

BOXER-6638U-H1

Fanless Embedded Box PC

User's Manual 1st Ed

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Packing List

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

Item	Quantity
● BOXER-6638U-H1	1
● Wallmount bracket	2
● Screw package	1
● Product DVD with User's Manual (in pdf) and drivers	1
● Industrial EtherNet Installation Manual	1
● Industrial EtherNet User Manual	1
● Product CD with Industrial EtherNet driver	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.**

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	○	○	○	○	○	○

○: 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、电源为选购品。

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	○	○	○	○	○	○
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

Product Specifications

1.1 Specifications

System

- **Processor** Intel® Core™ i3-5010U
- **System Memory** 204-pin SODIMM DDR3L 1600 MHz, up to 8 GB
- **Chipset** SoC integrated
- **Storage** 2.5" SATA HDD bay x 1
mSATA x 1 (Shared with full-size MiniCard)
- **I/O** USB type II x 2 for USB 3.0
DB-9 x 2 for RS-232
DB-9 x 2 for RS-232/422/485
RS-45 x 2 for LAN
RJ-45 x 2 for Industrial EtherNet Port,
Power switch x 1
Line-Out x 1
- **Indicators** System LED x 1
HDD LED x1
- **Expansion Slot** Half-size Mini-card x 1
- **OS Support** Windows® 10
Windows® 7
Windows® Embedded Standard 7

Mechanical

- **Construction** Rugged aluminum chassis
- **Mounting** Wallmount

- Dimension (W x H x D) 197 x 55 x 143 mm (7.76 x 2.17 x 5.63")
- Gross Weight 5.1 Kg (11.2 lb)

Environmental

- Operating Temperature 0 ~ 50°C (32 ~ 122°F) - with 0.5 m/s airflow (HDD/CFast) (compliance to IEC 68-2-14)
- Storage Temperature -40 ~ 80°C (-40 ~ 176°F)
- Operating Humidity 0~ 95% @ 40°C, non-condensing
- Anti-Vibration 1 G_{rms}/ 5 ~ 500 Hz/ Operation (HDD)
- Anti-Shock 20 G peak acceleration (11 msec. duration)-CFast
20 G peak acceleration (11 msec. duration)-HDD
- EMC CE/FCC Class A

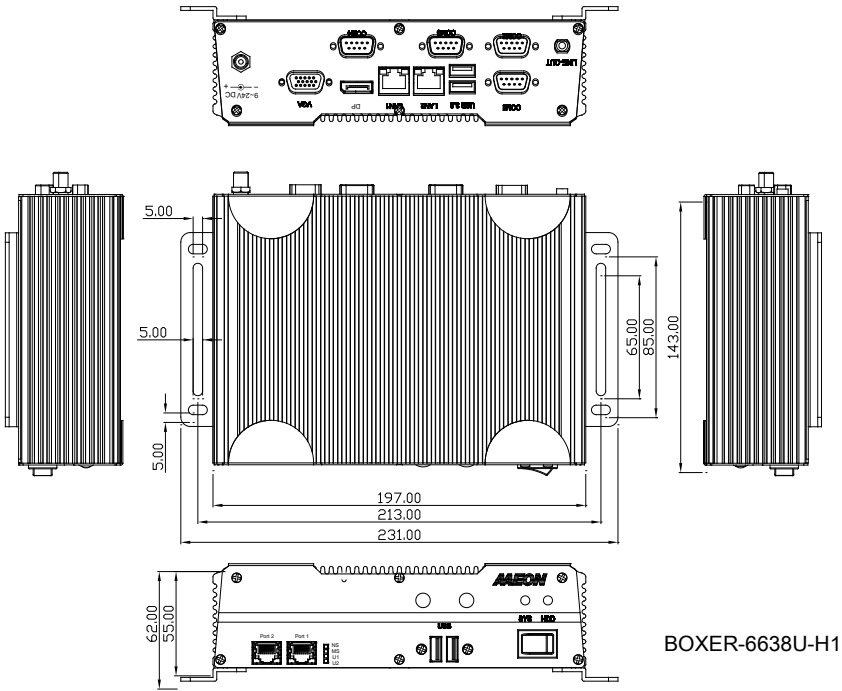
Power Supply

- DC Input 9 ~ 24 V, ATX mode

Chapter 2

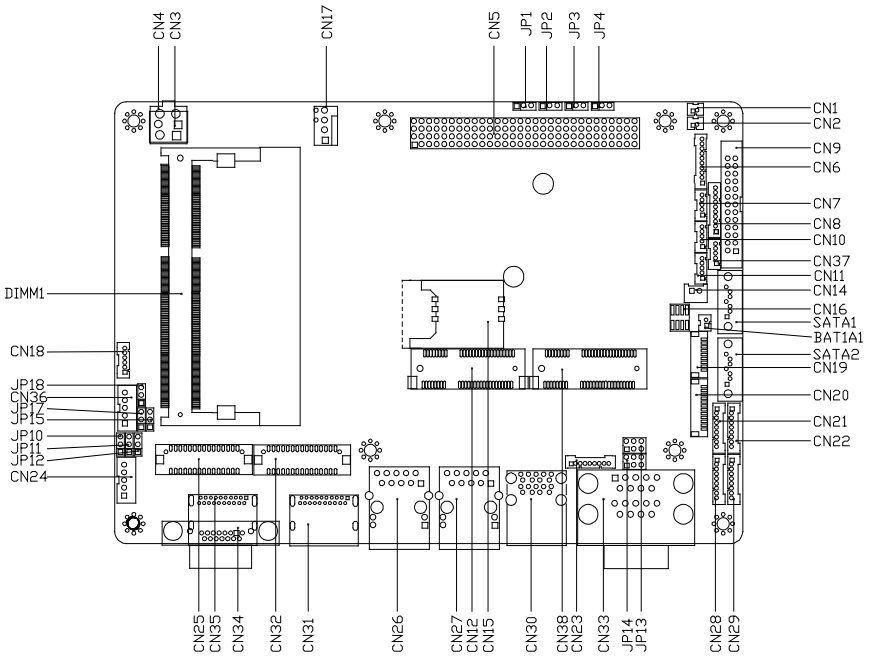
Hardware Information

2.1 Dimensions



BOXER-6638U-H1

2.2 Jumpers and Connectors

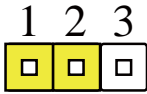


2.3 List of Jumpers

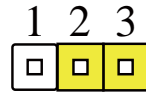
Please refer to the table below for all of the system's jumpers that you can configure for your application

Label	Function
JP1	PCI-104 I/O Voltage Selection
JP2	Clear CMOS Jumper
JP3	Touch Screen 4/5/8 Wire Mode Selection
JP4	AT/ATX Power Supply Mode Selection
JP10	LVDS Port1/eDP Backlight Inverter Voltage Selection
JP11	LVDS Port1/eDP Operating Voltage Selection
JP12	LVDS Port1/eDP Backlight Lightness Control Mode
JP13	COM1 (D-SUB) Ring/+12V/+5V Selection
JP14	COM3 Ring/+12V/+5V Selection
JP15	LVDS Port2 Backlight Lightness Control Mode Selection
JP17	LVDS Port2 Backlight Inverter Voltage Selection
JP18	LVDS Port2 Operating Voltage Selection

2.3.1 Clear CMOS Jumper (JP2)

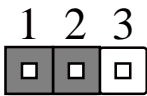


Normal (default)

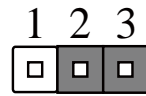


Clear CMOS

2.3.2 AT/ATX Power Supply Mode Selection (JP4)

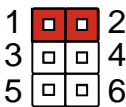


ATX mode (default)

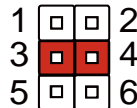


AT mode (default)

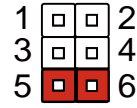
2.3.3 COM1 (D-SUB) Ring/+12V/+5V Selection (JP13)



+12V

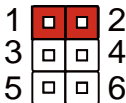


Ring (Default)

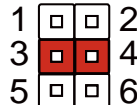


+5V

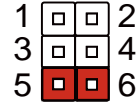
2.3.4 COM3 Ring/+12V/+5V Selection (JP14)



+12V



Ring (Default)



+5V

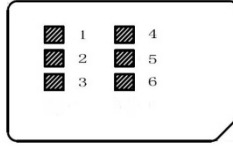
2.4 List of Connectors

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

Label	Function
CN1	Stereo Audio RIGHT Channel
CN2	Stereo Audio LEFT Channel
CN3	Main Power Input (+12V ONLY)
CN4	Main Power Input (+9V to +24V)
CN5	PCI-104 Connector
CN6	High Definition Audio
CN7	USB 2.0 Port 4
CN8	Front Panel
CN9	LPT/Digital IO Port
CN10	USB 2.0 Port 3
CN11	USB 2.0 Port 5
CN12	Mini-Card (Half Size)
CN14	+5V Output for SATA HDD
CN15	UIM Socket
CN16	SPI Programming Header (Debug ONLY)
CN17	CPU FAN
CN18	PS/2 Keyboard/Mouse Combo Port
CN19	Touch Screen Connector
CN20	LPC Expansion Connector
CN21	COM Port 6 (RS232)
CN22	COM Port 5 (RS232)
CN23	COM Port 1 (RS232)
CN24	LVDS Port1/eDP Inverter / Backlight Connector

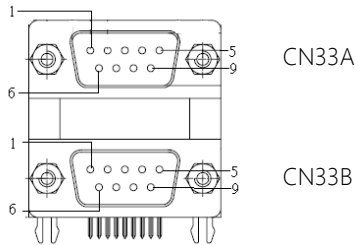
CN25	LVDS Port1/eDP
CN26	10M/100M/1G Ethernet Port 1
CN27	10M/100M/1G Ethernet Port 2
CN28	COM Port 4 (RS232)
CN29	COM Port 3 (RS232/485/422)
CN30	USB 2.0/3.0 Port 1 & 2
CN31	Display Port 2
CN32	LVDS Port 2
CN33A	COM Port 2 (RS232)
CN33B	COM Port 1 (RS232/485/422)
CN34	VGA Port
CN35	Display Port 1
CN36	LVDS Port 2 Inverter / Backlight Connector
CN37	USB 2.0 Port 6
SATA1	SATA Port 1
SATA2	SATA Port 2
DIMM1	DDR3L SODIMM

2.4.1 UIM Socket (CN15)



Pin	Pin Name	Signal Type	Signal Level
1	UIM_PWR	PWR	
2	UIM_RST	IN	
3	UIM_CLK	IN	
4	GND	GND	
5	UIM_VPP	PWR	
6	UIM_DAT	I/O	

2.4.2 COM Port 1/ 2/ 3/ 4 (CN33B/CN33A/CN29/CN28)



COM 1 & 3/ COM 2 & 4 (RS-232)

Pin	Pin Name	Signal Type	Signal Level
1	DCD	IN	
2	RX	IN	
3	TX	OUT	±9V
4	DTR	OUT	±9V
5	GND	GND	
6	DSR	IN	

7	RTS	OUT	±9V
8	CTS	IN	
9	RI_+5V_+12V	IN/PWR	+5V/+12V

COM 1 & 3 (RS-422)

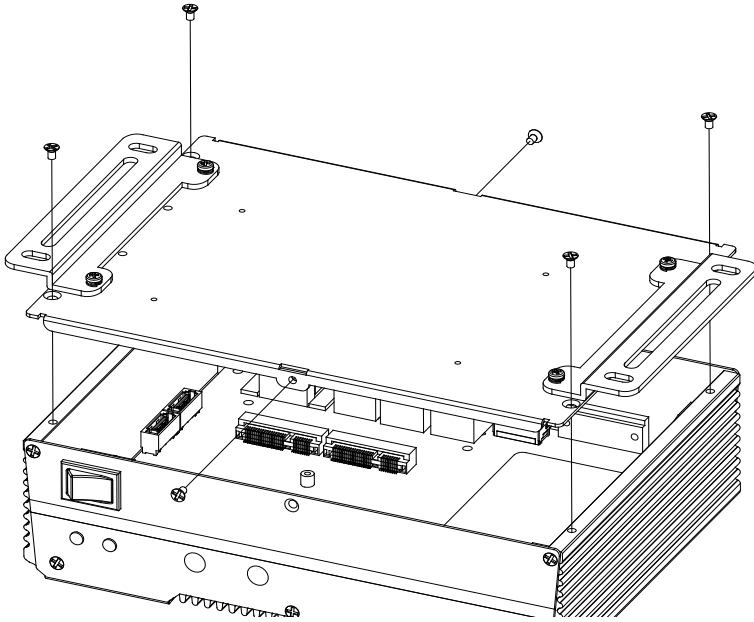
Pin	Pin Name	Signal Type	Signal Level
1	422TXD-	OUT	
2	422TXD+	OUT	
3	422RXD+	IN	
4	422RXD-	IN	422RXD-
5	NC		
6	NC		
7	NC		
8	NC		
9	NC/+5V/+12V	PWR	+5V/+12V

COM 1 & 3 (RS-485)

Pin	Pin Name	Signal Type	Signal Level
1	485D-	I/O	
2	485D+	I/O	
3	NC		
4	NC		
5	NC		
6	NC		
7	NC		
8	NC		
9	NC/+5V/+12V	PWR	+5V/+12V

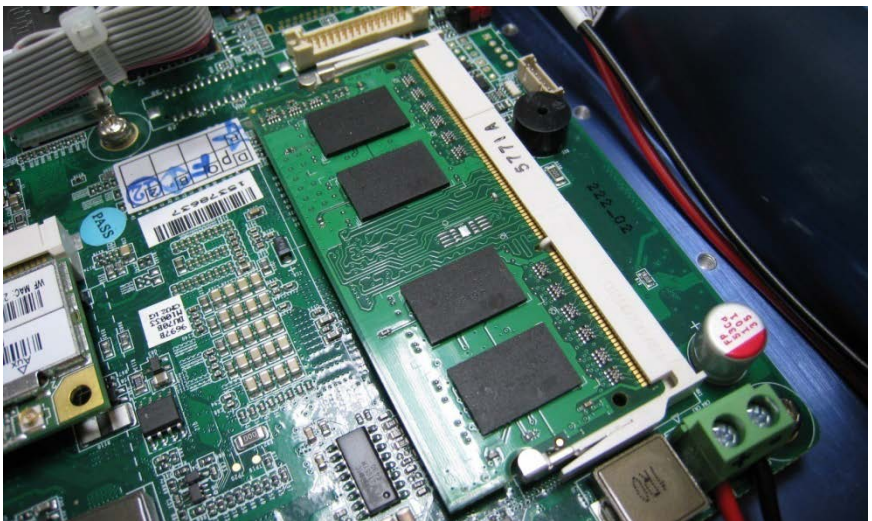
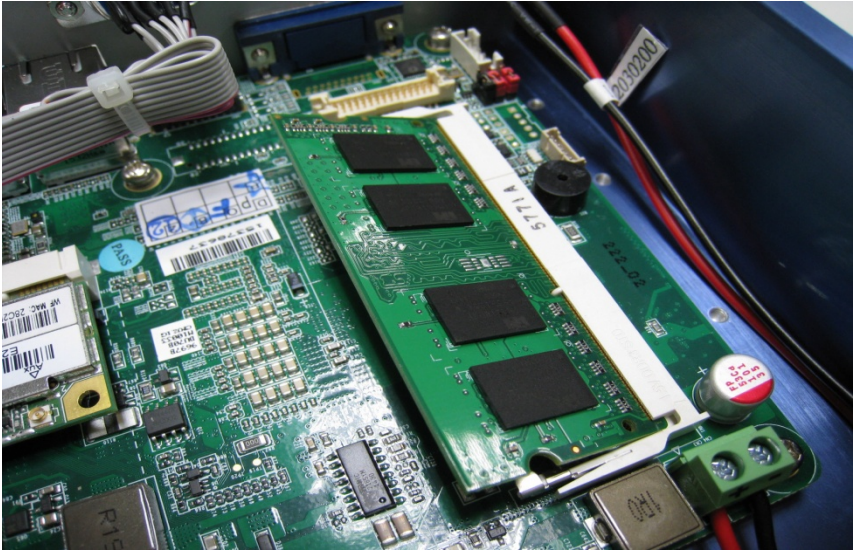
2.5 Installing RAM/ MiniCard/ HDD

To install RAM and MiniCard, remove the following screws to access the system's interior.



