



# VPC-3300S

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Mobile NVR

User's Manual 7<sup>th</sup> Ed

## Copyright Notice

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## Packing List

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

Item	Quantity
● VPC-3300S	1
● Product CD with User's Manual (in pdf) and drivers	1

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

## About this Document

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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](http://AAEON.com) for the latest version of this document.

## Safety Precautions

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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.**

### **Warning!**



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	○	○	○	○	○	○
外部信号 连接器及线材	○	○	○	○	○	○
外壳	○	○	○	○	○	○
中央处理器 与内存	○	○	○	○	○	○
硬盘	○	○	○	○	○	○
电源	○	○	○	○	○	○
<p>○：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。</p> <p>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。</p> <p>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、电源为选购品。</p>						

## 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	○	○	○	○	○	○
Wires & Connectors for External Connections	○	○	○	○	○	○
Chassis	○	○	○	○	○	○
CPU & RAM	○	○	○	○	○	○
Hard Disk	○	○	○	○	○	○
PSU	○	○	○	○	○	○

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**

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# Chapter 1

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Product Specifications

## 1.1 Specifications

### System

● CPU		Onboard Intel® Celeron® J1900 SoC (4C, 2M Cache, up to 2.42GHz)
● Chipset		-
● System Memory		204-pin single channel DDR3L 1333 MHz SODIMM x 1, up to 8 GB
● Display	VGA	DB-15 x 1 for VGA
Interface	DP	-
	HDMI	HDMI x 1
● Storage	HDD/SSD	SATA 6.0 Gb/s x 1
Device	mSATA	mSATA Socket x 1
● Network	LAN	Intel® Gigabit Ethernet x 6, support PoE (4 port 802.3at)
	Wireless	Optional by MiniCard (see below for MiniCard options)
● Front I/O	Power Input	Min. 9V ~ Max. 36V DC-in (OVP: 36.7V, UVP: 8.4V) 3-pin terminal block x 1 (ACC, V-, V+)
	Remote power	3-pin Terminal Block x1
	CAN Bus	(Read-only) 2-pin terminal block with isolation x1
	DIO	8bit GPIO with isolation (10 pin terminal block)
	Others	SIM Socket x 2 Power On/Off switch x 1

- **Rear I/O**
  - USB** USB 2.0 x 2, USB 3.0 x 1
  - HDMI** HDMI x 1
  - Audio** Line-out x 1, Mic-in x 1
  - VGA** 15-pin D-SUB x 1
- **Expansion**
  - MiniCard** Full MiniCard x 2 (2 x full function)  
Half MiniCard x 1 (USB only,)
- **Internal I/O**
  - Serial Port** Header for RS-232 x 1,  
Header for RS-232/422/485 x 1
- **Indicator**
  - HDD LED (Red) x 1
  - WLAN LED (Red, for mPCIe) x 3
- **OS Support**
  - Windows® 7
  - Windows® 8.1
  - Windows® Embedded Standard 7
  - Windows® Embedded Standard 8
  - Linux by Fedora

## Mechanical

- **Mounting** Wall mounted
- **System Cooling** Passive
- **Dimension (W x H x D)** 174 x 200 x 60 mm (6.85 x 7.87 x 2.36")
- **Gross Weight** 2.6 kg (5.7 lb)

## Environmental

- **Operating Temperature** -20 ~ 70°C (-4 ~ 158°F) with 0.5 m/s Airflow
- **Storage Temperature** -40 ~ 85°C (-40 ~ 185°F)
- **Anti-Vibration** 3 G<sub>rms</sub>/ 5~500 Hz/ operation - mSATA  
1 G<sub>rms</sub>/ 5~500 Hz/ operation - SSD

- **Anti-Shock** 50G peak acceleration (11 msec. duration) - mSATA  
20G peak acceleration (11 msec. duration) - SSD
- **Certification** EMC E-Mark E13

## Power

- **Power Requirement** Vehicle power:
  - Input voltage: 9-36V DC
  - Supports Ignition cold crank
  - Supports Ignition on/off
  - Supports battery protection
  - Supports power on/off delay
- **Power Consumption** 12V@1.68A



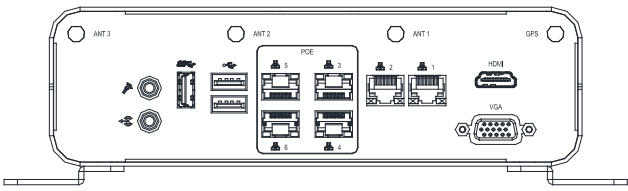
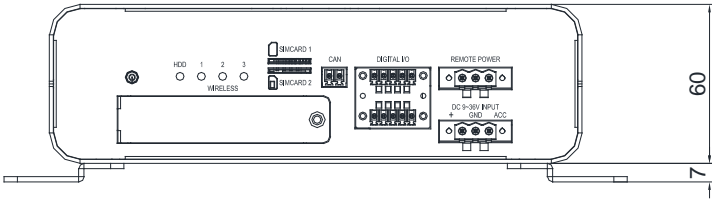
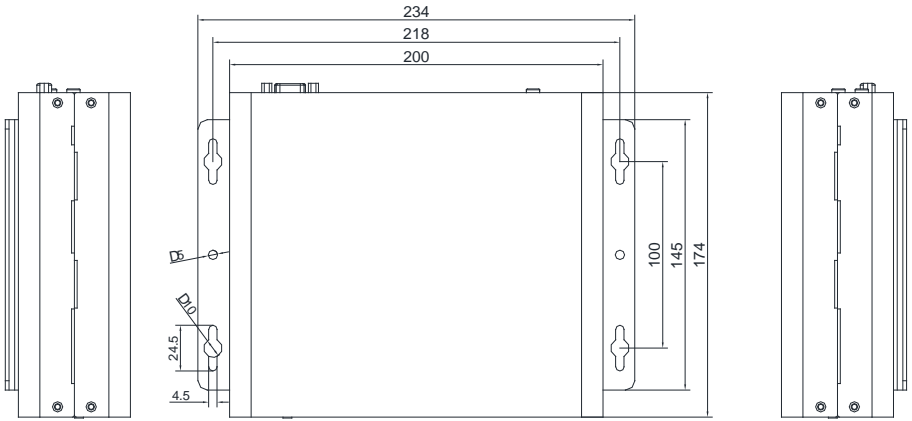
# Chapter 2

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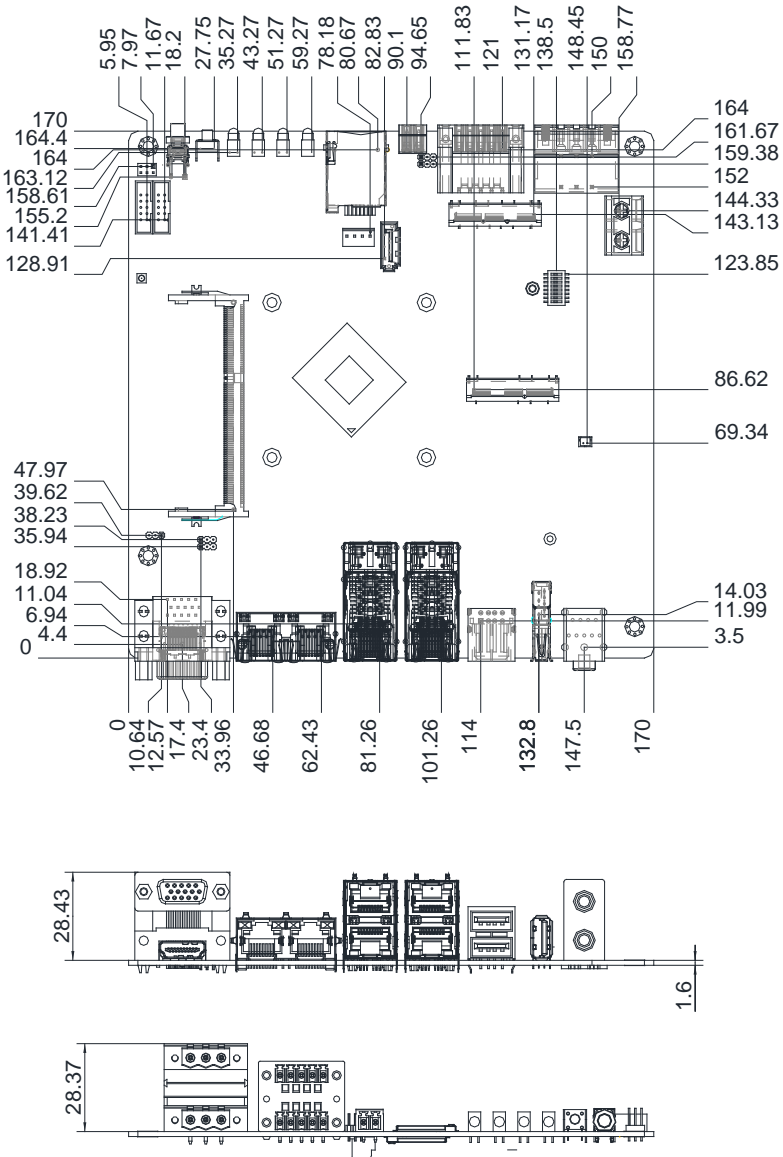
Hardware Information

