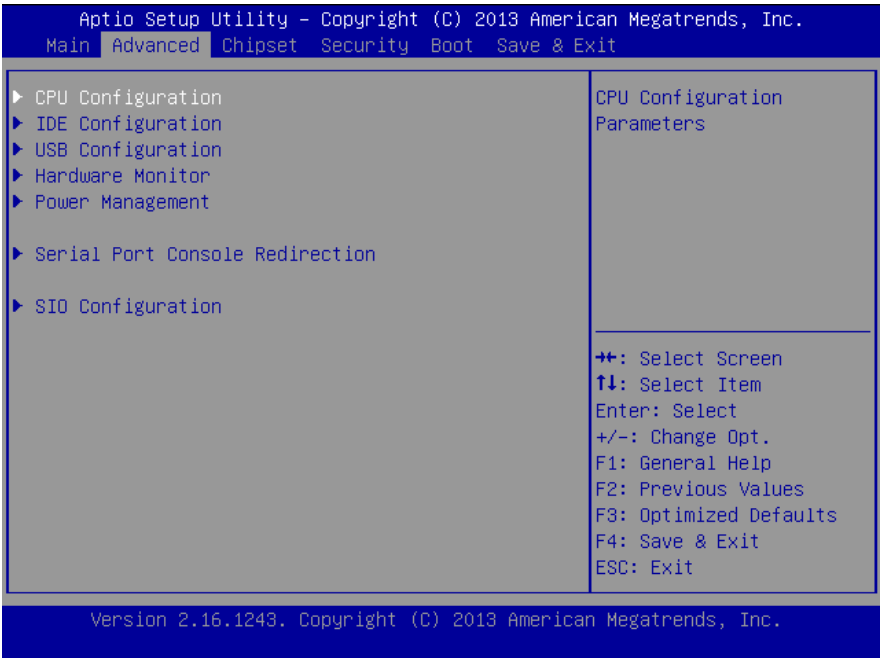
Security – The setup administrator password can be set here

Save & Exit –Save your changes and exit the program

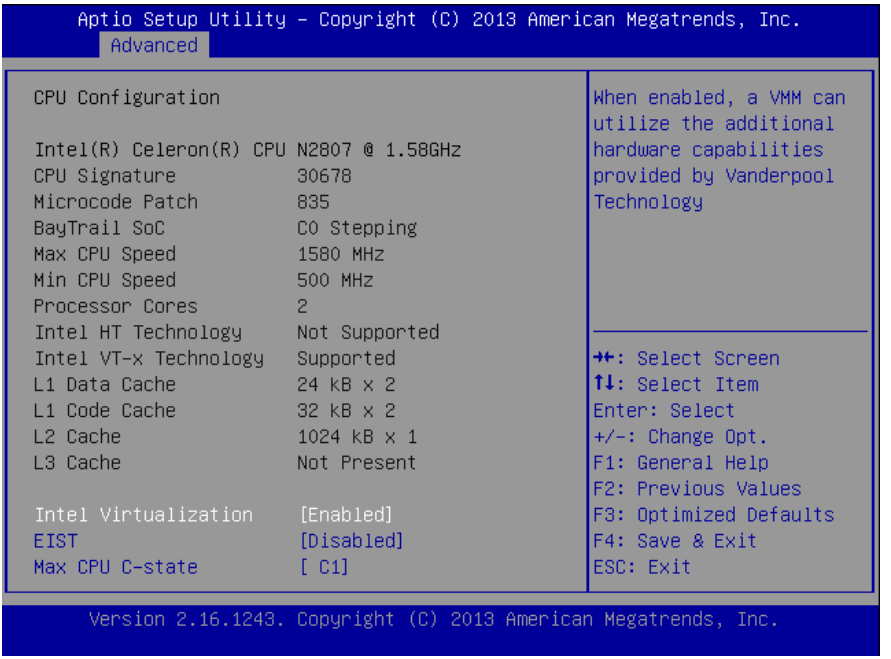
3.3 Setup Submenu: Main



3.4 Setup Submenu: Advanced



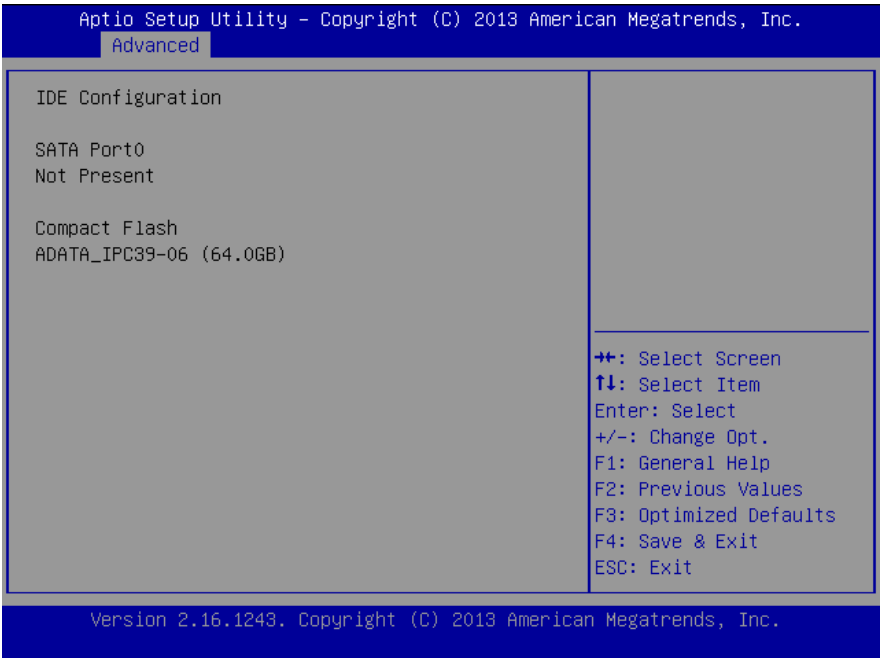
3.4.1 Advanced: CPU Configuration



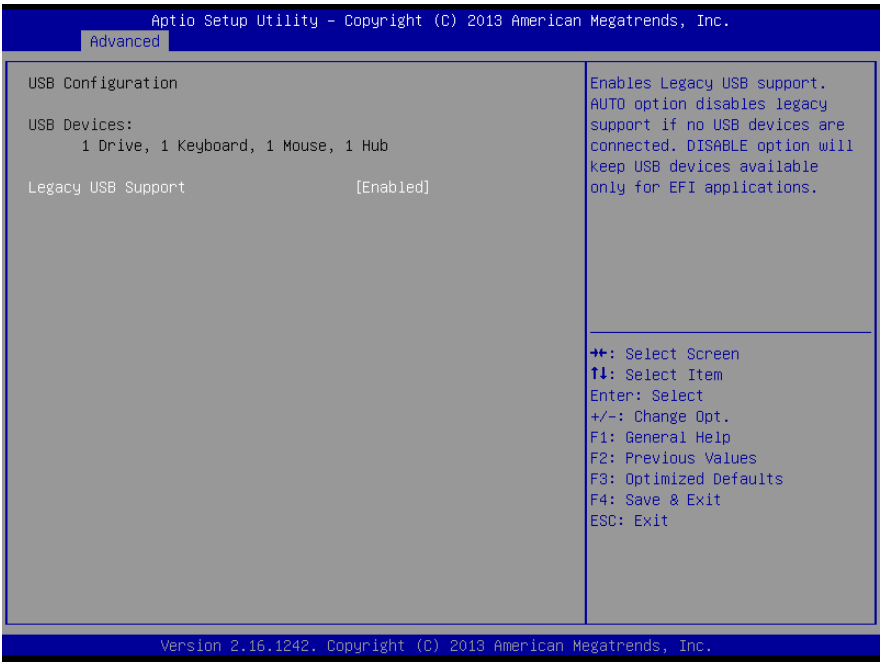
Options summary:

Intel Virtualization Technology	Disabled	
	Enabled	Optimal Default, Failsafe Default
When enabled, a VMM can utilize the additional hardware capabilities provided by Vanderpool Technology		
EIST	Disabled	Optimal Default, Failsafe Default
	Enabled	
Enable/Disable Intel SpeedStep		
Max CPU C-State	C7	
	C6	
	C1	Optimal Default, Failsafe Default
This option controls Max C state that the processor will support		

