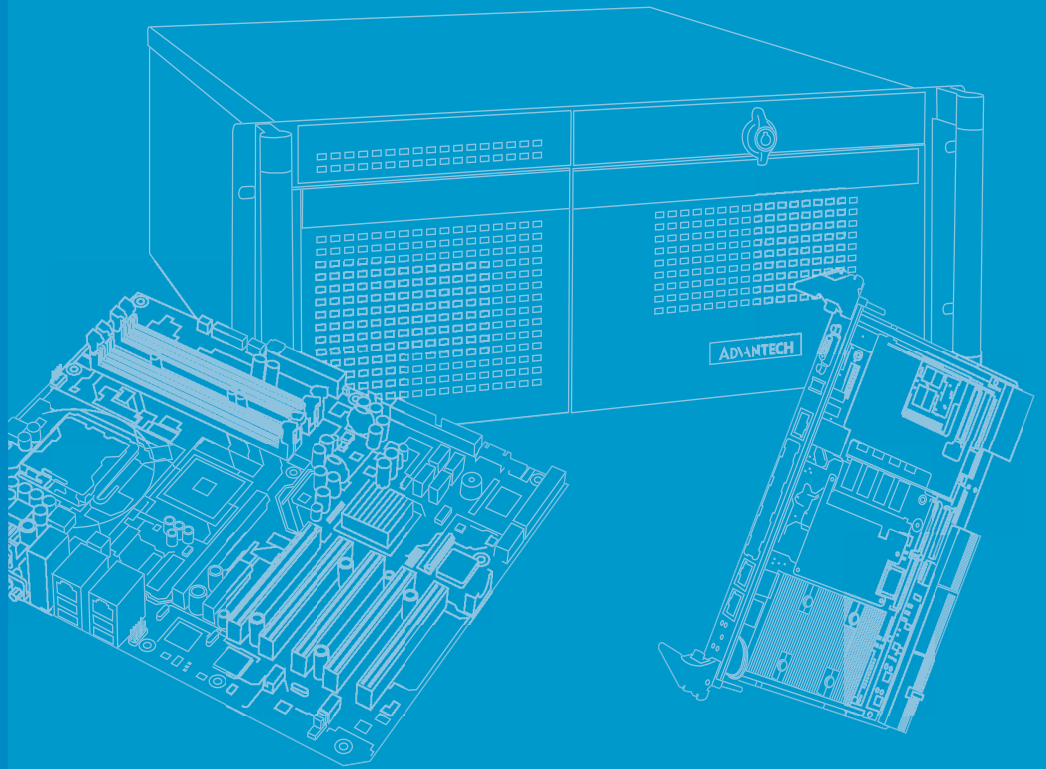




MIC-7420

19", 2U Fanless System with
Intel® 6th Gen Core™ i
Processor

ADVANTECH

Enabling an Intelligent Planet

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5. Write the RMA number visibly on the outside of the package and ship it prepaid to your dealer.

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While unpacking MIC-7420, please ensure that the following items are included in your shipment:

- 1 x MIC-7420 IPC
- 1 x MIC-7420 accessory box
- 1 x Warranty card

If any of these items are missing or damaged, contact your distributor or sales representative immediately. All MIC-7420 devices are mechanically and electrically inspected before shipment. Thus, your product should be free of marks and scratches and in perfect working order upon receipt. While unpacking MIC-7420, check the product for signs of shipping damage (for example, a damaged box, scratches, dents, etc.). If the device is damaged or fails to meet the specifications, notify our service department or your local sales representative immediately. Please also notify the carrier. Retain the shipping carton and packing material for inspection by the carrier. After this inspection, we will make arrangements to repair or replace the unit.

Warnings, Cautions, and Notes

Warning! Warnings indicate conditions, which if not observed, can cause personal injury!



Caution! Cautions are included to help you avoid damaging hardware or losing data. e.g.



There is a danger of a new battery exploding if it is incorrectly installed. Replace the battery only with the same or equivalent type recommended by the manufacturer. Discard used batteries according to the manufacturer's instructions.

Note! Notes provide optional additional information.



Safety Instructions

1. Read these safety instructions carefully.
2. Keep this User Manual for later reference.
3. Disconnect this equipment from any AC outlet before cleaning. Use a damp cloth. Do not use liquid or spray detergents for cleaning.
4. For plug-in equipment, the power outlet socket must be located near the equipment and must be easily accessible.
5. Keep this equipment away from humidity.
6. Put this equipment on a reliable surface during installation. Dropping it or letting it fall may cause damage.
7. Make sure the voltage of the power source is correct before connecting the equipment to the power outlet.
8. Position the power cord so that people cannot step on it. Do not place anything over the power cord.
9. All cautions and warnings on the equipment should be noted.
10. If the equipment is not used for a long time, disconnect it from the power source to avoid damage by transient overvoltage.
11. Never pour any liquid into an opening. This may cause fire or electrical shock.
12. Never open the equipment. For safety reasons, the equipment should be opened only by qualified service personnel.
13. If one of the following situations arises, get the equipment checked by service personnel:
 - The power cord or plug is damaged.
 - Liquid has penetrated into the equipment.
 - The equipment has been exposed to moisture.
 - The equipment does not work well, or you cannot get it to work according to the user's manual.
 - The equipment has been dropped and damaged.
 - The equipment has obvious signs of breakage.
14. DO NOT LEAVE THIS EQUIPMENT IN AN ENVIRONMENT WHERE THE STORAGE TEMPERATURE MAY GO BELOW -25° C (-13° F) OR ABOVE 60° C (140° F). THIS COULD DAMAGE THE EQUIPMENT.
15. This equipment has been tested and found to comply with the requirements for a Class A digital device. Operation of this equipment in a residential area is likely to cause harmful interference to radio communications; in such events, users are required to correct this interference.
16. This equipment is sold without a power cord. Users are advised to purchase a CCC-certified power cord.

CAUTION: THE COMPUTER IS PROVIDED WITH A BATTERY-POWERED REAL-TIME CLOCK CIRCUIT. THERE IS A DANGER OF EXPLOSION IF BATTERY IS INCORRECTLY REPLACED. REPLACE ONLY WITH THE SAME OR EQUIVALENT TYPE RECOMMENDED BY THE MANUFACTURER, DISCARD USED BATTERIES ACCORDING TO THE MANUFACTURER'S INSTRUCTIONS.

The sound pressure level at the operator's position according to IEC 704-1:1982 is no more than 70 dB (A).

DISCLAIMER: This set of instructions is given according to IEC 704-1. Advantech disclaims all responsibility for the accuracy of any statements contained herein.

CAUTION

DOUBLE POLE / NEUTRAL FUSING

The fuses must be replaced by service person. Service person shall fully disconnect the power before servicing to avoid the risk of electric shock.

Safety Precaution - Static Electricity

Follow these simple precautions to protect yourself from harm and the products from damage.

- To avoid electrical shock, always disconnect the power from your PC chassis before you work on it. Don't touch any components on the CPU card or other cards while the PC is on.
- Disconnect power before making any configuration changes. The sudden rush of power as you connect a jumper or install a card may damage sensitive electronic components.

Always disconnect the power cord from the chassis when making adjustments. Do not connect when the power is on. A sudden rush of power can damage sensitive electronic components. Only experienced electronics personnel should open the chassis. Always ground yourself to remove any static electric charge before touching the motherboard, backplane, or add-on cards. Modern electronic devices are very sensitive to static electric charges. Use a grounding wrist strap at all times. Place all electronic components on a static-dissipative surface or in a static- shielded bag.

Contents

Chapter 1	Overview	1
1.1	Introduction	2
1.2	Specification	2
1.3	Environment	2
	Table 1.1: Environment	2
1.4	Dimensions	3
	Figure 1.1 MIC-7420 Dimension	3
Chapter 2	Industrial Motherboard	5
2.1	Introduction	6
2.2	System View and LED Indicator	6
2.2.1	System View	6
	Figure 2.1 Front View	6
	Figure 2.2 Rear View	6
2.2.2	System Status LED Indicator	6
2.2.3	Network Interface LED Indicator	7
2.2.4	Serial Port Status LED Indicator	7
2.3	Jumpers and Connectors	7
2.3.1	Jumper Description	7
2.3.2	Jumper and Connector Location	8
	Figure 2.3 Jumper and Connector Location on Main Board	8
	Table 2.1: Jumpers	8
	Table 2.2: JCMOS1: Clear CMOS Settings	9
	Table 2.3: PSON1: Start-up Mode Selection	9
	Table 2.4: VCCGPIO1: GPIO Voltage Selection	9
2.4	I/O Connector	10
2.4.1	COM Connector	10
	Table 2.5: COM Connectors	10
2.4.2	DVI-D Connector	10
	Table 2.6: DVI-D Connector	10
2.4.3	DVI-I Connector	11
	Table 2.7: DVI-I Connector	11
2.4.4	USB 2.0 Connector	11
	Table 2.8: USB2.0 Pin Assignment	11
2.4.5	USB 3.0 Connector	12
	Table 2.9: USB 3.0 Pin Assignment	12
2.4.6	Audio-in Connector	12
2.4.7	LAN Connector	13
	Table 2.10: LAN Connector	13
Chapter 3	System Installation	15
3.1	Introduction	16
3.1.1	Installing mainboard mini-PCle and M.2 cards	16
	Figure 3.1 Installing M.2 and mini-PCle	16
3.1.2	Installing the HDD Module	16
	Figure 3.2 Installing HDD Module	17
3.1.3	Installing the Top Cover	18
	Figure 3.3 Installing the Top Cover	18
3.1.4	Installing Ears and Handles	19
	Figure 3.4 Installing the Foot Stand	19
3.1.5	Installing the add-on card	19

Figure 3.5 Installing the add-on card	19
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Chapter 4 AMI BIOS Setting 21

4.1	Introduction	22
	Figure 4.1 Setup Program Initial Screen	22
4.2	Entering Setup	23
4.2.1	Main Setup.....	23
	Figure 4.2 Main Setup Screen.....	23
4.2.2	Advanced BIOS Features Setup.....	24
	Figure 4.3 Advanced BIOS Features Setup Screen.....	24
	Figure 4.4 Trusted Computing.....	25
	Figure 4.5 AMT Configuration	25
	Figure 4.6 PCH-FW Configuration.....	26
	Figure 4.7 F81866 Super IO Configuration	27
	Figure 4.8 Serial Port Configuration	27
	Figure 4.9 Hardware Monitor.....	28
	Figure 4.10 Serial Port Console Redirection	28
	Figure 4.11 CPU Configuration	29
	Figure 4.12 SATA Configuration.....	31
	Figure 4.13 Network Stack Configuration	32
4.2.3	Advanced Chipset Features Setup	36
	Figure 4.14 Intel Graphics Configuration	37
	Figure 4.15 PEG Port Configuration.....	39
	Figure 4.16 PCI Express Configuration	41
4.3	Boot Setup	42
	Figure 4.17 Boot Setup.....	42
4.3.1	Boot Configuration	42
4.4	Security Setup.....	43
	Figure 4.18 Setup Security Menu	43
4.4.1	Save & Exit Setup.....	44
	Figure 4.19 Setup Save & Exit Menu	44

Chapter 5 Driver Installation..... 47

5.1	Introduction	48
5.2	Driver Installation	48
5.2.1	Chipset Windows Driver Setup	49
5.2.2	Windows Driver Setup	49
5.2.3	LAN windows Driver Setup	50
5.2.4	AUDIO windows Driver Setup.....	50
5.2.5	ME windows Driver Setup.....	51
5.2.6	RST windows Driver Setup.....	51
5.2.7	Serial IO windows Driver Setup	52
5.2.8	USB3.0 windows Driver Setup.....	53

Appendix A Programming the Watchdog Timer . 55

A.1	Programming the Watchdog Timer	56
A.1.1	Watchdog Timer Overview	56
A.1.2	Programming the Watchdog Timer.....	56
	Table A.1: Watchdog Timer Registers.....	56
A.1.3	Example Program	57

Chapter 1

Overview

1.1 Introduction

MIC-7420 is a 19", 2U Fanless system with Intel® 6th Gen Core™ i Processor. Based on Core i7 Quad-core processor, it is a comprehensive monitoring and communication management system. The powerful computing platform supports 7/24 operation.

1.2 Specification

- **Chipset:** Intel® 6th Gen Core™ i7/i3 (BGA type) processor with Intel® QM170 chipset
- **BIOS:** AMI SPI 128 Mb Flash
- **Memory:**
 - 8GB DDR4 2133MHz on-board memory
 - 1 x 260-pins DDR4 SODIMM socket, supports up to 16GB
- **Display:** Intel® HD Graphics 530, supports DirectX 12
- **Display Mode:**
 - 1 x DVI-D display resolution: 1920 x 1200 @ 60 Hz
 - 1 x DVI-I display resolution: 1920 x 1200 @ 60 Hz
- **Storage:** 2 x 3.5" or 2 x 2.5" HDD socket
- **Expansion Slot:**
 - 1 x M.2 socket (2260 M-Key, with SATA interface)
 - 2 x PCIe4 and 2 x PCI slots, support size 108(H) x 172(L) mm
- **Ethernet:**
 - LAN 1: Intel® i219-LM; LAN 2: Intel® i210IT
 - 2 x 10/100/1000Mb RJ45 Ethernet connector
 - Both LANs support Wake-on LAN function
- **USB:** 2 x USB3.0, 6 x USB2.0
- **Serial Port:** 2 x DB9 ports, support RS-232/422/485 with 2.5KV Isolation protection
- **Audio:** 1 x Speaker-out with 2 x 4W amplifier, 1 x Mic-in
- **Power input:** 100 ~ 240VAC or 110VDC
- **Dimension (W x H x D):** 427 x 88 x 325 mm
- **Weight:** 6.8kg(14.96lb)

1.3 Environment

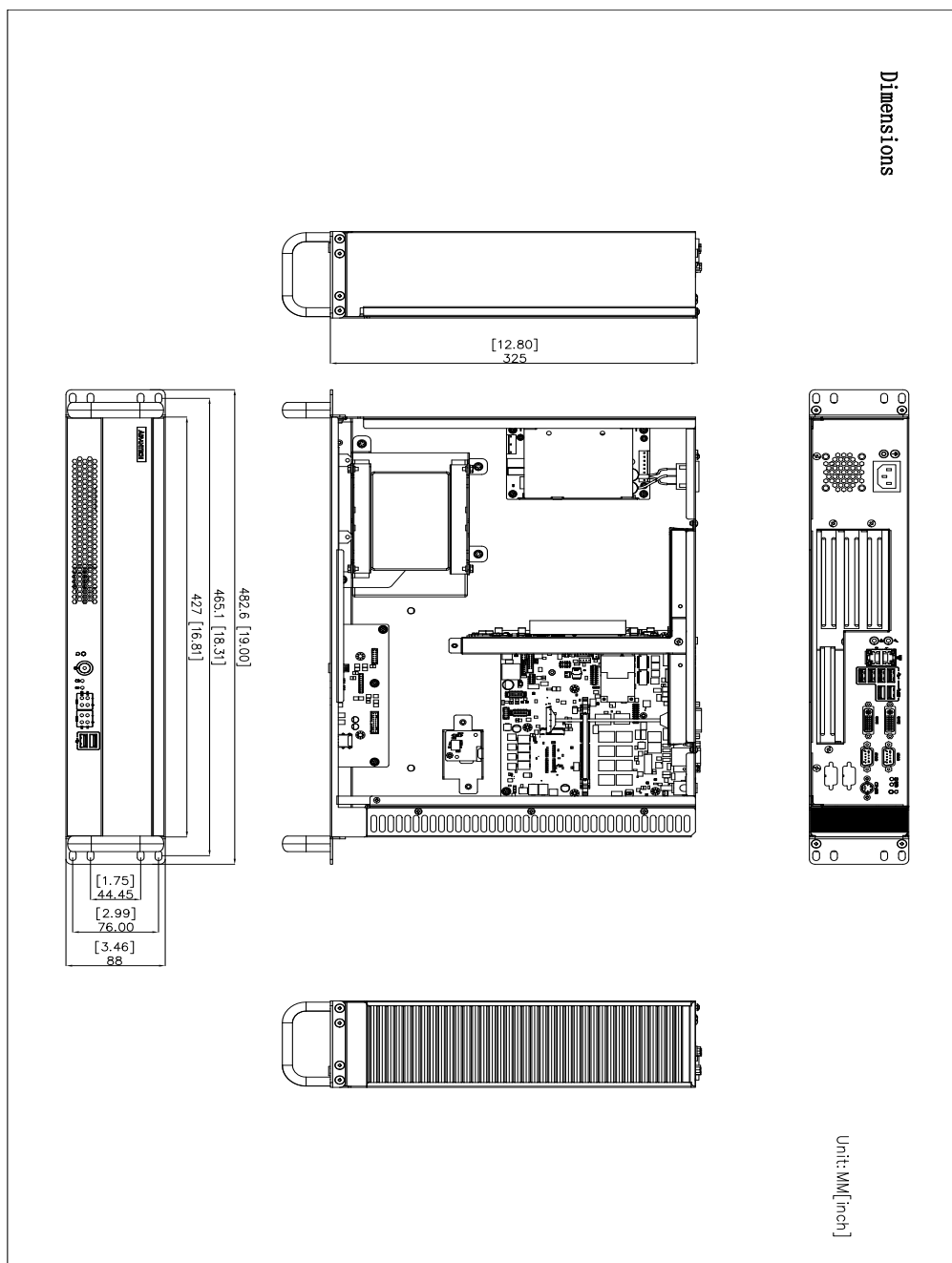
Table 1.1: Environment

Operating temperature	With industrial HDD: 0~40°C
	With SSD only: -20~60°C (0.7m/s air-flow)
	With SSD and add-on card: -20~40°C (0.7m/s air-flow)
Storage temperature	-40~85°C
Temperature	95% @ 40°C, non-condensing
Vibration	With SSD: 2Grms @ 5~500 Hz, random, 1hr/axis
	With HDD: 1Grms @ 5~500 Hz, random, 1hr/axis
	IEC60068-2-6 Sine 2G @ 5~500Hz, 1hr/axis