Installing RAM

- 1) To install RAM, remove the RAM cover and slot in the RAM to the RAM slot. Push it down to secure



2) Place a thermal pad onto the RAM

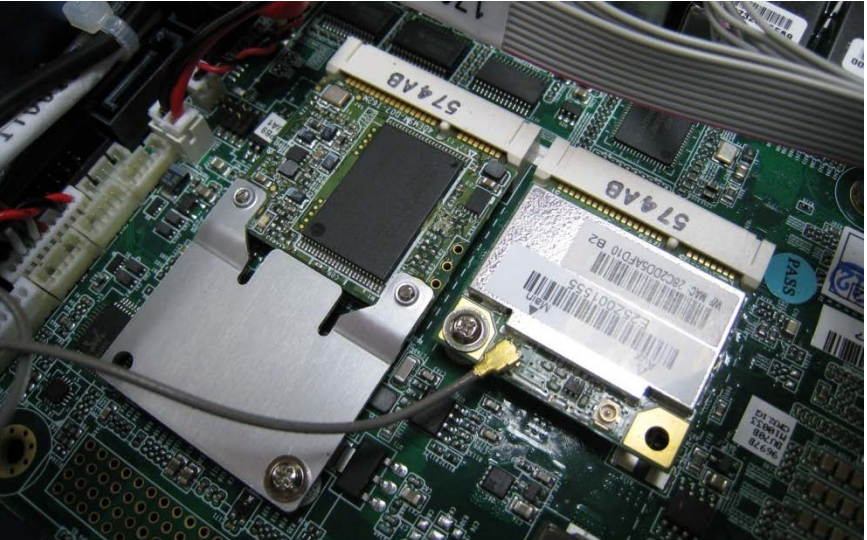
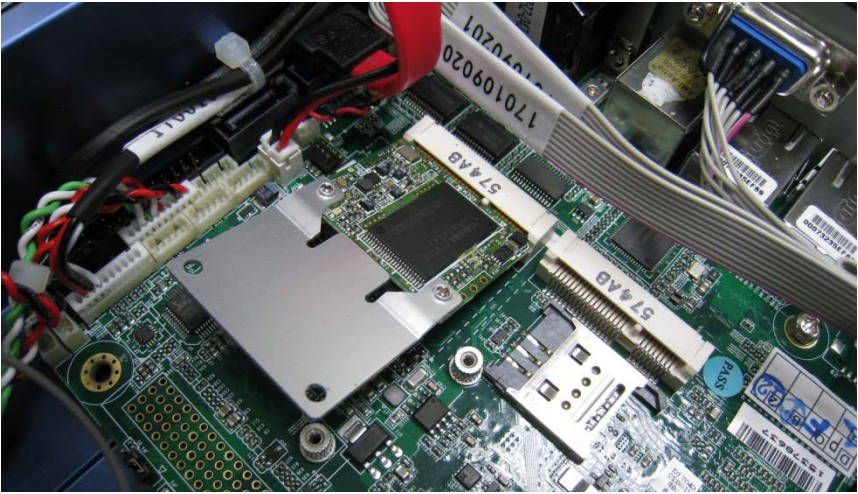


3) Cover the RAM and the thermal pad with the RAM cover



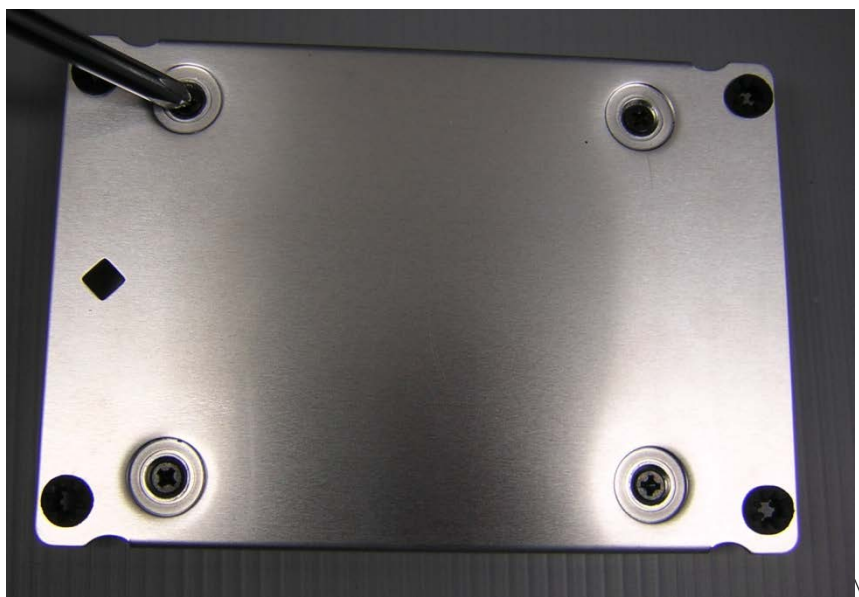
Installing MiniCard

To install MiniCard, simply slot the MiniCard into the card slot and secure with screws.



Installing HDD

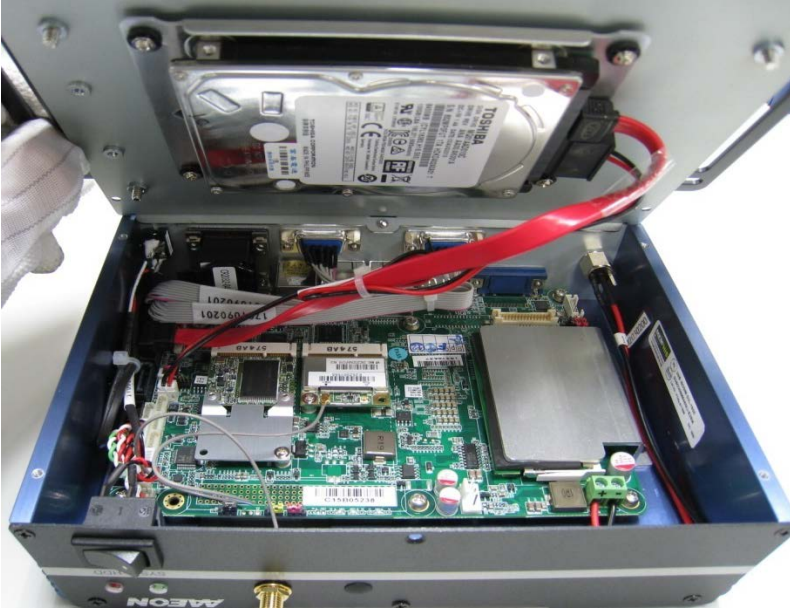
- 1) To install HDD, first attach the HDD to the HDD bracket as shown below



- 2) Attach and secure the assembly to the topside of the baseplate and attach the cables



- 3) Close up the device



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 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

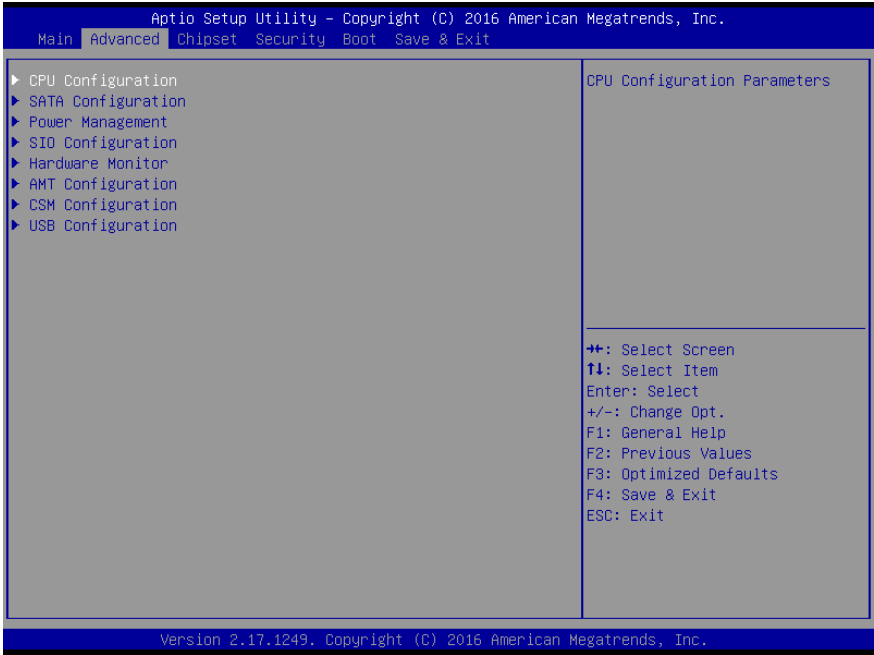
3.3 Setup Submenu: Main



Options summary: **(default setting)**

System Language	English	
Only English support in this BIOS		
System Date	Day MM:DD:YYYY	
Change the month, year and century. The 'Day' is changed automatically.		
System Time	HH : MM : SS	
Change the clock of the system.		

3.4 Setup Submenu: Advanced

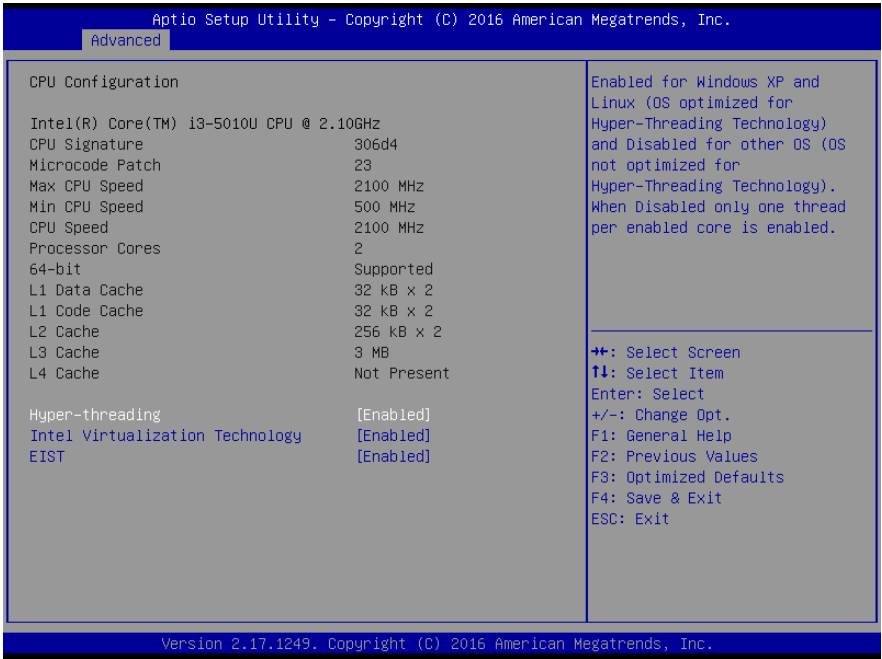


Options summary: (default setting)

CPU Configuration		
CPU Configuration Parameters		
SATA Configuration		
SATA Controller/ Serial ATA Port Parameters		
Power Management		
System ACPI/Power Mode/Wake Event Configuration		
SIO Configuration		
Super IO Configuration Parameters		
Hardware Monitor		
Monitor hardware status		

AMT Configuration		
AMT Configuration Settings		
CSM Configuration		
CSM Configuration Parameters		
Trusted Computing		
Trusted Computing Settings		
USB Configuration		
USB Configuration Parameters		
Digital IO Port Configuration		
DIO configuration		

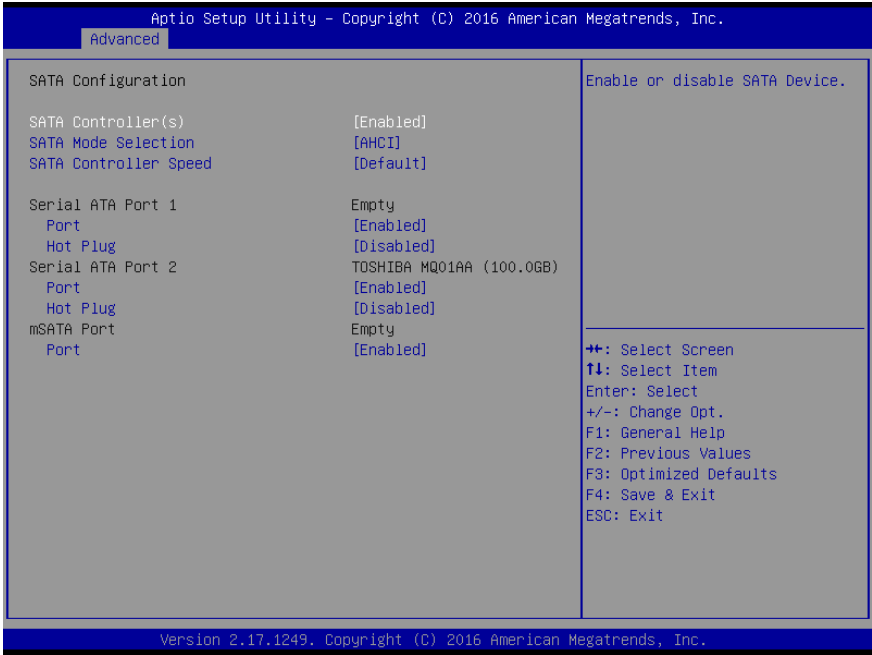
3.4.1 Advanced: CPU Configuration



Options summary: (default setting)

Hyper-threading	Disabled	
	Enabled	
Enable for Windows XP		
Intel Virtualization Technology	Disabled	
	Enabled	
When enabled, a VMM can utilize the additional hardware capabilities provided by Vanderpool Technology		
EIST	Disabled	
	Enabled	
Enable/Disable Intel SpeedStep		

3.4.2 Advanced: SATA Configuration

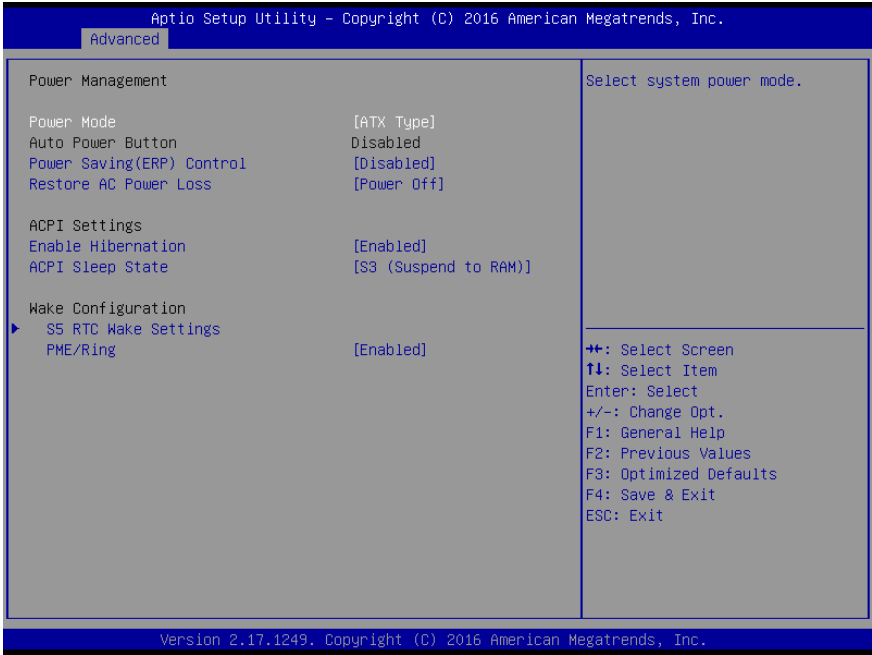


Options summary: (default setting)

SATA Controller(s)	Disabled	
	Enabled	
En/Disable SATA Device		
SATA Mode Selection	AHCI	
	RAID	
SATA Controller Speed	Default	
	Gen1	
	Gen2	
	Gen3	

Indicates the maximum speed the SATA controller can support		
SATA Port1/Port2/mSATA	Enabled	
Port	Disabled	
Enabled/Disabled SATA Port1/Port2		
HotPlug	Disabled	
	Enabled	
Enabled/Disabled SATA Port1/Port2 HotPlug function		