3.4.2 Advanced: IDE Configuration



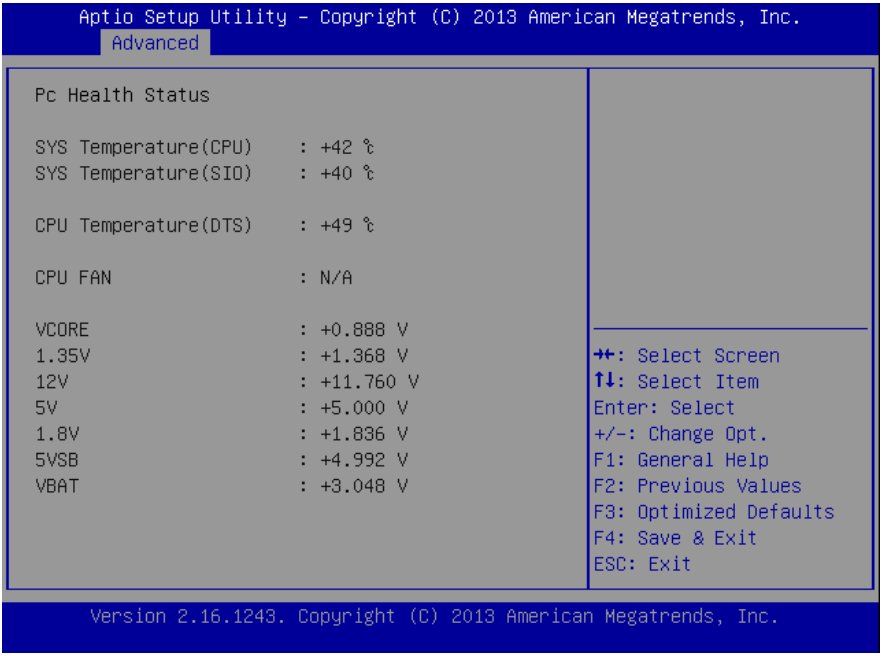
3.4.3 Advanced: USB Configuration



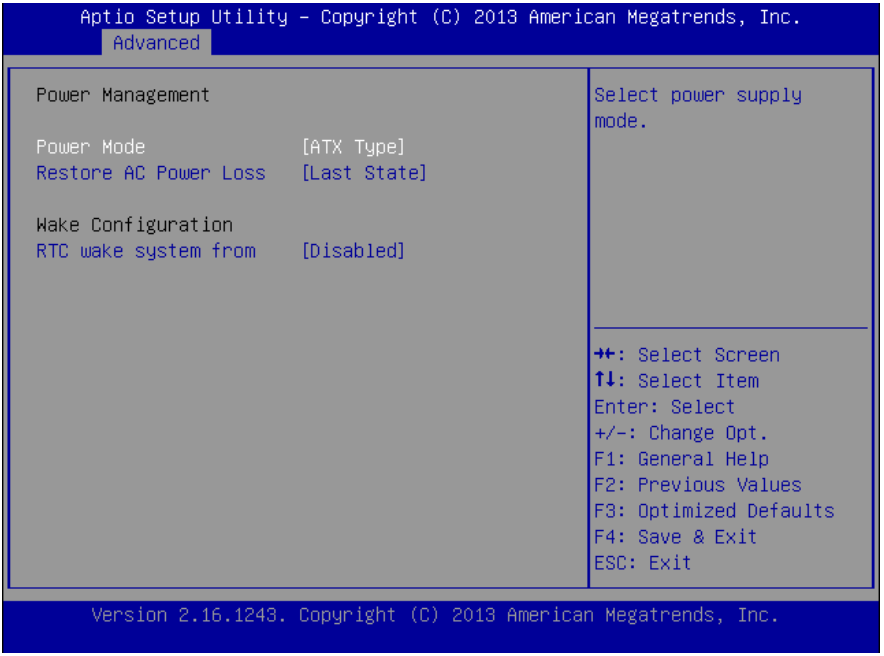
Options summary:

Legacy USB Support	Enabled	Optimal Default, Failsafe Default
	Disabled	
	Auto	
Enables BIOS Support for Legacy USB Support. When enabled, USB can be functional in legacy environment like DOS. AUTO option disables legacy support if no USB devices are connected		

3.4.4 Advanced: Hardware Monitor



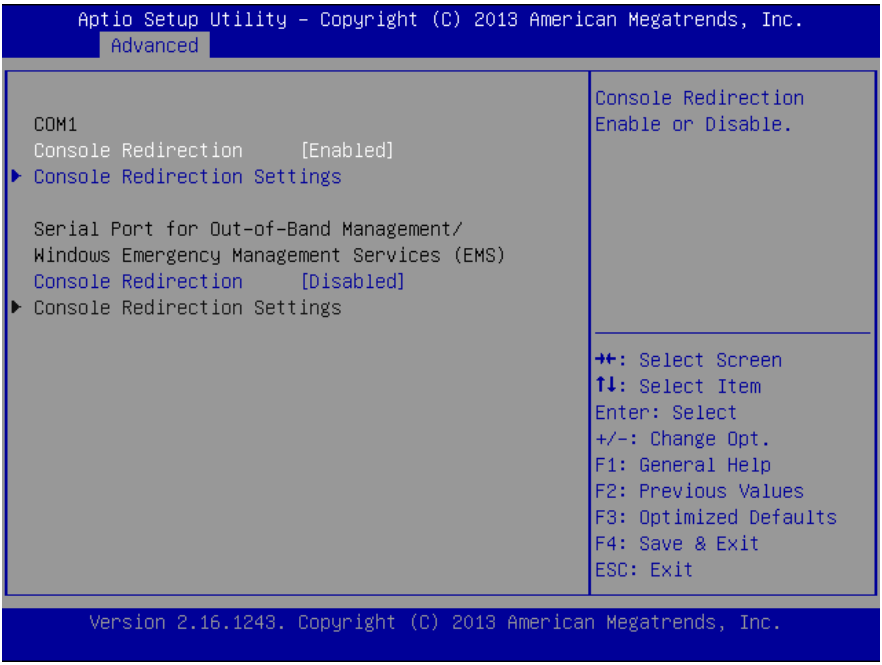
3.4.5 Advanced: Power Management



Options summary:

Power Mode	ATX Type	Optimal Default, Failsafe Default
	AT Type	
Select power supply mode.		
Restore on Power Loss	Last State	Optimal Default, Failsafe Default
	Power On	
	Power Off	
Select power state when power is re-applied after a power failure.		
RTC wake system from	Disable	Optimal Default, Failsafe Default
	Fixed Time	
	Dynamic Time	
Fixed Time: System will wake on the hr::min::sec specified./n Dynamic Time: System will wake on the current time + Increase minute(s)		

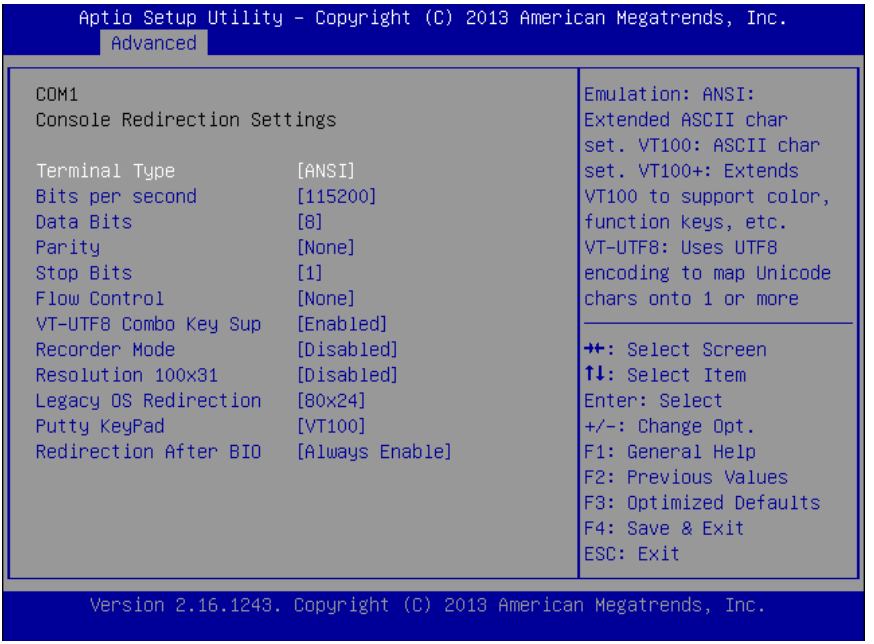
3.4.6 Advanced: Serial Port Console Redirection



Options summary:

Console Redirection	Disabled	Optimal Default, Failsafe Default
	Enabled	
Console Redirection Enable or Disable		

3.4.6.1 Serial Port Console Redirection: COM1 Console Redirection Settings



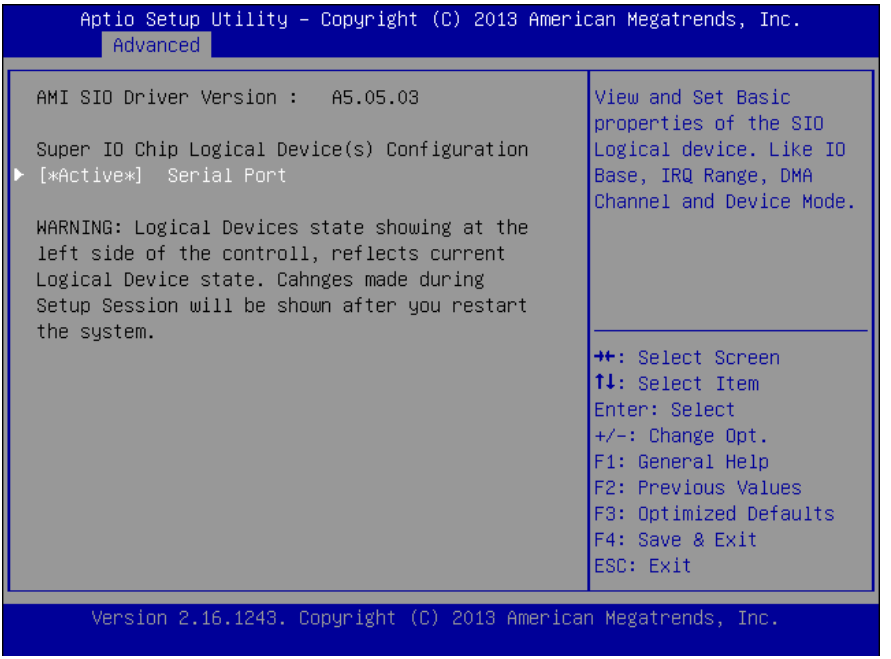
Options summary:

Terminal Type	VT100	
	VT100+	
	VT-UTF8	
	ANSI	Optimal Default, Failsafe Default
Emulation: ANSI: Extended ASCII char set. VT100: ASCII char set. VT100+: Extends VT100 to support color, function keys, etc. VT-UTF8: Uses UTF8 encoding to map Unicode chars onto 1 or more bytes.		
Bits per second	9600	
	19200	
	38400	
	57600	
	115200	Optimal Default, Failsafe Default
Selects serial port transmission speed. The speed must be matched on the other side. Long or noisy lines may require lower speeds.		