Table 1.1: Environment

Shock	10G, IEC-68-2-27, half sine wave, 11ms duration
	With 2.5-inch HDD: 10G, IEC-68-2-27, half sine wave, 11ms duration
Certificate	CCC/CE/FCC/CB/UL compliant

1.4 Dimensions

**Figure 1.1 MIC-7420 Dimension**

Chapter 2

Industrial Motherboard

2.1 Introduction

This chapter introduces internal jumper settings and external pin assignments for application integration.

2.2 System View and LED Indicator

2.2.1 System View

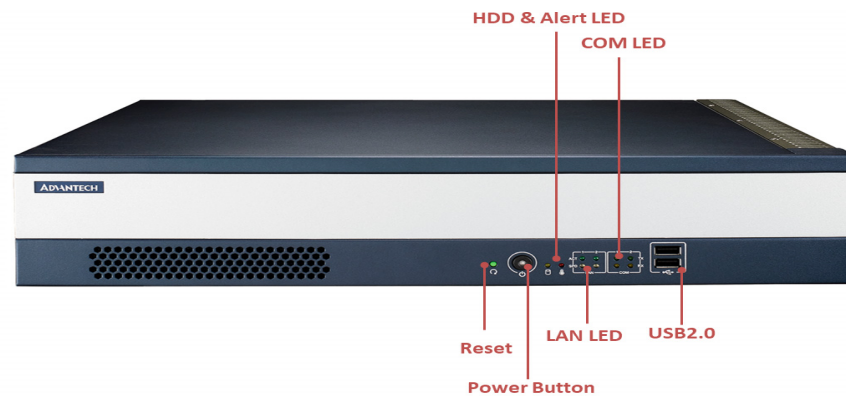


Figure 2.1 Front View

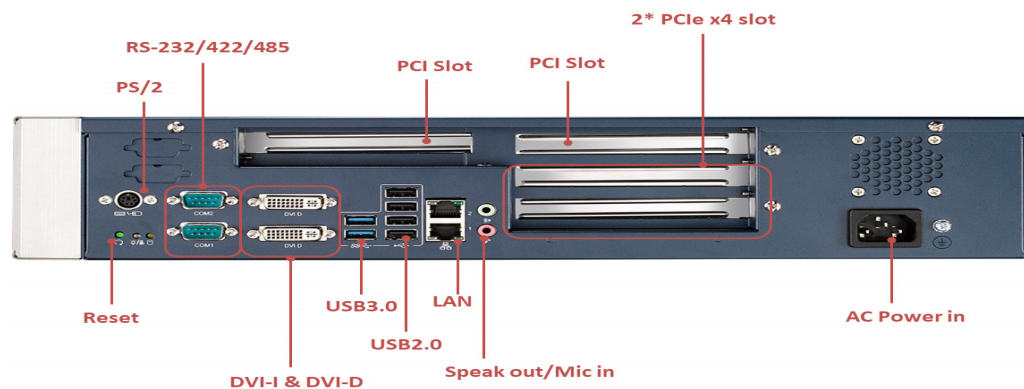


Figure 2.2 Rear View

2.2.2 System Status LED Indicator

The LED indicator at the bottom left of the front panel indicates system link/activity status.

The following table provides detailed information of LED definition.

Item	LED	Status	Color	Description
1	Alarm LED	On	Red	System exception.
2	HDD LED	Flash	Orange	Receiving/transferring data.
		Off		No data is being received/transferred.
3	Power LED	On	Green	System power on
		Off	Orange	System power off

2.2.3 Network Interface LED Indicator

The following table provides detailed information of LED definition.

Item	LED	Status	Color	Description
1	1000M	On	Green	1000M Receiving/transferring network data.
	100M	On	Orange	100M Receiving/transferring network data.
	10M	Off		10M Receiving/transferring network data.
	Connected	Flash	Green	Connecting.

2.2.4 Serial Port Status LED Indicator

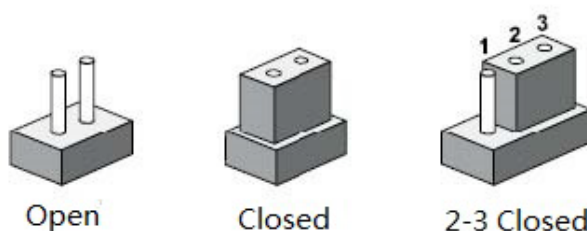
The following table provides detailed information of LED definition.

Item	LED	Status	Color	Description
1	TX Active	Flash	Green	Transferring data through the serial port.
	TX No Data	Off		No data is being transferred through the serial port.
	RX Active	Flash	Orange	Receiving data through the serial port.
	RX No Data	Off		No data is being received through the serial port.

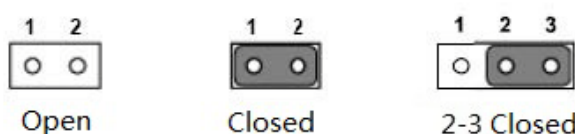
2.3 Jumpers and Connectors

2.3.1 Jumper Description

You may configure the MIC-7420 to match the needs of your application by setting jumpers. A jumper is a metal bridge used to close an electric circuit. It consists of two metal pins and a small metal clip (often protected by a plastic cover) that slides over the pins to connect them. To close a jumper, you remove the clip. Sometime a jumper will have three pins, labelled 1, 2 and 3. In this case you would connect either pins 1 and 2, or 2 and 3.



The jumpers setting are schematically depicted in this manual as follows.



A pair of needle-nose pliers may be helpful when working with jumpers. If you have any doubts about the best hardware configuration for your application, contact your local distributor or sales representative before you make any changes. Generally, you simply need a standard cable to make most connections.

2.3.2 Jumper and Connector Location

The board has a number of connectors and jumpers that allow you to configure your system to suit your application. The table below lists the function of each of the connectors and jumpers. The locations of jumpers and connector on the board are shown in Figure 2.3.

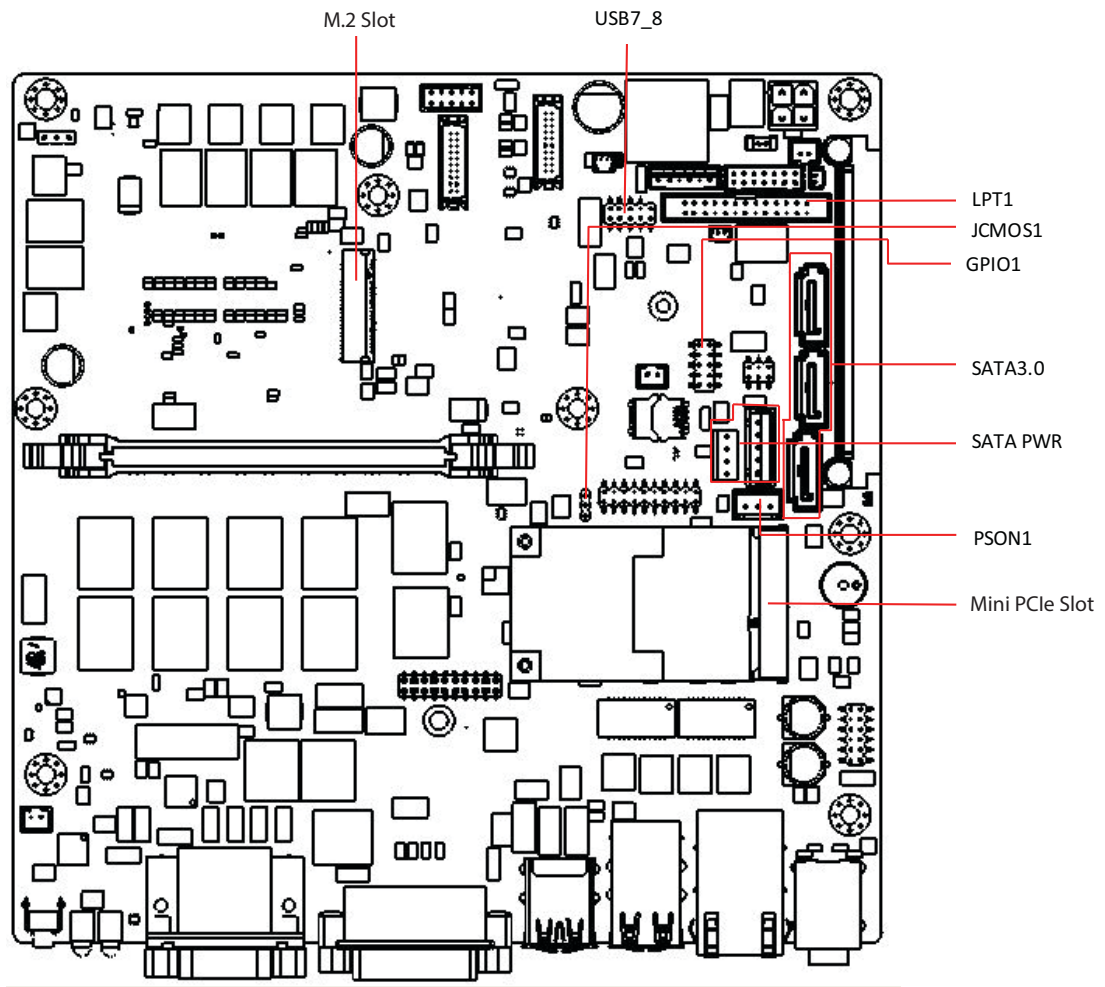


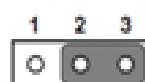
Figure 2.3 Jumper and Connector Location on Main Board

Table 2.1: Jumpers

Name	Function
JCMOS1	Clear CMOS settings
PS0N1	Start-up mode selection
VCCGPIO1	GPIO voltage selection



Default setting



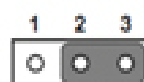
Clear CMOS setting

Table 2.2: JCMOS1: Clear CMOS Settings

Closed Pins	Setting
1-2	Normal*
2-3	Clear CMOS settings
*Default setting	



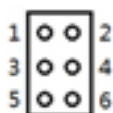
AT mode



ATX mode

Table 2.3: PSON1: Start-up Mode Selection

Closed Pins	Setting
1-2	AT mode
2-3	ATX mode*
*Default setting	

**Table 2.4: VCCGPIO1: GPIO Voltage Selection**

Closed Pins	Setting
1-3	+V5_SB*
2-4	+V3.3_SB
3-5	+V5
4-6	+V3.3
*Default setting	

2.4 I/O Connector

2.4.1 COM Connector

MIC-7420 provides two DB9 connectors for RS-232/422/485.

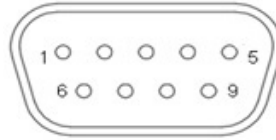


Table 2.5: COM Connectors

	RS-232	RS-422	RS-485
Pin	Signal Name	Signal Name	Signal Name
1	DCD	Tx-	DATA-
2	RxD	Tx+	DATA+
3	TxD	Rx+	NC
4	DTR	Rx-	NC
5	GND	GND	GND
6	DSR	NC	NC
7	RTS	NC	NC
8	CTS	NC	NC
9	RI	NC	NC

2.4.2 DVI-D Connector

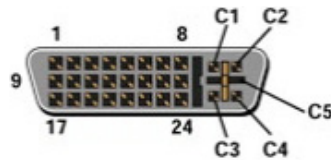


Table 2.6: DVI-D Connector

Pin	Signal	Pin	Signal
1	T.M.D.S. Data2-	16	Hot Plug Detect
2	T.M.D.S. Data2+	17	T.M.D.S. Data0-
3	Ground	18	T.M.D.S. Data0+
4	VGA DCC Clock	19	Ground
5	VGA DCC Data	20	Ground
6	DDC Clock	21	Ground
7	DDC Data	22	DVI Detect
8	Analog Vertical Sync	23	T.M.D.S. Clock+
9	T.M.D.S. Data1-	24	T.M.D.S. Clock
10	T.M.D.S. Data1+	C1	N/A
11	Ground	C2	N/A
12	Ground	C3	N/A
13	Ground	C4	N/A
14	+5V Power	C5	Ground
15	Ground		

2.4.3 DVI-I Connector

MIC-7420 offers 1 DVI-I connector.

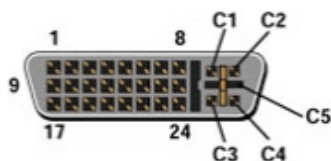


Table 2.7: DVI-I Connector

Pin	Signal	Pin	Signal
1	T.M.D.S. Data2-	16	Hot Plug Detect
2	T.M.D.S. Data2+	17	T.M.D.S. Data0-
3	Ground	18	T.M.D.S. Data0+
4	VGA DCC Clock	19	Ground
5	VGA DCC Data	20	Ground
6	DDC Clock	21	Ground
7	DDC Data	22	DVI Detect
8	Analog Vertical Sync	23	T.M.D.S. Clock+
9	T.M.D.S. Data1-	24	T.M.D.S. Clock
10	T.M.D.S. Data1+	C1	Analog Red
11	Ground	C2	Analog Green
12	Ground	C3	Analog Blue
13	Ground	C4	Analog Horizontal Sync
14	+5V Power	C5	Ground
15	Ground		

2.4.4 USB 2.0 Connector

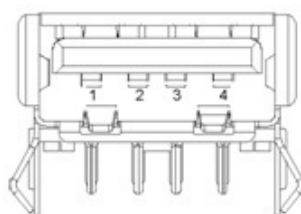


Table 2.8: USB2.0 Pin Assignment

Pin	Signal	Pin	Signal
1	+V5(VCC)	3	USB DATA+
2	USB DATA-	4	GND

2.4.5 USB 3.0 Connector

MIC-7420 provides two USB 3.0 connectors which are USB UHCI Rev. 3.0 compliant and can be disabled via BIOS setup.