3.4.3 Advanced: Power Management

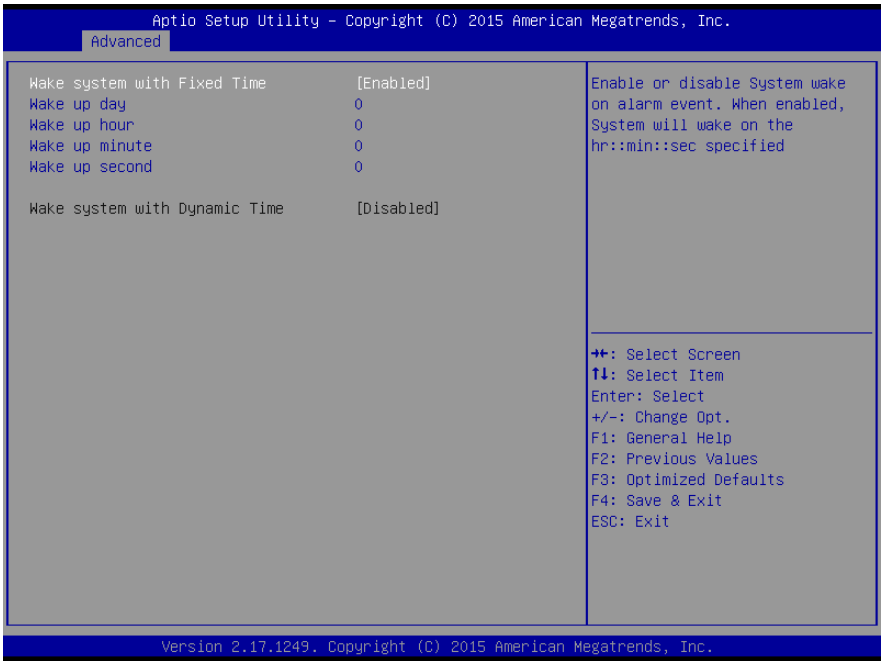


Options summary: (default setting)

Power Mode	ATX Type	
	AT Type	
Select system power mode		
Power Saving (ERP) Control	Disabled	
	Enabled	
Configure power mode for power saving function		
Restore AC Power Loss	Power Off	
	Power on	
	Late State	
Select AC power state when power is re-applied after a power failure		

Enable Hibernation	Enabled	
	Disabled	
<p>Enabled or disabled system ability to Hibernate (OS/S4 Sleep State).</p> <p>This option may be not effective with some OS.</p>		
ACPI Sleep State	Suspend Disabled	
	S3 only(Suspend to RAM)	
<p>Select highest ACPI sleep state the System will enter when the Suspend button is pressed</p>		
S5 RTC Wake Settings		
<p>Enable system to wake from S5 using RTC alarm.</p>		
PME/Ring	Enabled	
	Disabled	
<p>Use RI or PME to wake system from sleep state</p>		

3.4.4 Advanced: RTC Wake Settings

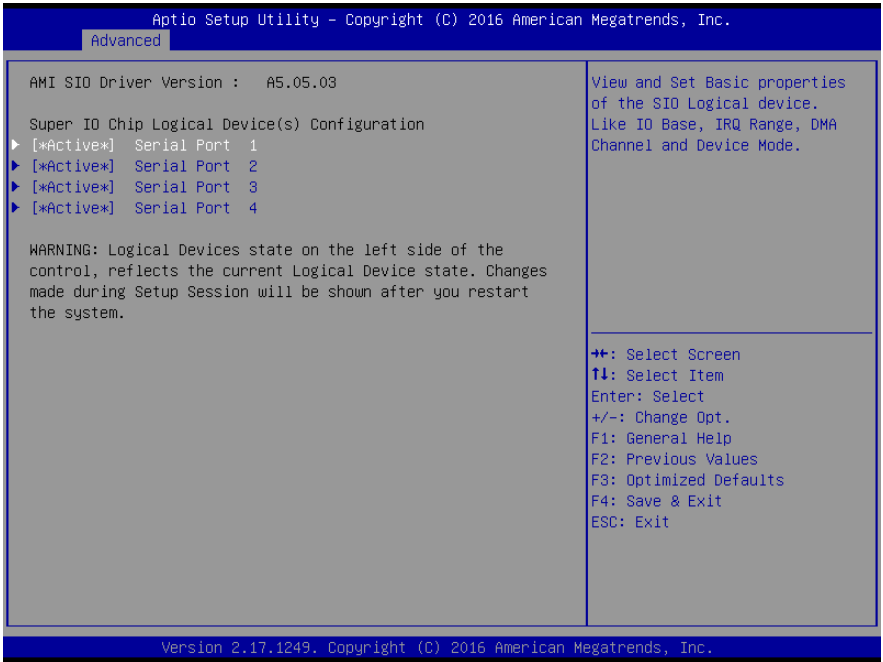


Options summary: **(default setting)**

Wake system with Fixed Time	Disabled	
	Enabled	
Enable or disable System wake on alarm event. Wake up time is setting by following settings.		
Wake up day	0-31	
Select 0 for daily system wake up 1-31 for which day of the month that you would like the system to wake up		
Wake up hour	0-23	
Wake up minute	0-59	

Wake up second	0-59	
Wake system with Dynamic	Disabled	
Time	Enabled	
Enable or disable System wake on alarm event. Wake up time is current time + Increase minutes.		
Wake up minute increase	1-5	

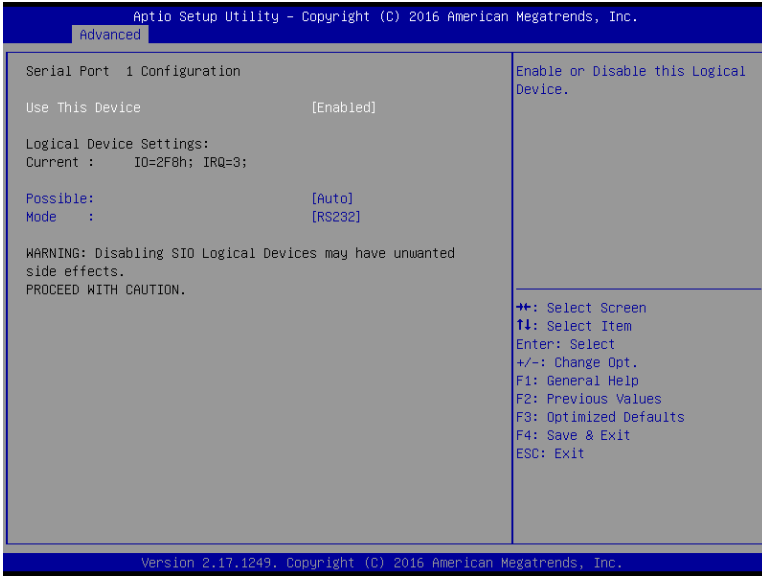
3.4.5 Advanced: SIO Configuration

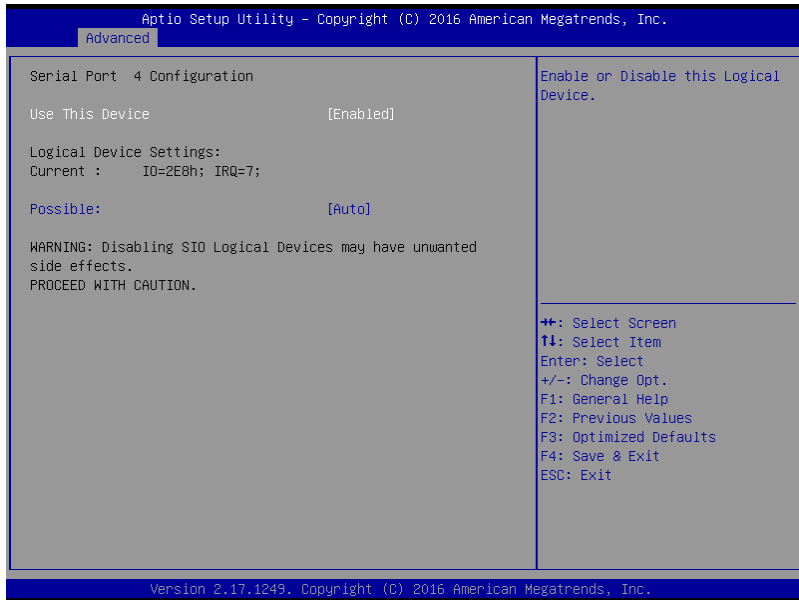
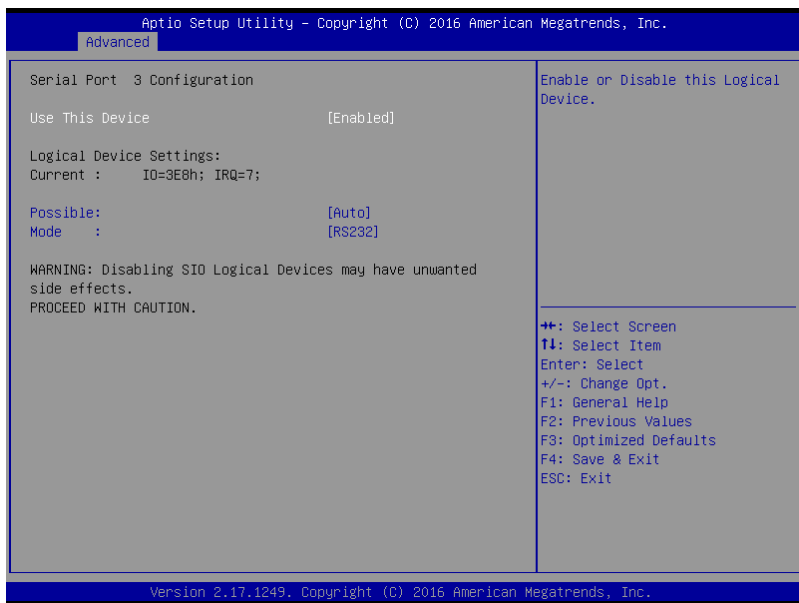


Options summary: (default setting)

Serial Port		
1/2/3/4Configuration		
Set Parameters of Serial Port 1/2/3/4		
Parallel Port Configuration		
Set Parameters of Parallel Port		

3.4.5.1 SIO Configuration: Serial Port 1-4 Configuration



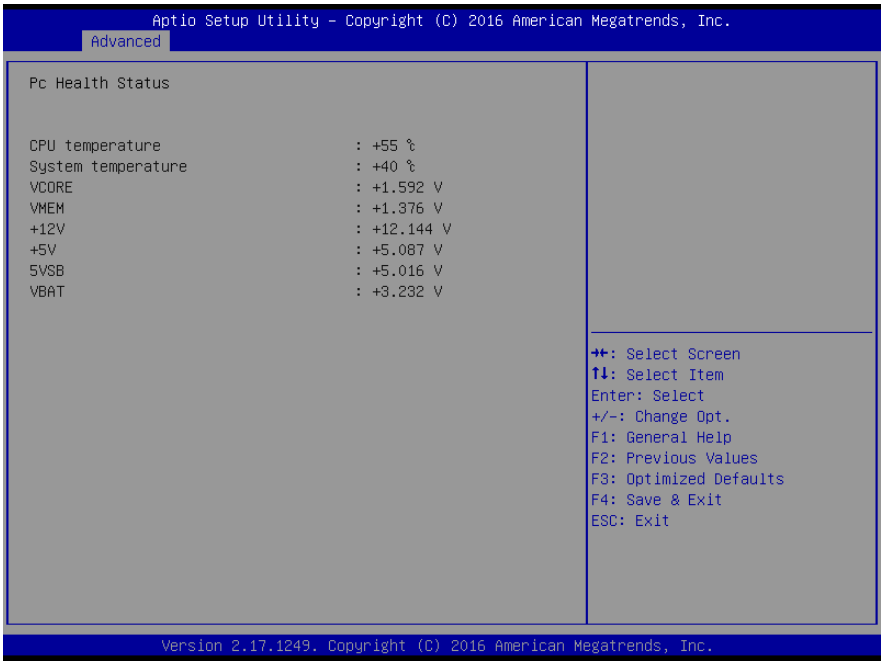


Options summary: (default setting)

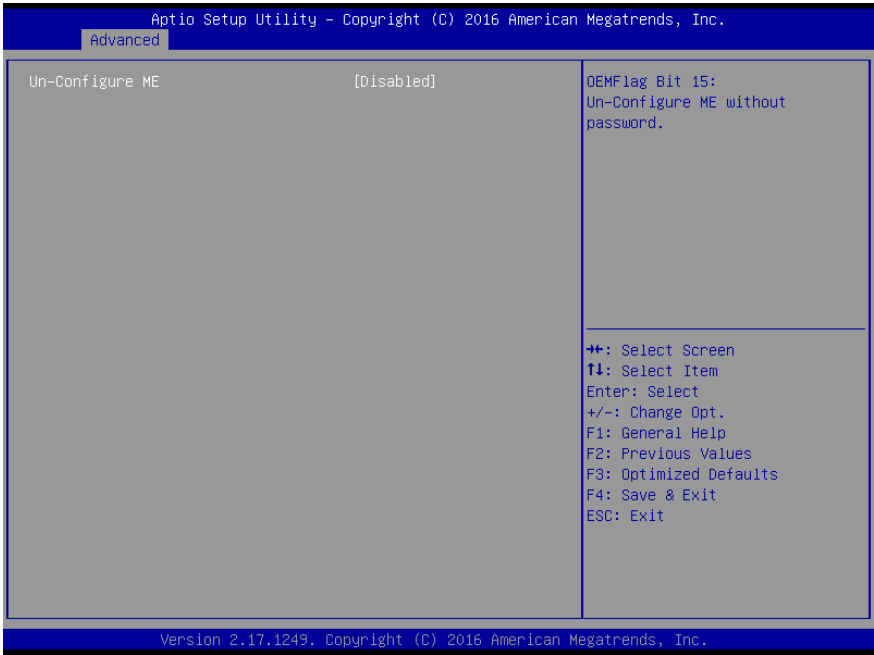
Use This Device	Disabled	
	Enabled	
En/Disable specified serial port.		
Possible (COM1)	Auto	
	IO=2F8h; IRQ=3; DMA;	
	IO=3F8h; IRQ=3,4,5,7,9,10,11,12; DMA;	
	IO=2F8h; IRQ=3,4,5,7,9,10,11,12; DMA;	
	IO=3E8h; IRQ=3,4,5,7,9,10,11,12; DMA;	
	IO=2E8h; IRQ=3,4,5,7,9,10,11,12; DMA;	
Possible (COM2)	Auto	
	IO=3F8h; IRQ=4; DMA;	
	IO=3F8h; IRQ=3,4,5,7,9,10,11,12; DMA;	
	IO=2F8h; IRQ=3,4,5,7,9,10,11,12; DMA;	
	IO=3E8h; IRQ=3,4,5,7,9,10,11,12; DMA;	
	IO=2E8h; IRQ=3,4,5,7,9,10,11,12; DMA;	
Possible (COM3)	Auto	
	IO=3E8h; IRQ=7; DMA	
	IO=3E8h; IRQ=3,4,5,6,7,10,11,12; DMA	
	IO=2E8h; IRQ=3,4,5,6,7,10,11,12; DMA	
	IO=2F0h; IRQ=3,4,5,6,7,10,11,12; DMA	
	IO=2E0h; IRQ=3,4,5,6,7,10,11,12; DMA	
Possible (COM4)	Auto	
	IO=3E8h; IRQ=7; DMA	
	IO=3E8h; IRQ=3,4,5,6,7,10,11,12; DMA	
	IO=2E8h; IRQ=3,4,5,6,7,10,11,12; DMA	
	IO=2F0h; IRQ=3,4,5,6,7,10,11,12; DMA	

	IO=2E0h; IRQ=3,4,5,6,7,10,11,12; DMA	
	IO=2D0h; IRQ=3,4,5,6,7,10,11,12; DMA	
	IO=2C0h; IRQ=3,4,5,6,7,10,11,12; DMA	
Select a resource setting for Super IO device.		
Mode	RS232	
	RS422	
	RS485	
Configure COM operated as RS232, RS422 or RS485. Only COM2 and COM3 support this function.		