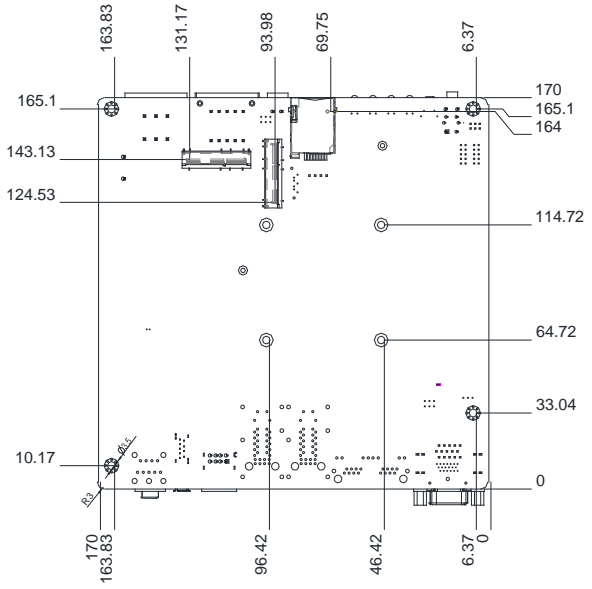
## 2.1 Dimensions

### Chassis

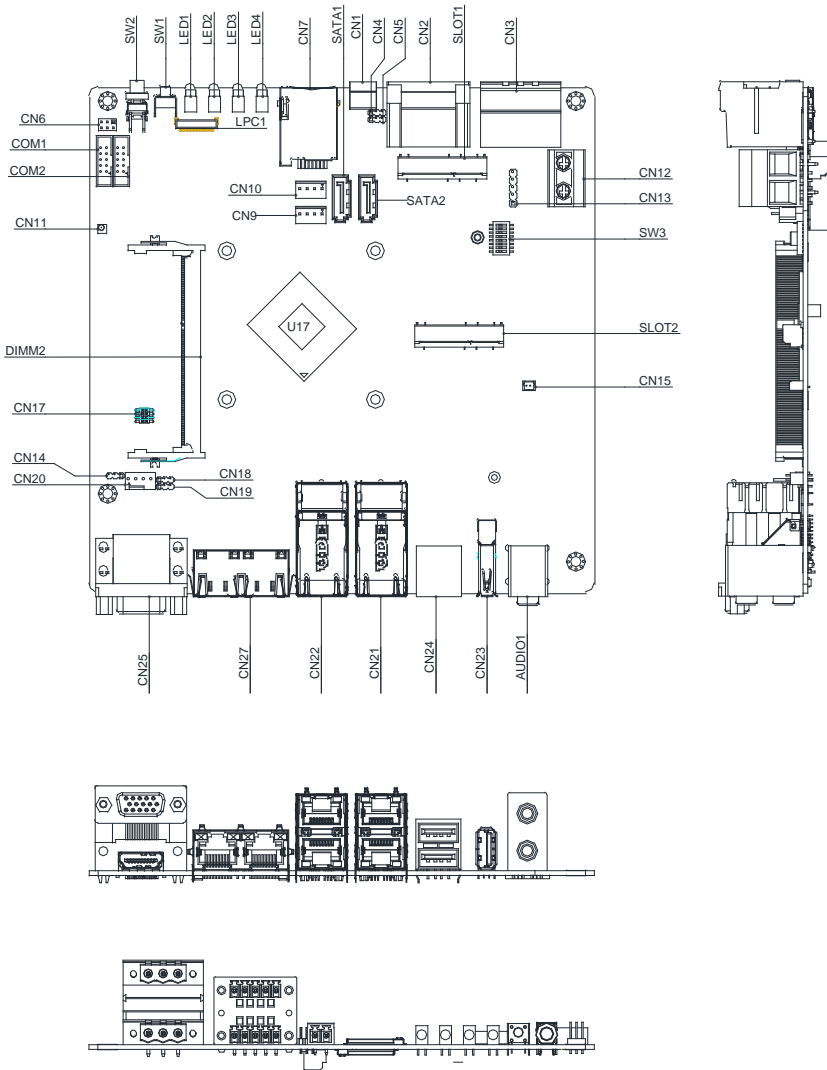


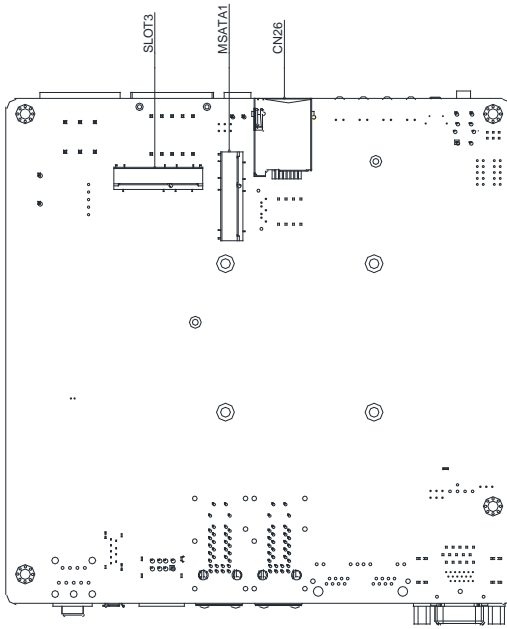
Board





## 2.2 Jumpers and Connectors





## 2.3 List of Jumpers

---

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

Label	Function
CN4	CAN BUS DOWNLOAD MODE
CN5	CAN BUS CONTROL MODE
CN18/CN19	CLEAR CMOS
CN6	FRONT PLANE
CN13	MCU DOWNLOAD
CN14	AT/ATX

### 2.3.1 CAN Bus Download Mode Selection (CN4)

---

Pin	Function
1-2	Default
2-3	Download mode

### 2.3.2 CAN Bus Control Mode Selection (CN5)

---

Pin	Function
1-2	Download mode
2-3	Default

### 2.3.3 AT/ATX Selection (CN14)

---

Pin	Function
1-2	AT (default)
2-3	ATX

### 2.3.4 CMOS Setting Selection (CN18, CN19)

---

Pin (CN18 / CN19)	Function
1-2 / 1-2	Clear CMOS
2-3 / 2-3	Default



## 2.4 List of Connectors

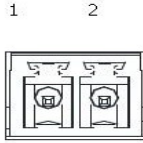
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Please refer to the table below for all of the system's connectors that you can configure for your application

Label	Function
SW1	Software Reset
SW2	Power Button
LED1	HDD Access LED
LED2	Slot1 WWAN/WAN LED
LED3	Slot3 WWAN/WAN LED
LED4	Slot2 WWAN/WAN LED
CN7	SLOT2 SIM CARD
CN1	CAN BUS CON
CN2	DIO CON
CN3	POWER INPUT CON/ REMOTE_SW
CN6	FRONT PLANE
COM1	COM1 RS232/422/485
COM2	COM2 only RS232
CN10	HDD POWER
CN9	HDD POWER
SATA1	SATA1
SATA2	SATA2
SLOT1	MINI CARD only USB
SLOT2/SLOT3	MINI CARD Full Function
CN12	FUSE CON
DIMM2	DDR3L SODIMM
CN25	VGA+HDMI CON
CN22	LAN3+LAN4

CN27	LAN1+LAN2
CN21	LAN5+LAN6
CN24	USB2.0*2
CN23	USB3.0*1
AUDIO1	AUDIO Front + MIC
SW3	Power on/off    Setting    Switch

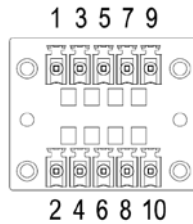
### 2.4.1 CAN Bus Connector (CN1)



Pin	Signal	Pin	Signal
1	CAN DATA +	2	CAN DATA-

Mating Connector: DINKLE EC381V-02P

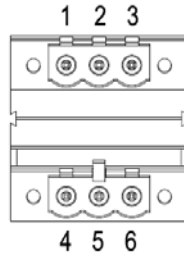
### 2.4.2 Digital I/O Connector (CN2)



Pin	Signal	Pin	Signal
1	ISOLATE GND	2	+GP_V
3	GPI0	4	GPO0
5	GPI1	6	GPO1
7	GPI2	8	GPO2
9	GPI3	10	GPO3

Mating Connector: DINKLE EC350VM-05P

### 2.4.3 Power Input Connector & Remote Button (CN3)



Pin	Signal	Pin	Signal
1	ACC	2	GND_PRI
3	PWR_IN	4	REMOTE_SW
5	GND	6	PS_ON#

### 2.4.4 Front Plane (CN6)

Pin	Signal	Pin	Signal
1	PWR_SW#	2	FPANSWH#
3	GND	4	HWRST#
5	GND	6	FPANSWH#

### 2.4.5 RS-232/422/485 Connector (COM1)

Pin	Signal	Pin	Signal
1	DCD(RS485 Data+/RS422 TX+)	2	RXD(RS422 RX-)
3	TXD(RS485 Data-/RS422 TX-)	4	DTR(RS422 RX+)
5	GND	6	DSR
7	RTS	8	CTS
9	RI	10	NC