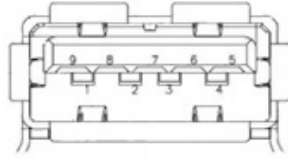
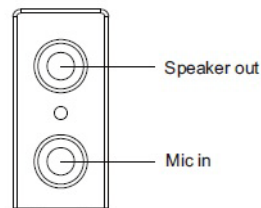


Table 2.9: USB 3.0 Pin Assignment

Pin	Signal	Pin	Signal
1	+V5(VCC)	6	StdA_SSRX+
2	D-	7	GND_DRAIN
3	D+	8	StdA_SSTX-
4	GND	9	StdA_SSTX+
5	StdA_SSRX-		

2.4.6 Audio-in Connector

MIC-7420 provides one integrated Mic-in/speaker out audio connector.



2.4.7 LAN Connector

MIC-7420 provides two RJ-45 Ethernet connectors, which are compliant with IEEE 802.3, IEEE802.3u, IEEE 802.3ab, with LEDs indicating network status.

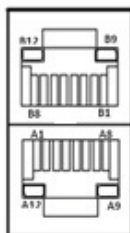


Table 2.10: LAN Connector

Pin	Signal Name
A1/B1	MDIO0+
A2/B2	MDIO0-
A3/B3	MDIO1+
A4/B4	MDIO2+
A5/B5	MDIO2-
A6/B6	MDIO1-
A7/B7	MDIO3+
A8/B8	MDIO3-
A9/B9	LED GREEN-
A10/B10	LED GREEN+
A11/B11	1000M LED
A12/B12	100M/10M LED

Chapter 3

System Installation

3.1 Introduction

The following procedures will instruct you to install all modules into MIC-7420.

3.1.1 Installing mainboard mini-PCle and M.2 cards

1. MIC-7420 mainboard has a mini-PCle slot and a M.2 slot. Each one has a label for users to distinguish them.
2. Insert a mini-PCle card and M.2 card to the respective slot and fix with screws.

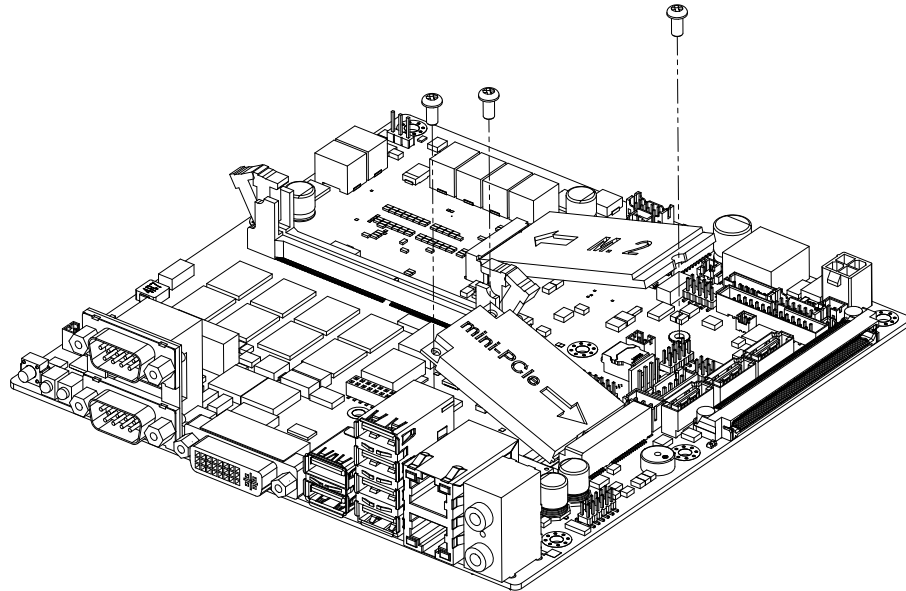


Figure 3.1 Installing M.2 and mini-PCle

3.1.2 Installing the HDD Module

MIC-7420 reserves the space for two 2.5" HDD or 3.5" HDD module. Please refer to the following instructions to install the HDD.

3.1.2.1 Installing 3.5" HDD

1. Open the top cover and remove the HDD holder in front of the mainboard.
2. Place the 3.5" HDD into the HDD holder with the metal-side up. Align the screw holes on both sides of the HDD with the central holes, and fix with screws.
3. Connect the HDD interface and the cable. Place the HDD module into the chassis with HDD interface facing the backplane.

3.1.2.2 Installing 2.5" HDD

1. Place the HDD into the 2.5" HDD bracket with the metal-side up and lock it. The bracket supports up to two 2.5" HDDs.
2. Open the top cover and remove the HDD holder in front of the mainboard.
3. Place the assembled 2.5" HDD into HDD holder and fix with screws.
4. Connect the HDD interface and the cable. Place the HDD module into the chassis with HDD interface facing the backplane.

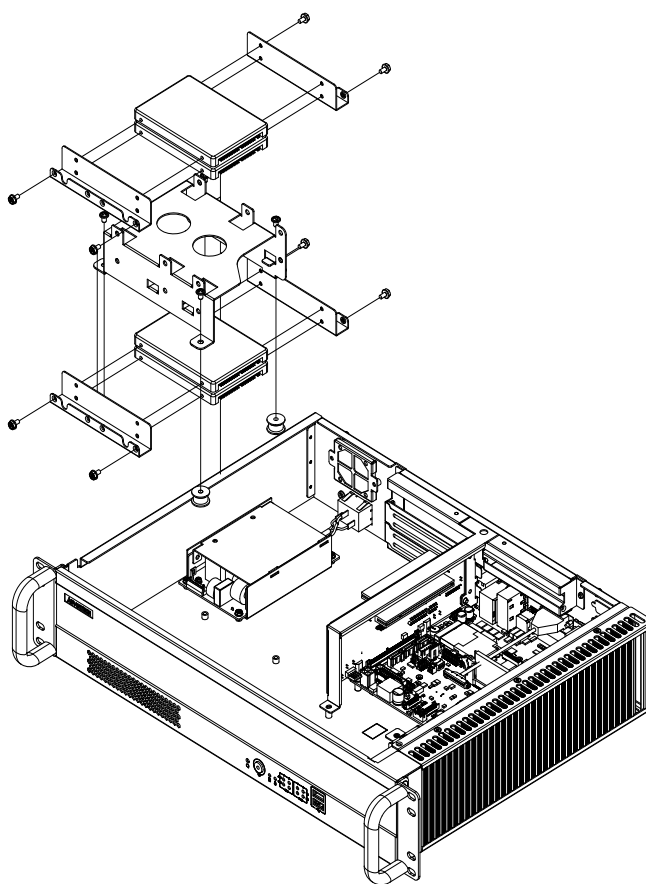


Figure 3.2 Installing HDD Module

3.1.3 Installing the Top Cover

Please refer to the following instructions to install the top cover.

1. Insert the top cover towards the front panel and make sure it's installed firmly.
2. Fix the top cover with two screws.

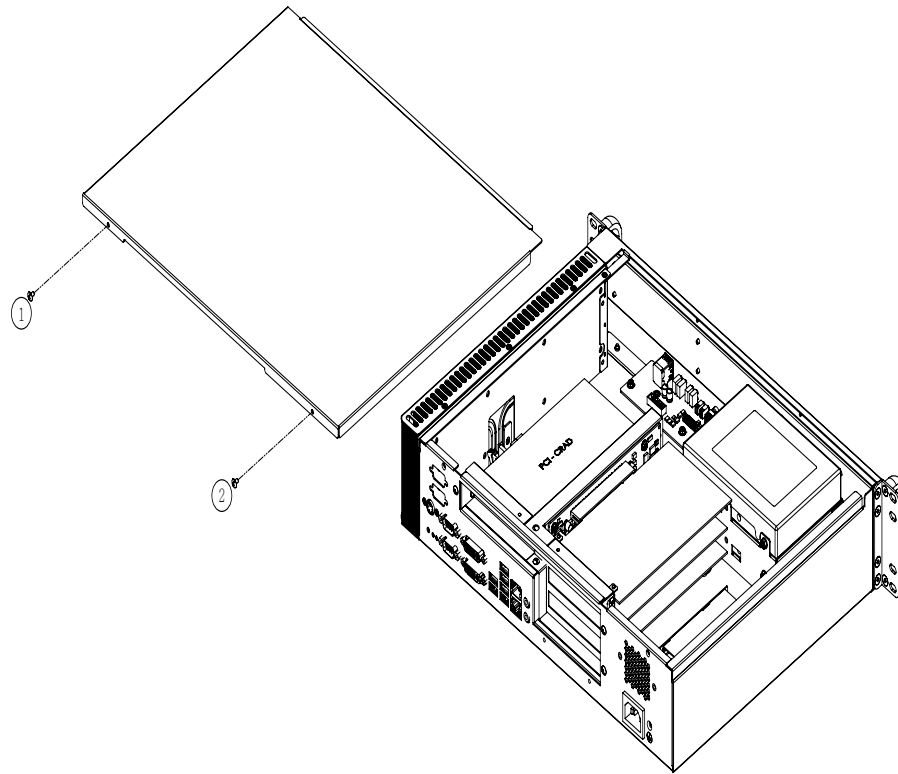


Figure 3.3 Installing the Top Cover

3.1.4 Installing Ears and Handles

Align two ears with the screw holes on both sides of the chassis, and fasten with screws. Align two handles with the screw holes on the ears, and fasten with screws.

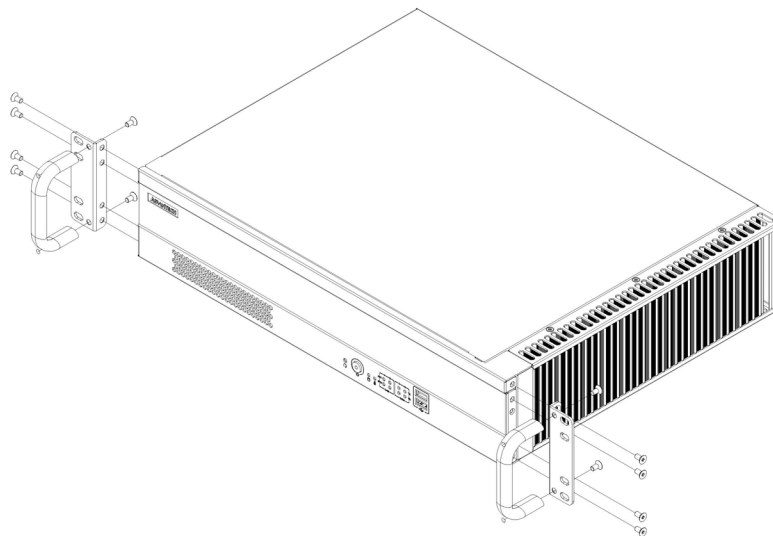


Figure 3.4 Installing the Foot Stand

3.1.5 Installing the add-on card

Please refer to the following instructions to install the add-on card.

1. Undo the two screws and open the chassis cover of MIC-7420.
2. Undo the five screws and uninstall the expansion card module.
3. Install a PCIe or PCI card into the expansion card module.
4. Replace the expansion card module and replace the chassis cover.

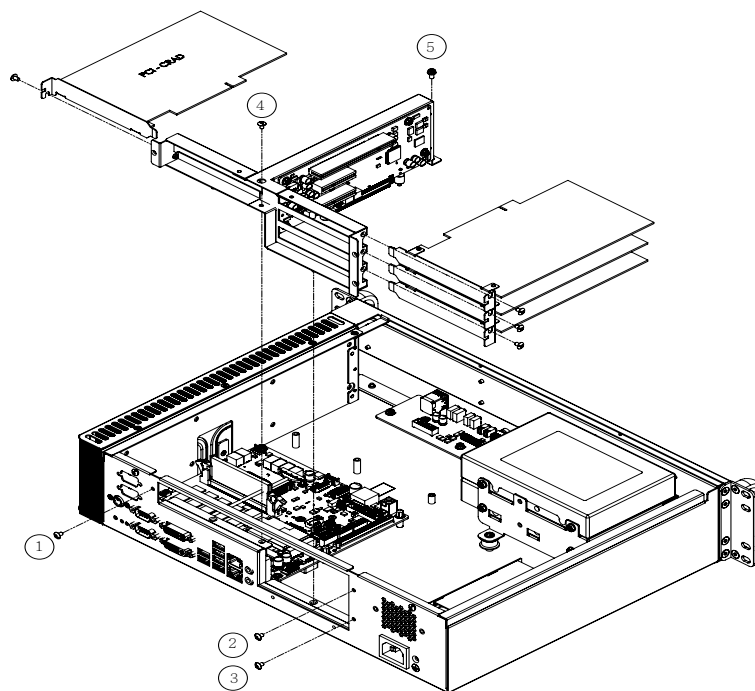


Figure 3.5 Installing the add-on card

Chapter 4

AMI BIOS Setting

4.1 Introduction

This chapter introduces how to configure the AMI BIOS for MIC-7420. With the AMI-BIOS Setup program, you can modify BIOS settings and control the special features of your computer. The Setup program uses a number of menus for making changes and turning the special features on or off. This chapter describes the basic navigation of the MIC-7420 setup screens.



Figure 4.1 Setup Program Initial Screen

AMI's BIOS ROM has a built-in Setup program that allows users to modify the basic system configuration. This type of information is stored in BIOS ROM so it retains the Setup information when the power is turned off.

4.2 Entering Setup

Press <Del> to enter AMI BIOS Setup Utility, the Main Menu will appear on the screen. Use arrow keys to select among the items and press <Enter> to accept or enter the sub-menu.

When users first enter the BIOS Setup Utility, they enter the Main setup screen.

Users can always return to the Main setup screen by selecting the Main tab. There are two Main Setup options described in this section. The Main BIOS Setup screen is shown below.

4.2.1 Main Setup

When you first enter the BIOS Setup Utility, you will enter the Main setup screen. You can always return to the Main setup screen by selecting the Main tab. There are two Main Setup options. They are described in this section. The Main BIOS Setup screen is shown below.

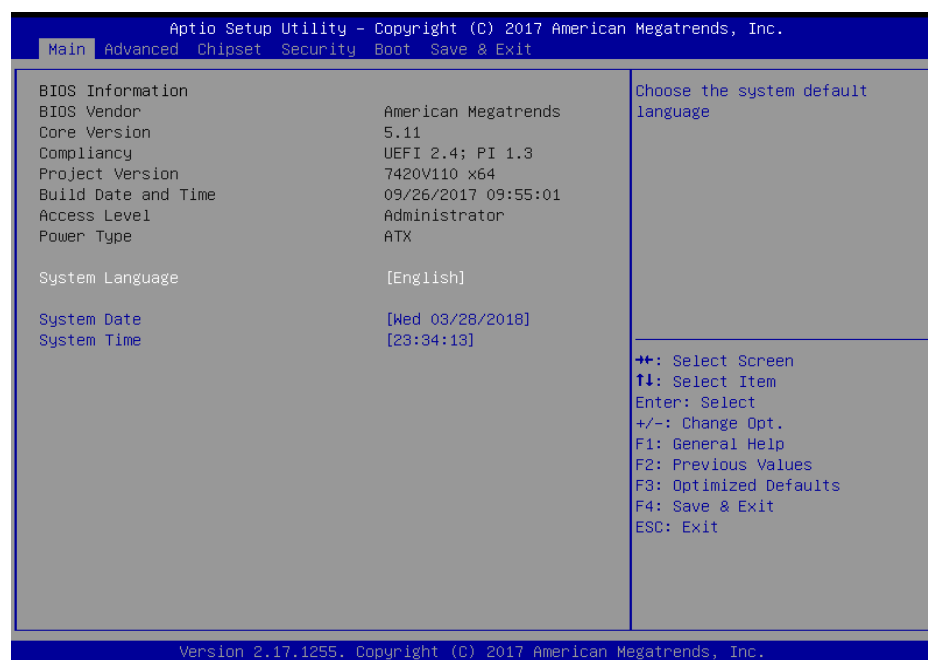


Figure 4.2 Main Setup Screen

The Main BIOS setup screen has two main frames. The left frame displays all the options that can be configured. Grayed-out options cannot be configured; options in blue can. The right frame displays the key legend. Above the key legend is an area reserved for a text message. When an option is selected in the left frame, it is highlighted in white. Often a text message will accompany it.