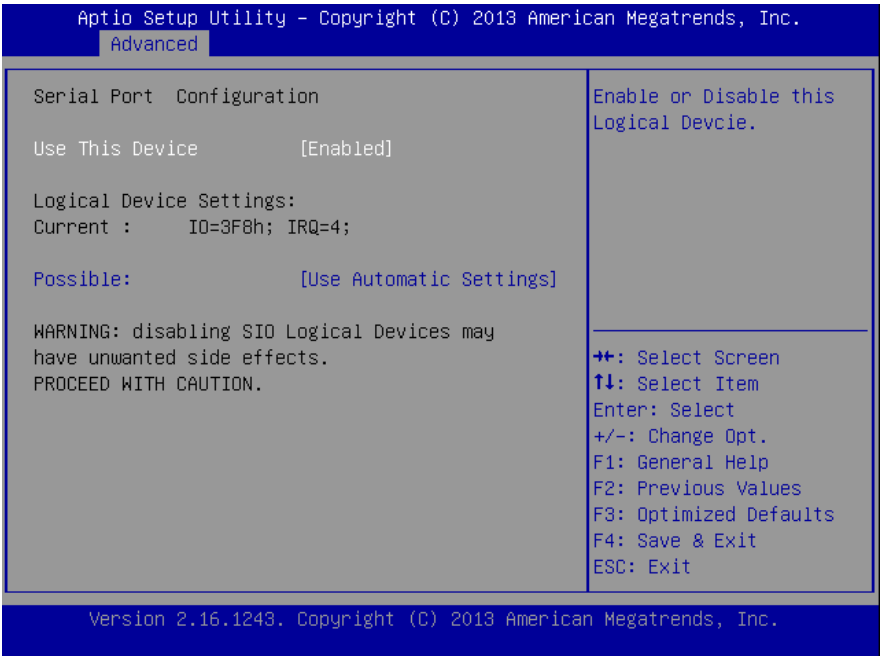
Data Bits	7	
	8	Optimal Default, Failsafe Default
Data Bits		
Parity	None	Optimal Default, Failsafe Default
	Even	
	Odd	
	Mark	
	Space	
A parity bit can be sent with the data bits to detect some transmission errors. Even: parity bit is 0 if the num of 1's in the data bits is even. Odd: parity bit is 0 if num of 1's in the data bits is odd. Mark: parity bit is always 1. Space: Parity bit is always 0. Mark and Space Parity do not allow for error detection.		
Stop Bits	1	Optimal Default, Failsafe Default
	2	
Stop bits indicate the end of a serial data packet. (A start bit indicates the beginning). The standard setting is 1 stop bit. Communication with slow devices may require more than 1 stop bit.		
Flow Control	None	Optimal Default, Failsafe Default
	Hardware RTC/CTS	
Flow control can prevent data loss from buffer overflow. When sending data, if the receiving buffers are full, a 'stop' signal can be sent to stop the data flow. Once the buffers are empty, a 'start' signal can be sent to re-start the flow. Hardware flow control uses two wires to send start/stop signals.		
VT-UTF8 Combo Key Sup	Enable	Optimal Default, Failsafe Default
	Disable	
Enable VT-UTF8 Combination Key Support for ANSI/VT100 terminals		
Recorder Mode	Enable	
	Disable	Optimal Default, Failsafe Default
With this mode enabled only text will be send. This is to capture Terminal data.		
Resolution 100x31	Enable	
	Disable	Optimal Default, Failsafe Default
Enables or disables extended terminal resolution		
Legacy OS Redirection	80x24	Optimal Default, Failsafe Default
	80x24	
On Legacy OS, the Number of Rows and Columns supported redirection		
Putty KeyPad	VT100	Optimal Default, Failsafe Default
	LINUX	
	XRERMR6	
	SCO	
	ESCN	

	VT400	
Select FunctionKey and KeyPad on Putty.		
Redirection After BIO	Always Enable	Optimal Default, Failsafe Default
	Boot Loader	
The Setting Specify if BootLoader is selected than Legacy console redirection is disabled before booting to Legacy OS. Default value is Always Enable which means Legacy console Redirection is enabled for Legacy OS.		

3.4.7 Advanced: SIO Configuration



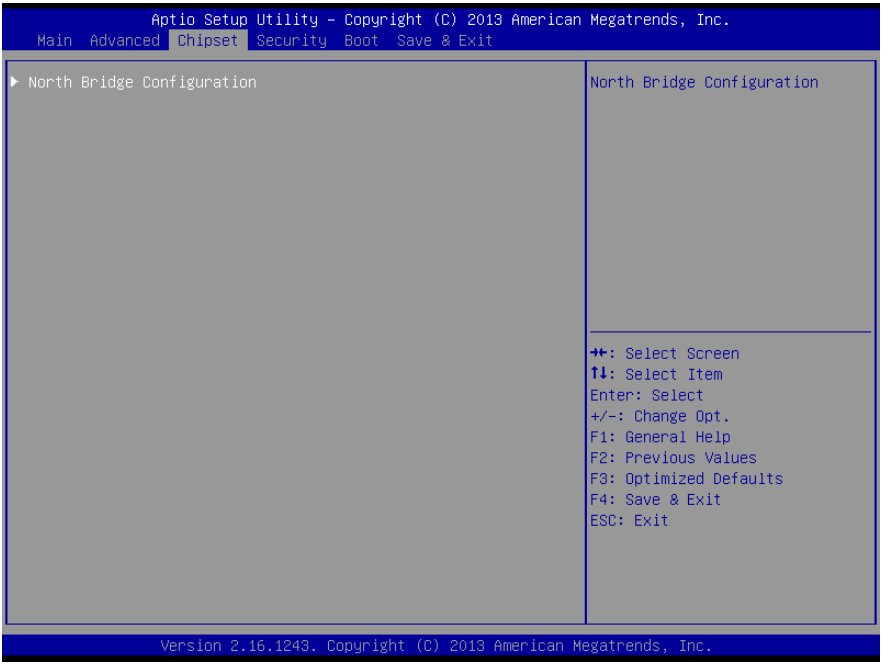
3.4.7.1 SIO Configuration: Serial Port Configuration



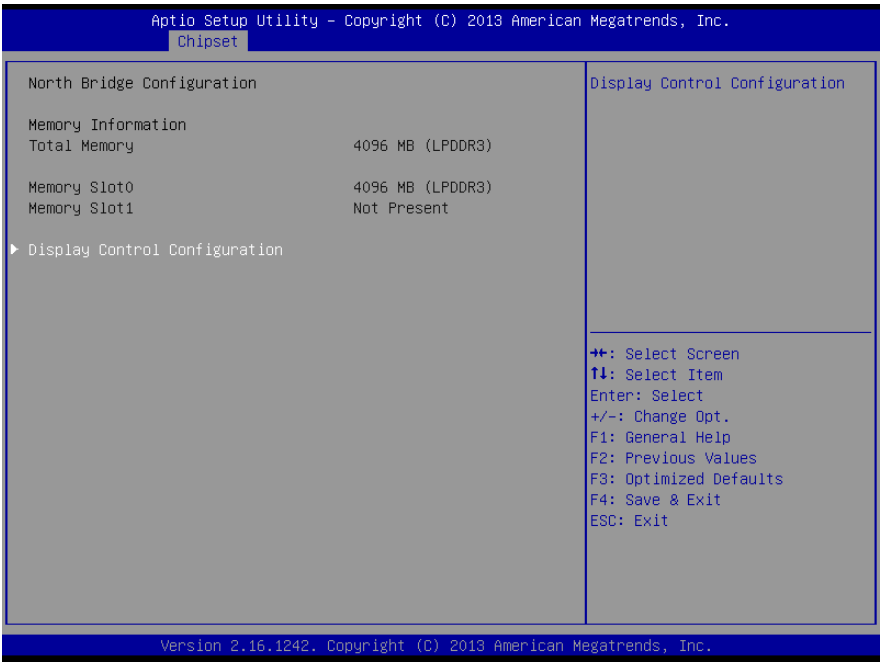
Options summary:

Serial Port	Disabled	Optimal Default, Failsafe Default
	Enabled	
En/Disable Serial Port (COM)		
Possible:	Use Automatic Settings	Optimal Default, Failsafe Default
	IO=3F8; IRQ=4;	
	IO=2F8; IRQ=3;	
Select an optimal setting for IO device		

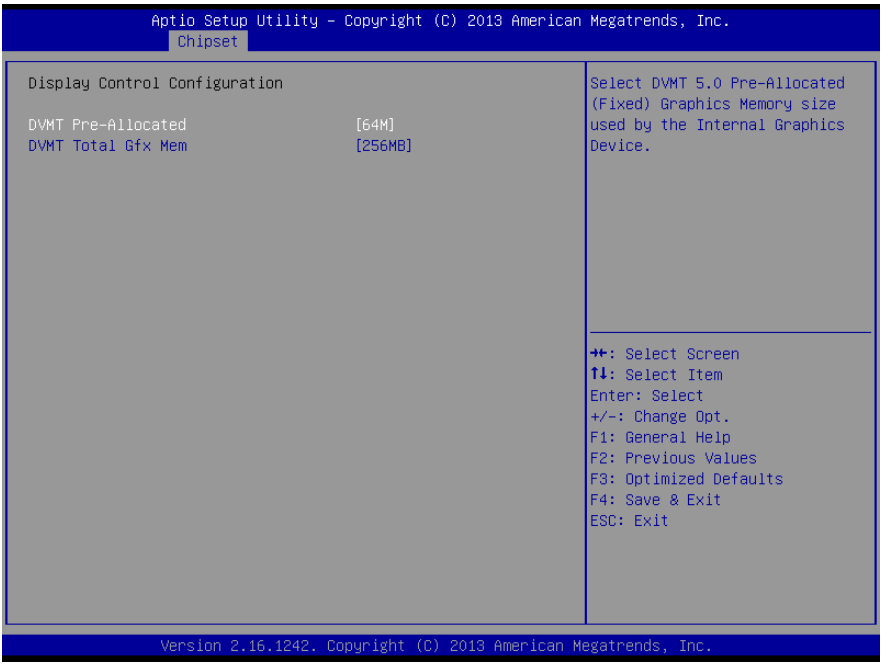
3.5 Setup submenu: Chipset



3.5.1 Chipset: North Bridge



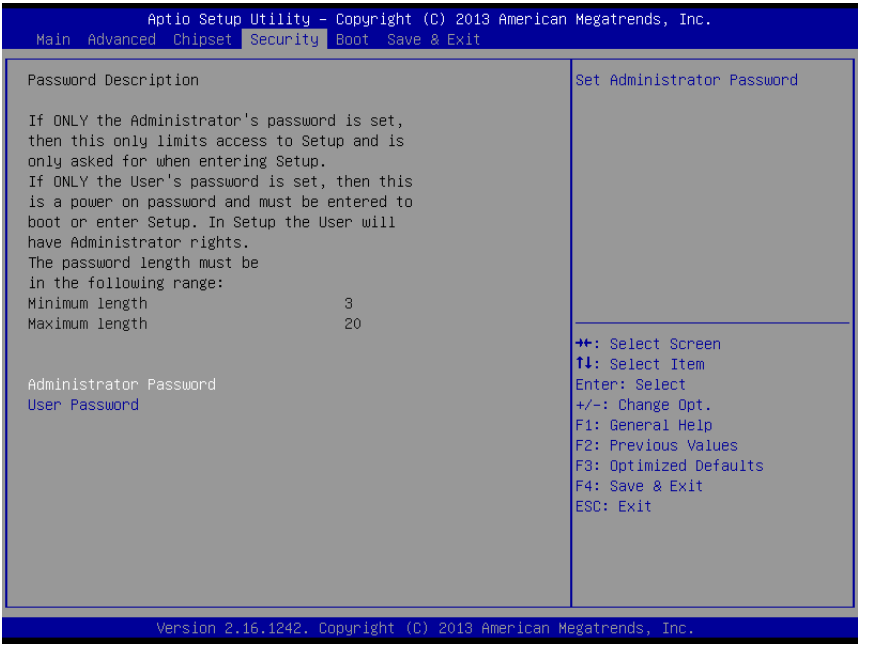
3.5.1.1 North Bridge: Display Control Configuration



Options summary:

DVMT Pre-Allocated	64M	Optimal Default, Failsafe Default
	96M	
	128M	
	160M	
	512M.....	
Select DVMT 5.0 Pre-Allocated (Fixed) Graphics Memory size used by the Internal Graphics Device.		
DVMT Total Gfx Mem	128MB	Optimal Default, Failsafe Default
	256MB	
	Max	
Select DVMT 5.0 Pre-Allocated (Fixed) Graphics Memory size used by the Internal Graphics Device.		

3.6 Setup submenu: Security



Change User/Administrator Password

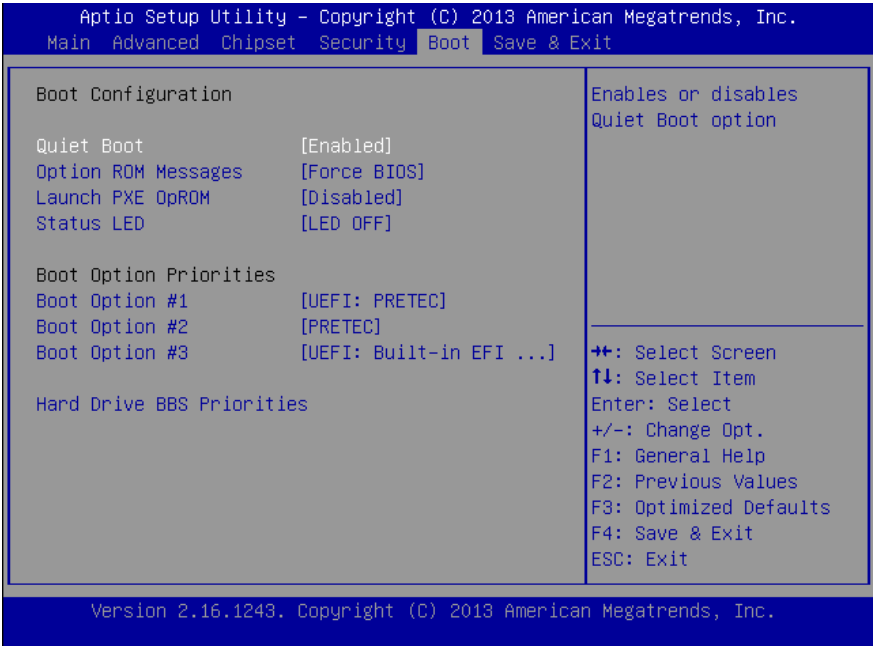
You can set a User Password once an Administrator Password is set. The password will be required during boot up, or when the user enters the Setup utility. Please Note that a User Password does not provide access to many of the features in the Setup utility.

Select the password you wish to set, press Enter to open a dialog box to enter your password (you can enter no more than six letters or numbers). Press Enter to confirm your entry, after which you will be prompted to retype your password for a final confirmation. Press Enter again after you have retyped it correctly.

Removing the Password

Highlight this item and type in the current password. At the next dialog box press Enter to disable password protection.

3.7 Setup submenu: Boot

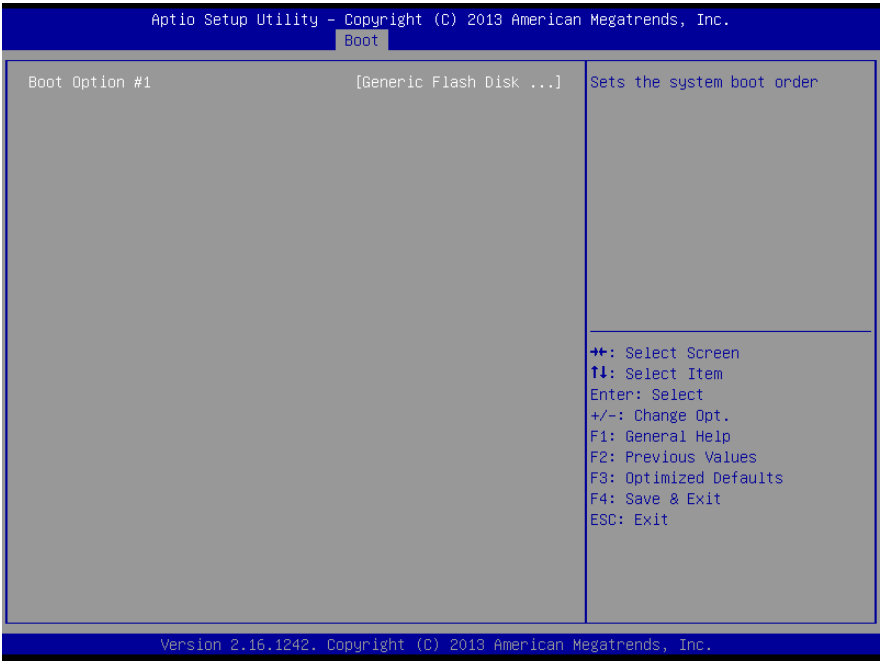


Options summary:

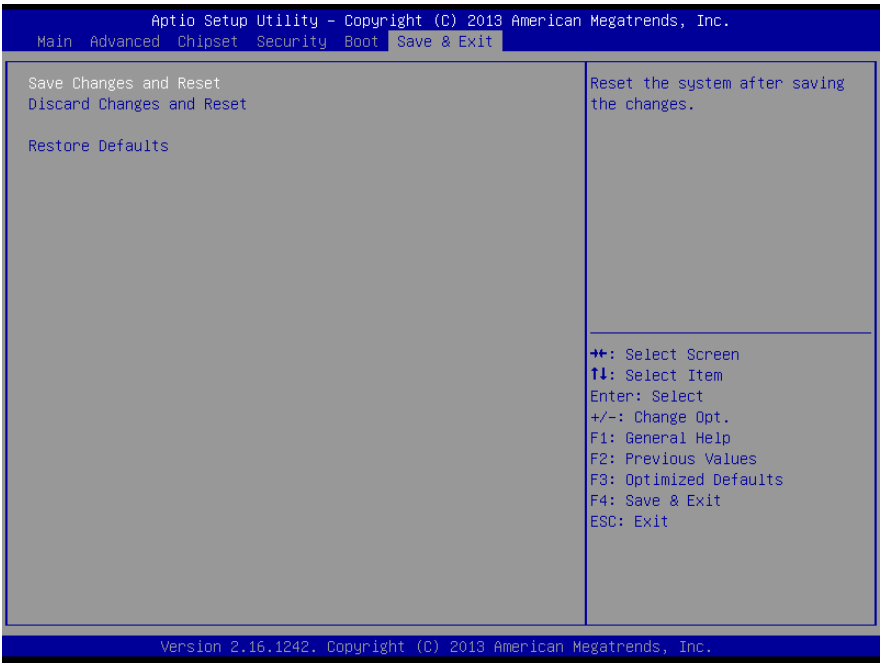
Quiet Boot	Disabled	
	Enabled	Default
En/Disable showing boot logo.		
Option ROM Messages	Force BIOS	Default
	Keep Current	
Set display mode for Option ROM		
Launch PXE OpROM	Disabled	Default
	Enabled	
En/Disable Legacy Boot Option		
Status LED	LED OFF	Default
	RED LED ON	
	RED LED BLINK	
	RED LED FAST BLINK	
	GREEN LED ON	
	GREEN LED BLINK	

	GREEN LED FAST BLINK	
Configure Status LED		

3.7.1 Boot: BBS Priorities



3.8 Setup submenu: Exit



Chapter 4

Drivers Installation

4.1 Product CD/DVD

The FWS-2253 comes with a product DVD that contains all the drivers and utilities you need to setup your product. Insert the DVD and follow the steps in the autorun program to install the drivers.

In case the program does not start, follow the sequence below to install the drivers.

Step 1 – Install Chipset Drivers

1. Open the **Step 1 - Chipset** folder followed by the **SetupChipset.exe** file
2. Follow the instructions
3. Drivers will be installed automatically

Step 2 – Install Graphics Driver

1. Open the **Step 2 - Graphics** and select your OS
2. Open the **Setup.exe** file in the folder
3. Follow the instructions
4. Drivers will be installed automatically

Step 3 – Install Network Driver

1. Open the **Step 3 - Network** folder and select your OS
2. Open the**.exe** file in the folder
3. Follow the instructions
4. Drivers will be installed automatically

Step 4 – Install xHCI Driver (Windows 7 only)

1. Open the **Step 4 - xHCI** folder followed by **Setup.exe**

2. Follow the instructions
3. Drivers will be installed automatically

Step 5 – Install Intel Sideband Fabric Device Driver (Windows 8.1 only)

1. Open the **Step 5 –Intel Sideband Fabric Device** followed by **Setup.exe**
2. Follow the instructions
3. Drivers will be installed automatically

Appendix A

Watchdog Timer Programming

A.1 Watchdog Timer Initial Program

Table 1 : SuperIO relative register table		
	Default Value	Note
Index	0x2E(Note1)	SIO MB PnP Mode Index Register 0x2E or 0x4E
Data	0x2F(Note2)	SIO MB PnP Mode Data Register 0x2F or 0x4F

Table 2 : Watchdog relative register table					
	LDN	Register	BitNum	Value	Note
Timer Counter	0x07(Note3)	0x73(Note4)		(Note24)	Time of watchdog timer (0~255) This register is byte access
Counting Unit	0x07(Note5)	0x72(Note6)	7(Note7)	1(Note8)	Select time unit. 1: second 0: minute
Watchdog Enable (KRST)	0x07(Note9)	0x72(Note10)	6(Note11)	1(Note12)	0: Disable 1: Enable
Timeout Status	0x07(Note13)	0x71(Note14)	0(Note15)	1	1: Clear timeout status

```
*******************************************************************************
// SuperIO relative definition (Please reference to Table 1)
#define byte   SIOIndex   //This parameter is represented from Note1
#define byte   SIOData   //This parameter is represented from Note2
#define   void   IOWriteByte(byte IOPort, byte Value);
#define   byte   IOReadByte(byte IOPort);
// Watch Dog relative definition (Please reference to Table 2)
#define byte   TimerLDN   //This parameter is represented from Note3
#define byte   TimerReg   //This parameter is represented from Note4
#define byte   TimerVal   // This parameter is represented from Note24
#define byte   UnitLDN   //This parameter is represented from Note5
#define byte   UnitReg   //This parameter is represented from Note6
#define byte   UnitBit   //This parameter is represented from Note7
#define byte   UnitVal   //This parameter is represented from Note8
#define byte   EnableLDN   //This parameter is represented from Note9
#define byte   EnableReg   //This parameter is represented from Note10
#define byte   EnableBit   //This parameter is represented from Note11
#define byte   EnableVal   //This parameter is represented from Note12
#define byte   StatusLDN   // This parameter is represented from Note13
#define byte   StatusReg   // This parameter is represented from Note14
#define byte   StatusBit   // This parameter is represented from Note15
*******************************************************************************
```

```
*******************************************************************************
VOID   Main(){
       // Procedure : AaeonWDTConfig
       // (byte)Timer : Time of WDT timer.(0x00~0xFF)
       // (boolean)Unit : Select time unit(0: second, 1: minute).
       AaeonWDTConfig();

       // Procedure : AaeonWDTEnable
        // This procudure will enable the WDT counting.
       AaeonWDTEnable();
}
*******************************************************************************
```

```
*********************************************************************************
// Procedure : AaeonWDTEnable
VOID    AaeonWDTEnable ( ){
        WDTEnableDisable(EnableLDN, EnableReg, EnableBit, 1);
}

// Procedure : AaeonWDTConfig
VOID    AaeonWDTConfig ( ){
         // Disable WDT counting
         WDTEnableDisable(EnableLDN, EnableReg, EnableBit, 0);
         // Clear Watchdog Timeout Status
         WDTClearTimeoutStatus();
         // WDT relative parameter setting
         WDTParameterSetting();
}

VOID    WDTEnableDisable(byte LDN, byte Register, byte BitNum, byte Value){
       SIOBitSet(LDN, Register, BitNum, Value);
}

VOID    WDTParameterSetting(){
         // Watchdog Timer counter setting
        SIOByteSet(TimerLDN, TimerReg, TimerVal);
       // WDT counting unit setting
       SIOBitSet(UnitLDN, UnitReg, UnitBit, UnitVal);
}

VOID    WDTClearTimeoutStatus(){
       SIOBitSet(StatusLDN, StatusReg, StatusBit, 1);
}
*********************************************************************************
```