## 2.4.6 RS-232 Connector (COM2)

Pin	Signal	Pin	Signal
1	DCD	2	RXD
3	TXD	4	DTR
5	GND	6	DSR
7	RTS	8	CTS
9	RI	10	

## 2.4.7 Power On/Off Switch Setting (SW3)

SWITCH Pin Number	Power on Delay			Sec	Power off Delay			Sec
	6	7	8		5	4	3	
Control Table	off	off	off	5	off	off	off	180
	off	off	on	10	off	off	on	300
	off	on	off	15	off	on	off	900
	off	on	on	30	off	on	on	1800
	on	off	off	Null	on	off	off	2Day
	on	off	on	Null	on	off	on	Null
	on	on	off	Null	on	on	off	Null
	on	on	on	Null	on	on	on	Null

## 2.5 Installing the 2.5" HDD

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1. Remove the highlighted screws to open the top cover



2. Remove the screw and take out the HDD brackets



3. Place the HDD within the brackets and attach the screws.



4. Place the assembled HDD into the chassis and connect the SATA and power cable



5. Put the HDD bracket onto the chassis and fasten the screw



# 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> or <F2> 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

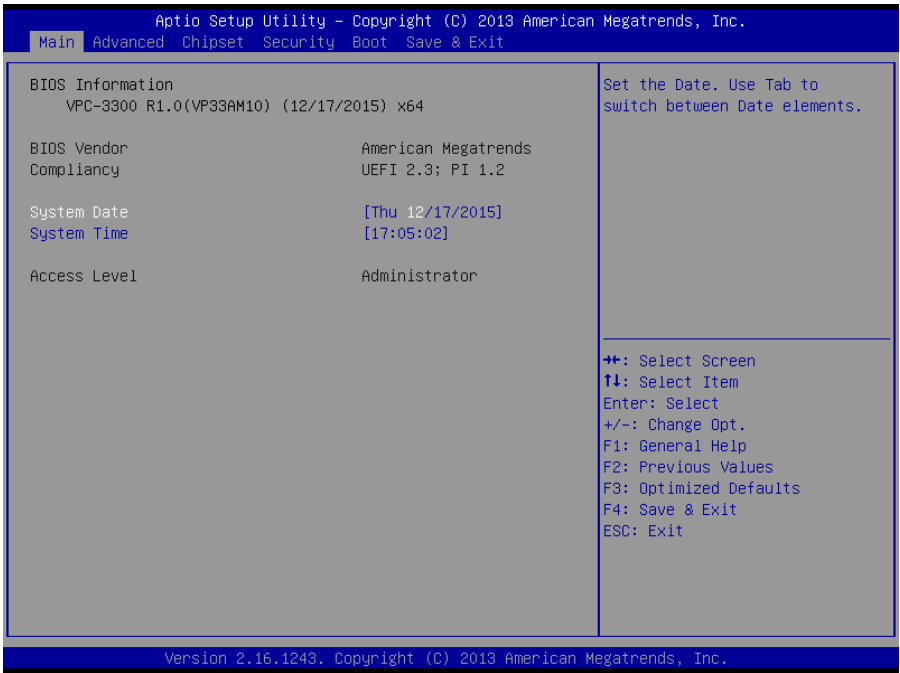
**Chipset** – For hosting bridge parameters

**Boot** – Enable/ Disable quiet Boot Option

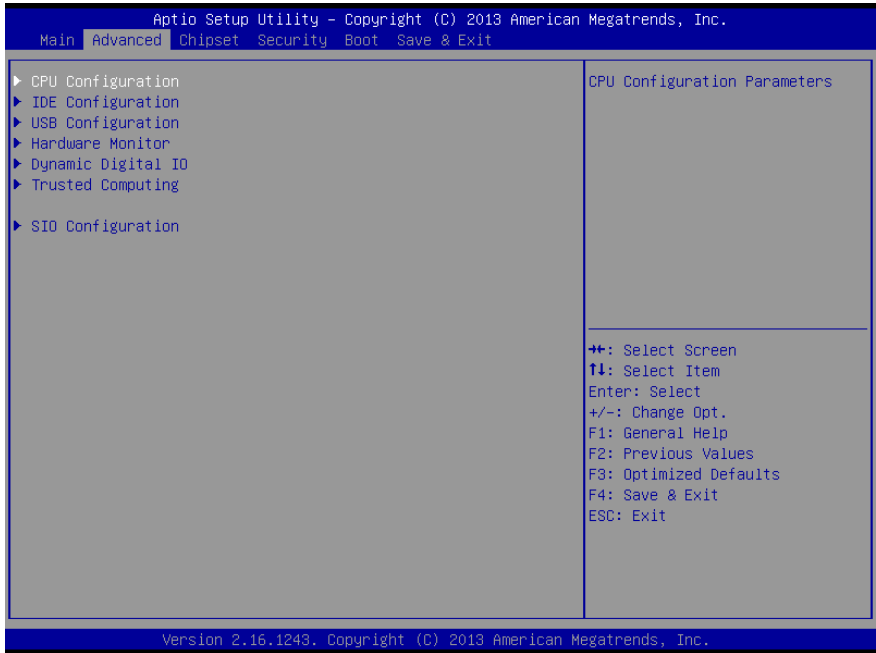
**Security** – The setup administrator password can be set here

**Save & Exit** – Save your changes and exit the program

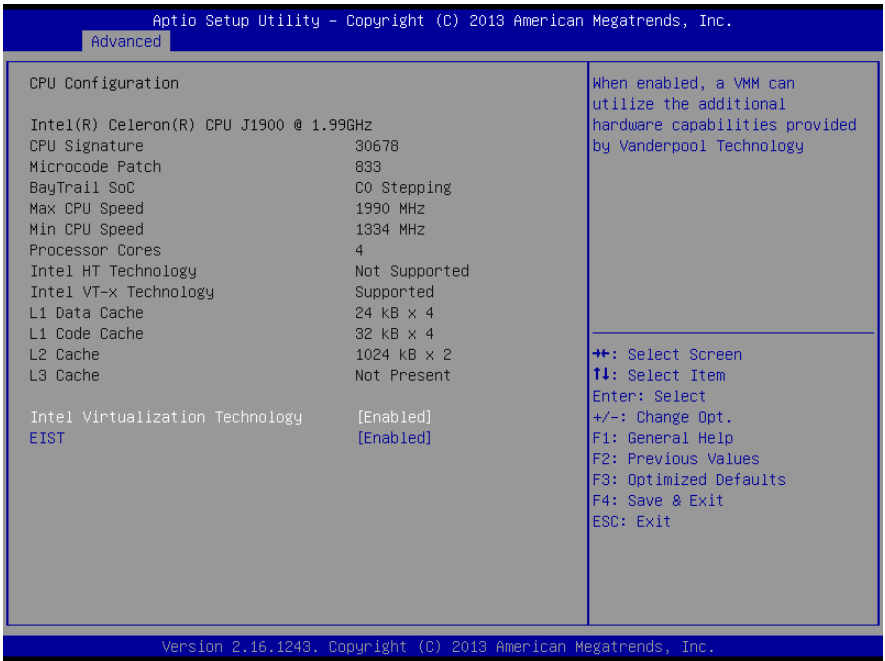
### 3.3 Setup Submenu: Main



### 3.4 Setup Submenu: Advanced



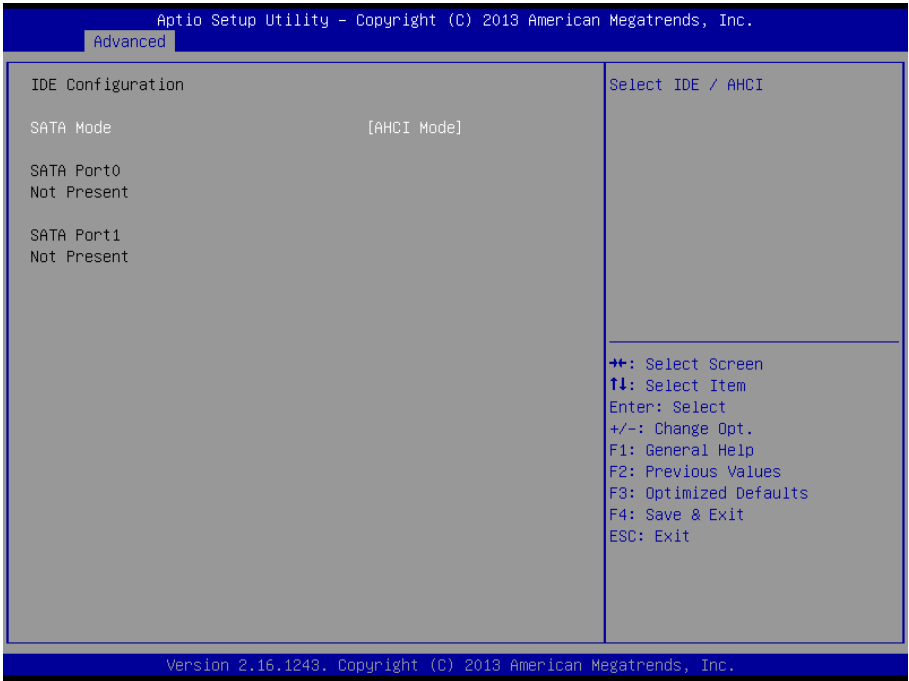
### 3.4.1 Advanced: CPU Configuration



Options summary:

Intel Virtualization Technology	Disabled	
	Enabled	Optimal Default, Failsafe Default
EIST	Disabled	
	Enabled	Optimal Default, Failsafe Default

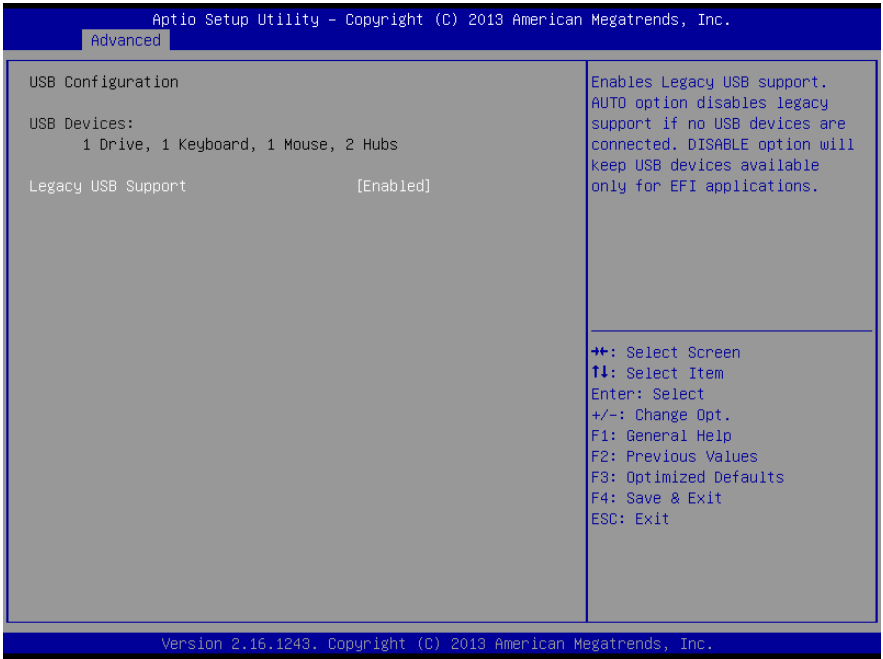
### 3.4.2 Advanced: IDE Configuration



Options summary:

SATA Mode	IDE Mode	
	AHCI Mode	Optimal Default, Failsafe Default

### 3.4.3 Advanced: USB Configuration

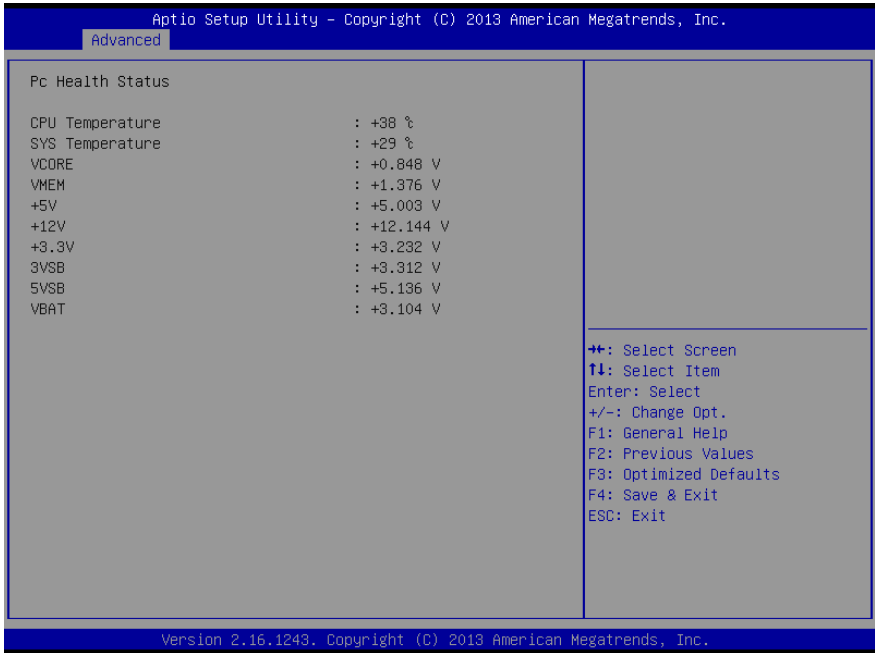


Options summary:

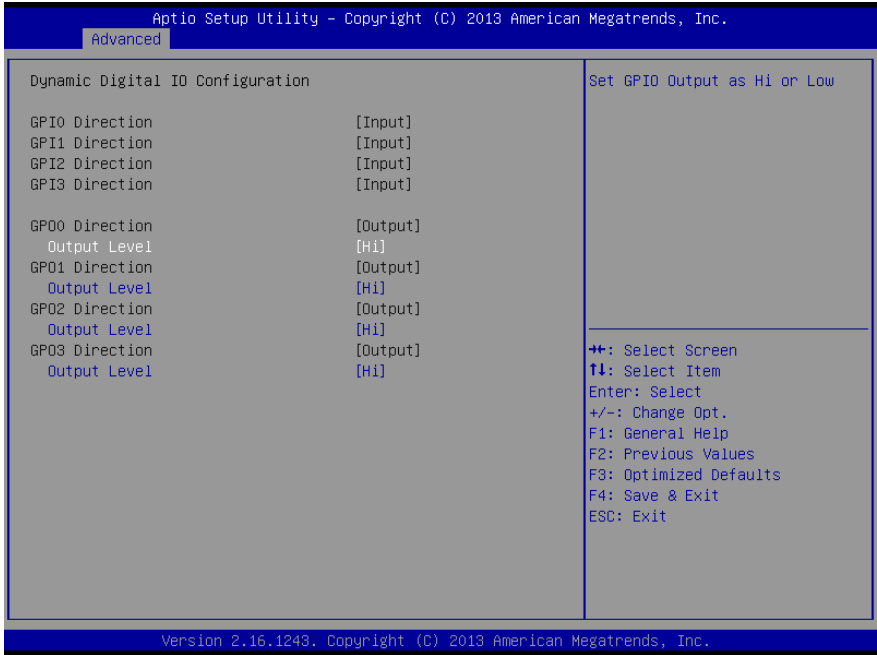
Legacy USB Support	Enabled	Optimal Default, Failsafe Default
	Disabled	
	Auto	
<p>Enables BIOS Support for Legacy USB Support. When enabled, USB can be functional in legacy environment like DOS.          AUTO option disables legacy support if no USB devices are connected</p>		



### 3.4.4 Advanced: Hardware Monitor



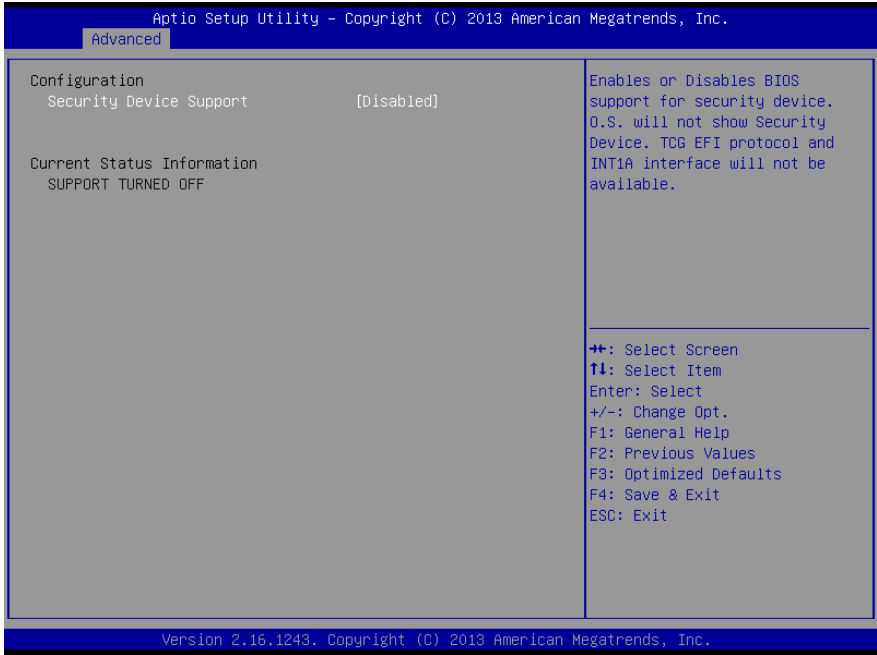
### 3.4.5 Advanced: Dynamic Digital IO Configuration



Options summary:

GPO[3:0] Output Level	Hi	Optimal Default, Failsafe Default
	Low	
Set GPO[3:0] Output as Hi or Low		