■ System Time / System Date

Use this option to change the system time and date. Highlight System Time or System Date using the <Arrow> keys. Enter new values through the keyboard. Press the <Tab> key or the <Arrow> keys to move between fields. The date must be entered in MM/DD/YY format. The time must be entered in HH:MM:SS format.

4.2.2 Advanced BIOS Features Setup

Select the Advanced tab from the MIC-7420 setup screen to enter the Advanced BIOS Setup screen. You can select any of the items in the left frame of the screen, such as CPU Configuration, to go to the sub menu for that item. You can display an Advanced BIOS Setup option by highlighting it using the <Arrow> keys. All Advanced BIOS Setup options are described in this section. The Advanced BIOS Setup screen is shown below. The sub menus are described on the following pages.

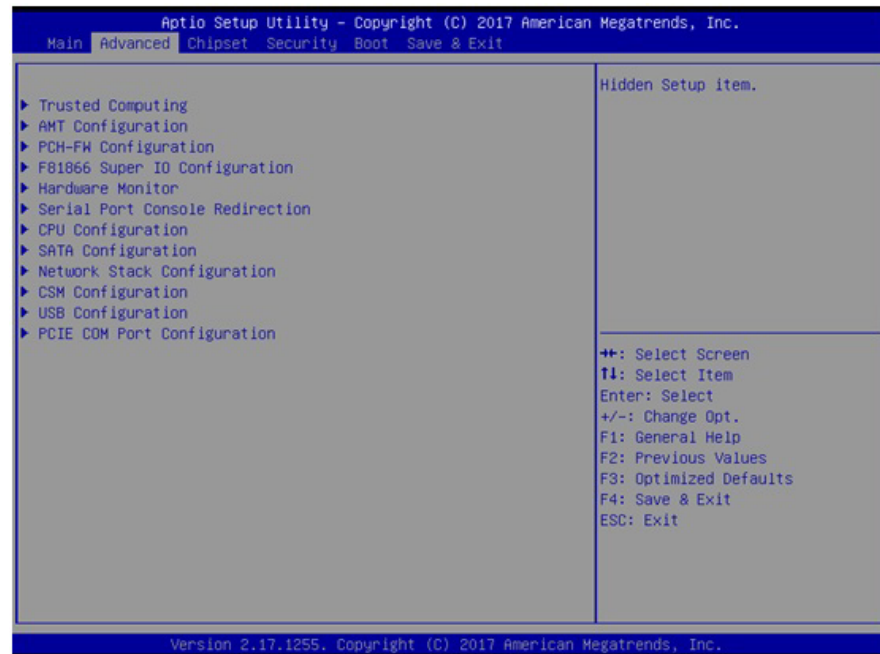


Figure 4.3 Advanced BIOS Features Setup Screen

4.2.2.1 Trusted Computing

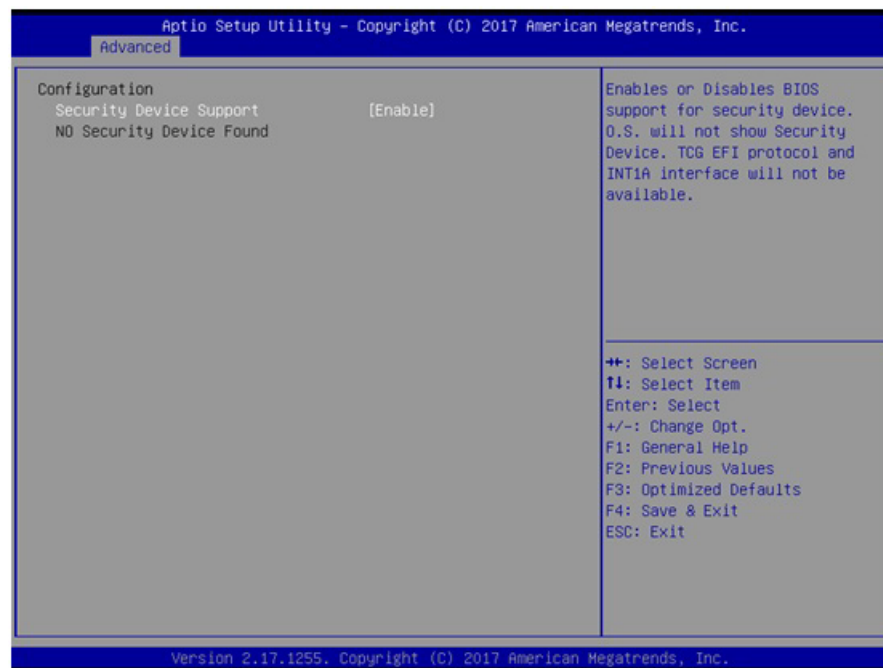


Figure 4.4 Trusted Computing

- **Security Device Support**
Enable or Disable TPM.

4.2.2.2 AMT Configuration

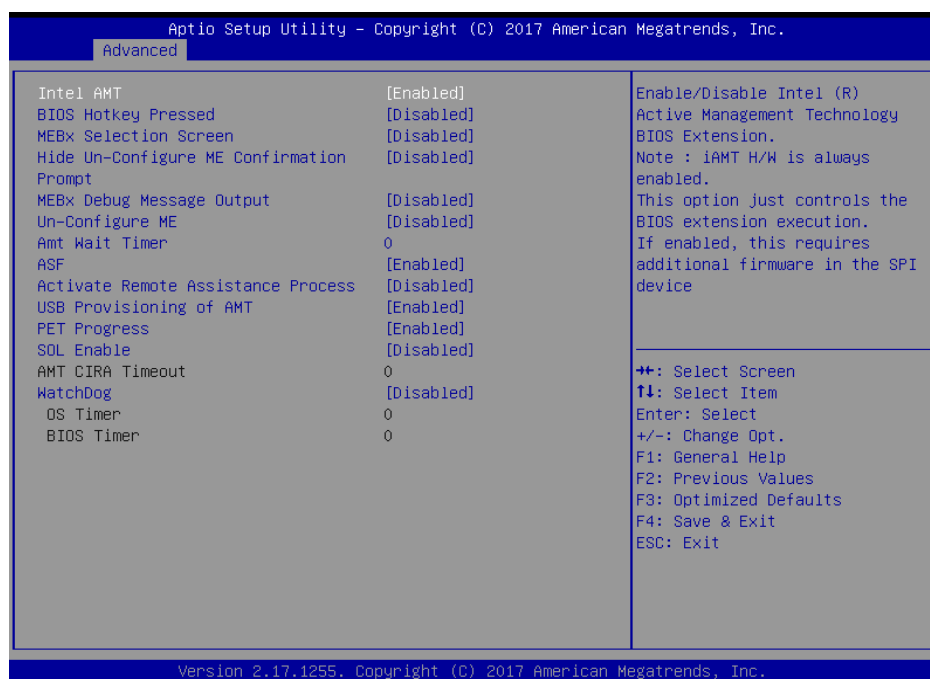


Figure 4.5 AMT Configuration

- **Intel AMT**
Enable or Disable AMT.
- **BIOS Hotkey Pressed**

This item allows the BIOS to trigger AMT via the hotkey.

- **MEBX Selection Screen**

Enable or disable MEBX selection screen.

- **Hide Un-Configure ME Configuration Prompt**

This item allows users to choose whether to hide the option of ME configuration initialization.

- **MEBX Debug Message Output**

This item allows users to choose whether to display MEBX debug message output.

- **Un-Configure ME**

This item allows users to choose whether to initialize AMT.

- **AMT Wait Timer**

Configure AMT waiting time.

- **ASF**

Enable or disable ASF.

- **Activate Remote Assistance Process**

This item allows users to choose whether to activate the remote assistance process.

- **USB Provisioning of AMT**

Enable or disable USB provisioning of AMT.

- **PET Process**

Enable or disable PET process.

- **SOL Enable**

Enable or disable serial over LAN function

- **WatchDog**

Enable or disable AMT watchdog.

4.2.2.3 PCH-FW Configuration

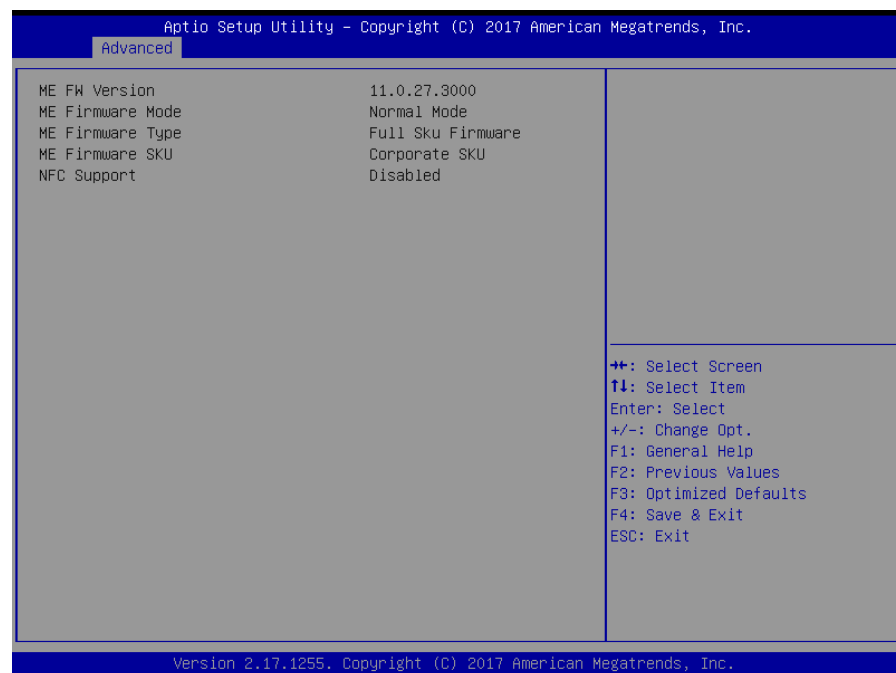


Figure 4.6 PCH-FW Configuration

Indicate the version and the type of the current ME.

4.2.2.4 F81866 Super IO Configuration

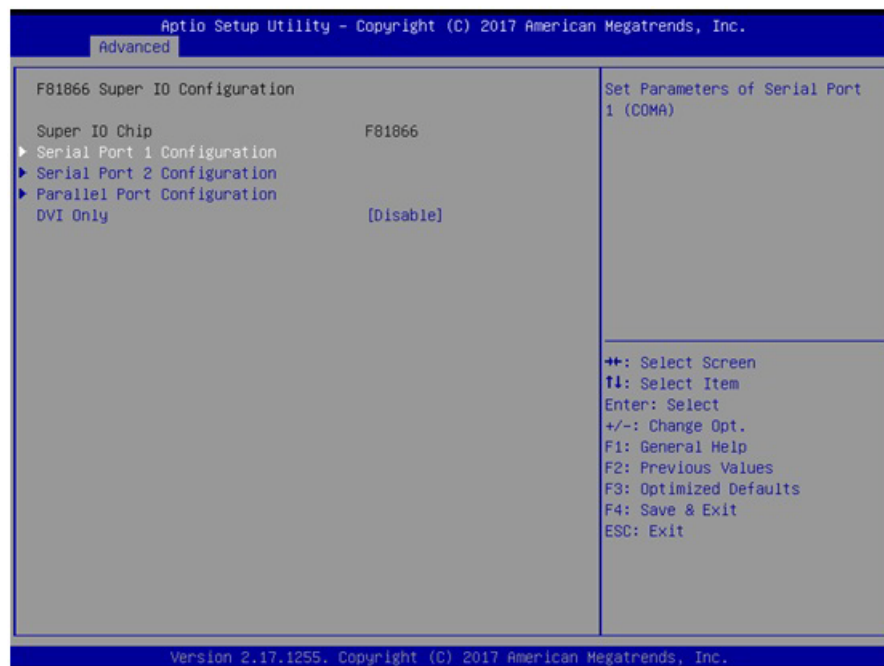


Figure 4.7 F81866 Super IO Configuration

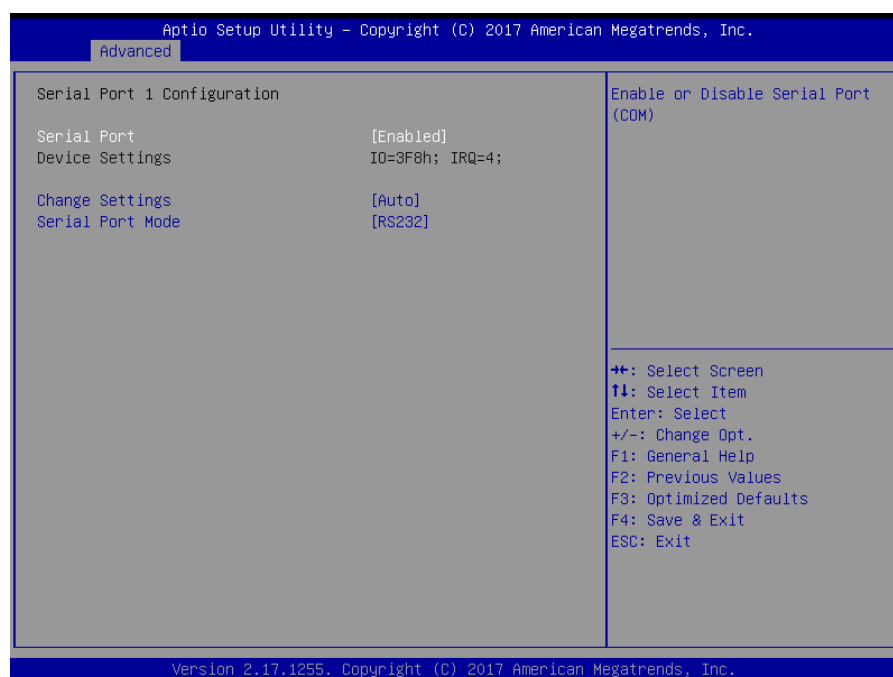


Figure 4.8 Serial Port Configuration

- **Serial Port**
Enable or disable serial port. Default: Enable.
- **Device Settings**
Indicates the current IO port and IRQ value of the serial port.
- **Change settings**

Select the IO port and IRQ value of serial port.

■ **Serial Port Mode**

Selects the serial port mode (RS232/RS485).

4.2.2.5 Hardware Monitor

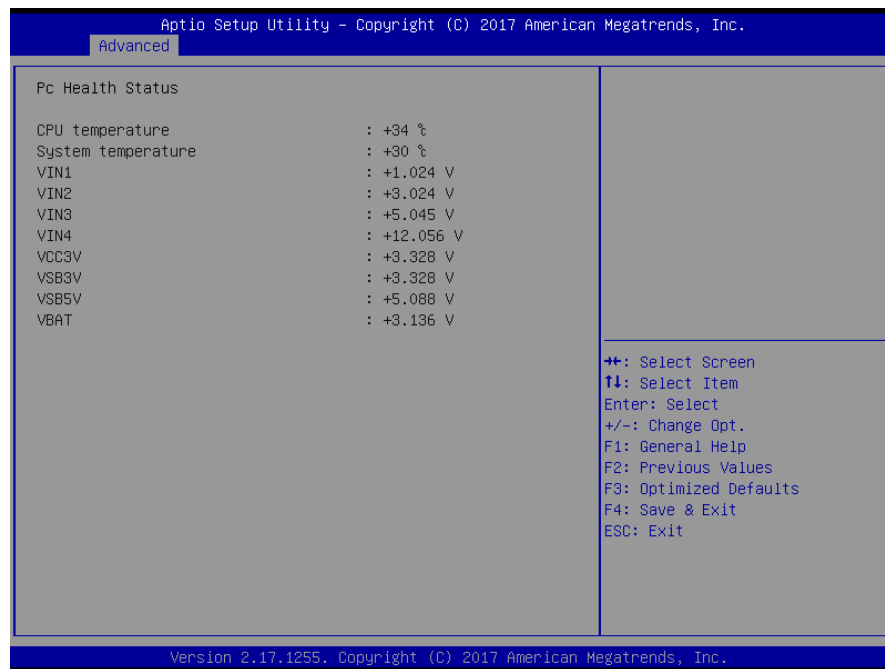


Figure 4.9 Hardware Monitor

This item is used for hardware monitoring. The BIOS will display the current system temperature, CPU temperature, and related voltage values. The values of the parameters listed above should not exceed the corresponding value ranges.