3.4.5 Advanced: Hardware Monitor



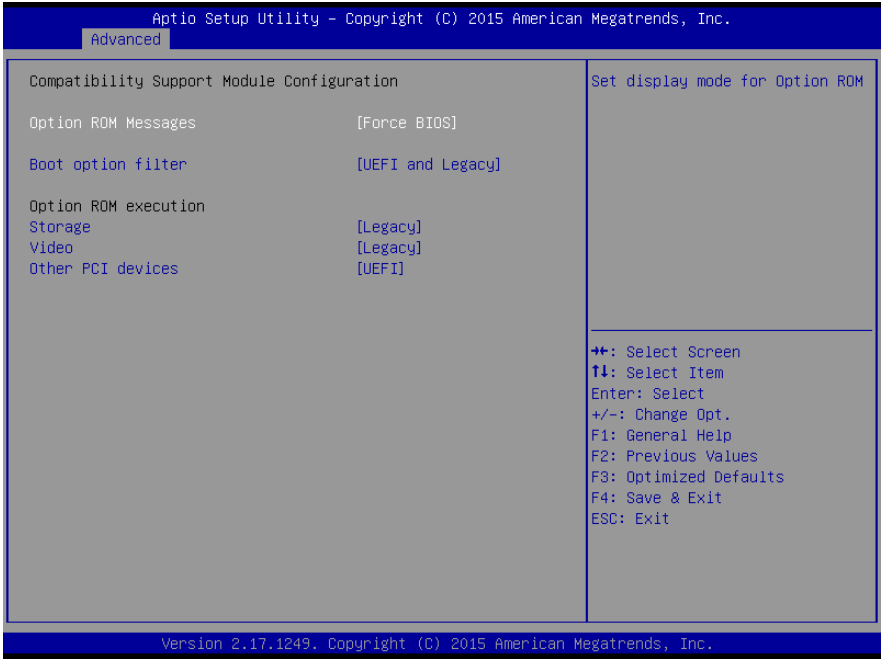
3.4.6 Advanced: AMT Configuration



Options summary: (default setting)

Un-Configure ME	Disabled	
	Enabled	
Un-configure ME without password.		
Disable ME	Disabled	
	Enabled	
Set ME to soft Temporary Disabled.		

3.4.7 Advanced: CSM Configuration

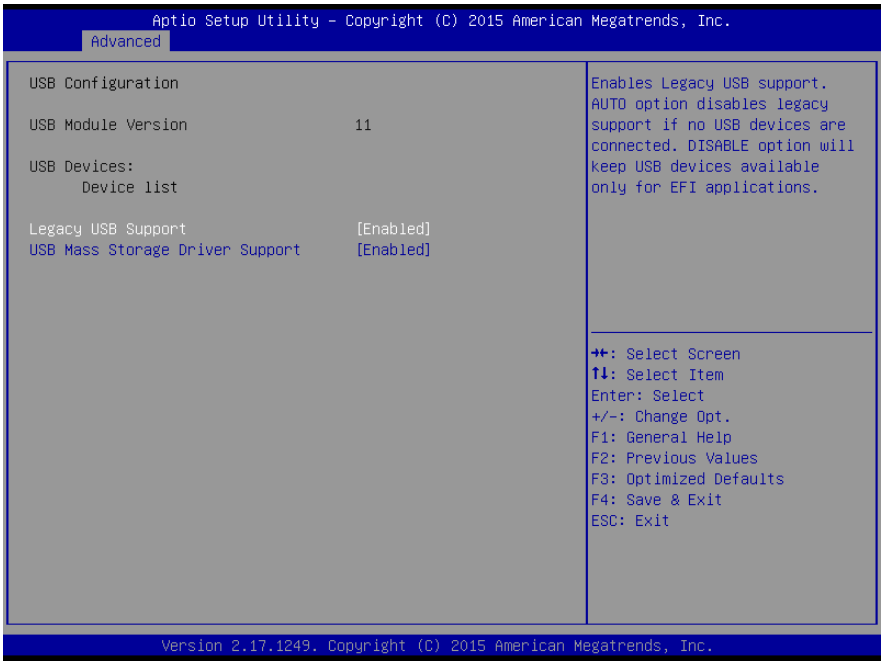


Options summary: (default setting)

Option ROM Messages	Force BIOS	
	Keep Current	
Set display mode for Option ROM		
Boot option filter	UEFI and Legacy	
	Legacy only	
	UEFI only	
Legacy/UEFI ROMs priority		
Storage/Video	Do not launch	
	UEFI	
	Legacy	

Controls the execution of UEFI and Legacy Storage OpROM		
Other PCI devices	Do not launch	
	UEFI	
	Legacy	
Determines OpROM execution policy for devices other than Network, Storage, or Video		

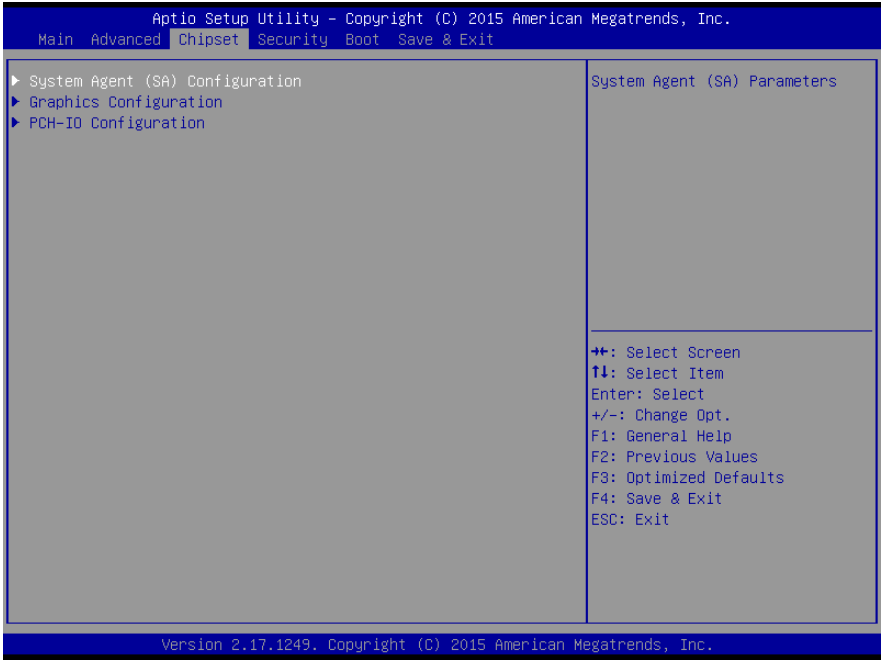
3.4.8 Advanced: USB Configuration



Options summary: (default setting)

Legacy USB Support	Enabled	
	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. DISABLE option will keep USB devices available only for EFI application		
USB Mass Storage Driver Support	Disabled	
	Enabled	
Enable/Disable USB Mass Storage Driver Support		

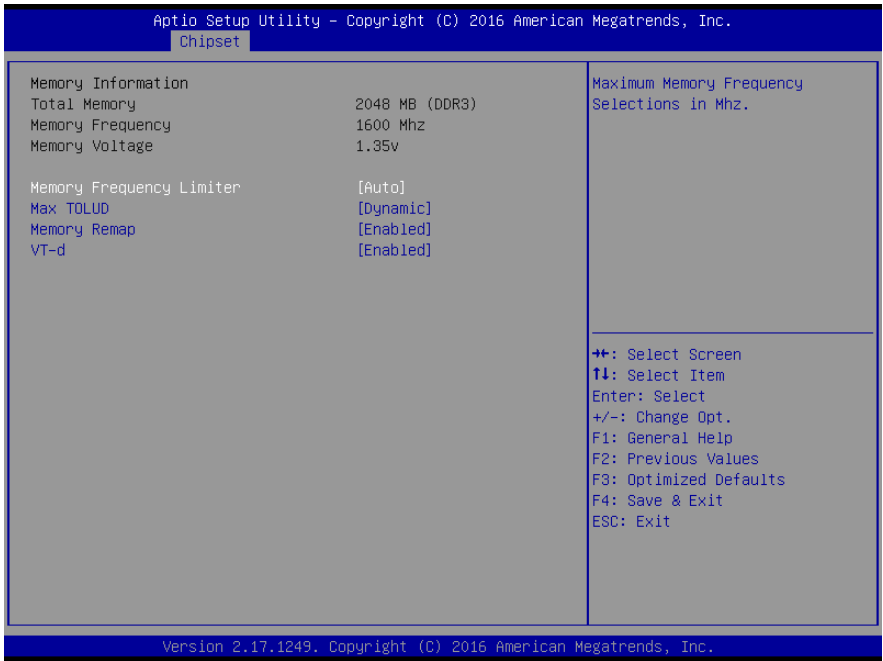
3.5 Setup submenu: Chipset



Options summary: **(default setting)**

System Agent (SA) Configuration		
System Agent (SA) Parameters		
Graphics Configuration		
Configure Graphics Settings.		
PCH-IO Configuration		
Configure PCH Parameters		

3.5.1 Chipset: System Agent (SA) Configuration



Options summary: (default setting)

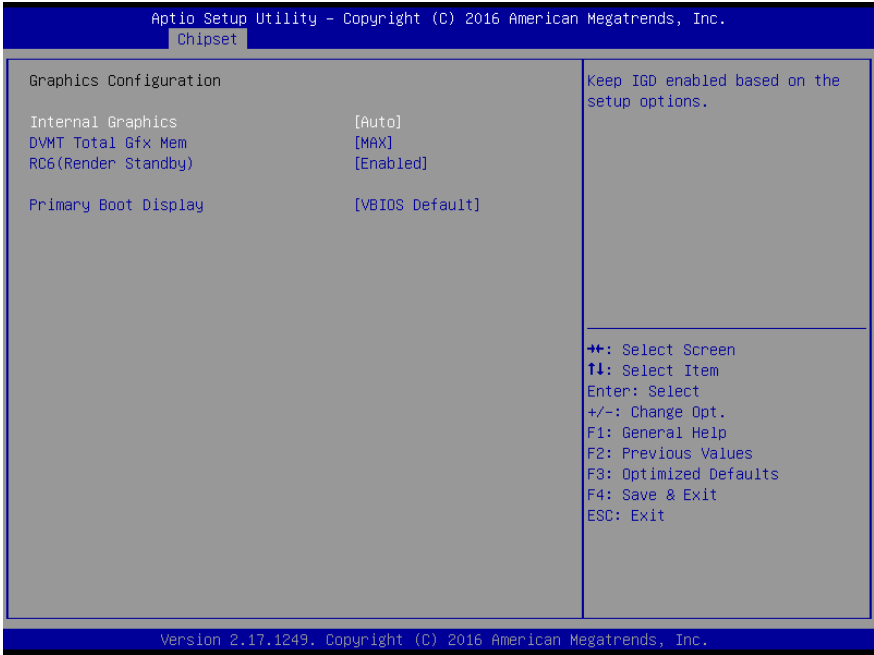
Memory Frequency Limiter	Auto	
	1333	
	1600	

Maximum Memory Frequency Selections in Mhz.

Max TOLUD	Dynamic	
	1 GB	
	1.25 GB	
	1.5 GB	
	1.75 GB	
	2 GB	

	2.25 GB	
	2.5 GB	
	2.75 GB	
	3 GB	
	3.25 GB	
Maximum Value of TOLOUD. Dynamic assignment would adjust TOLUD automatically base on largest MMIO length of installed graphic controller.		
Memory Remap	Enabled	
	Disabled	
Enabled/Disabled Memory Remap above 4G.		

3.5.2 Chipset: Graphics Configuration

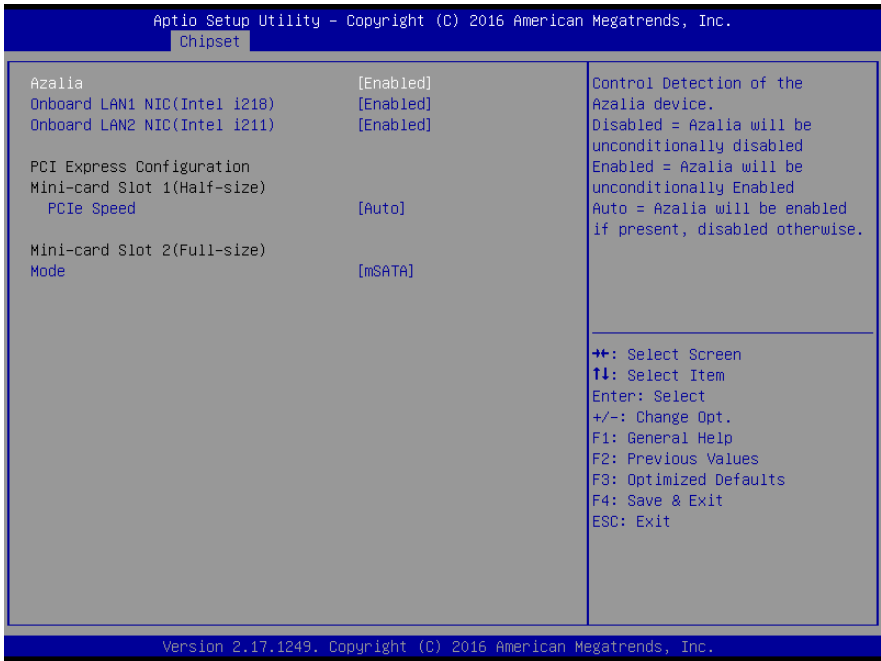


Options summary: (default setting)

Internal Graphics	Auto	
	Disabled	
	Enabled	
Keep IGD enabled based on the setup option.		
DVMT Total Gfx Mem	128M	
	256M	
	MAX	
Select DVMT5.0 Total Graphic Memory size used by the internal Graphic Device.		
RC6(Render Standby)	Disabled	
	Enabled	

Check to enable render standby support.		
Primary Boot Display	VBIOS Default	
	CRT	
	DisplayPort	
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		

3.5.3 Chipset: PCH-IO Configuration

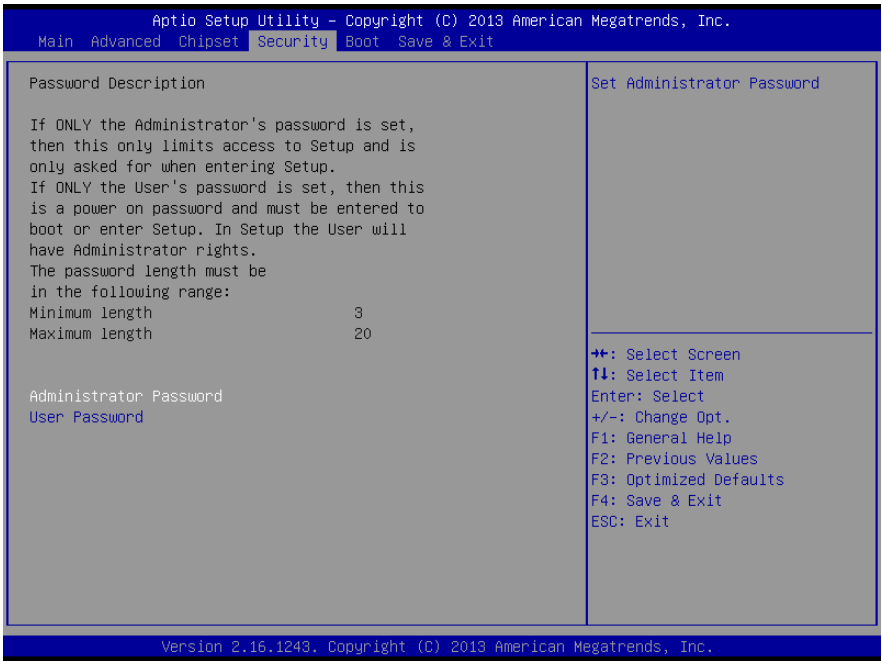


Options summary: (default setting)

Azalia	Disabled	
	Enabled	
Enable or disabled Azalia device for audio function.		
Hot Plug for Mini-card Slot 1(Half-size) Mini-card Slot 2(Full-size)	Disabled	
	Enabled	
Enabled/Disabled PCIe Hot Plug feature for the port.		
PCIe Speed for Mini-card Slot 1(Half-size) Mini-card Slot 2(Full-size)	Auto	
	Gen1	
	Gen2	

Select PCI Express port speed.		
ASPM for	Disabled	
Mini-card Slot 1(Half-size)	L0s	
Mini-card Slot 2(Full-size)	L1	
Onboard LAN2 NIC	L0sL1	
	Auto	
Set the ASPM Level:		
Force L0s-Force all links to L0s State		
AUTO-BIOS auto configure		
DISABLE-Disables ASPM		
Mini-card Slot 2(Full-size)	mSATA	
Mode	PCI Express	
Configure slot 2 function to PCIe or mSATA.		
SLP_S4 Assertion Width	Disabled	
	1-2 Seconds	
	2-3 Seconds	
	3-4 Seconds	
	4-5 Seconds	
Select a minimum assertion width of the SLP_S4# signal		

3.6 Setup submenu: Security



Options summary: (*default setting*)

Administrator Password/	<i>Not set</i>
User Password	

Change User/Administrator Password

You can set a User Password once an Administrator Password. 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.