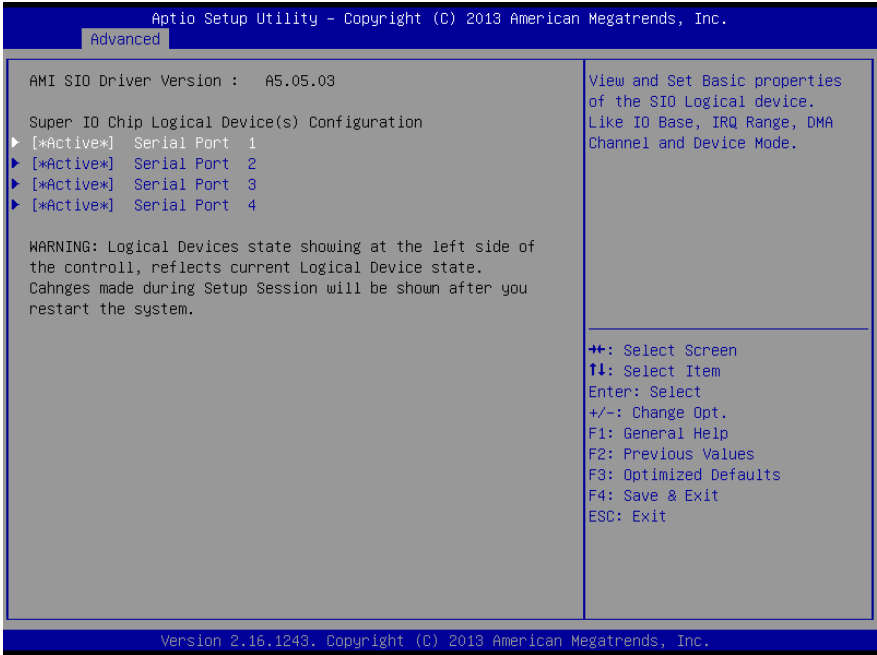
### 3.4.6 Advanced: Trusted Computing



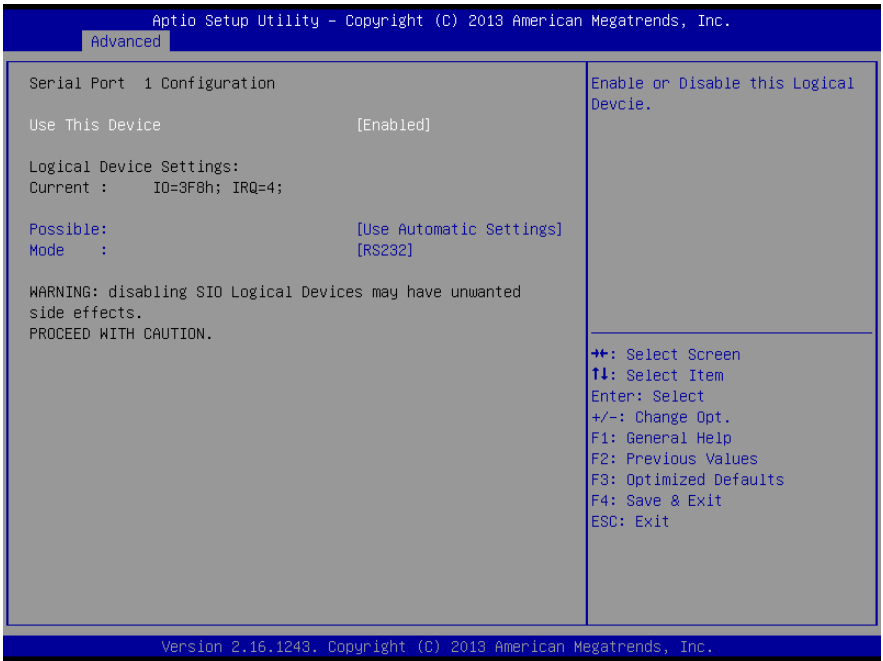
Options summary:

Security Device Support	Disabled	Optimal Default, Failsafe Default
	Enabled	
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.		
TPM State	Disabled	Optimal Default, Failsafe Default
	Enabled	
Enable/Disable Security Device. NOTE: Your Computer will reboot during restart in order to change State of the Device.		
Pending operation	None	Optimal Default, Failsafe Default
	TPM Clear	
Schedule an Operation for the Security Device. NOTE: Your Computer will reboot during restart in order to change State of Security Device.		

### 3.4.7 Advanced: SIO Configuration



### 3.4.7.1 SIO Configuration: Serial Port Configuration

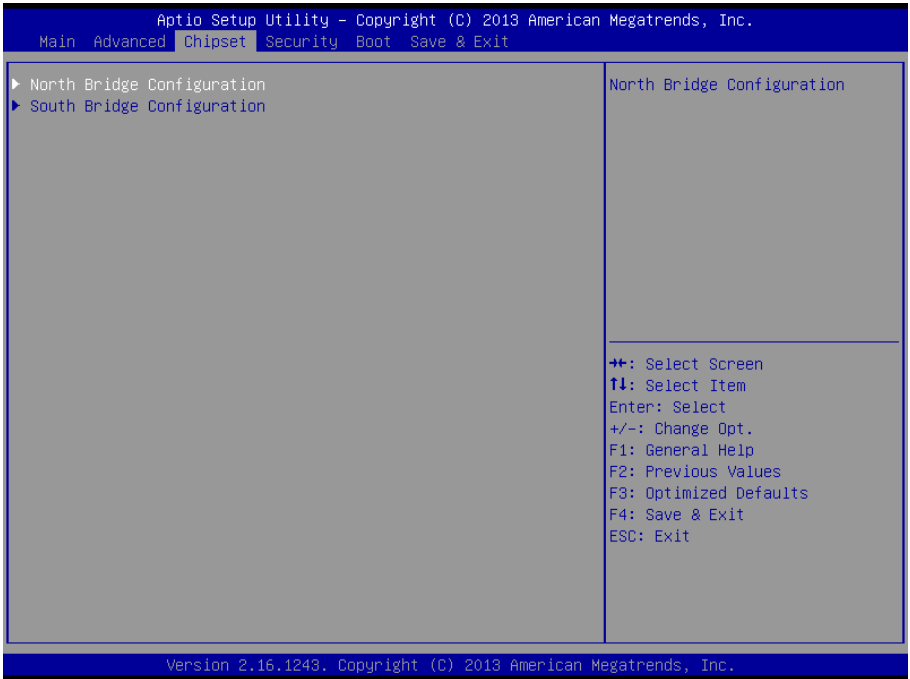


Options summary:

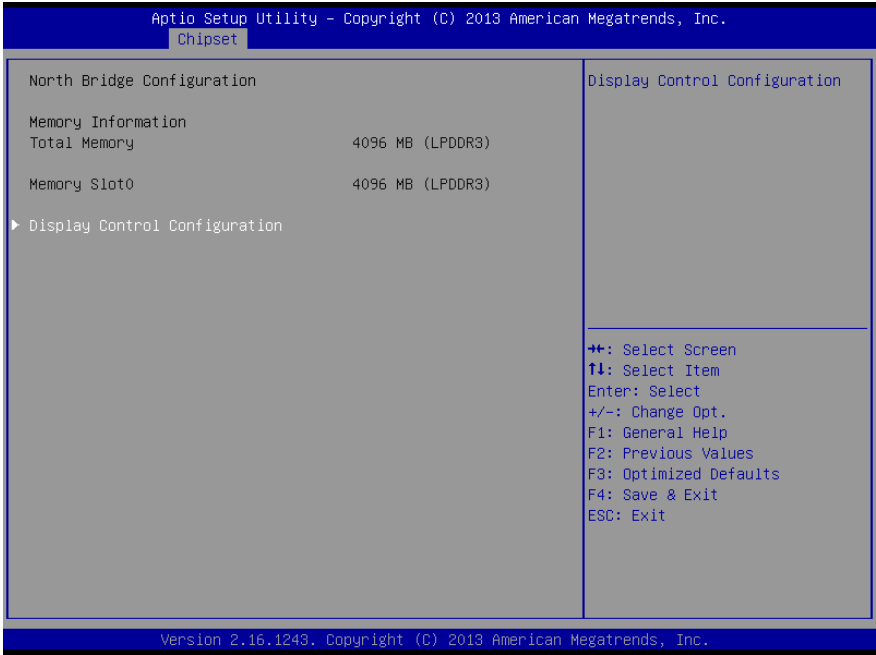
Use This Device	Disabled	Optimal Default, Failsafe Default
	Enabled	
En/Disable Serial Port (COM)		
Possible:	Use Automatic Settings	Optimal Default, Failsafe Default
	IO=3F8; IRQ=4;	
	IO=2F8; IRQ=3;	
Select an optimal setting for IO device (Serial Port 1)		
Possible:	Use Automatic Settings	Optimal Default, Failsafe Default
	IO=2F8; IRQ=3;	
	IO=3F8; IRQ=4;	
Select an optimal setting for IO device (Serial Port 2)		
Possible:	Use Automatic Settings	Optimal Default, Failsafe Default
	IO=3E8; IRQ=11;	
	IO=2E8; IRQ=11;	
Select an optimal setting for IO device (Serial Port 3)		
Possible:	Use Automatic Settings	Optimal Default, Failsafe Default

	IO=2E8; IRQ=11;	
	IO=3E8; IRQ=11;	
Select an optimal setting for IO device (Serial Port 4)		
Mode	RS232	Optimal Default, Failsafe Default
	RS422	
	RS485	
UART RS232, 422, 485 selection (Serial Port 1 only)		