4.2.2.6 Serial Port Console Redirection

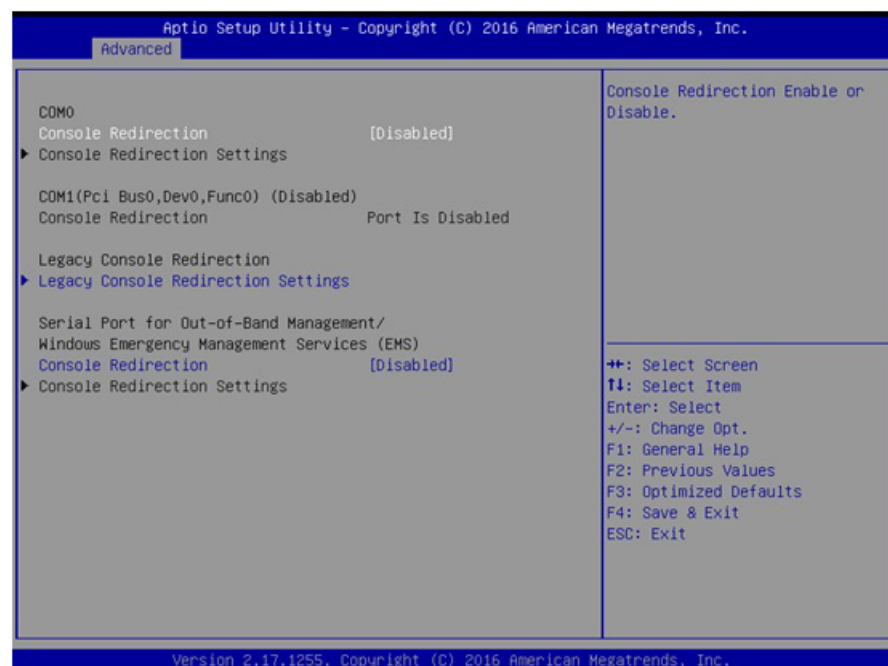


Figure 4.10 Serial Port Console Redirection

■ Console redirection

Enable or disable serial port console redirection.



■ Legacy Serial Redirection Port

Choose the redirection port

4.2.2.7 CPU Configuration

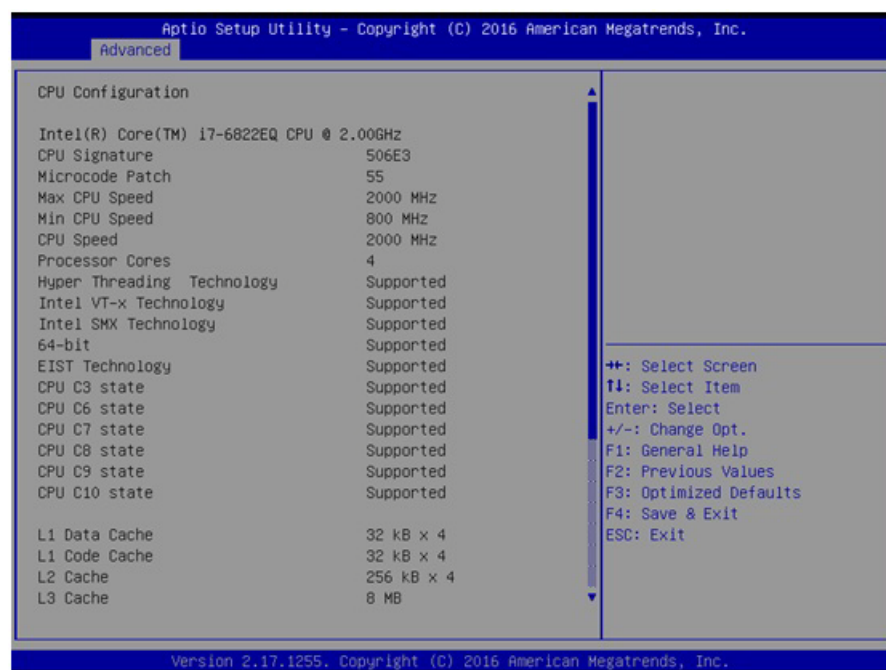
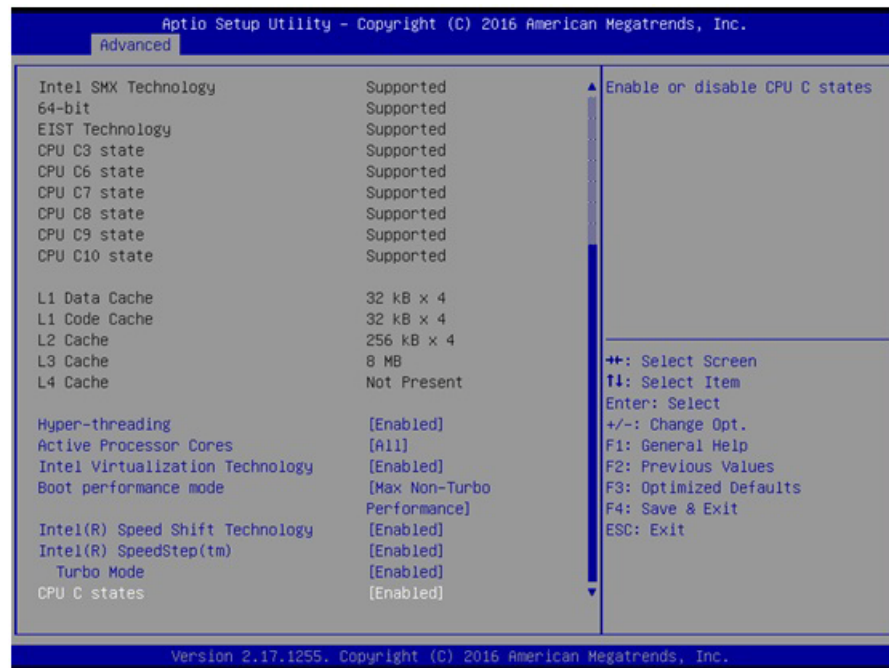


Figure 4.11 CPU Configuration



- **Hyper-threading**
Enable or disable hyper-threading.
- **Active Processor Cores**
Configure the number of processor cores.
- **Intel Virtualization Technology**
Enable or disable VT technology.
- **Boot performance mode**
Configures the performance mode of the CPU.
- **Intel(R) Speed shift Technology**
Enable or disable Intel(R) Speed shift Technology.
- **Intel(R) Speedstep (tm)**
Enable or disable Intel(R) Speedstep function
- **Turbo mode**
Enable or disable CPU turbo mode
- **CPU C States**
Enable or disable C-State.

4.2.2.8 SATA Configuration

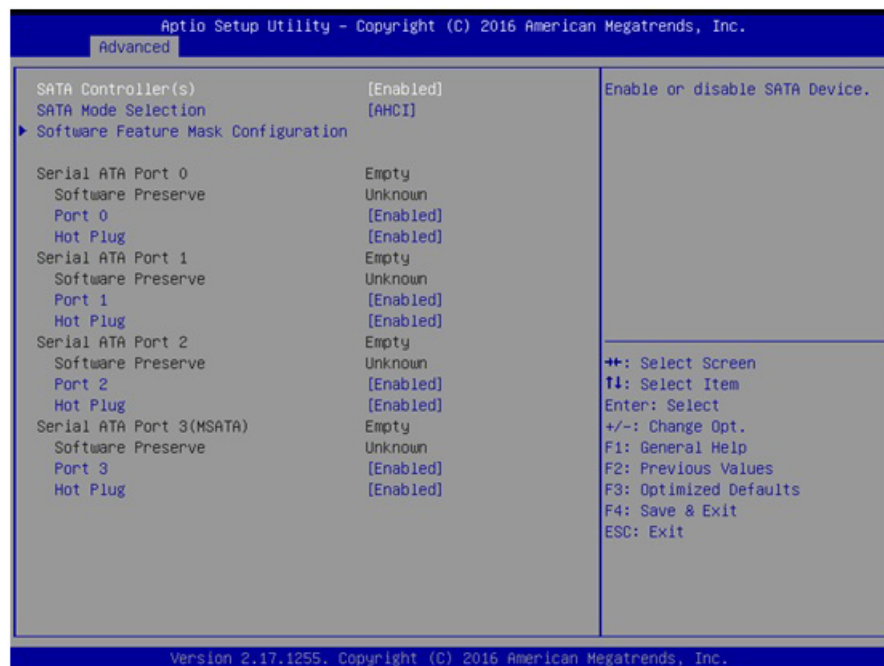


Figure 4.12 SATA Configuration

- **SATA Controller(s)**
Enable or disable SATA controller.
- **SATA Mode Selection**
Select SATA mode (AHCI or RAID).
- **SATA Port 0/1/2**
Enable or disable SATA port 0/1/2.
- **Hot plug**
Enable or disable hot plug support for the SATA port.

4.2.2.9 Network Stack Configuration

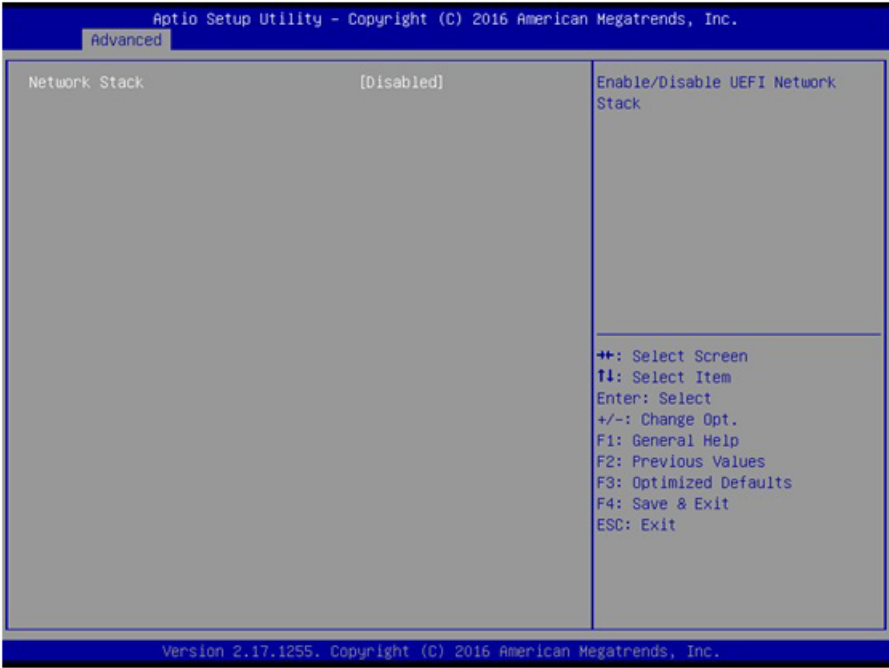
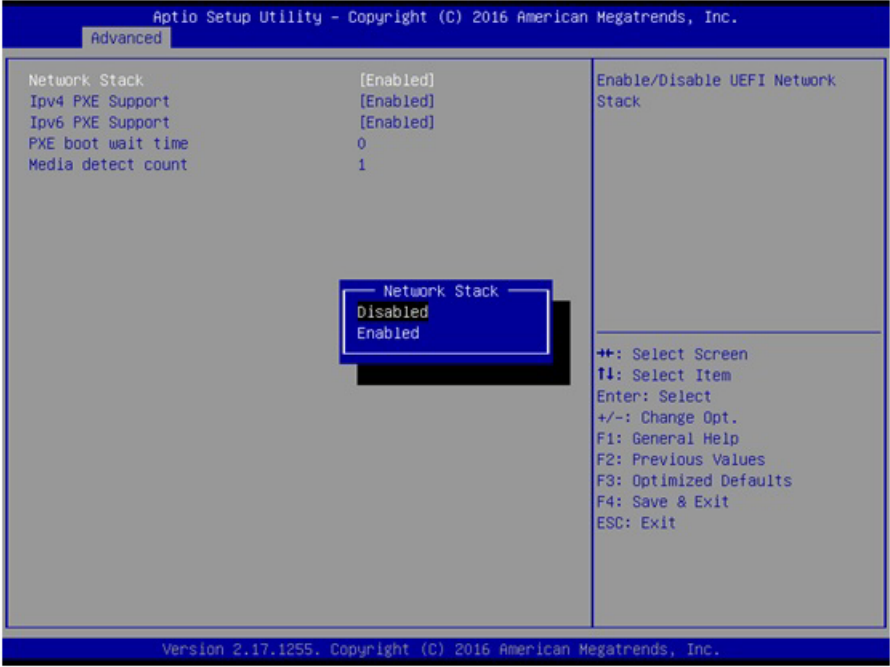


Figure 4.13 Network Stack Configuration

- **Network Stack**
Enable or disable the UEFI network stack.



When network stack is enabled, the users will have to configure the following parameters (as shown in the figure above):

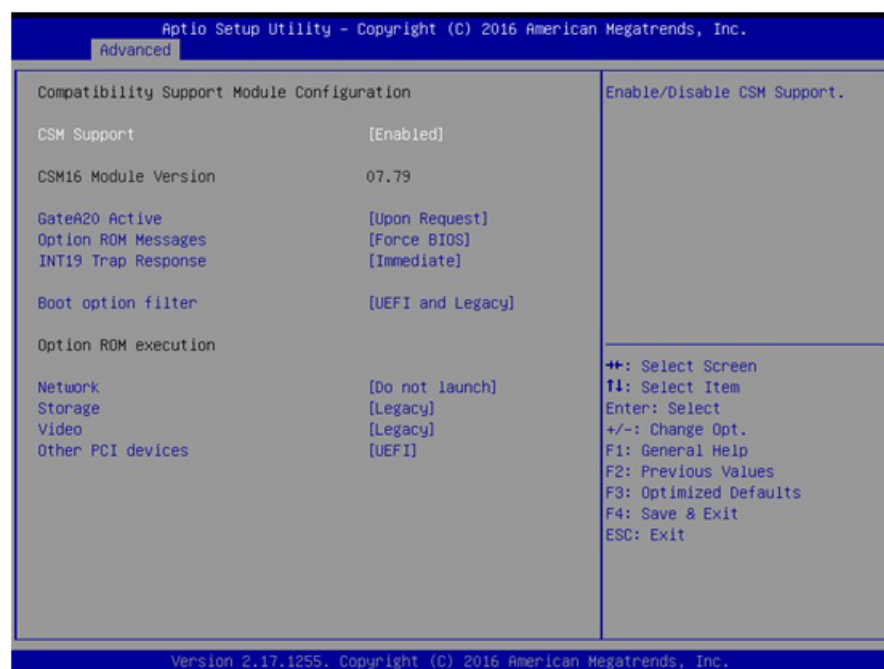
- **Ipv4 PXE Support**
Enable or disable IPV4 PXE support.
- **Ipv6 PXE Support**
Enable or disable IPV6 PXE support.
- **PXE boot wait time**

Set the PXE boot waiting time.

- **Media detect count**

Set the number of media detection times.

4.2.2.10 CSM Configuration



- **CSM Support**

Enable or disable CSM support.

- **GateA20 Active**

Set the activation time of GateA20.

- **Option ROM Messages**

Set the display mode of option ROM message.

- **INT19 Trap Response**

Set the time for implementing INT19.

- **Boot option filter**

Selects the boot sequence of legacy/UEFI.

- **Network**

Selects the optional ROM execution of UEFI/legacy for network.

- **Storage**

Selects the optional ROM execution of UEFI/legacy for storage.