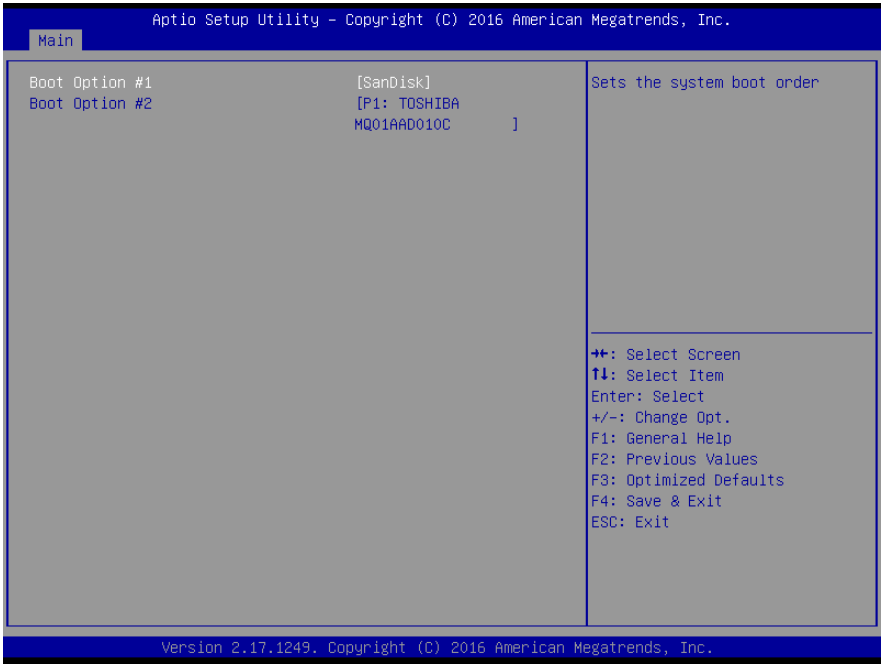
3.7 Setup submenu: Boot



Options summary: (default setting)

Quiet Boot	Disabled	
	Enabled	
En/Disable showing boot logo.		
Launch Network PXE OpROM	Do not launch	
	UEFI	
	Legacy	
En/Disable network OpROM for PXE boot		
Boot Option #X/ XXXX Drive BBS Priorities		
The order of boot priorities.		

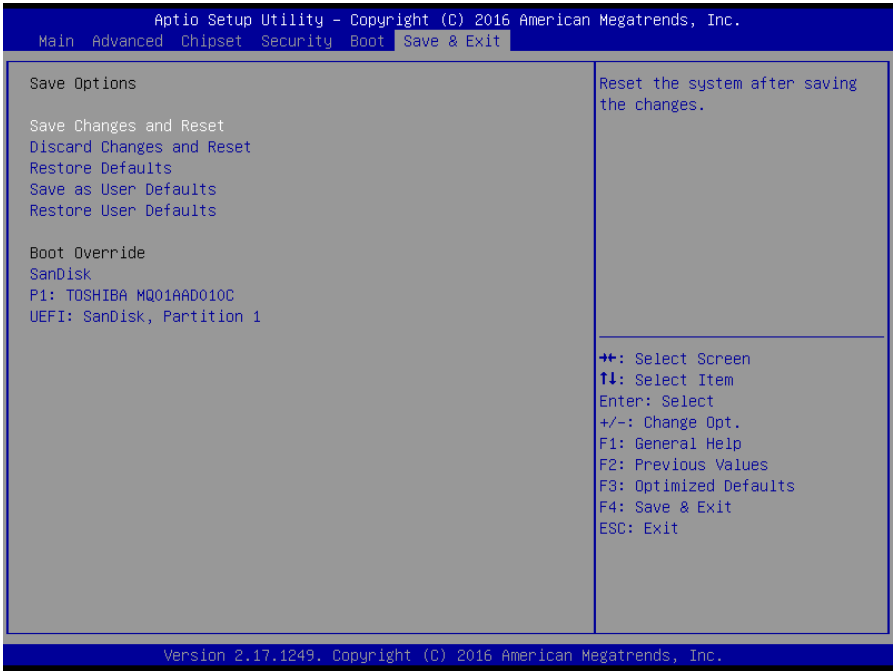
3.7.1 Boot: BBS Priorities



Options summary: **(default setting)**

Boot Option #x	Disabled	
	Device name	
Sets the system boot order		

3.8 Setup submenu: Save & Exit



Options summary: **(default setting)**

Save Changes and Reset		
Reset the system after saving the changes		
Discard Changes and Reset		
Reset system setup without saving any changes		
Restore Defaults		
Restore/Load Default values for all the setup options.		
Save as User Defaults		
Save the changes done so far as User Defaults		
Boot Override		
Select the boot device for this boot.		

Restore User Defaults		
Restore the User Defaults to all the setup options		

Chapter 4

Drivers Installation

4.1 Product CD/DVD

The BOXER-6638U-H1 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 **Step 1 - Chipset** folder and select your OS
2. Open **SetupChipset.exe**
3. Follow the instructions
4. Drivers will be installed automatically

Step 2 – Install Graphics Driver

Note 1: Please install dotNet4.5-x86-x64-AllOS-ENU.exe (Microsoft.NET framework) prior to installing the drivers

Note 2: If you are using Windows 8.1, please install the hotfix provided

1. Open the **Step 2 - Graphics** 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 Audio Driver

1. Open the **Step 3 - Audio** 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 LAN Driver

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

Step 5 –Install ME SW Driver

Note : If you are using Windows 7, please install the KMDF update prior to installing the drivers

1. Open the **Step 5 – ME SW** folder and select your OS
2. Open **MEISetup.exe**
3. Follow the instructions
4. Drivers will be installed automatically

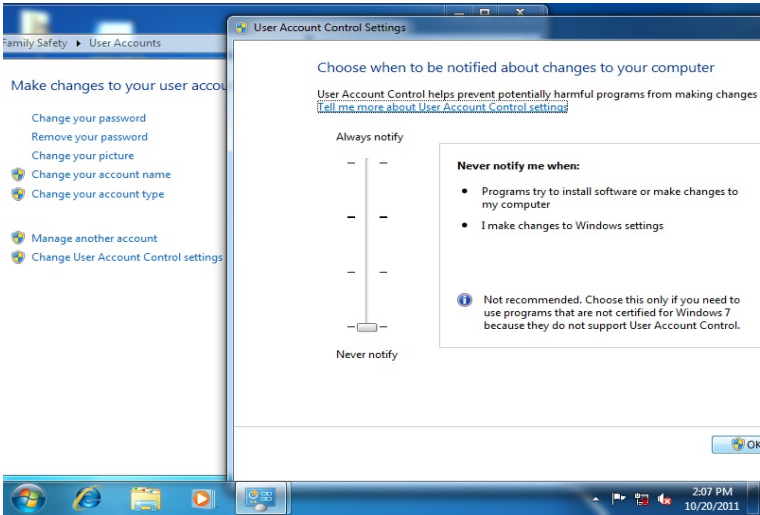
Step 6 – Install USB 3.0 Driver (Windows 7 only)

1. Open the **Step 6 – USB3.0** folder followed by **Setup.exe**
2. Follow the instructions
3. Drivers will be installed automatically

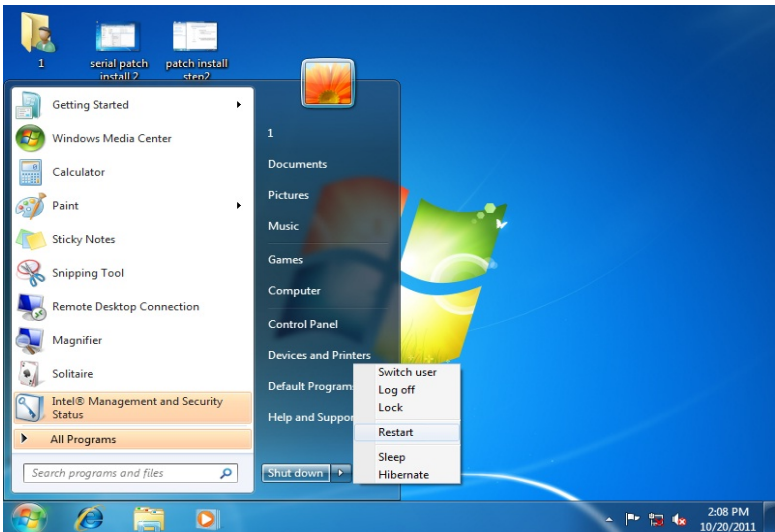
Step 7 – Install Serial Port Driver (Optional)

For Windows 7:

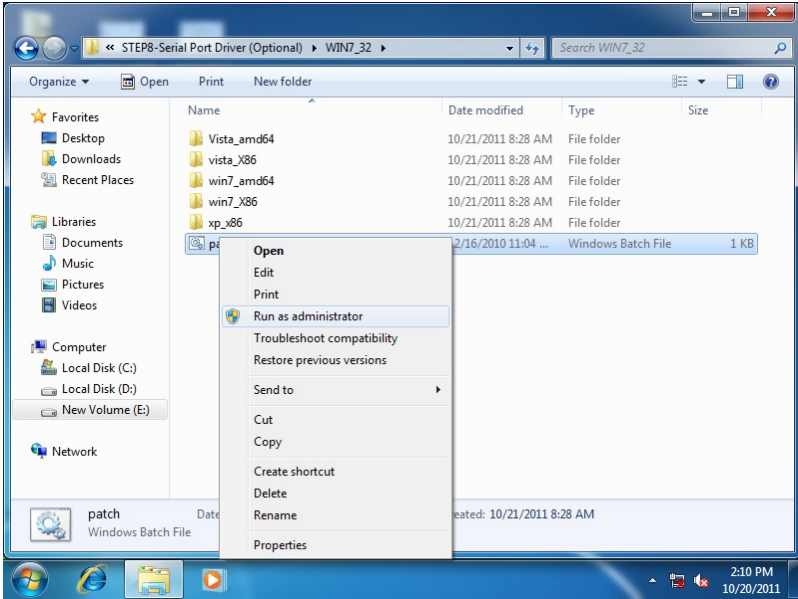
1. Change User Account Control settings to **Never notify**



2. Reboot and log in as administrator

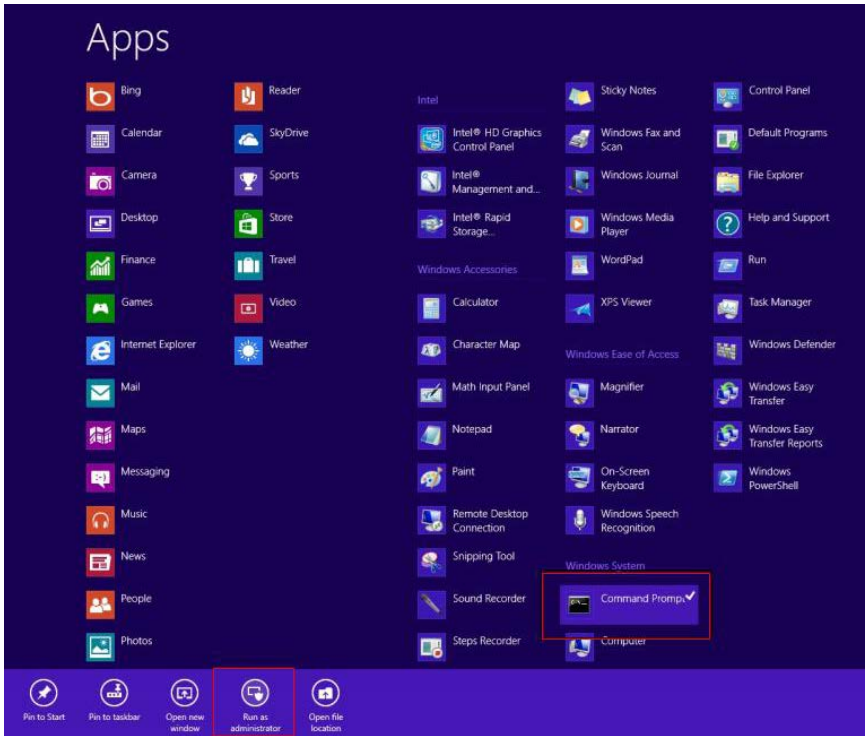


3. Run patch.bat as administrator

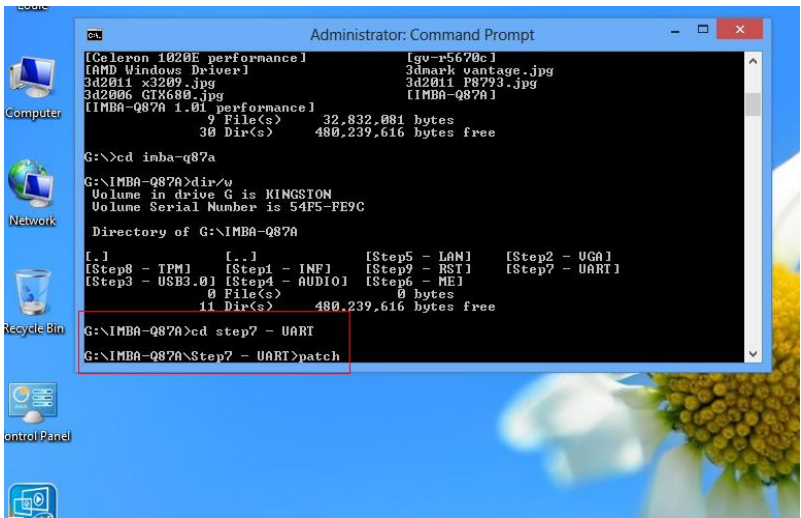


For Windows 8:

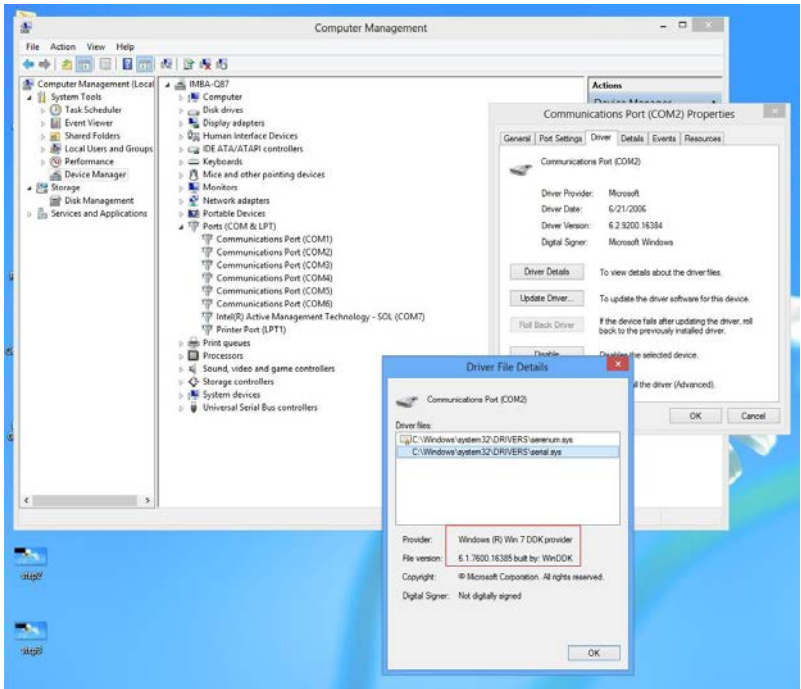
1. Open the Apps Screen, right click on the **Command Prompt** tile and select **Run as Administrator**



2. To install the driver (patch.bat), you will first have to locate the file in command prompt. To do that, go to the folder in which the file resides by entering **cd (file path)** eg: if the file is in a folder named abc in c drive, enter **cd c:\abc** (screenshot for reference only)
3. You are now at the folder where the file is located. Enter the **patch.bat** to open and install the drivers.