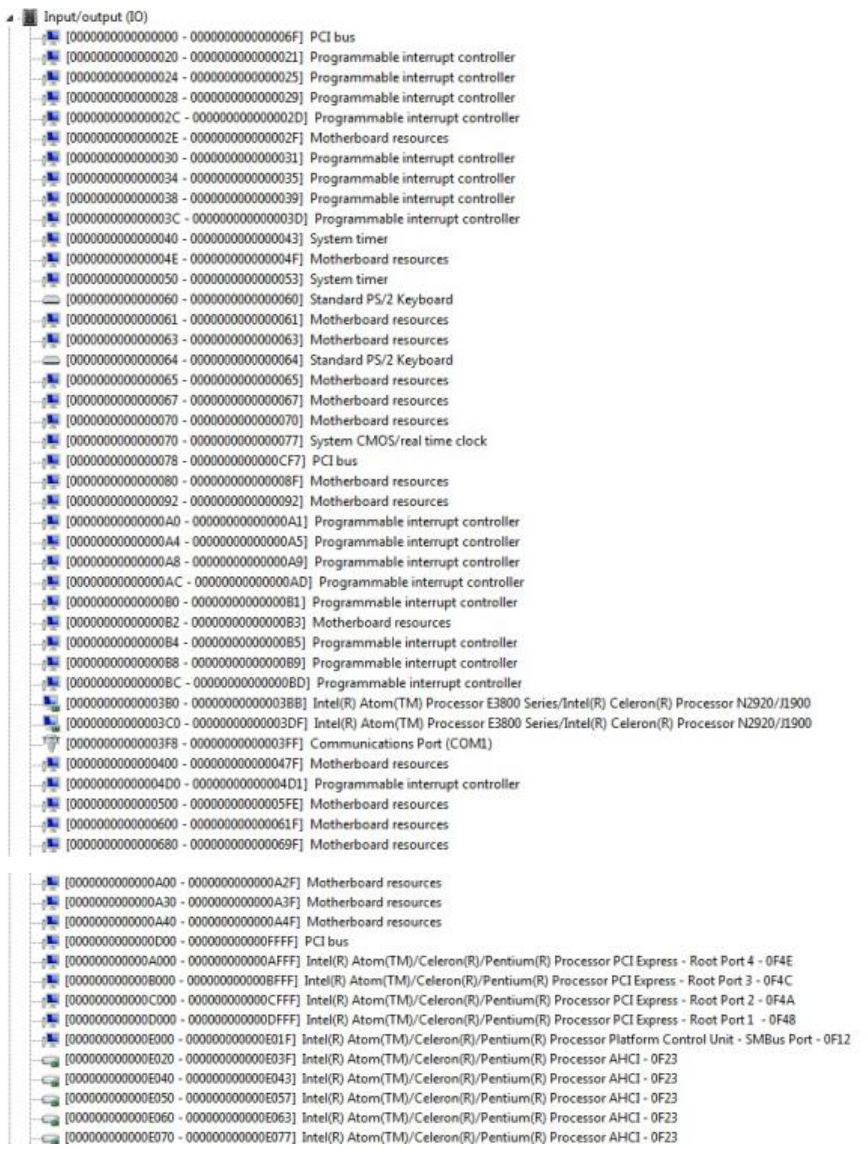
```
*******************************************************************************
VOID    SIOEnterMBPnPMode(){
        Switch(SIOIndex){
                Case 0x2E:
                        IOWriteByte(SIOIndex, 0x87);
                        IOWriteByte(SIOIndex, 0x01);
                           IOWriteByte(SIOIndex, 0x55);
                           IOWriteByte(SIOIndex, 0x55);
                           Break;
                Case 0x4E:
                        IOWriteByte(SIOIndex, 0x87);
                        IOWriteByte(SIOIndex, 0x01);
                           IOWriteByte(SIOIndex, 0x55);
                           IOWriteByte(SIOIndex, 0xAA);
                        Break;
        }
}

VOID    SIOExitMBPnPMode(){
        IOWriteByte(SIOIndex, 0x02);
        IOWriteByte(SIOData, 0x02);
}

VOID    SIOSelectLDN(byte LDN){
         IOWriteByte(SIOIndex, 0x07); // SIO LDN Register Offset = 0x07
        IOWriteByte(SIOData, LDN);
}
*******************************************************************************
```

```
*****************************************************************************
VOID   SIOBitSet(byte LDN, byte Register, byte BitNum, byte Value){
       Byte TmpValue;

       SIOEnterMBPnPMode();
        SIOSelectLDN(byte LDN);
       IOWriteByte(SIOIndex, Register);
       TmpValue = IOReadByte(SIOData);
       TmpValue &= ~(1 << BitNum);
       TmpValue |= (Value << BitNum);
       IOWriteByte(SIOData, TmpValue);
       SIOExitMBPnPMode();
}

VOID   SIOByteSet(byte LDN, byte Register, byte Value){
       SIOEnterMBPnPMode();
        SIOSelectLDN(LDN);
       IOWriteByte(SIOIndex, Register);
        IOWriteByte(SIOData, Value);
        SIOExitMBPnPMode();
}
*****************************************************************************
```