### 3.5 Setup submenu: Chipset

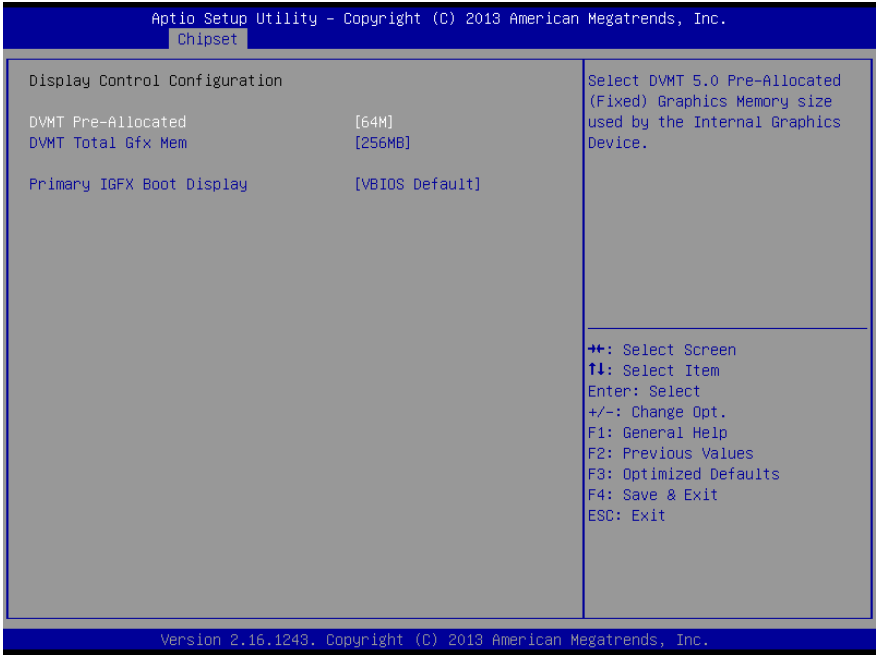


### 3.5.1 Chipset: North Bridge





### 3.5.1.1 North Bridge: Display Control Configuration



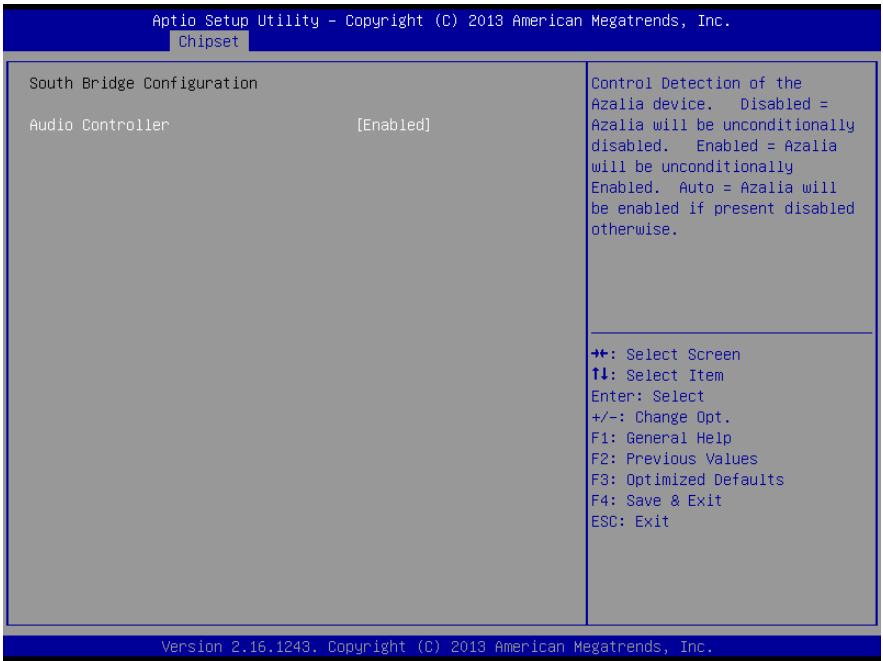
Options summary:

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 Total Graphics Memory size used by the Internal Graphics Device.		
Primary IGFX Boot Display	VBIOS Default	Optimal Default, Failsafe Default
	CRT	
	HDMI	

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

Secondary IGFX Boot Display	Disabled	Optimal Default, Failsafe Default
	CRT	
	HDMI	
Select Secondary Display Device		

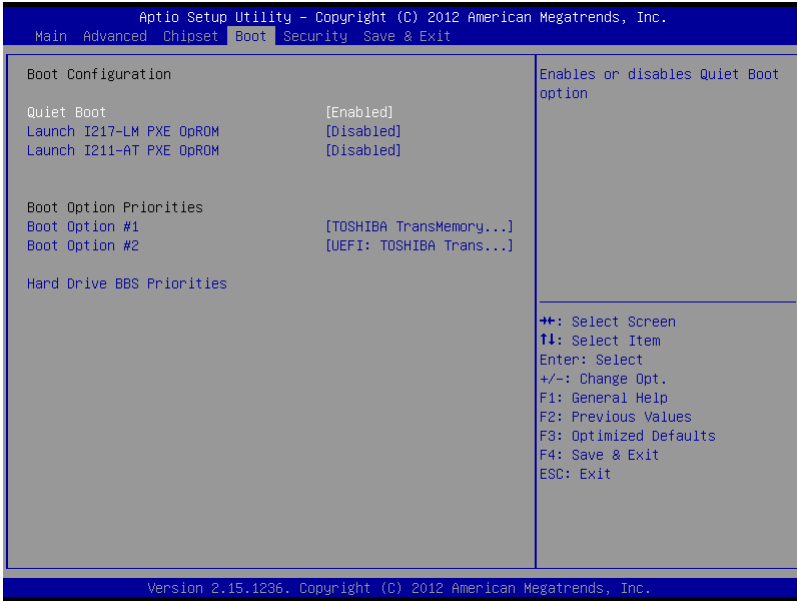
### 3.5.2 Chipset: South Bridge



Options summary:

Audio Controller	Enabled	Optimal Default, Failsafe Default
	Disabled	
<p>Control Detection of the Azalia device.                  Disabled = Azalia will be unconditionally disabled.                  Enabled = Azalia will be unconditionally Enabled.                  Auto = Azalia will be enabled if present disabled otherwise.</p>		

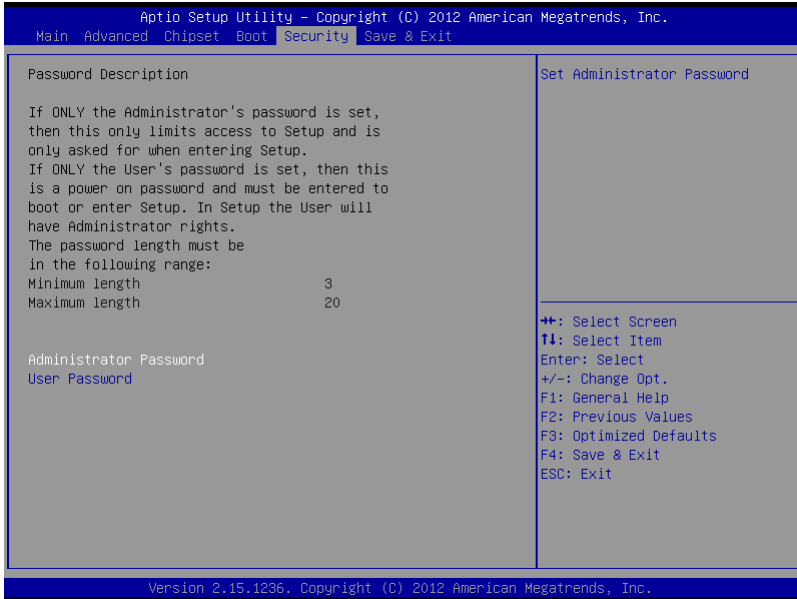
### 3.6 Setup submenu: Boot



Options summary:

Quiet Boot	Disabled	
	Enabled	Default
En/Disable showing boot logo.		
Launch I217-LM PXE OpROM	Disabled	Default
	Enabled	
Enable or Disable Legacy Boot Option for I217-LM.		
Launch I211-AT PXE OpROM	Disabled	Default
	Enabled	
Enable or Disable Legacy Boot Option for I211-AT.		

## 3.6 Setup submenu: Security



### Change User/Administrator Password

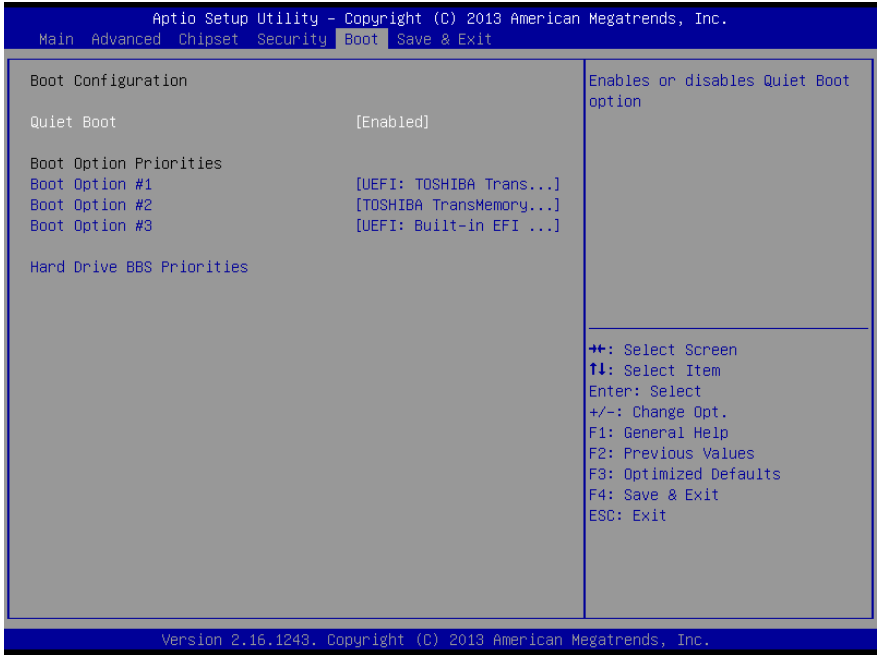
You can set a User Password once an Administrator Password is set. The password will be required during boot up, or when the user enters the Setup utility. Please Note that a User Password does not provide access to many of the features in the Setup utility.