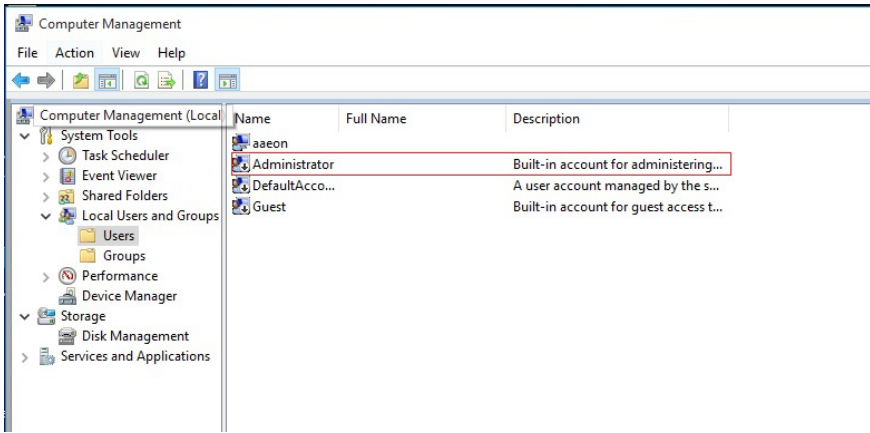


4. Reboot after installation completes.
5. To confirm the installation, go to Device Manager, expand the Ports (COM & LPT) tree and double click on any of the COM ports to open its properties. Go to the Driver tab, select Driver Details and click on **serial.sys**, you should see its provider as **Windows (R) Win 7 DDK Provider**.

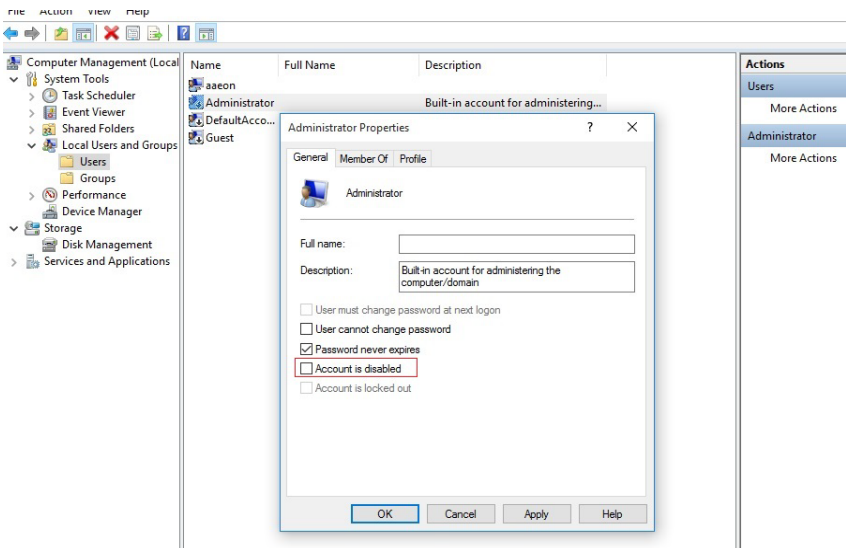


For Windows 10:

1. You will need administrator rights to install the drivers. To get it, first go to **Computer Management in Control Panel** and double-click on **Administrator**



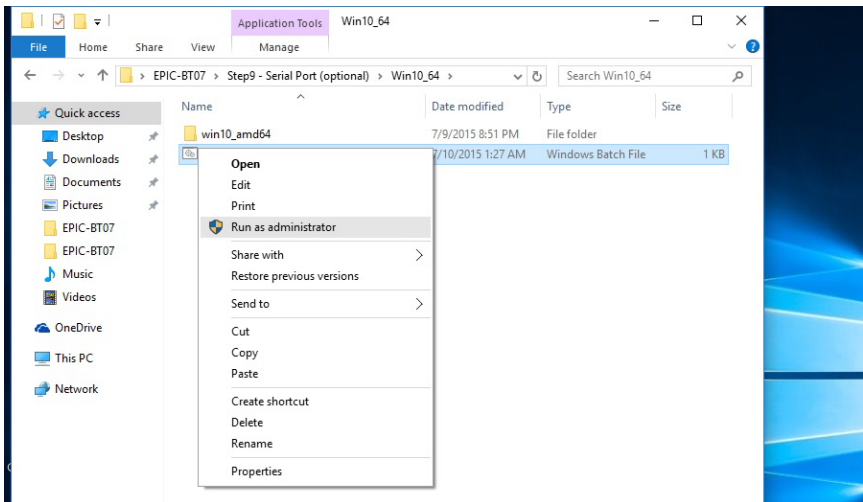
- In the dialog box, **uncheck** the **Account is disabled** option to enable administrator account.



- Restart and sign in as the administrator (not password-protected by default)



4. Go back to the Windows 10 Serial Port drivers directory and run `patch.bat` as administrator.



4.2 Industrial EtherNet Driver Installation

Step 1: Installing update file from Microsoft

If the operating system is Microsoft Windows 7 32 bit, install the following 2 update files from Microsoft before installing Industrial EtherNet driver.

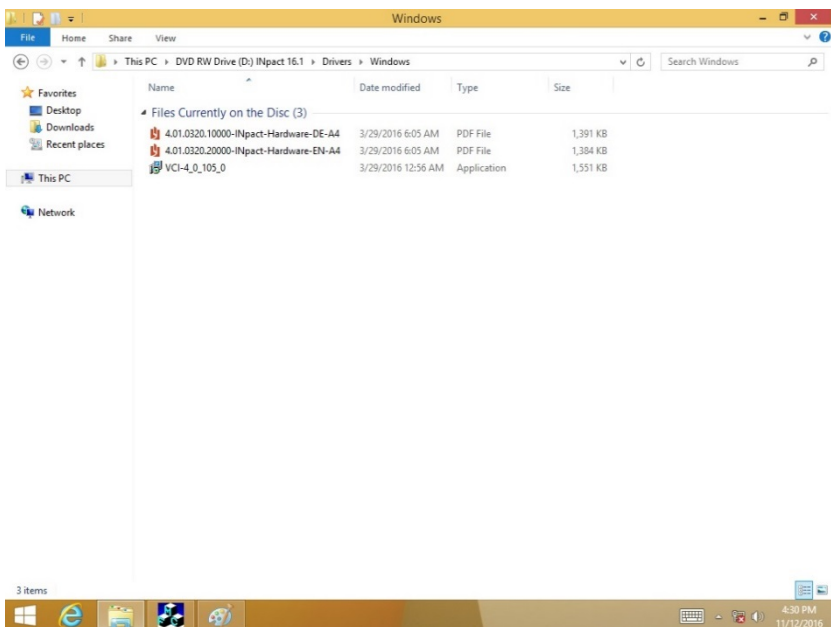
1. windows6.1-kb3020369-x86_82e168117c23f7c479a97ee96c82af788d07452e
2. windows6.1-kb3125574-v4-x86_ba1ff5537312561795cc04db0b02fbb0a74b2cbd

If the operating system is Microsoft Windows 7 64 bit, install the following 2 update files from Microsoft before installing Industrial EtherNet driver.

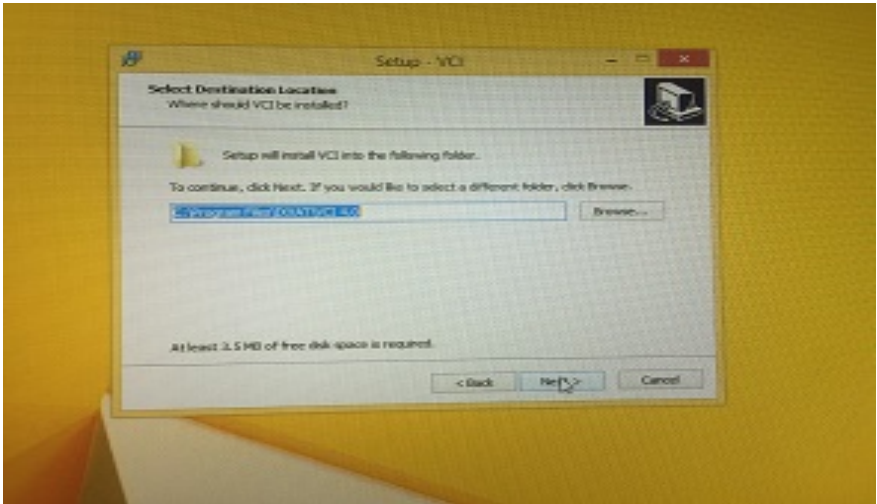
1. windows6.1-kb3020369-x64_5393066469758e619f21731fc31ff2d109595445
2. windows6.1-kb3125574-v4-x64_2dafb1d203c8964239af3048b5dd4b1264cd93b9

Step 2: Installing Industrial EtherNet Driver from Product CD

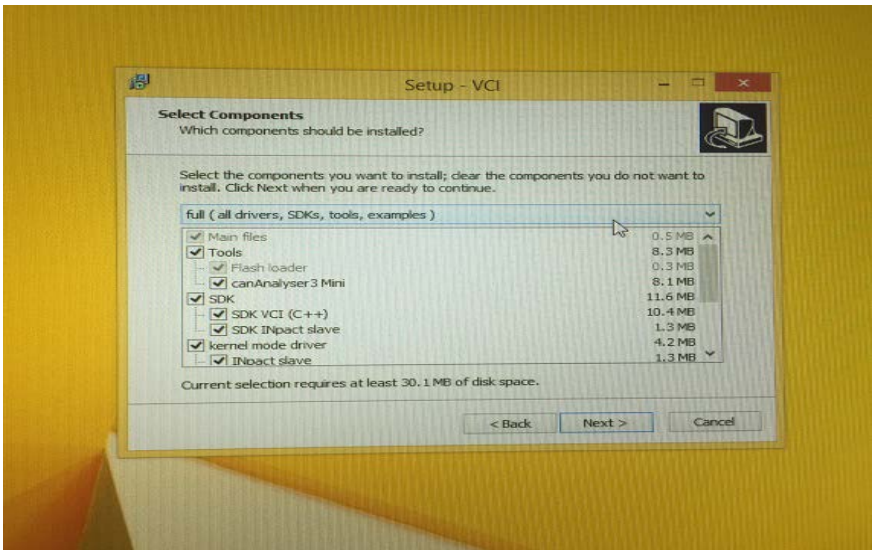
1. Click **VID-4.0** to install the driver



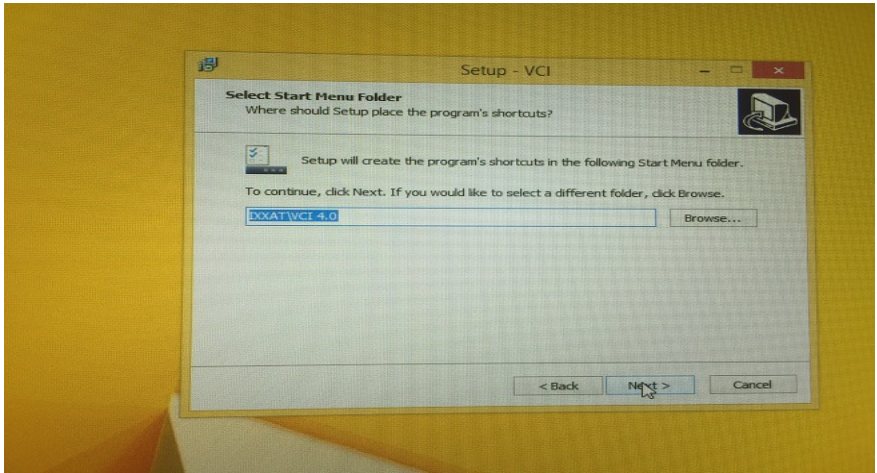
2. Click **Next** to continue the Industrial EtherNet Driver installation



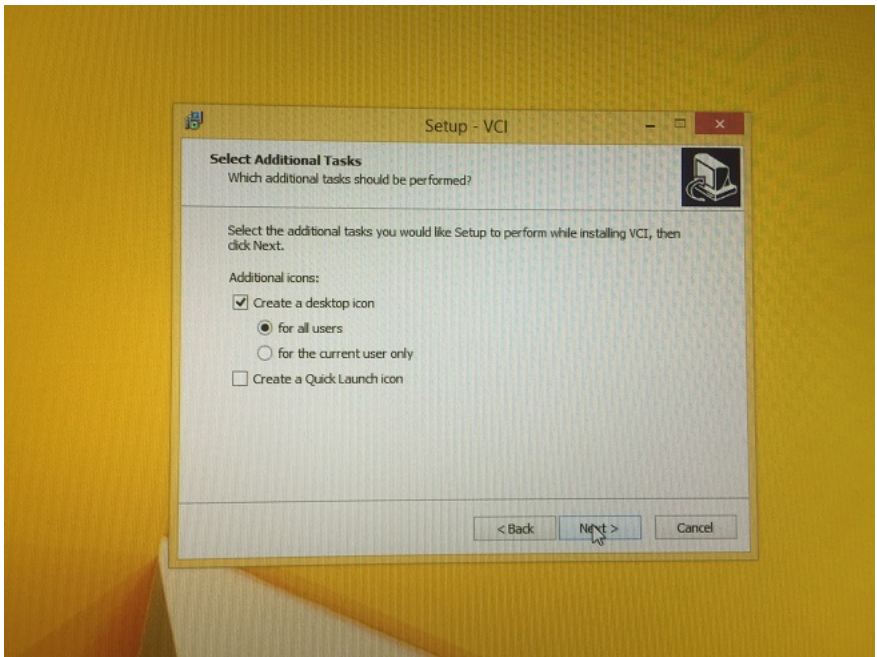
3. Click **Next** to continue the Industrial EtherNet Driver installation



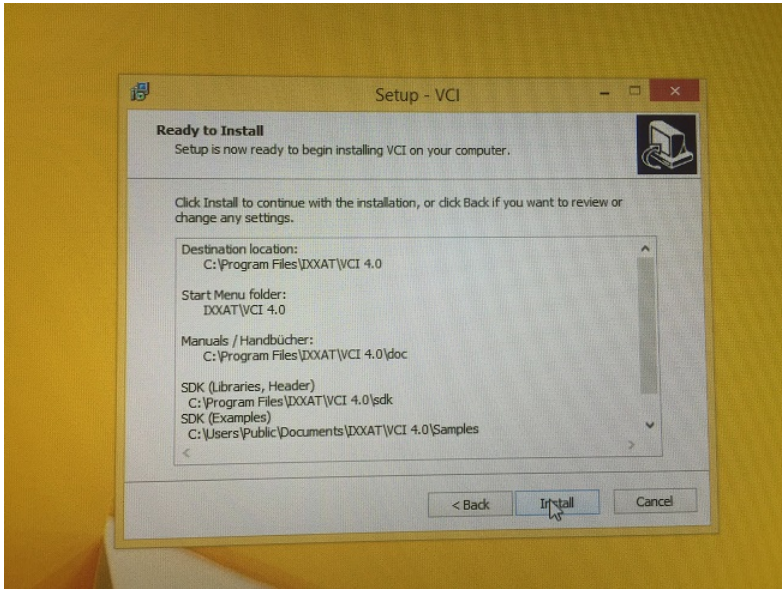
4. Click **Next** to continue the Industrial EtherNet Driver installation