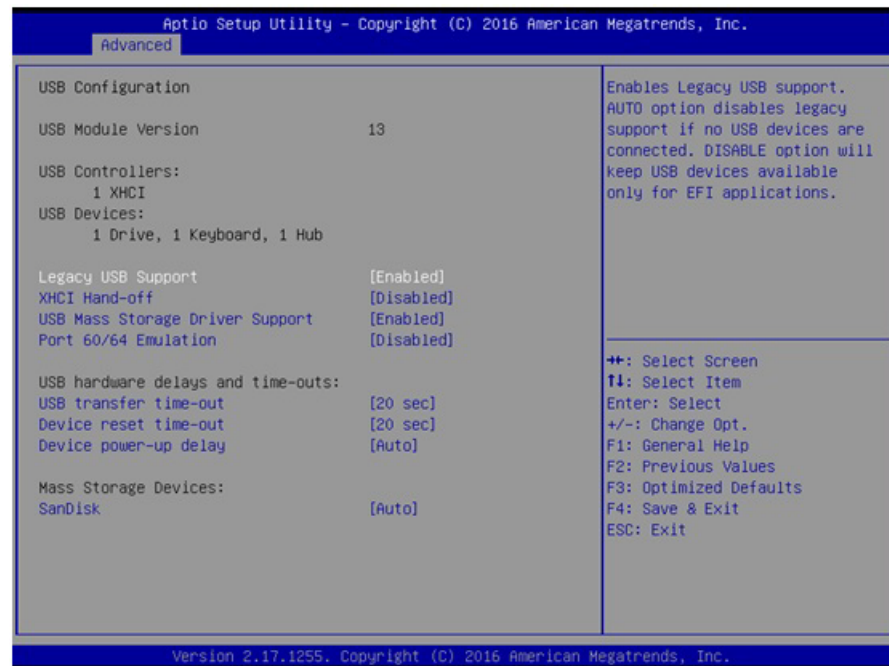
- **Video**

Selects the optional ROM execution of UEFI/legacy for video.

- **Other PCI devices**

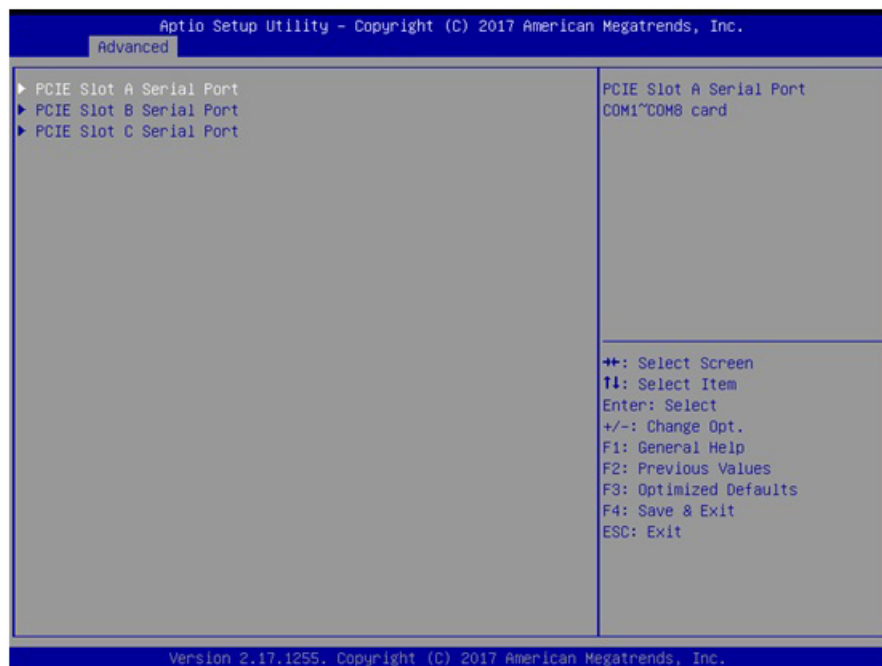
Selects the optional ROM execution of UEFI/legacy for other PCI devices.

4.2.2.11 USB Configuration

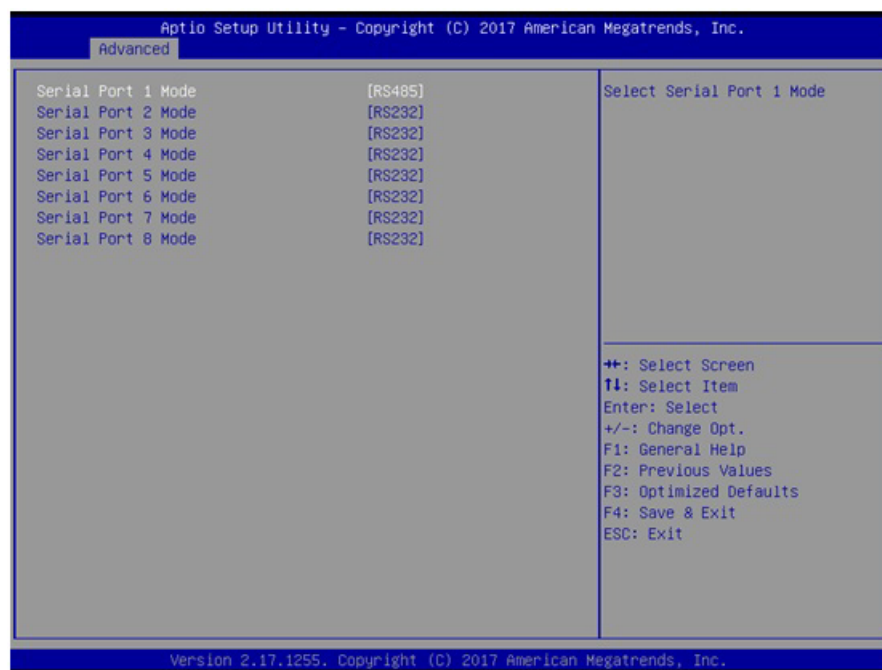


- **Legacy USB Support**
Enable or disable legacy USB support.
- **XHCI Hand-off**
Enable or disable XHCI hand-off. This item is the alternative for OS which do not have the XHCI hand-off function.
- **USB Mass Storage Driver Support**
Enable or disable USB storage device support.
- **Port 60/64 Emulation**
Enable or disable emulation support for port 60/64. For OS which do not support USB, this option should be enabled.
- **USB transfer time-out**
Sets the time of USB transfer time-out.
- **Device power-up delay**
Sets the delay time of command execution for USB storage device.

4.2.2.12 PCIE COM Port Configuration



Configure the corresponding PCIE serial port card.



■ Serial Port Mode

Configure the serial port mode to RS232, RS422 or RS485.

4.2.3 Advanced Chipset Features Setup



- **VT-d**
Enable or disable VT-d technology.
- **Above 4GB MMIO BIOS assignment**
Enable or disable BIOS assignment for MMIO above 4GB.

4.2.3.1 Graphics Configuration

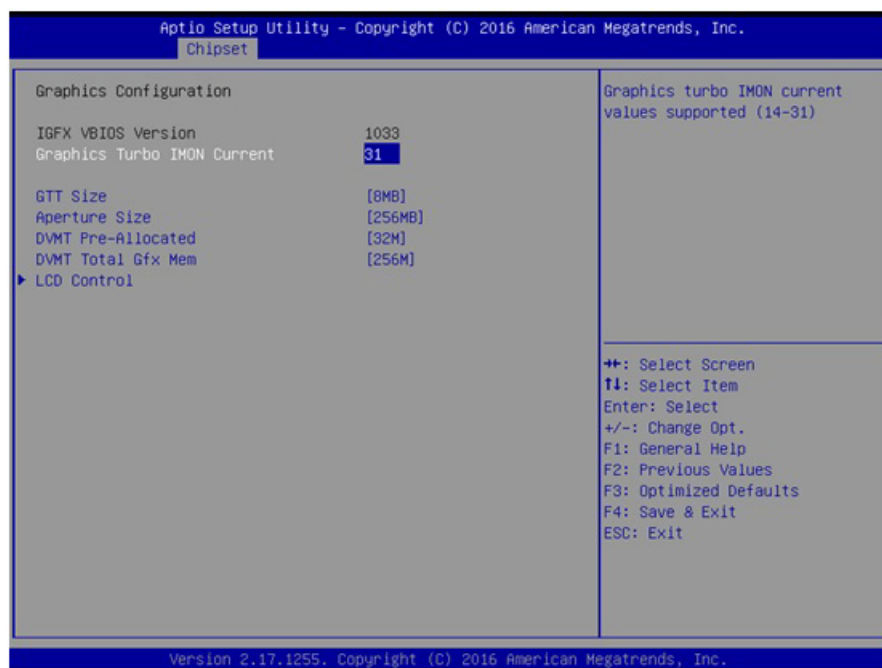


Figure 4.14 Intel Graphics Configuration

- **IGFX VBIOS Version**
Shows the current VBIOS version.
- **Graphics Turbo IMON Current**
Sets the IMON current value.
- **GTT size**
Set GTT size.
- **Aperture size**
Sets aperture size.
- **DVMT Pre-Allocated**
Sets the video memory size pre-allocated by DVMT5.0.
- **DVMT Total GFX Mem**
Sets the total size of video memory allocated by DVMT5.0.

■ LCD control

Please refer to the following screen.



■ Primary IGFX Boot Display

Select the display device in POST phase. MIC-7420 supports HDMI, DVI, screen and VGA display.

■ eDP LVDS Panel Type

MIC-7420 doesn't support eDP

■ Panel Scaling

Enable or disable automatic screen scaling.

■ Backlight Control

Select the type of backlight control.

■ Spread Spectrum clock chip

Set the control mode of spread spectrum.

■ Active LFP

Configures the port for LFP.

■ Panel Color Depth

Sets the color depth for a LFP panel.

4.2.3.2 PEG Port Configuration

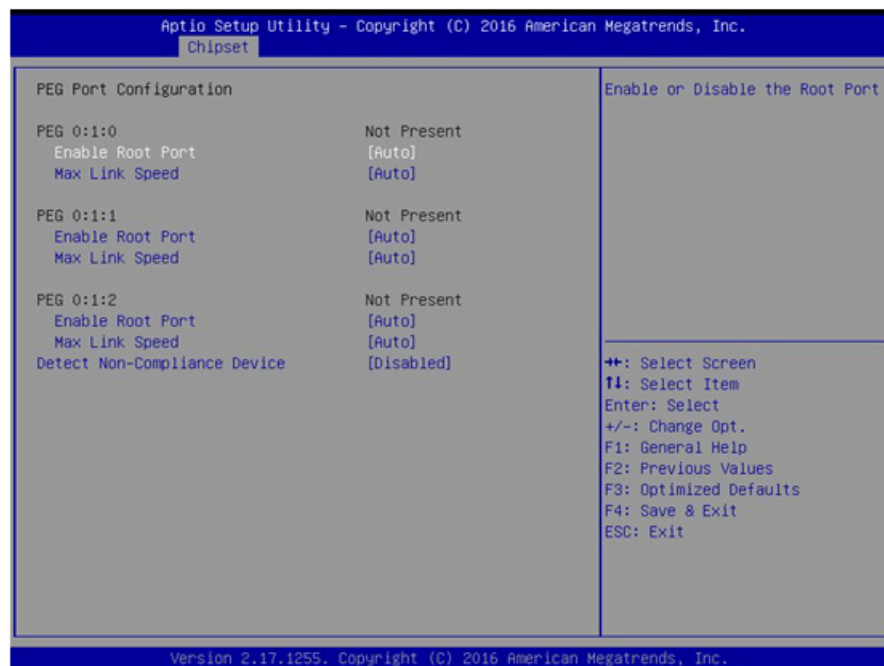
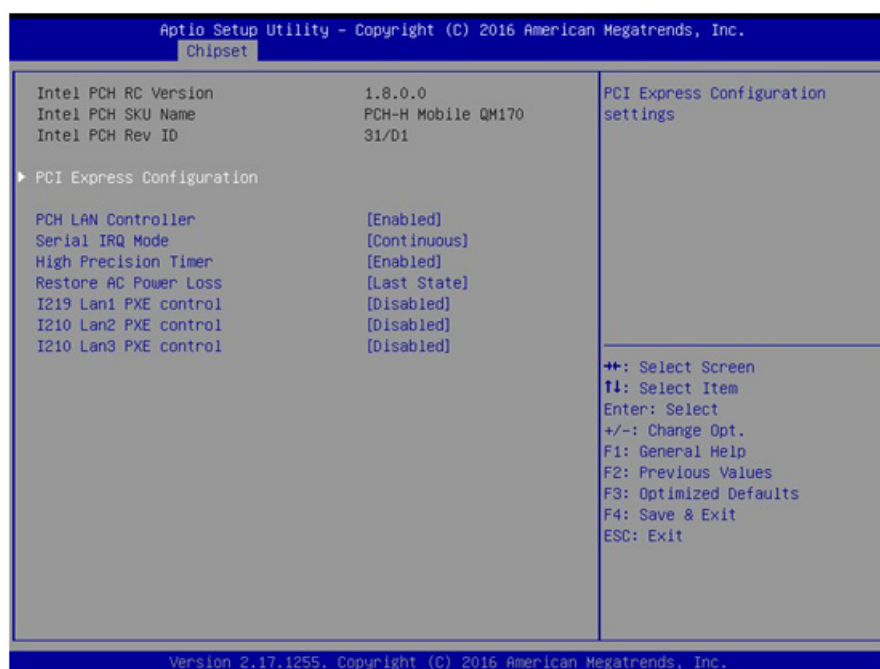


Figure 4.15 PEG Port Configuration

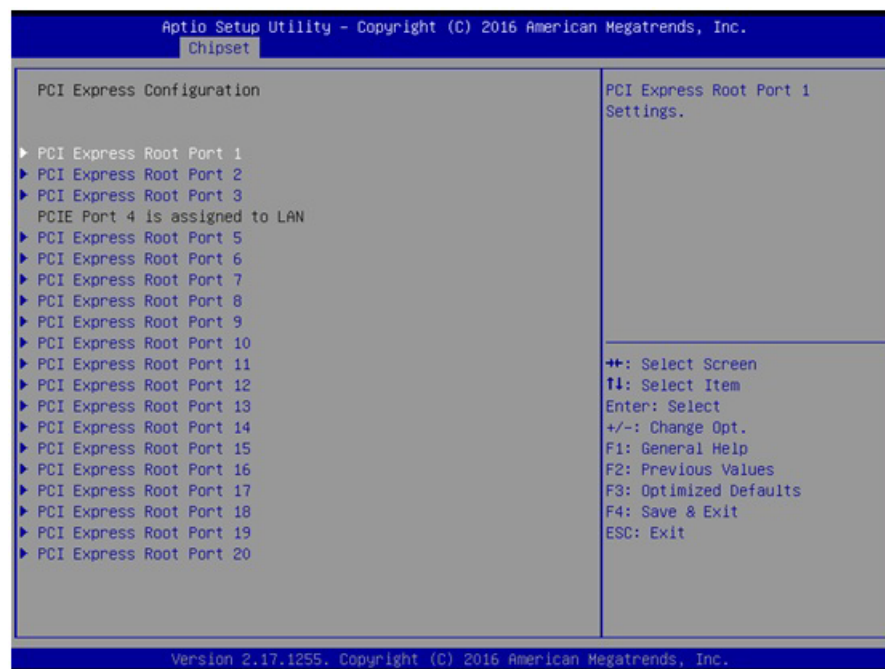
- **Enable Root Port**
Enable or disable the port.
- **Max Link Speed**
Configure the max link speed of PEG port.
- **Detect Non-Compliance Device**
Enable or disable non-compliance device detection.

PCH-IO Configurations



- **Intel PCH RC Version**
Display the current Intel PCH RC version.
- **Intel PCH SKU Name**
Indicates the model name of current Intel PCH.
- **Intel PCH Rev ID**
Indicates the version of current Intel PCH.
- **PCI Express Configuration**
Please refer to the next page.
- **PCH LAN Controller**
Enable or disable i219 network controller.
- **Serial IRQ Mode**
Configure serial IRQ mode.
- **High Precision Timer**
Enable or disable the high precision timer.
- **Restore AC Power Loss**
Select the AC power state after restoring.
- **I219/I210 LAN PXE Control**
Enable or disable LAN PXE control for I210/I219.

PCI Express Configuration



Select the PCIE port to be controlled.



Figure 4.16 PCI Express Configuration

- **PCI Express Root Port**
Enable or disable the current port.
- **Hot plug**
Enable or disable hot-plug support for PCIE device.
- **PCIe speed**
Sets the speed of the PCIe port.
- **Detect Non-Compliance device**
Are incompatible devices detected?