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.

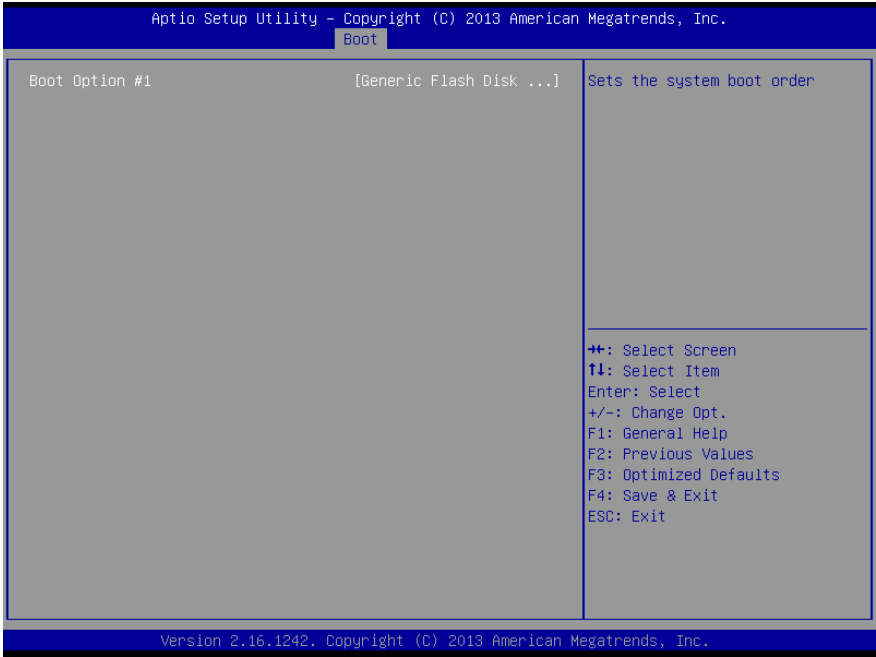
### 3.7 Setup submenu: Boot



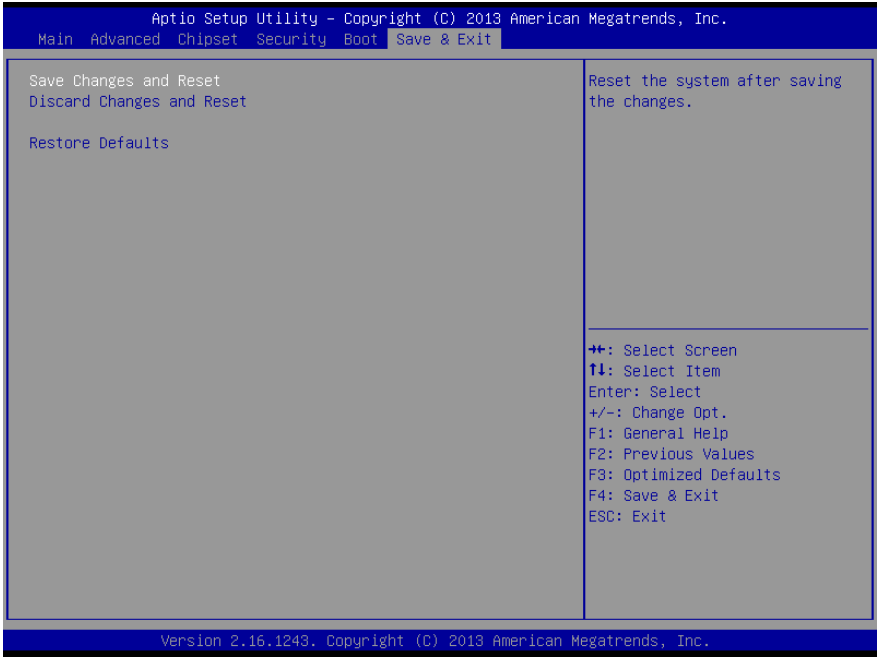
Options summary:

Quiet Boot	Disabled	Default
	Enabled	
En/Disable showing boot logo.		

### 3.7.1 Boot: BBS Priorities



### 3.8 Setup submenu: Save & Exit





# Chapter 4

---

Drivers Installation

## 4.1 Product CD/DVD

---

The VPC-3300S 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 Driver

1. Open the **Step1 - Chipset** folder followed by **SetupChipset.exe**
2. Follow the instructions
3. Drivers will be installed automatically

### Step 2 – Install Graphics Driver

1. Open the **Step2 - Graphic** folder 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 LAN Driver (Windows 7 only)

1. Open the **Step3 - LAN** folder and select your OS
2. Open the **Setup.exe** file in the folder
3. Follow the instructions
4. Drivers will be installed automatically

### Step 4 – Install Audio Driver

1. Open the **Step4 - Audio** folder followed by the **.exe** file in the folder
2. Follow the instructions

3. Drivers will be installed automatically

#### Step 5 – Install USB 3.0 Driver (Windows 7 only)

1. Open the **Step5 – USB 3.0** folder followed by **Setup.exe**
2. Follow the instructions
3. Drivers will be installed automatically

#### Step 6 – Install CAN Bus Driver

1. Open **Device Manager**
2. Right click on the device with the **exclamation mark** and select **Properties**
3. Go to the **Drivers tab** and select **Update Drivers**
4. Select manual install and browse to the driver's directory
5. Confirm and the drivers will be installed automatically

#### Step 7 – Install MBI Driver (Windows 8.1 only, optional)

1. Open the **Step7 - MBI** folder followed by **setup.exe** file in the folder
2. Follow the instructions
3. Drivers will be installed automatically

#### Step 8 – Install Serial Port Driver (optional)

1. Open the **Step8 – Serial Port Driver** folder followed by **setup.exe** file in the folder
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)	0xF6(Note4)		(Note24)	Time of watchdog timer (0~255) This register is byte access
Counting Unit	0x07(Note5)	0xF5(Note6)	3(Note7)	0(Note8)	Select time unit. 0: second 1: minute
Watchdog Enable	0x07(Note9)	0xF5(Note10)	5(Note11)	1(Note12)	0: Disable 1: Enable
Timeout Status	0x07(Note13)	0xF5(Note14)	6(Note15)	1	1: Clear timeout status
Output Mode	0x07(Note16)	0xF5(Note17)	4(Note18)	1(Note19)	Select WDTRST# output mode 0: level 1: pulse
WDTRST output	0x07(Note20)	0xFA(Note21)	0(Note22)	1(Note23)	Enable/Disable time out output via WDTRST# 0: Disable 1: Enable

```

*****
// 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
#define byte   ModeLDN    // This parameter is represented from Note16
#define byte   ModeReg    // This parameter is represented from Note17
#define byte   ModeBit    // This parameter is represented from Note18
#define byte   ModeVal    // This parameter is represented from Note19
#define byte   WDTRstLDN  // This parameter is represented from Note20
#define byte   WDTRstReg  // This parameter is represented from Note21
#define byte   WDTRstBit  // This parameter is represented from Note22
#define byte   WDTRstVal  // This parameter is represented from Note23
*****

```

```
*****
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 procedure 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);
    // WDT output mode setting, level / pulse
    SIOBitSet(ModelLDN, ModeReg, ModeBit, ModeVal);
    // Watchdog timeout output via WDTRST#
    SIOBitSet(WDTRstLDN, WDTRstReg, WDTRstBit, WDTRstVal);
}

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

```



```

*****
VOID  SIOEnterMBPnPMode(){
    IOWriteByte(SIOIndex, 0x87);
    IOWriteByte(SIOIndex, 0x87);
}

VOID  SIOExitMBPnPMode(){
    IOWriteByte(SIOIndex, 0xAA);
}

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();
}
*****

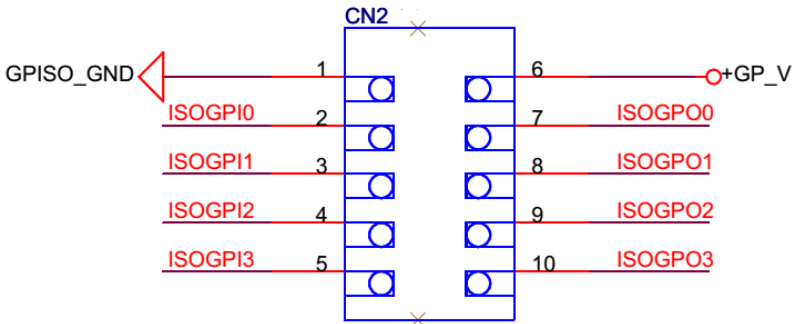
```

# Appendix B

---

Digital I/O Ports

## B.1 Electrical Specifications for Digital I/O Ports



GPIO80	ISOGPIO0	Input Only
GPIO81	ISOGPIO1	Input Only
GPIO82	ISOGPIO2	Input Only
GPIO83	ISOGPIO3	Input Only
GPIO84	ISOGPO0	Output Only
GPIO85	ISOGPO1	Output Only
GPIO86	ISOGPO2	Output Only
GPIO87	ISOGPO3	Output Only

## B.2 DIO Programming

---

The VPC-3300S utilizes FINTEK F81866D chipset as its Digital I/O controller. Below are the procedures to complete its configuration. AAEON initial DI/O program is also attached for developing customized program for your application.