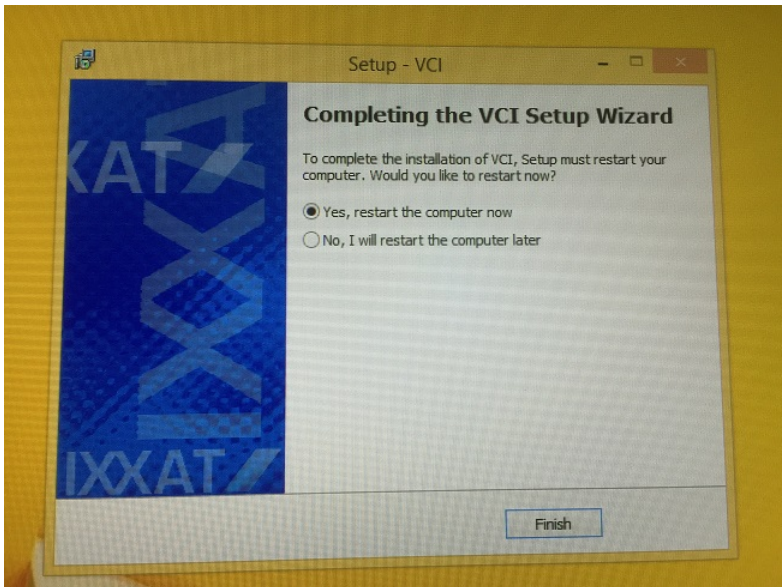
5. Click **Next** to continue the Industrial EtherNet Driver installation



6. Click **Next** to continue the Industrial EtherNet Driver installation



7. Click **Finish** to complete the Industrial EtherNet Driver installation



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)	Timeof 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();
}
*****
























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Appendix B

I/O Information

B.1 I/O Address Map

Input/output (IO)	
[0000000000000000 - 00000000000001F]	Direct memory access controller
[0000000000000000 - 000000000000CF7]	PCI Express Root Complex
[0000000000000020 - 000000000000021]	Programmable interrupt controller
[0000000000000024 - 000000000000025]	Programmable interrupt controller
[0000000000000028 - 000000000000029]	Programmable interrupt controller
[000000000000002C - 00000000000002D]	Programmable interrupt controller
[000000000000002E - 00000000000002F]	Motherboard resources
[0000000000000030 - 000000000000031]	Programmable interrupt controller
[0000000000000034 - 000000000000035]	Programmable interrupt controller
[0000000000000038 - 000000000000039]	Programmable interrupt controller
[000000000000003C - 00000000000003D]	Programmable interrupt controller
[0000000000000040 - 000000000000043]	System timer
[000000000000004E - 00000000000004F]	Motherboard resources
[0000000000000050 - 000000000000053]	System timer
[0000000000000060 - 000000000000060]	Standard PS/2 Keyboard
[0000000000000061 - 000000000000061]	Motherboard resources
[0000000000000063 - 000000000000063]	Motherboard resources
[0000000000000064 - 000000000000064]	Standard PS/2 Keyboard
[0000000000000065 - 000000000000065]	Motherboard resources
[0000000000000067 - 000000000000067]	Motherboard resources
[0000000000000070 - 000000000000070]	Motherboard resources
[0000000000000070 - 000000000000077]	System CMOS/real time clock
[0000000000000080 - 000000000000080]	Motherboard resources
[0000000000000081 - 000000000000091]	Direct memory access controller
[0000000000000092 - 000000000000092]	Motherboard resources
[0000000000000093 - 00000000000009F]	Direct memory access controller
[00000000000000A0 - 0000000000000A1]	Programmable interrupt controller
[00000000000000A4 - 0000000000000A5]	Programmable interrupt controller
[00000000000000A8 - 0000000000000A9]	Programmable interrupt controller
[00000000000000AC - 0000000000000AD]	Programmable interrupt controller
[00000000000000B0 - 0000000000000B1]	Programmable interrupt controller
[00000000000000B2 - 0000000000000B3]	Motherboard resources
[00000000000000B4 - 0000000000000B5]	Programmable interrupt controller
[00000000000000B8 - 0000000000000B9]	Programmable interrupt controller
[00000000000000BC - 0000000000000BD]	Programmable interrupt controller
[00000000000000C0 - 0000000000000DF]	Direct memory access controller
[00000000000002E0 - 00000000000002E7]	Communications Port (COM6)
[00000000000002E8 - 00000000000002EF]	Communications Port (COM4)
[00000000000002F0 - 00000000000002F7]	Communications Port (COM5)
[00000000000002F8 - 00000000000002FF]	Communications Port (COM2)
[00000000000003B0 - 00000000000003BB]	Intel(R) HD Graphics 5500
[00000000000003C0 - 00000000000003DF]	Intel(R) HD Graphics 5500
[00000000000003E8 - 00000000000003EF]	Communications Port (COM3)
[00000000000003F8 - 00000000000003FF]	Communications Port (COM1)
[00000000000004D0 - 00000000000004D1]	Programmable interrupt controller
[0000000000000680 - 000000000000069F]	Motherboard resources
[0000000000000A00 - 0000000000000A0F]	Motherboard resources
[0000000000000A10 - 0000000000000A1F]	Motherboard resources
[0000000000000A20 - 0000000000000A2F]	Motherboard resources



















































	[00000000000003C0 - 00000000000003DF]	Intel(R) HD Graphics 5500
	[00000000000003E8 - 00000000000003EF]	Communications Port (COM3)
	[00000000000003F8 - 00000000000003FF]	Communications Port (COM1)
	[00000000000004D0 - 00000000000004D1]	Programmable interrupt controller
	[0000000000000680 - 000000000000069F]	Motherboard resources
	[0000000000000A00 - 0000000000000A0F]	Motherboard resources
	[0000000000000A10 - 0000000000000A1F]	Motherboard resources
	[0000000000000A20 - 0000000000000A2F]	Motherboard resources
	[0000000000000D00 - 0000000000000FFF]	PCI Express Root Complex
	[000000000000164E - 000000000000164F]	Motherboard resources
	[0000000000001800 - 00000000000018FE]	Motherboard resources
	[0000000000001854 - 0000000000001857]	Motherboard resources
	[0000000000003000 - 0000000000003FFF]	Mobile 5th Generation Intel(R) Core(TM) PCI Express Root Port #4 - 9C96
	[0000000000004000 - 000000000000403F]	Intel(R) HD Graphics 5500
	[0000000000004040 - 000000000000405F]	Mobile 5th Generation Intel(R) Core(TM) SMBus Controller - 9CA2
	[0000000000004060 - 000000000000407F]	Mobile 5th Generation Intel(R) Core(TM) SATA Controller [AHCI Mode] - 9C83
	[00000000000040A0 - 00000000000040A3]	Mobile 5th Generation Intel(R) Core(TM) SATA Controller [AHCI Mode] - 9C83
	[00000000000040B0 - 00000000000040B7]	Mobile 5th Generation Intel(R) Core(TM) SATA Controller [AHCI Mode] - 9C83
	[00000000000040C0 - 00000000000040C3]	Mobile 5th Generation Intel(R) Core(TM) SATA Controller [AHCI Mode] - 9C83
	[00000000000040D0 - 00000000000040D7]	Mobile 5th Generation Intel(R) Core(TM) SATA Controller [AHCI Mode] - 9C83
	[000000000000FFFF - 000000000000FFFF]	Motherboard resources
	[000000000000FFFF - 000000000000FFFF]	Motherboard resources
	[000000000000FFFF - 000000000000FFFF]	Motherboard resources
▶	Interrupt request (IRQ)	
▶	Memory	


























B.2 Memory Address Map


























Address Range	Device Name
[00000000000A0000 - 00000000000BFFFF]	Intel(R) HD Graphics 5500
[00000000000A0000 - 00000000000BFFFF]	PCI Express Root Complex
[000000007E000000 - 00000000FEAFFFFF]	PCI Express Root Complex
[000000000800000000 - 000000008000FFFFF]	Motherboard resources
[000000000800100000 - 000000008001FFFFF]	Motherboard resources
[000000000810000000 - 0000000081FFFFF]	Intel(R) HD Graphics 5500
[000000000820000000 - 00000000820BFFFF]	Intel(R) I211 Gigabit Network Connection
[000000000820000000 - 00000000820FFFFF]	Mobile 5th Generation Intel(R) Core(TM) PCI Express Root Port #4 - 9C96
[000000000820200000 - 0000000082023FFFF]	Intel(R) I211 Gigabit Network Connection
[000000000821000000 - 000000008211FFFF]	Intel(R) Ethernet Connection I218-LM
[000000000821200000 - 000000008212FFFF]	Intel(R) USB 3.0 eXtensible Host Controller - 0100 (Microsoft)
[000000000821300000 - 0000000082133FFF]	High Definition Audio Controller
[000000000821340000 - 0000000082137FFF]	Mobile 5th Generation Intel(R) Core(TM) and Intel(R) Core(TM) M Audio Controller - 1
[000000000821380000 - 00000000821380FF]	Mobile 5th Generation Intel(R) Core(TM) SMBus Controller - 9CA2
[000000000821390000 - 00000000821397FF]	Mobile 5th Generation Intel(R) Core(TM) SATA Controller [AHCI Mode] - 9C83
[0000000008213A0000 - 000000008213A3FF]	Mobile 5th Generation Intel(R) Core(TM) USB EHCI Controller - 9CA6
[0000000008213B0000 - 000000008213BFFF]	Intel(R) Ethernet Connection I218-LM
[0000000008213E0000 - 000000008213E01F]	Intel(R) Management Engine Interface
[000000009000000000 - 000000009FFFFFFF]	Intel(R) HD Graphics 5500
[0000000082000000 - 00000000820FFFFF]	Mobile 5th Generation Intel(R) Core(TM) PCI Express Root Port #4 - 9C96
[0000000082020000 - 0000000082023FFF]	Intel(R) I211 Gigabit Network Connection
[0000000082100000 - 000000008211FFFF]	Intel(R) Ethernet Connection I218-LM
[0000000082120000 - 000000008212FFFF]	Intel(R) USB 3.0 eXtensible Host Controller - 0100 (Microsoft)
[0000000082130000 - 0000000082133FFF]	High Definition Audio Controller
[0000000082134000 - 0000000082137FFF]	Mobile 5th Generation Intel(R) Core(TM) and Intel(R) Core(TM) M Audio Controller - 1
[0000000082138000 - 00000000821380FF]	Mobile 5th Generation Intel(R) Core(TM) SMBus Controller - 9CA2
[0000000082139000 - 00000000821397FF]	Mobile 5th Generation Intel(R) Core(TM) SATA Controller [AHCI Mode] - 9C83
[000000008213A000 - 000000008213A3FF]	Mobile 5th Generation Intel(R) Core(TM) USB EHCI Controller - 9CA6
[000000008213B000 - 000000008213BFFF]	Intel(R) Ethernet Connection I218-LM
[000000008213E000 - 000000008213E01F]	Intel(R) Management Engine Interface
[000000009000000000 - 000000009FFFFFFF]	Intel(R) HD Graphics 5500
[00000000F8000000 - 00000000FBFFFFFF]	Motherboard resources
[00000000FED00000 - 00000000FED003FF]	High precision event timer
[00000000FED10000 - 00000000FED17FFF]	Motherboard resources
[00000000FED18000 - 00000000FED18FFF]	Motherboard resources
[00000000FED19000 - 00000000FED19FFF]	Motherboard resources
[00000000FED1C000 - 00000000FED1FFFF]	Motherboard resources
[00000000FED20000 - 00000000FED3FFFF]	Motherboard resources
[00000000FED45000 - 00000000FED8FFFF]	Motherboard resources
[00000000FED90000 - 00000000FED93FFF]	Motherboard resources
[00000000FEE00000 - 00000000FEFFFFFF]	Motherboard resources
[00000000FF000000 - 00000000FFFFFFF]	Intel(R) 82802 Firmware Hub Device
[00000000FF000000 - 00000000FFFFFFF]	Motherboard resources



















































B.3 IRQ Mapping Chart















































Interrupt request (IRQ)	
(ISA) 0x00000000 (00)	System timer
(ISA) 0x00000001 (01)	Standard PS/2 Keyboard
(ISA) 0x00000003 (03)	Communications Port (COM2)
(ISA) 0x00000004 (04)	Communications Port (COM1)
(ISA) 0x00000007 (07)	Communications Port (COM3)
(ISA) 0x00000007 (07)	Communications Port (COM4)
(ISA) 0x00000007 (07)	Communications Port (COM5)
(ISA) 0x00000007 (07)	Communications Port (COM6)
(ISA) 0x00000008 (08)	System CMOS/real time clock
(ISA) 0x0000000B (11)	Mobile 5th Generation Intel(R) Core(TM) and Intel(R) Core(TM) M Audio Controller - 160C
(ISA) 0x0000000C (12)	Microsoft PS/2 Mouse
(ISA) 0x00000051 (81)	Microsoft ACPI-Compliant System
(ISA) 0x00000052 (82)	Microsoft ACPI-Compliant System
(ISA) 0x00000053 (83)	Microsoft ACPI-Compliant System
(ISA) 0x00000054 (84)	Microsoft ACPI-Compliant System
(ISA) 0x00000055 (85)	Microsoft ACPI-Compliant System
(ISA) 0x00000056 (86)	Microsoft ACPI-Compliant System
(ISA) 0x00000057 (87)	Microsoft ACPI-Compliant System
(ISA) 0x00000058 (88)	Microsoft ACPI-Compliant System
(ISA) 0x00000059 (89)	Microsoft ACPI-Compliant System
(ISA) 0x0000005A (90)	Microsoft ACPI-Compliant System
(ISA) 0x0000005B (91)	Microsoft ACPI-Compliant System
(ISA) 0x0000005C (92)	Microsoft ACPI-Compliant System
(ISA) 0x0000005D (93)	Microsoft ACPI-Compliant System
(ISA) 0x0000005E (94)	Microsoft ACPI-Compliant System
(ISA) 0x0000005F (95)	Microsoft ACPI-Compliant System
(ISA) 0x00000060 (96)	Microsoft ACPI-Compliant System
(ISA) 0x00000061 (97)	Microsoft ACPI-Compliant System
(ISA) 0x00000062 (98)	Microsoft ACPI-Compliant System
(ISA) 0x00000063 (99)	Microsoft ACPI-Compliant System
(ISA) 0x00000064 (100)	Microsoft ACPI-Compliant System
(ISA) 0x00000065 (101)	Microsoft ACPI-Compliant System
(ISA) 0x00000066 (102)	Microsoft ACPI-Compliant System
(ISA) 0x00000067 (103)	Microsoft ACPI-Compliant System
(ISA) 0x00000068 (104)	Microsoft ACPI-Compliant System
(ISA) 0x00000069 (105)	Microsoft ACPI-Compliant System
(ISA) 0x0000006A (106)	Microsoft ACPI-Compliant System
(ISA) 0x0000006B (107)	Microsoft ACPI-Compliant System
(ISA) 0x0000006C (108)	Microsoft ACPI-Compliant System
(ISA) 0x0000006D (109)	Microsoft ACPI-Compliant System
(ISA) 0x0000006E (110)	Microsoft ACPI-Compliant System
(ISA) 0x0000006F (111)	Microsoft ACPI-Compliant System
(ISA) 0x00000070 (112)	Microsoft ACPI-Compliant System
(ISA) 0x00000071 (113)	Microsoft ACPI-Compliant System
(ISA) 0x00000072 (114)	Microsoft ACPI-Compliant System
(ISA) 0x00000073 (115)	Microsoft ACPI-Compliant System
(ISA) 0x00000074 (116)	Microsoft ACPI-Compliant System
(ISA) 0x00000075 (117)	Microsoft ACPI-Compliant System
(ISA) 0x00000076 (118)	Microsoft ACPI-Compliant System


