4.3 Boot Setup

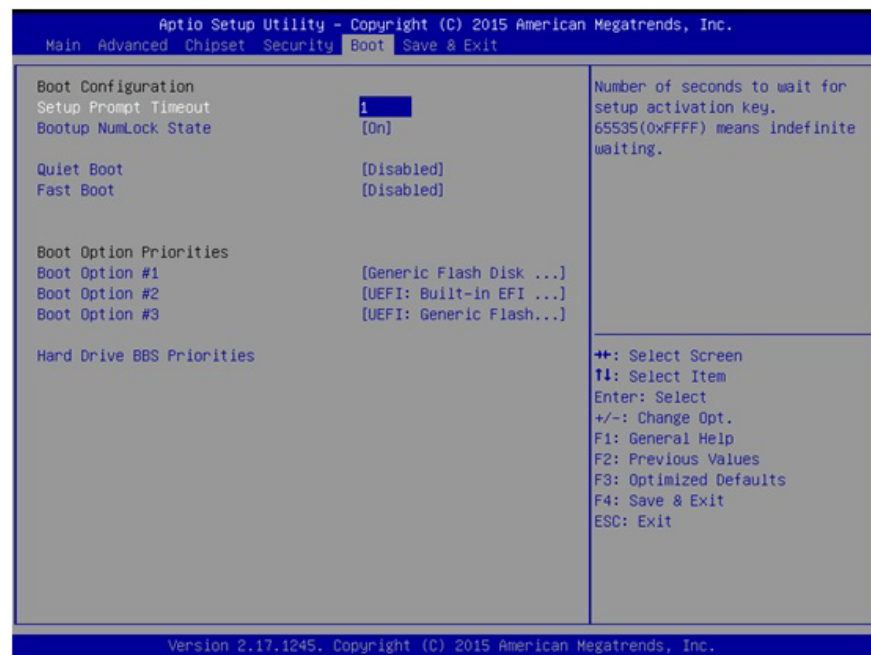
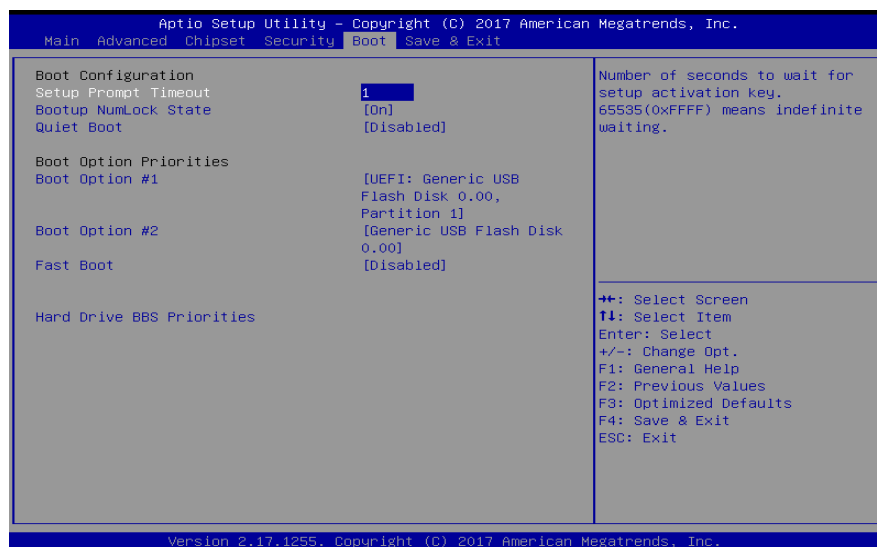


Figure 4.17 Boot Setup

4.3.1 Boot Configuration

- **Setup Prompt Timeout**
This item is the waiting time when pressing the Setup button. If the Setup button is not pressed within the set time, the system will continue to boot.
- **Bootup NumLock State**
This item allows users to active Bootup NumLock State function after the system powers into DOS. The default setting is "On".
 - On: NumLock function is on when system boots.
 - Off: Cursor control is activated for keypad when system boots.
- **Quiet Boot**
If it is set to "Disabled", BIOS will display normal POST information; If it is set to "Enabled", BIOS will show OEM icon rather than POST information.
- **Fast Boot**
This item allows the BIOS to skip some testing procedures during boot so as to reduce system boot-up time. The default setting is "Disabled".



4.4 Security Setup

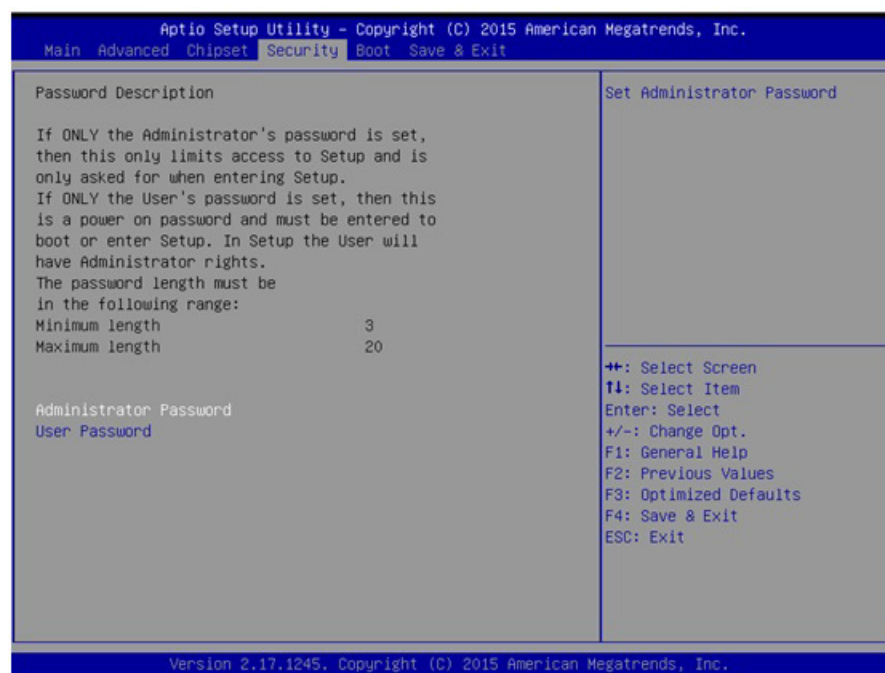


Figure 4.18 Setup Security Menu

- **Administrator Password**
This item is used to set Administrator Password.
- **User Password**
This item is used to set User Password.

4.4.1 Save & Exit Setup



Figure 4.19 Setup Save & Exit Menu

■ Save Changes and Exit

When you have completed system configuration, select this option to save your changes, exit BIOS setup and reboot the computer so the new system configuration parameters can take effect.

1. Select Save Changes and Exit from the Exit menu and press <Enter>. The following message appears:
Save Configuration Changes and Exit Now?
[Ok] [Cancel]
2. Select Ok or Cancel.

■ Discard Changes and Exit

Select this option to quit Setup without making any permanent changes to the system configuration.

1. Select Exit Discard Changes and Exit from the Exit menu and press <Enter>. The following message appears:
Discard Changes and Exit Setup Now?
[Ok] [Cancel]
2. Select Ok to discard changes and exit.

■ Save Changes and Reset

When you have completed system configuration, select this option to save your changes, exit BIOS setup and reboot the computer so the new system configuration parameters can take effect.

1. Select Save Changes and Reset and press <Enter>. The following message appears:
Save configuration and Reset?
[Yes] [No]
2. Select Ok or Cancel.

- **Discard Changes and Reset**
Select this option to quit Setup without making any permanent changes to the system configuration.
 1. Select Discard Changes and Reset from the Exit menu and press <Enter>. The following message appears:
Discard Changes and Reset Setup Now?
[Ok] [Cancel]
 2. Select Ok to discard changes and exit.
- **Save Changes**
This item allows users to save changes done so far to any of the options.
- **Discard Changes**
This item allows users to discard changes done so far to any of the options.
- **Restore Defaults**
This item allows users to restore/load default values for all the options.
- **Save as User Defaults**
This item allows users to save the changes done so far as user defaults.
- **Restore User Defaults**
This item allows users to restore the user defaults to all the options.
- **Boot Override**
This item allows users to set boot device.
- **Launch EFI Shell from file system device**
This item allows to boot EFI shell from system file device

Chapter 5

Driver Installation

5.1 Introduction

Advantech offers a complete range of device driver and software support for Windows programming developers. You can apply the Windows Device Drivers to the most popular Windows Programming tools, such as Visual C++, Visual Basic, Borland C++ Builder and Borland Delphi.

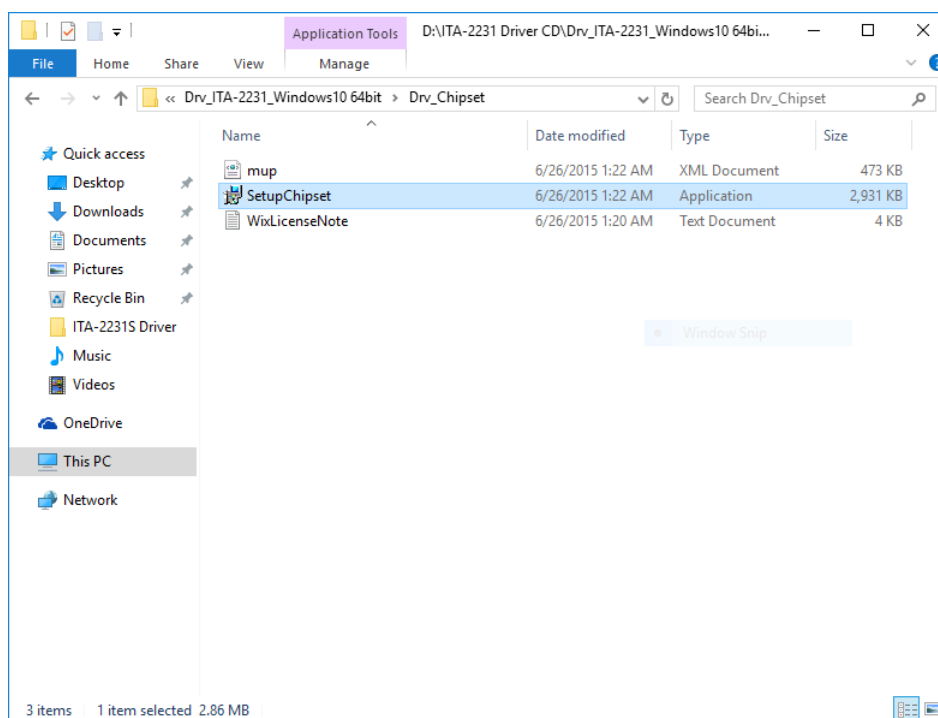
5.2 Driver Installation

Insert the driver CD into your system's CD-ROM drive. You can see the driver folder items. Please choose the correct folder by your OS version. MIC-7420 uses the same driver CD with ITA-2231.

	Drv_ITA-2231_Windows7 32bit	2018/2/8 下午 06...	檔案資料夾	
	Drv_ITA-2231_Windows7 64bit	2018/2/8 下午 06...	檔案資料夾	
	Drv_ITA-2231_Windows8.1 64bit	2018/2/8 下午 06...	檔案資料夾	
	Drv_ITA-2231_Windows10 64bit	2018/2/8 下午 06...	檔案資料夾	
	ITA-2231 User Manual	2017/2/24 上午 1...	檔案資料夾	
	LAN sequence SOP for Windows8.1_W...	2018/2/8 下午 06...	檔案資料夾	
	WIN7& WIN8.1& WIN10_ITAM-SR01 ...	2016/12/30 下午 ...	Microsoft Word ...	753 KB
	WIN7&WIN8.1 &WIN10_ITAM-SR01 d...	2016/12/30 下午 ...	Microsoft Word ...	1,399 KB

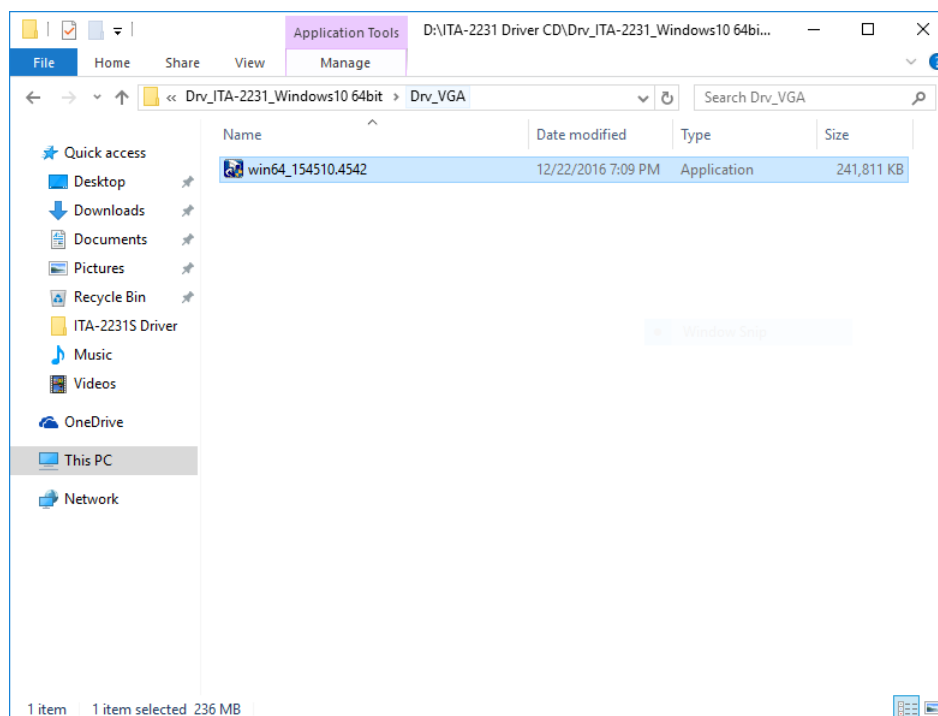
5.2.1 Chipset Windows Driver Setup

Navigate to the "Chipset" folder and click "SetupChipset.exe" to complete the installation of the driver.



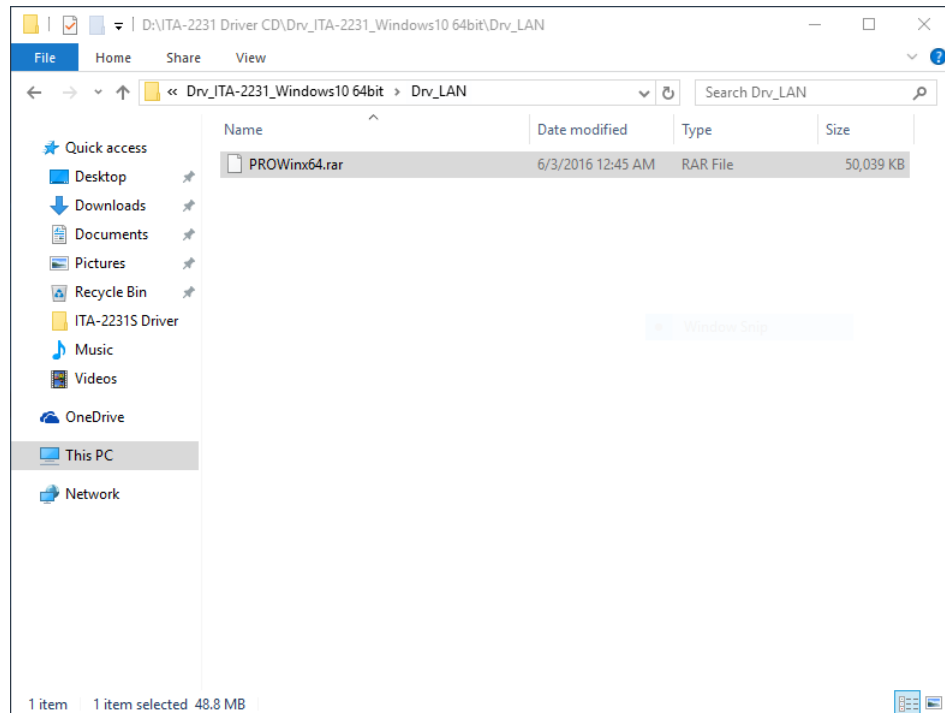
5.2.2 Windows Driver Setup

Navigate to the "VGA" folder and click "win64_154510.4542.exe" to complete the installation of the driver.