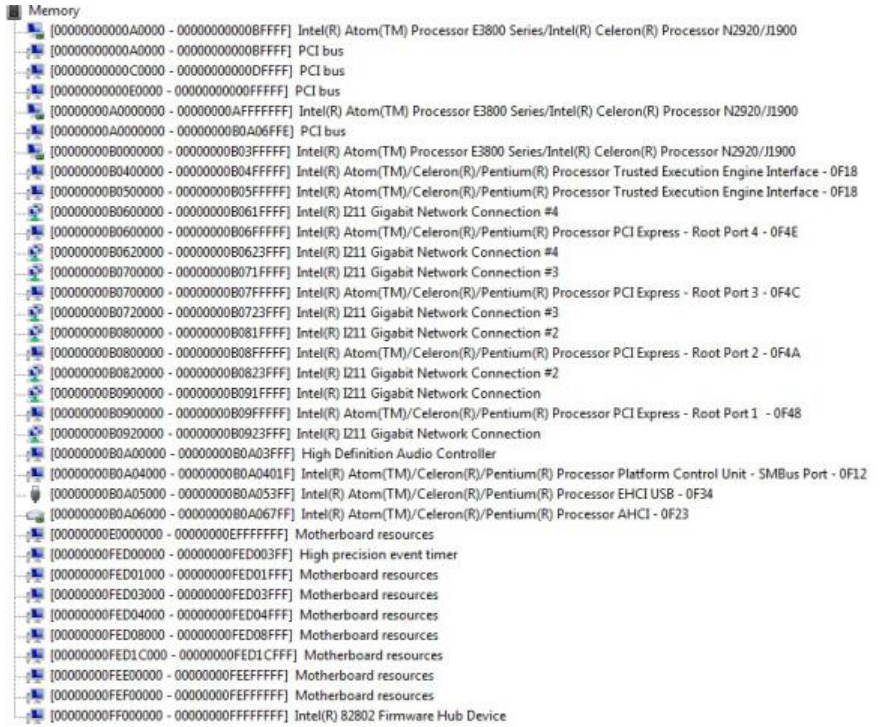
Appendix B

I/O Information

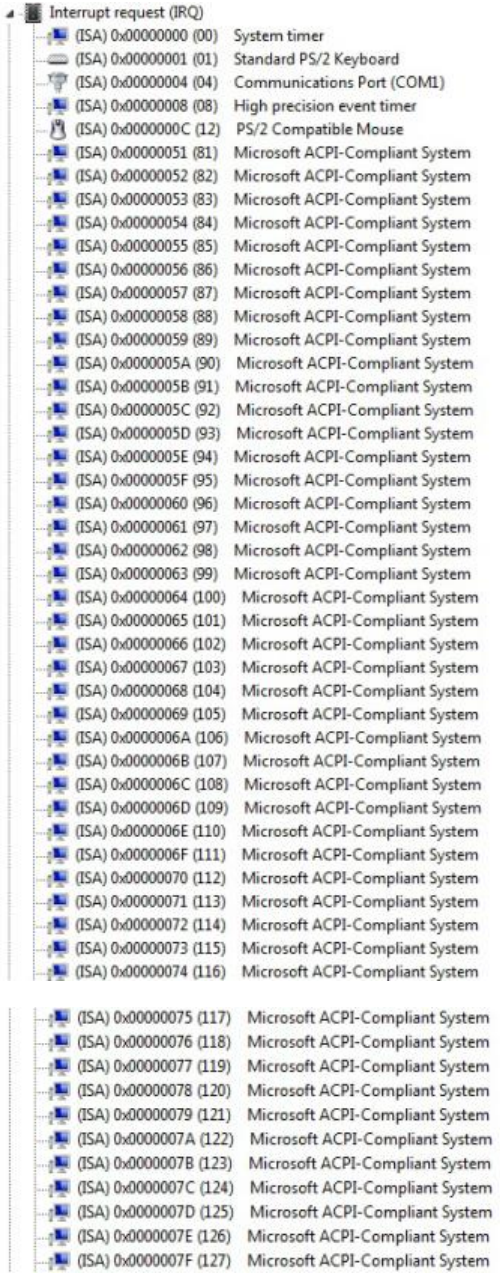
B.1 I/O Address Map

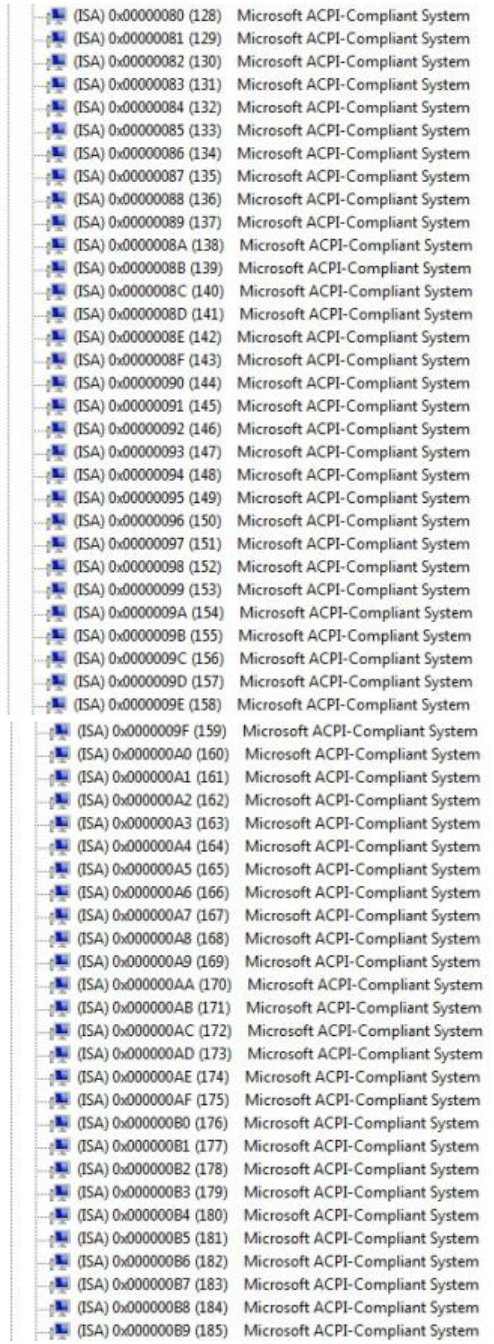


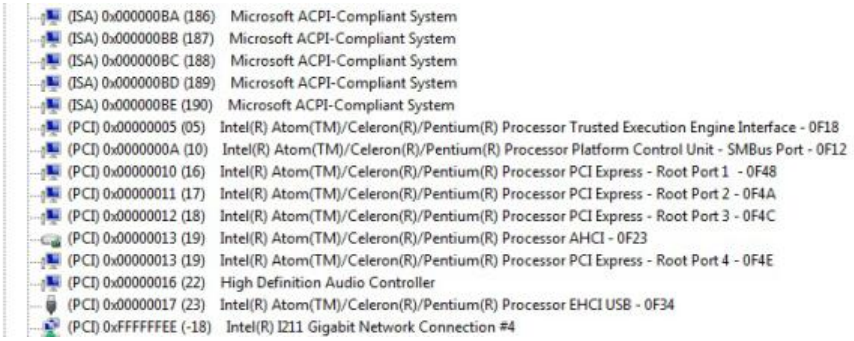
B.2 Memory Address Map



B.3 IRQ Mapping Chart




(ISA) 0x00000080 (128) Microsoft ACPI-Compliant System
(ISA) 0x00000081 (129) Microsoft ACPI-Compliant System
(ISA) 0x00000082 (130) Microsoft ACPI-Compliant System
(ISA) 0x00000083 (131) Microsoft ACPI-Compliant System
(ISA) 0x00000084 (132) Microsoft ACPI-Compliant System
(ISA) 0x00000085 (133) Microsoft ACPI-Compliant System
(ISA) 0x00000086 (134) Microsoft ACPI-Compliant System
(ISA) 0x00000087 (135) Microsoft ACPI-Compliant System
(ISA) 0x00000088 (136) Microsoft ACPI-Compliant System
(ISA) 0x00000089 (137) Microsoft ACPI-Compliant System
(ISA) 0x0000008A (138) Microsoft ACPI-Compliant System
(ISA) 0x0000008B (139) Microsoft ACPI-Compliant System
(ISA) 0x0000008C (140) Microsoft ACPI-Compliant System
(ISA) 0x0000008D (141) Microsoft ACPI-Compliant System
(ISA) 0x0000008E (142) Microsoft ACPI-Compliant System
(ISA) 0x0000008F (143) Microsoft ACPI-Compliant System
(ISA) 0x00000090 (144) Microsoft ACPI-Compliant System
(ISA) 0x00000091 (145) Microsoft ACPI-Compliant System
(ISA) 0x00000092 (146) Microsoft ACPI-Compliant System
(ISA) 0x00000093 (147) Microsoft ACPI-Compliant System
(ISA) 0x00000094 (148) Microsoft ACPI-Compliant System
(ISA) 0x00000095 (149) Microsoft ACPI-Compliant System
(ISA) 0x00000096 (150) Microsoft ACPI-Compliant System
(ISA) 0x00000097 (151) Microsoft ACPI-Compliant System
(ISA) 0x00000098 (152) Microsoft ACPI-Compliant System
(ISA) 0x00000099 (153) Microsoft ACPI-Compliant System
(ISA) 0x0000009A (154) Microsoft ACPI-Compliant System
(ISA) 0x0000009B (155) Microsoft ACPI-Compliant System
(ISA) 0x0000009C (156) Microsoft ACPI-Compliant System
(ISA) 0x0000009D (157) Microsoft ACPI-Compliant System
(ISA) 0x0000009E (158) Microsoft ACPI-Compliant System
(ISA) 0x0000009F (159) Microsoft ACPI-Compliant System
(ISA) 0x000000A0 (160) Microsoft ACPI-Compliant System
(ISA) 0x000000A1 (161) Microsoft ACPI-Compliant System
(ISA) 0x000000A2 (162) Microsoft ACPI-Compliant System
(ISA) 0x000000A3 (163) Microsoft ACPI-Compliant System
(ISA) 0x000000A4 (164) Microsoft ACPI-Compliant System
(ISA) 0x000000A5 (165) Microsoft ACPI-Compliant System
(ISA) 0x000000A6 (166) Microsoft ACPI-Compliant System
(ISA) 0x000000A7 (167) Microsoft ACPI-Compliant System
(ISA) 0x000000A8 (168) Microsoft ACPI-Compliant System
(ISA) 0x000000A9 (169) Microsoft ACPI-Compliant System
(ISA) 0x000000AA (170) Microsoft ACPI-Compliant System
(ISA) 0x000000AB (171) Microsoft ACPI-Compliant System
(ISA) 0x000000AC (172) Microsoft ACPI-Compliant System
(ISA) 0x000000AD (173) Microsoft ACPI-Compliant System
(ISA) 0x000000AE (174) Microsoft ACPI-Compliant System
(ISA) 0x000000AF (175) Microsoft ACPI-Compliant System
(ISA) 0x000000B0 (176) Microsoft ACPI-Compliant System
(ISA) 0x000000B1 (177) Microsoft ACPI-Compliant System
(ISA) 0x000000B2 (178) Microsoft ACPI-Compliant System
(ISA) 0x000000B3 (179) Microsoft ACPI-Compliant System
(ISA) 0x000000B4 (180) Microsoft ACPI-Compliant System
(ISA) 0x000000B5 (181) Microsoft ACPI-Compliant System
(ISA) 0x000000B6 (182) Microsoft ACPI-Compliant System
(ISA) 0x000000B7 (183) Microsoft ACPI-Compliant System
(ISA) 0x000000B8 (184) Microsoft ACPI-Compliant System
(ISA) 0x000000B9 (185) Microsoft ACPI-Compliant System


(ISA) 0x000000BA (186) Microsoft ACPI-Compliant System
(ISA) 0x000000BB (187) Microsoft ACPI-Compliant System
(ISA) 0x000000BC (188) Microsoft ACPI-Compliant System
(ISA) 0x000000BD (189) Microsoft ACPI-Compliant System
(ISA) 0x000000BE (190) Microsoft ACPI-Compliant System
(PCI) 0x00000005 (05) Intel(R) Atom(TM)/Celeron(R)/Pentium(R) Processor Trusted Execution Engine Interface - 0F18
(PCI) 0x0000000A (10) Intel(R) Atom(TM)/Celeron(R)/Pentium(R) Processor Platform Control Unit - SMBus Port - 0F12
(PCI) 0x00000010 (16) Intel(R) Atom(TM)/Celeron(R)/Pentium(R) Processor PCI Express - Root Port 1 - 0F48
(PCI) 0x00000011 (17) Intel(R) Atom(TM)/Celeron(R)/Pentium(R) Processor PCI Express - Root Port 2 - 0F4A
(PCI) 0x00000012 (18) Intel(R) Atom(TM)/Celeron(R)/Pentium(R) Processor PCI Express - Root Port 3 - 0F4C
(PCI) 0x00000013 (19) Intel(R) Atom(TM)/Celeron(R)/Pentium(R) Processor AHCI - 0F23
(PCI) 0x00000013 (19) Intel(R) Atom(TM)/Celeron(R)/Pentium(R) Processor PCI Express - Root Port 4 - 0F4E
(PCI) 0x00000016 (22) High Definition Audio Controller
(PCI) 0x00000017 (23) Intel(R) Atom(TM)/Celeron(R)/Pentium(R) Processor EHCI USB - 0F34
(PCI) 0xFFFFFFEE (-18) Intel(R) I211 Gigabit Network Connection #4


(PCI) 0xFFFFFFEF (-17) Intel(R) I211 Gigabit Network Connection #4
(PCI) 0xFFFFFFF0 (-16) Intel(R) I211 Gigabit Network Connection #4
(PCI) 0xFFFFFFF1 (-15) Intel(R) I211 Gigabit Network Connection #4
(PCI) 0xFFFFFFF2 (-14) Intel(R) I211 Gigabit Network Connection #3
(PCI) 0xFFFFFFF3 (-13) Intel(R) I211 Gigabit Network Connection #3
(PCI) 0xFFFFFFF4 (-12) Intel(R) I211 Gigabit Network Connection #3
(PCI) 0xFFFFFFF5 (-11) Intel(R) I211 Gigabit Network Connection #3
(PCI) 0xFFFFFFF6 (-10) Intel(R) I211 Gigabit Network Connection #2
(PCI) 0xFFFFFFF7 (-9) Intel(R) I211 Gigabit Network Connection #2
(PCI) 0xFFFFFFF8 (-8) Intel(R) I211 Gigabit Network Connection #2
(PCI) 0xFFFFFFF9 (-7) Intel(R) I211 Gigabit Network Connection #2
(PCI) 0xFFFFFFFA (-6) Intel(R) I211 Gigabit Network Connection
(PCI) 0xFFFFFFFB (-5) Intel(R) I211 Gigabit Network Connection
(PCI) 0xFFFFFFFC (-4) Intel(R) I211 Gigabit Network Connection
(PCI) 0xFFFFFFFD (-3) Intel(R) I211 Gigabit Network Connection
(PCI) 0xFFFFFFFE (-2) Intel(R) Atom(TM) Processor E3800 Series/Intel(R) Celeron(R) Processor N2920/J1900

Appendix C

Standard Firewall Platform Setting

C.1 Standard Firewall Platform Setting

Status LED Control Table.