 (ISA) 0x00000077 (119)	Microsoft ACPI-Compliant System
 (ISA) 0x00000078 (120)	Microsoft ACPI-Compliant System
 (ISA) 0x00000079 (121)	Microsoft ACPI-Compliant System
 (ISA) 0x0000007A (122)	Microsoft ACPI-Compliant System
 (ISA) 0x0000007B (123)	Microsoft ACPI-Compliant System
 (ISA) 0x0000007C (124)	Microsoft ACPI-Compliant System
 (ISA) 0x0000007D (125)	Microsoft ACPI-Compliant System
 (ISA) 0x0000007E (126)	Microsoft ACPI-Compliant System
 (ISA) 0x0000007F (127)	Microsoft ACPI-Compliant System
 (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
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 (ISA) 0x000000BD (189)	Microsoft ACPI-Compliant System
 (ISA) 0x000000BE (190)	Microsoft ACPI-Compliant System
 (ISA) 0x000000BF (191)	Microsoft ACPI-Compliant System
 (ISA) 0x00000100 (256)	Microsoft ACPI-Compliant System
 (ISA) 0x00000101 (257)	Microsoft ACPI-Compliant System



















































 (ISA) 0x00000102 (258)	Microsoft ACPI-Compliant System
 (ISA) 0x00000103 (259)	Microsoft ACPI-Compliant System
 (ISA) 0x00000104 (260)	Microsoft ACPI-Compliant System
 (ISA) 0x00000105 (261)	Microsoft ACPI-Compliant System
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 (ISA) 0x0000010C (268)	Microsoft ACPI-Compliant System
 (ISA) 0x0000010D (269)	Microsoft ACPI-Compliant System
 (ISA) 0x0000010E (270)	Microsoft ACPI-Compliant System
 (ISA) 0x0000010F (271)	Microsoft ACPI-Compliant System
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 (ISA) 0x00000117 (279)	Microsoft ACPI-Compliant System
 (ISA) 0x00000118 (280)	Microsoft ACPI-Compliant System
 (ISA) 0x00000119 (281)	Microsoft ACPI-Compliant System
 (ISA) 0x0000011A (282)	Microsoft ACPI-Compliant System


















































 (ISA) 0x0000011B (283)	Microsoft ACPI-Compliant System
 (ISA) 0x0000011C (284)	Microsoft ACPI-Compliant System
 (ISA) 0x0000011D (285)	Microsoft ACPI-Compliant System
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 (ISA) 0x00000140 (320)	Microsoft ACPI-Compliant System
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 (ISA) 0x0000014A (330)	Microsoft ACPI-Compliant System
 (ISA) 0x0000014B (331)	Microsoft ACPI-Compliant System
 (ISA) 0x0000014C (332)	Microsoft ACPI-Compliant System

 (ISA) 0x0000014D (333)	Microsoft ACPI-Compliant System
 (ISA) 0x0000014E (334)	Microsoft ACPI-Compliant System
 (ISA) 0x0000014F (335)	Microsoft ACPI-Compliant System
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 (ISA) 0x00000151 (337)	Microsoft ACPI-Compliant System
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 (ISA) 0x00000173 (371)	Microsoft ACPI-Compliant System
 (ISA) 0x00000174 (372)	Microsoft ACPI-Compliant System
 (ISA) 0x00000175 (373)	Microsoft ACPI-Compliant System
 (ISA) 0x00000176 (374)	Microsoft ACPI-Compliant System
 (ISA) 0x00000177 (375)	Microsoft ACPI-Compliant System
 (ISA) 0x00000178 (376)	Microsoft ACPI-Compliant System
 (ISA) 0x00000179 (377)	Microsoft ACPI-Compliant System
 (ISA) 0x0000017A (378)	Microsoft ACPI-Compliant System
(ISA) 0x0000017B (379)	Microsoft ACPI-Compliant System
(ISA) 0x0000017C (380)	Microsoft ACPI-Compliant System
(ISA) 0x0000017D (381)	Microsoft ACPI-Compliant System
(ISA) 0x0000017E (382)	Microsoft ACPI-Compliant System

 (ISA) 0x0000017F (383)	Microsoft ACPI-Compliant System
 (ISA) 0x00000180 (384)	Microsoft ACPI-Compliant System
 (ISA) 0x00000181 (385)	Microsoft ACPI-Compliant System
 (ISA) 0x00000182 (386)	Microsoft ACPI-Compliant System
 (ISA) 0x00000183 (387)	Microsoft ACPI-Compliant System
 (ISA) 0x00000184 (388)	Microsoft ACPI-Compliant System
 (ISA) 0x00000185 (389)	Microsoft ACPI-Compliant System
 (ISA) 0x00000186 (390)	Microsoft ACPI-Compliant System
 (ISA) 0x00000187 (391)	Microsoft ACPI-Compliant System
 (ISA) 0x00000188 (392)	Microsoft ACPI-Compliant System
 (ISA) 0x00000189 (393)	Microsoft ACPI-Compliant System
 (ISA) 0x0000018A (394)	Microsoft ACPI-Compliant System
 (ISA) 0x0000018B (395)	Microsoft ACPI-Compliant System
 (ISA) 0x0000018C (396)	Microsoft ACPI-Compliant System
 (ISA) 0x0000018D (397)	Microsoft ACPI-Compliant System
 (ISA) 0x0000018E (398)	Microsoft ACPI-Compliant System
 (ISA) 0x0000018F (399)	Microsoft ACPI-Compliant System
 (ISA) 0x00000190 (400)	Microsoft ACPI-Compliant System
 (ISA) 0x00000191 (401)	Microsoft ACPI-Compliant System
 (ISA) 0x00000192 (402)	Microsoft ACPI-Compliant System
 (ISA) 0x00000193 (403)	Microsoft ACPI-Compliant System
 (ISA) 0x00000194 (404)	Microsoft ACPI-Compliant System
 (ISA) 0x00000195 (405)	Microsoft ACPI-Compliant System
 (ISA) 0x00000196 (406)	Microsoft ACPI-Compliant System
 (ISA) 0x00000197 (407)	Microsoft ACPI-Compliant System

 (ISA) 0x00000198 (408)	Microsoft ACPI-Compliant System
 (ISA) 0x00000199 (409)	Microsoft ACPI-Compliant System
 (ISA) 0x0000019A (410)	Microsoft ACPI-Compliant System
 (ISA) 0x0000019B (411)	Microsoft ACPI-Compliant System
 (ISA) 0x0000019C (412)	Microsoft ACPI-Compliant System
 (ISA) 0x0000019D (413)	Microsoft ACPI-Compliant System
 (ISA) 0x0000019E (414)	Microsoft ACPI-Compliant System
 (ISA) 0x0000019F (415)	Microsoft ACPI-Compliant System
 (ISA) 0x000001A0 (416)	Microsoft ACPI-Compliant System
 (ISA) 0x000001A1 (417)	Microsoft ACPI-Compliant System
 (ISA) 0x000001A2 (418)	Microsoft ACPI-Compliant System
 (ISA) 0x000001A3 (419)	Microsoft ACPI-Compliant System
 (ISA) 0x000001A4 (420)	Microsoft ACPI-Compliant System
 (ISA) 0x000001A5 (421)	Microsoft ACPI-Compliant System
 (ISA) 0x000001A6 (422)	Microsoft ACPI-Compliant System
 (ISA) 0x000001A7 (423)	Microsoft ACPI-Compliant System
 (ISA) 0x000001A8 (424)	Microsoft ACPI-Compliant System
 (ISA) 0x000001A9 (425)	Microsoft ACPI-Compliant System
 (ISA) 0x000001AA (426)	Microsoft ACPI-Compliant System
 (ISA) 0x000001AB (427)	Microsoft ACPI-Compliant System
 (ISA) 0x000001AC (428)	Microsoft ACPI-Compliant System
 (ISA) 0x000001AD (429)	Microsoft ACPI-Compliant System
 (ISA) 0x000001AE (430)	Microsoft ACPI-Compliant System
 (ISA) 0x000001AF (431)	Microsoft ACPI-Compliant System
 (ISA) 0x000001B0 (432)	Microsoft ACPI-Compliant System

 (ISA) 0x00001B1 (433)	Microsoft ACPI-Compliant System
 (ISA) 0x00001B2 (434)	Microsoft ACPI-Compliant System
 (ISA) 0x00001B3 (435)	Microsoft ACPI-Compliant System
 (ISA) 0x00001B4 (436)	Microsoft ACPI-Compliant System
 (ISA) 0x00001B5 (437)	Microsoft ACPI-Compliant System
 (ISA) 0x00001B6 (438)	Microsoft ACPI-Compliant System
 (ISA) 0x00001B7 (439)	Microsoft ACPI-Compliant System
 (ISA) 0x00001B8 (440)	Microsoft ACPI-Compliant System
 (ISA) 0x00001B9 (441)	Microsoft ACPI-Compliant System
 (ISA) 0x00001BA (442)	Microsoft ACPI-Compliant System
 (ISA) 0x00001BB (443)	Microsoft ACPI-Compliant System
 (ISA) 0x00001BC (444)	Microsoft ACPI-Compliant System
 (ISA) 0x00001BD (445)	Microsoft ACPI-Compliant System
 (ISA) 0x00001BE (446)	Microsoft ACPI-Compliant System
 (ISA) 0x00001BF (447)	Microsoft ACPI-Compliant System
 (ISA) 0x00001C0 (448)	Microsoft ACPI-Compliant System
 (ISA) 0x00001C1 (449)	Microsoft ACPI-Compliant System
 (ISA) 0x00001C2 (450)	Microsoft ACPI-Compliant System
 (ISA) 0x00001C3 (451)	Microsoft ACPI-Compliant System
 (ISA) 0x00001C4 (452)	Microsoft ACPI-Compliant System
 (ISA) 0x00001C5 (453)	Microsoft ACPI-Compliant System
 (ISA) 0x00001C6 (454)	Microsoft ACPI-Compliant System
 (ISA) 0x00001C7 (455)	Microsoft ACPI-Compliant System
 (ISA) 0x00001C8 (456)	Microsoft ACPI-Compliant System
 (ISA) 0x00001C9 (457)	Microsoft ACPI-Compliant System
 (ISA) 0x00001CA (458)	Microsoft ACPI-Compliant System
 (ISA) 0x00001CB (459)	Microsoft ACPI-Compliant System
 (ISA) 0x00001CC (460)	Microsoft ACPI-Compliant System
 (ISA) 0x00001CD (461)	Microsoft ACPI-Compliant System
 (ISA) 0x00001CE (462)	Microsoft ACPI-Compliant System
 (ISA) 0x00001CF (463)	Microsoft ACPI-Compliant System
 (ISA) 0x00001D0 (464)	Microsoft ACPI-Compliant System
 (ISA) 0x00001D1 (465)	Microsoft ACPI-Compliant System
 (ISA) 0x00001D2 (466)	Microsoft ACPI-Compliant System
 (ISA) 0x00001D3 (467)	Microsoft ACPI-Compliant System
 (ISA) 0x00001D4 (468)	Microsoft ACPI-Compliant System
 (ISA) 0x00001D5 (469)	Microsoft ACPI-Compliant System
 (ISA) 0x00001D6 (470)	Microsoft ACPI-Compliant System
 (ISA) 0x00001D7 (471)	Microsoft ACPI-Compliant System
 (ISA) 0x00001D8 (472)	Microsoft ACPI-Compliant System
 (ISA) 0x00001D9 (473)	Microsoft ACPI-Compliant System
 (ISA) 0x00001DA (474)	Microsoft ACPI-Compliant System
 (ISA) 0x00001DB (475)	Microsoft ACPI-Compliant System
 (ISA) 0x00001DC (476)	Microsoft ACPI-Compliant System
 (ISA) 0x00001DD (477)	Microsoft ACPI-Compliant System
 (ISA) 0x00001DE (478)	Microsoft ACPI-Compliant System
 (ISA) 0x00001DF (479)	Microsoft ACPI-Compliant System
 (ISA) 0x00001E0 (480)	Microsoft ACPI-Compliant System
 (ISA) 0x00001E1 (481)	Microsoft ACPI-Compliant System
 (ISA) 0x00001E2 (482)	Microsoft ACPI-Compliant System

	(ISA) 0x000001E3 (483)	Microsoft ACPI-Compliant System
	(ISA) 0x000001E4 (484)	Microsoft ACPI-Compliant System
	(ISA) 0x000001E5 (485)	Microsoft ACPI-Compliant System
	(ISA) 0x000001E6 (486)	Microsoft ACPI-Compliant System
	(ISA) 0x000001E7 (487)	Microsoft ACPI-Compliant System
	(ISA) 0x000001E8 (488)	Microsoft ACPI-Compliant System
	(ISA) 0x000001E9 (489)	Microsoft ACPI-Compliant System
	(ISA) 0x000001EA (490)	Microsoft ACPI-Compliant System
	(ISA) 0x000001EB (491)	Microsoft ACPI-Compliant System
	(ISA) 0x000001EC (492)	Microsoft ACPI-Compliant System
	(ISA) 0x000001ED (493)	Microsoft ACPI-Compliant System
	(ISA) 0x000001EE (494)	Microsoft ACPI-Compliant System
	(ISA) 0x000001EF (495)	Microsoft ACPI-Compliant System
	(ISA) 0x000001F0 (496)	Microsoft ACPI-Compliant System
	(ISA) 0x000001F1 (497)	Microsoft ACPI-Compliant System
	(ISA) 0x000001F2 (498)	Microsoft ACPI-Compliant System
	(ISA) 0x000001F3 (499)	Microsoft ACPI-Compliant System
	(ISA) 0x000001F4 (500)	Microsoft ACPI-Compliant System
	(ISA) 0x000001F5 (501)	Microsoft ACPI-Compliant System
	(ISA) 0x000001F6 (502)	Microsoft ACPI-Compliant System
	(ISA) 0x000001F7 (503)	Microsoft ACPI-Compliant System
	(ISA) 0x000001F8 (504)	Microsoft ACPI-Compliant System
	(ISA) 0x000001F9 (505)	Microsoft ACPI-Compliant System
	(ISA) 0x000001FA (506)	Microsoft ACPI-Compliant System
	(ISA) 0x000001FB (507)	Microsoft ACPI-Compliant System
<hr/>		
	(ISA) 0x000001F6 (502)	Microsoft ACPI-Compliant System
	(ISA) 0x000001F7 (503)	Microsoft ACPI-Compliant System
	(ISA) 0x000001F8 (504)	Microsoft ACPI-Compliant System
	(ISA) 0x000001F9 (505)	Microsoft ACPI-Compliant System
	(ISA) 0x000001FA (506)	Microsoft ACPI-Compliant System
	(ISA) 0x000001FB (507)	Microsoft ACPI-Compliant System
	(ISA) 0x000001FC (508)	Microsoft ACPI-Compliant System
	(ISA) 0x000001FD (509)	Microsoft ACPI-Compliant System
	(ISA) 0x000001FE (510)	Microsoft ACPI-Compliant System
	(ISA) 0x000001FF (511)	Microsoft ACPI-Compliant System
	(PCI) 0x0000000B (11)	Mobile 5th Generation Intel(R) Core(TM) SMBus Controller - 9CA2
	(PCI) 0x00000013 (19)	Mobile 5th Generation Intel(R) Core(TM) SATA Controller [AHCI Mode] - 9C83
	(PCI) 0x00000016 (22)	High Definition Audio Controller
	(PCI) 0x00000017 (23)	Mobile 5th Generation Intel(R) Core(TM) USB EHCI Controller - 9CA6
	(PCI) 0xFFFFFFFF5 (-11)	Intel(R) I211 Gigabit Network Connection
	(PCI) 0xFFFFFFFF6 (-10)	Intel(R) I211 Gigabit Network Connection
	(PCI) 0xFFFFFFFF7 (-9)	Intel(R) I211 Gigabit Network Connection
	(PCI) 0xFFFFFFFF8 (-8)	Intel(R) I211 Gigabit Network Connection
	(PCI) 0xFFFFFFFF9 (-7)	Intel(R) Ethernet Connection I218-LM
	(PCI) 0xFFFFFFFFFA (-6)	Intel(R) Management Engine Interface
	(PCI) 0xFFFFFFFFFB (-5)	Intel(R) USB 3.0 eXtensible Host Controller - 0100 (Microsoft)
	(PCI) 0xFFFFFFFFFC (-4)	Intel(R) HD Graphics 5500
	(PCI) 0xFFFFFFFFFD (-3)	Intel(R) 82801 PCI Bridge - 2448
	(PCI) 0xFFFFFFFFFE (-2)	Mobile 5th Generation Intel(R) Core(TM) PCI Express Root Port #4 - 9C96

B.4 DMA Channel Assignments