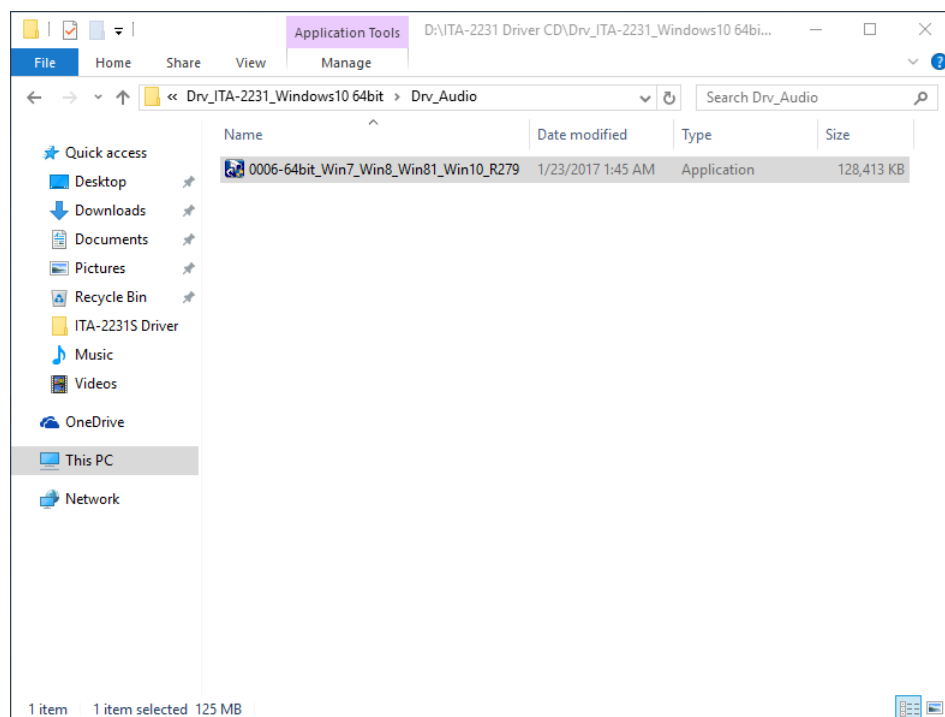
5.2.3 LAN windows Driver Setup

Navigate to the "LAN" folder and click "PROWinx64.rar" to complete the installation of the driver.



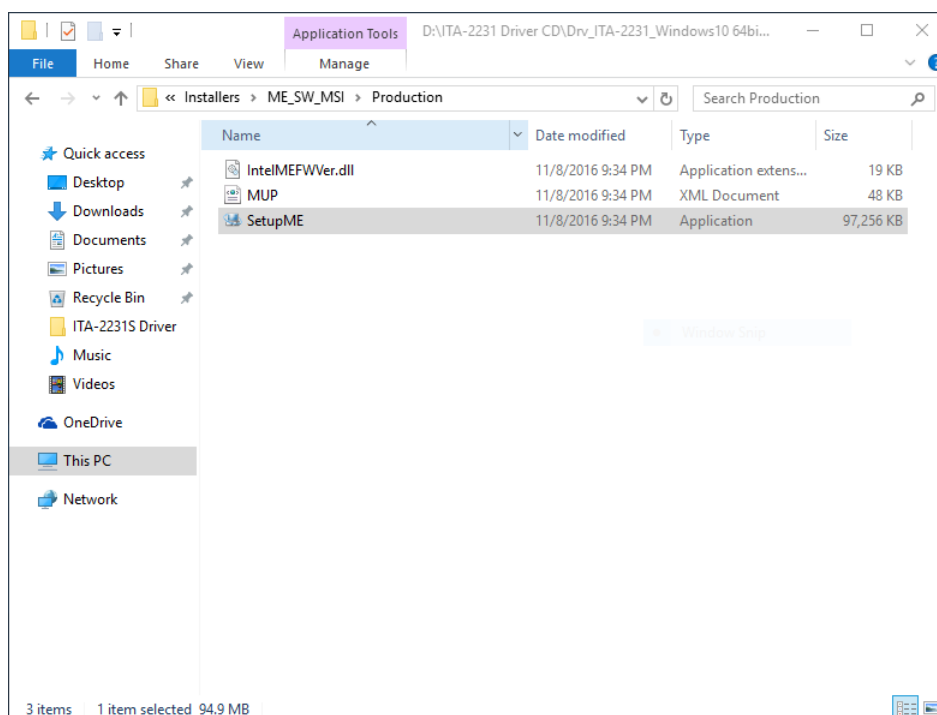
5.2.4 AUDIO windows Driver Setup

Navigate to the "Audio" folder and click "0006-64bit_Win7_Win8_Win81_Win10_R279.exe" to complete the installation of the driver.



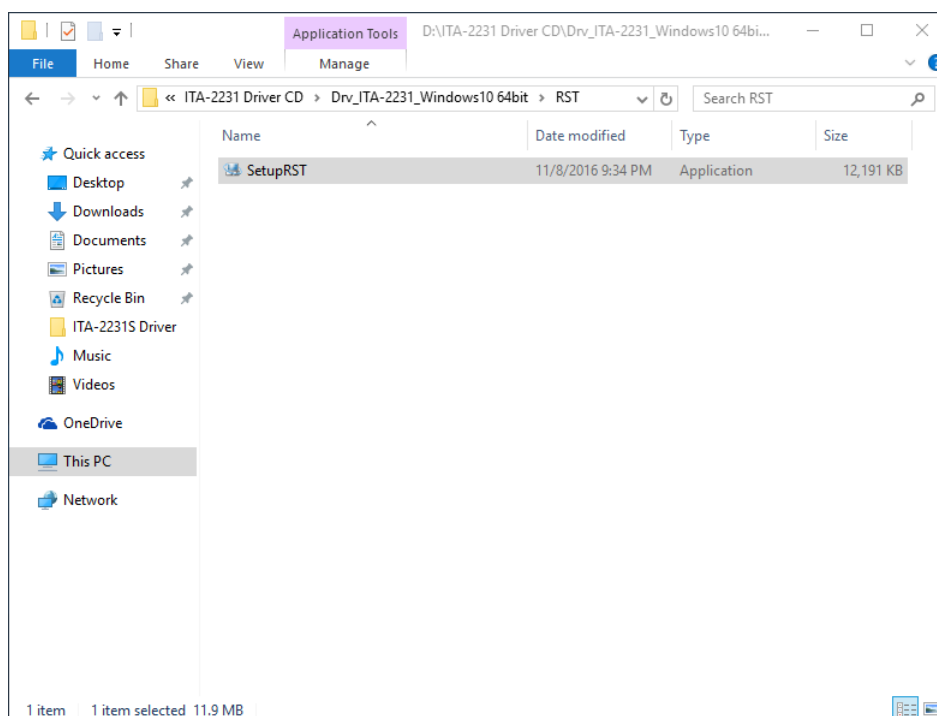
5.2.5 ME windows Driver Setup

Navigate to the "ME" folder and click "SetupME.exe" to complete the installation of the driver.



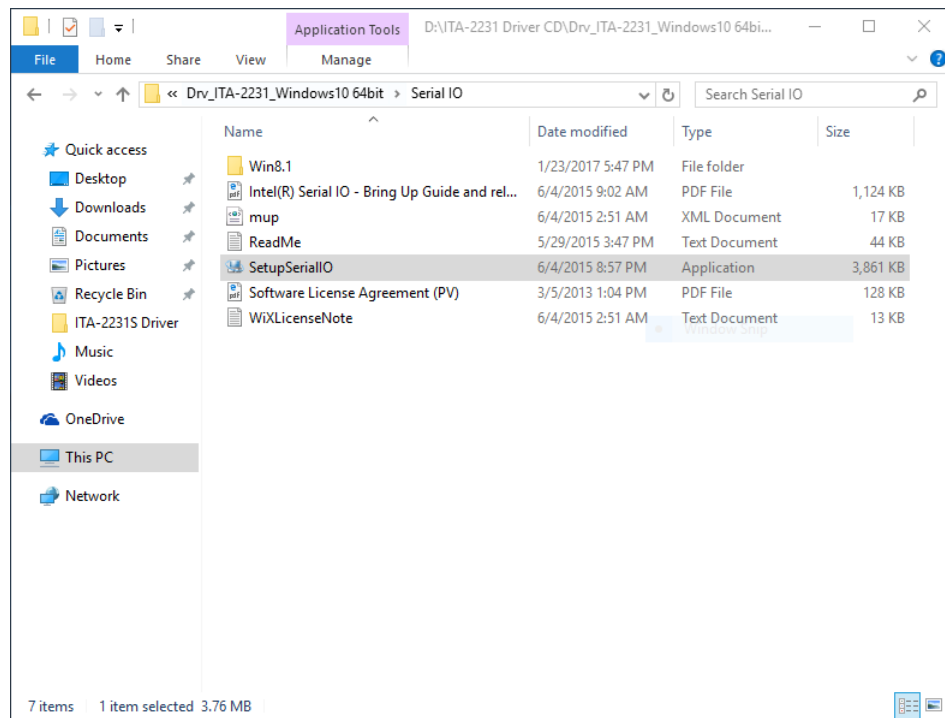
5.2.6 RST windows Driver Setup

Navigate to the "RST" folder and click "SetupRST.exe" to complete the installation of the driver.



5.2.7 Serial IO windows Driver Setup

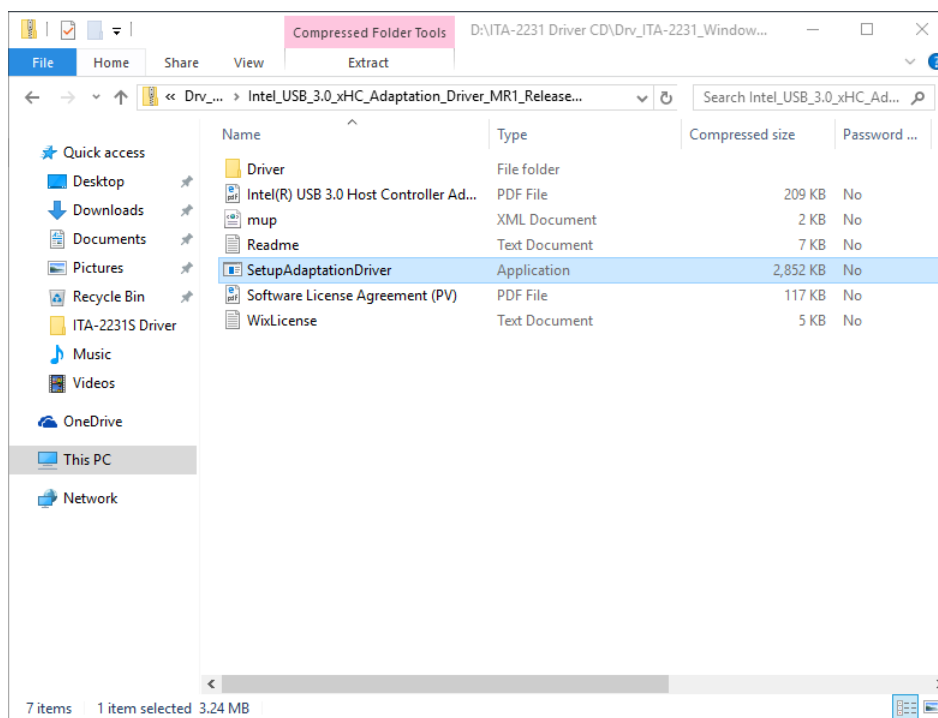
Insert the driver CD into your system's CD-ROM drive. You can see the MIC-7420 driver folder. Navigate to the "Serial IO" folder and click "SetupSerialIO.exe" to complete the installation of the driver.



5.2.8 USB3.0 windows Driver Setup

Insert the driver CD into your system's CD-ROM drive. You can see the MIC-7420 driver folder. Navigate to the "USB 3.0" folder and click "SetupAdaptationDriver.exe" to complete the installation of the driver.

Note: In Win10, MIC-7420 can directly use the USB 3.0 driver included in Win10 OS, instead of installing USB 3.0 driver additionally.



Appendix **A**

Programming the Watchdog Timer

A.1 Programming the Watchdog Timer

The MIC-7420 watchdog timer can be used to monitor system software operation and take corrective action if the software fails to function within the programmed period. This section describes the operation of the watchdog timer and how to program it.

A.1.1 Watchdog Timer Overview

The watchdog timer is built into the super I/O controller MIC-7420. It provides the following user-programmable functions:

- Can be enabled or disabled via user program
- Timer can be set from 1 to 255 seconds or 1 to 255 minutes
- Generates an interrupt or resets signal if the software fails to reset the timer before time-out

A.1.2 Programming the Watchdog Timer

The I/O port address of the watchdog timer is 680h (hex).

Table A.1: Watchdog Timer Registers

Address: 680h (hex)

Register Shift	Read/Write	Description
65 (hex)	write	Set seconds or minutes as units for the timer. Write 0 to bit 7: set second as counting unit. [default] Write 1 to bit 7: set minutes as counting unit.
66 (hex)	write	0: Stop timer [default] 01~FF (hex): The amount of the count, in seconds or minutes, depends on the value set in register 65 (hex). This number decides how long the watchdog timer waits for strobe before generating an interrupt or reset signal. Writing a new value to this register can reset the timer to count with the new value.
67 (hex)	read/write	Configure watchdog timer Bit 1: Write 1 to enable keyboard to reset the timer, 0 to disable. [default] Bit 2: Write 1 to enable mouse to reset the timer, 0 to disable. [default] Bit 7~4: Set the interrupt mapping of watchdog timer: 1111=IRQ15 0011=IRQ3 0010=IRQ2 0001=IRQ1 0000=Disable [default]
68 (hex)	read/write	Control watchdog timer Bit0: Read watchdog state; 1=Timer timeout Bit2: Write 1 to immediately generate timeout signal, and automatically return to 0 (Write only). Bit3: Write 1 to allow triggering of timer timeout when P20 is effective, 0 to disable. [default]

A.1.3 Example Program

```

;-----
1.  Enable watchdog timer and set 10 sec. as timeout interval
;-----
Mov dx,A65h ; Select register 65h, watchdog timer I/O port address 680h+ register
shifts 65h
Mov al,80h ; Set second as counting unit
Out dx,al

Mov dx,A66h ; Select register 66h, watchdog timer I/O port address 680h+ register
shift 66h
Mov al,10 ; Set timeout interval as 10 seconds and start counting
Out dx,al

;-----
2.  Enable watchdog timer and set 5 min. as timeout interval
;-----
Mov dx,A65h ; Select register 65h, watchdog timer I/O port address 680h+ register
shifts 65h
Mov al,00h ; Set minute as counting unit
Out dx,al
680h
Mov dx,A66h ; Select register 66h, watchdog timer I/O port address 680h+ register
shifts 66h
Mov al,5 ;Set timeout interval as 5 minutes and start counting
Out dx,al

;-----
3.  Enable watchdog timer to be reset by mouse
;-----
Mov dx,A67h ; Select register 67h, watchdog timer I/O port address 680h+ register
shifts 67h
In al,dx
Or al,4h ; Enable watchdog timer to be reset by mouse
Out dx,al

;-----
4.  Enable watchdog timer to be reset by keyboard
;-----
Mov dx,A67h ; Select register 67h, watchdog timer I/O port address 680h+ register
shifts 67h
In al,dx
Or al,2h ; Enable watchdog timer to be reset by keyboard
Out dx,al

;-----
5.  Generate a time-out signal without timer counting
;-----
Mov dx,A68h ; Select register 68h, watchdog timer I/O port address 680h+ register
shifts 68h
In al,dx
Or al,4h ; Generate a time-out signal
Out dx,al
;-----

```



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