	IO 0XA04 BIT4	IO 0XA03 BIT0	IO 0XA01 BIT2
LED Off	0	0	0
Red LED On	0	0	1
Red LED Blink	0	1	0
Red LED Fast Blink	0	1	1
Green LED Blink	1	0	1
Green LED Fast Blink	1	1	0
Green LED On	1	1	1

LAN ByPass Config Table

Item			IO 0XA00 BIT5	IO 0XA00 BIT6	IO 0XA00 BIT4	IO 0XA00 BIT2	IO 0XA00 BIT1
LAN1 ~2	Power On	Bypass	Negedge	0	1		0(WDT_RESET) 1(BYPASS)
		Pass Through	Negedge	0	0		
LAN1 ~2	Power Off	Bypass	Negedge	0		1	
		Pass Through	Negedge	0		0	

Note : "IO 0XA00 BIT5" will be activated when "0XA00 BIT6.4.2.1" is ready.

C.2 Status LED Sample Code

```
        #define LED_BASE_ADDR0x48E

// LED Off
VOID  LED_OFF()
{
        UINT16        TEMP16;

        TEMP16 = IoIn16(LED_BASE_ADDR) & 0xF7ED;
        IoOut16(LED_BASE_ADDR, TEMP16);
}

// Red LED On
VOID  RED_LED_ON()
{
        UINT16        TEMP16;

        TEMP16 = IoIn16(LED_BASE_ADDR) & 0xF7ED;
        TEMP16 |= 0x0002;
        IoOut16(LED_BASE_ADDR, TEMP16);
}

// Red LED Blink
VOID  RED_LED_BLINK()
{
        UINT16        TEMP16;

        TEMP16 = IoIn16(LED_BASE_ADDR) & 0xF7ED;
```

```
        TEMP16 |= 0x0800;
        IoOut16(LED_BASE_ADDR, TEMP16);
}

// Red LED Fast Blink
VOID  RED_LED_FBLINK()
{
        UINT16        TEMP16;

        TEMP16 = IoIn16(LED_BASE_ADDR) & 0xF7ED;
        TEMP16 |= 0x0802;
        IoOut16(LED_BASE_ADDR, TEMP16);
}

// Green LED On
VOID  GREEN_LED_ON()
{
        UINT16        TEMP16;

        TEMP16 = IoIn16(LED_BASE_ADDR) & 0xF7ED;
        TEMP16 |= 0x0812;
        IoOut16(LED_BASE_ADDR, TEMP16);
}

// Green LED Blink
VOID  GREEN_LED_BLINK()
{
        UINT16        TEMP16;
```

```
        TEMP16 = IoIn16(LED_BASE_ADDR) & 0xF7ED;
        TEMP16 |= 0x0012;
        IoOut16(LED_BASE_ADDR, TEMP16);
}

// Green LED Fast Blink
VOID  GREEN_LED_FBLINK()
{
        UINT16        TEMP16;

        TEMP16 = IoIn16(LED_BASE_ADDR) & 0xF7ED;
        TEMP16 |= 0x0810;
        IoOut16(LED_BASE_ADDR, TEMP16);
}
```

C.3 LAN Bypass Mode Sample Code

```
        #define LANBP_BASE_ADDR             0x48C
        #define PAIR_SEL_BASE_ADDR  0x4B8


/*
Select LAN Pair I or II
PAIR_NUM =          0x00 - PAIR I
                    0x01 - PAIR II
*/
VOID  SEL_PAIR(
        IN      UINT8PAIR_NUM;
)
{
        UINT8TEMP8;

        PAIR_NUM = PAIR_NUM << 5;
        TEMP8 = IoIn8(PAIR_SEL_BASE_ADDR) & 0xDF;
        TEMP8 |= PAIR_NUM;
        IoOut8(PAIR_SEL_BASE_ADDR, TEMP8);
}



/*
Execute LAN ByPass Settings
*/
VOID  EXE_SET()
{
        UINT8TEMP8;
```

```
        TEMP8 = IoIn8(LANBP_BASE_ADDR + 3) | 0x10;
        IoOut8(LANBP_BASE_ADDR + 3, TEMP8);
        Sleep(500);
        IoOut8(LANBP_BASE_ADDR + 3, TEMP8 & 0xEF);
}



/*
LAN1 & 2 Power On ByPass Mode Set
BP_MODE = 0x00 - Pass Through Mode
                = 0x01 - By Pass Mode
*/
VOID LAN12_PWRON_BP()
{
        UINT8TEMP8;

        SEL_PAIR(0x00) ;            // Select Pair I
        TEMP8 = IoIn8(LANBP_BASE_ADDR + 1) & 0xFE;
        TEMP8 |= BP_MODE;
        IoOut8(LANBP_BASE_ADDR + 1, TEMP8);

        EXE_SET();                  // Execute Set
}



/*
```

```
LAN1 & 2 Power Off ByPass Mode Set
BP_MODE = 0x00 - Pass Through Mode
                = 0x01 - By Pass Mode
*/
VOID LAN12_PWROFF_BP()
{
        UINT8TEMP8;

        SEL_PAIR(0x00) ;            // Select Pair I
        TEMP8 = IoIn8(LANBP_BASE_ADDR) & 0x7F;
        TEMP8 |= BP_MODE << 7;
        IoOut8(LANBP_BASE_ADDR, TEMP8);

        EXE_SET();                  // Execute Set
}


/*
LAN3 & 4 Power On ByPass Mode Set
BP_MODE = 0x00 - Pass Through Mode
                = 0x01 - By Pass Mode
*/
VOID LAN34_PWRON_BP()
{
        UINT8TEMP8;

        SEL_PAIR(0x01) ;            // Select Pair II
        TEMP8 = IoIn8(LANBP_BASE_ADDR + 1) & 0xFE;
```

```
        TEMP8 |= BP_MODE;
        IoOut8(LANBP_BASE_ADDR + 1, TEMP8);

        EXE_SET();                  // Execute Set
}


/*
LAN3 & 4 Power Off ByPass Mode Set
BP_MODE = 0x00 - Pass Through Mode
                = 0x01 - By Pass Mode
*/
VOID  LAN34_PWROFF_BP()
{
        UINT8TEMP8;

        SEL_PAIR(0x01) ;            // Select Pair II
        TEMP8 = IoIn8(LANBP_BASE_ADDR) & 0x7F;
        TEMP8 |= BP_MODE << 7;
        IoOut8(LANBP_BASE_ADDR, TEMP8);

        EXE_SET();                  // Execute Set
}


/*
Set Watch Dog as LAN1 & 2 By Pass mode
*/
```

```
VOID WDT_LAN12_BP()
{
        UINT8TEMP8;

        SEL_PAIR(0x00) ;            // Select Pair I
        TEMP8 = IoIn8(LANBP_BASE_ADDR) | 0x40;
        IoOut8(LANBP_BASE_ADDR, TEMP8);

        EXE_SET();                  // Execute Set
}


/*
Set Watch Dog as LAN3 & 4 By Pass mode
*/
VOID WDT_LAN34_BP()
{
        UINT8TEMP8;

        SEL_PAIR(0x01) ;            // Select Pair II
        TEMP8 = IoIn8(LANBP_BASE_ADDR) | 0x40;
        IoOut8(LANBP_BASE_ADDR, TEMP8);

        EXE_SET();                  // Execute Set
}


/*
```

```
Set Watch Dog as system reset mode
*/
VOID WDT_RESET()
{
        UINT8TEMP8;

        SEL_PAIR(0x00) ;            // Select Pair I
        TEMP8 = IoIn8(LANBP_BASE_ADDR) & 0xBF;
        IoOut8(LANBP_BASE_ADDR, TEMP8);

        SEL_PAIR(0x00) ;            // Select Pair II
        IoOut8(LANBP_BASE_ADDR, TEMP8);

        EXE_SET();                  // Execute Set
}
```

C.4 Console Redirection

Console redirection allows you to maintain a system from a remote location by re-directing keyboard input and text output through the serial port. This section will tell you how to use the console redirection.

1. Please insert console cable between on the FWS-2253 and remote client system.
2. Setup BIOS in FWS-2253

   BIOS >> Advanced >> Serial Port Console Redirection >> Console Redirection: Enabled (Default)

   Enabled Attempt to redirect console via COM port

   Disabled Console redirection function

   BIOS >> Advanced >> Serial Port Console Redirection >> Serial Redirection Settings >> Bits per second: 115200 (Default)
3. Configure Console redirection on client system. This example is for Windows platform.

   Step 1 - Click the Start button, point to programs >> Accessories >> Communication, and click Hyper Terminal

   Step 2 - Enter any name for the new connection and select any icon

   Step 3 - Click OK

   Step 4 - From the connect to pull-down menu, select a COM port available on your client system and click OK

   Step 5 - Select Baud Rate >> 19200, Flow control >> None, Data bit >>8, Parity cheek >> None, Stop bit>>1
4. Power on FWS-2253 and it will display the BIOS information on the client system.