There are three steps to complete the configuration setup:

- (1) Enter the MB PnP Mode
- (2) Modify the data of configuration registers
- (3) Exit the MB PnP Mode. Undesired result may occur if the MB PnP Mode is not exited normally.

## B.3 Digital I/O Register

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 : Digital Input relative register table

	LDN	Register	BitNum	Value	Note
DIO-1 Pin Status	0x06(Note3)	0x8A(Note4)	0(Note5)		GPIO80
DIO-2 Pin Status	0x06(Note6)	0x8A(Note7)	1(Note8)		GPIO81
DIO-3 Pin Status	0x06(Note9)	0x8A(Note10)	2(Note11)		GPIO82
DIO-4 Pin Status	0x06(Note12)	0x8A(Note13)	3(Note14)		GPIO83
DIO-5 Pin Status	0x06(Note15)	0x8A(Note16)	4(Note17)		GPIO84
DIO-6 Pin Status	0x06(Note18)	0x8A(Note19)	5(Note20)		GPIO85
DIO-7 Pin Status	0x06(Note21)	0x8A(Note22)	6(Note23)		GPIO86
DIO-8 Pin Status	0x06(Note24)	0x8A(Note25)	7(Note26)		GPIO87

Table 3 : Digital Output relative register table

	LDN	Register	BitNum	Value	Note
DIO-1 Output Data	0x06(Note27)	0x89(Note28)	0(Note29)	(Note30)	GPIO80
DIO-2 Output Data	0x06(Note31)	0x89(Note32)	1(Note33)	(Note34)	GPIO81
DIO-3 Output Data	0x06(Note35)	0x89(Note36)	2(Note37)	(Note38)	GPIO82
DIO-4 Output Data	0x06(Note39)	0x89(Note40)	3(Note41)	(Note42)	GPIO83
DIO-5 Output Data	0x06(Note43)	0x89(Note44)	4(Note45)	(Note46)	GPIO84
DIO-6 Output Data	0x06(Note47)	0x89(Note48)	5(Note49)	(Note50)	GPIO85
DIO-7 Output Data	0x06(Note51)	0x89(Note52)	6(Note53)	(Note54)	GPIO86
DIO-8 Output Data	0x06(Note55)	0x89(Note56)	7(Note57)	(Note58)	GPIO87

## B.4 Digital I/O Sample Program

---

```
*****
// 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);
// Digital Input Status relative definition (Please reference to Table 2)
#define byte DInput1LDN // This parameter is represented from Note3
#define byte DInput1Reg // This parameter is represented from Note4
#define byte DInput1Bit // This parameter is represented from Note5
#define byte DInput2LDN // This parameter is represented from Note6
#define byte DInput2Reg // This parameter is represented from Note7
#define byte DInput2Bit // This parameter is represented from Note8
#define byte DInput3LDN // This parameter is represented from Note9
#define byte DInput3Reg // This parameter is represented from Note10
#define byte DInput3Bit // This parameter is represented from Note11
#define byte DInput4LDN // This parameter is represented from Note12
#define byte DInput4Reg // This parameter is represented from Note13
#define byte DInput4Bit // This parameter is represented from Note14
#define byte DInput5LDN // This parameter is represented from Note15
#define byte DInput5Reg // This parameter is represented from Note16
#define byte DInput5Bit // This parameter is represented from Note17
#define byte DInput6LDN // This parameter is represented from Note18
#define byte DInput6Reg // This parameter is represented from Note19
#define byte DInput6Bit // This parameter is represented from Note20
#define byte DInput7LDN // This parameter is represented from Note21
#define byte DInput7Reg // This parameter is represented from Note22
#define byte DInput7Bit // This parameter is represented from Note23
#define byte DInput8LDN // This parameter is represented from Note24
#define byte DInput8Reg // This parameter is represented from Note25
#define byte DInput8Bit // This parameter is represented from Note26
*****
```

```

*****
// Digital Output control relative definition (Please reference to Table 3)
#define byte DOutput1LDN // This parameter is represented from Note27
#define byte DOutput1Reg // This parameter is represented from Note28
#define byte DOutput1Bit // This parameter is represented from Note29
#define byte DOutput1Val // This parameter is represented from Note30
#define byte DOutput2LDN // This parameter is represented from Note31
#define byte DOutput2Reg // This parameter is represented from Note32
#define byte DOutput2Bit // This parameter is represented from Note33
#define byte DOutput2Val // This parameter is represented from Note34
#define byte DOutput3LDN // This parameter is represented from Note35
#define byte DOutput3Reg // This parameter is represented from Note36
#define byte DOutput3Bit // This parameter is represented from Note37
#define byte DOutput3Val // This parameter is represented from Note38
#define byte DOutput4LDN // This parameter is represented from Note39
#define byte DOutput4Reg // This parameter is represented from Note40
#define byte DOutput4Bit // This parameter is represented from Note41
#define byte DOutput4Val // This parameter is represented from Note42
#define byte DOutput5LDN // This parameter is represented from Note43
#define byte DOutput5Reg // This parameter is represented from Note44
#define byte DOutput5Bit // This parameter is represented from Note45
#define byte DOutput5Val // This parameter is represented from Note46
#define byte DOutput6LDN // This parameter is represented from Note47
#define byte DOutput6Reg // This parameter is represented from Note48
#define byte DOutput6Bit // This parameter is represented from Note49
#define byte DOutput6Val // This parameter is represented from Note50
#define byte DOutput7LDN // This parameter is represented from Note51
#define byte DOutput7Reg // This parameter is represented from Note52
#define byte DOutput7Bit // This parameter is represented from Note53
#define byte DOutput7Val // This parameter is represented from Note54
#define byte DOutput8LDN // This parameter is represented from Note55
#define byte DOutput8Reg // This parameter is represented from Note56
#define byte DOutput8Bit // This parameter is represented from Note57
#define byte DOutput8Val // This parameter is represented from Note58
*****

```

```
*****
VOID Main(){
    Boolean PinStatus ;

    // Procedure : AaeonReadPinStatus
    // Input :
    //     Example, Read Digital I/O Pin 3 status
    // Output :
    //     InputStatus :
    //         0: Digital I/O Pin level is low
    //         1: Digital I/O Pin level is High
    PinStatus = AaeonReadPinStatus(DInput3LDN, DInput3Reg, DInput3Bit);

    // Procedure : AaeonSetOutputLevel
    // Input :
    //     Example, Set Digital I/O Pin 6 level
    AaeonSetOutputLevel(DOutput6LDN, DOutput6Reg, DOutput6Bit,
DOutput6Val);
}
*****
```



```
*****
Boolean  AaeonReadPinStatus(byte LDN, byte Register, byte BitNum){
    Boolean PinStatus ;

    PinStatus = SIOBitRead(LDN, Register, BitNum);
    Return PinStatus ;
}
VOID  AaeonSetOutputLevel(byte LDN, byte Register, byte BitNum, byte Value){
    ConfigToOutputMode(LDN, Register, BitNum);
    SIOBitSet(LDN, Register, BitNum, Value);
}
*****
```

```

*****
VOID  SIOEnterMBPnPMode(){
    IOWriteByte(SIOIndex, 0x87);
    IOWriteByte(SIOIndex, 0x87);
}

VOID  SIOExitMBPnPMode(){
    IOWriteByte(SIOIndex, 0xAA);
}

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();
}
*****

```

```
*****
Boolean  SIOBitRead(byte LDN, byte Register, byte BitNum){
    Byte TmpValue;

    SIOEnterMBPnPMode();
    SIOSelectLDN(LDN);
    IOWriteByte(SIOIndex, Register);
    TmpValue = IOReadByte(SIOData);
    TmpValue &= (1 << BitNum);
    SIOExitMBPnPMode();
    If(TmpValue == 0)
        Return 0;
    Return 1;
}
VOID  ConfigToOutputMode(byte LDN, byte Register, byte BitNum){
    Byte TmpValue, OutputEnableReg;

    OutputEnableReg = Register-1;
    SIOEnterMBPnPMode();
    SIOSelectLDN(LDN);
    IOWriteByte(SIOIndex, OutputEnableReg);
    TmpValue = IOReadByte(SIOData);
    TmpValue |= (1 << BitNum);
    IOWriteByte(SIOData, OutputEnableReg);
    SIOExitMBPnPMode();
}
*****
```