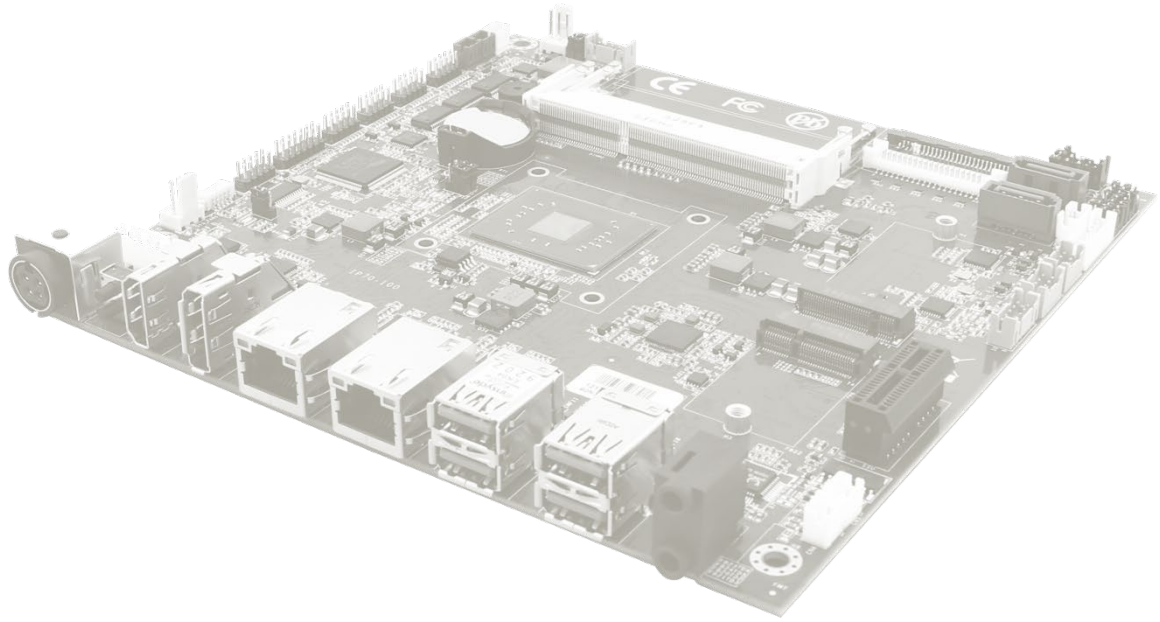
Mini-ITX SBC

Intel® Pentium® N4200 Apollo Lake Processor 1.10 GHz (up to 2.50 GHz with turbo boost technology)



IP70

User Manual

Document Version 1.0

Board Version V100

Document Part No. 91521110110Y

Please read this instructions before operating the device and retain them for future reference.

Contents

Preface

Copyright Notice

Trademark Acknowledgement

Disclaimer

We reserve the right to make changes, without notice, to any product, including circuits and/or software described or contained in this manual in order to improve design and/or performance. We assume no responsibility or liability for the use of the described product(s), conveys no license or title under any patent, copyright, or masks work rights to these products, and makes no representations or warranties that these products are free from patent, copyright, or mask work right infringement, unless otherwise specified. Applications that are described in this manual are for illustration purposes only. We make no representation or warranty that such application will be suitable for the specified use without further testing or modification.

Warranty

We warrant that each of its products will be free from material and workmanship defects for a period of one year from the invoice date. (Standard is one year, extended warranty will need to discuss with our sales representatives. If the customer discovers a defect, we will, at its option, repair or replace the defective product at no charge to the customer, provided it is returned during the warranty period of one year, with transportation charges prepaid. The returned product must be properly packaged in its original packaging to obtain warranty service.

If the serial number and the product shipping data differ by over 30 days, the in-warranty service will be made according to the shipping date. In the serial numbers the third and fourth two digits give the year of manufacture, and the fifth digit means the month (e. g., with A for October, B for November and C for December).

For example, the serial number 1W18Axxxxxxxx means October of year 2018.

Packing List

Before using this Motherboard, please make sure that all the items listed below are present in your package:

- IP70 Mini-ITX SBC
- User Manual & Driver CD

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

Customer Service

We provide a service guide as below for any problem by the following steps: First, contact your distributor, sales representative, or our customer service center for technical support if you need additional assistance.

You need to prepare the following information before you call:

- Product serial number
- Peripheral attachments
- Software (OS, version, application software, etc.)
- Detailed problem description
- The exact wording of any error messages

In addition, free technical support is available from our engineers every business day. We are always ready to give advice on application requirements or specific information on the installation and operation of any of our products. Please do not hesitate to call or e-mail us.

Advisory Conventions

Four types of advisories are used throughout the user manual to provide helpful information or to alert you to the potential for hardware damage or personal injury. These are Notes, Important, Cautions, and Warnings. The following is an example of each type of advisory.

Note:
A note is used to emphasize helpful information

Important:
An important note indicates information that is important for you to know.

Caution
A Caution alert indicates potential damage to hardware and explains how to avoid the potential problem.

Warning!
An Electrical Shock Warning indicates the potential harm from electrical hazards and how to avoid the potential problem.

Safety Precautions

Caution
Always ground yourself to remove any static charge before touching the CPU card. Modern electronic devices are very sensitive to static electric charges. As a safety precaution, use a grounding wrist strap at all times. Place all electronic components in a static-dissipative surface or static-shielded bag when they are not in the chassis.

Safety and Warranty

1. Please read these safety instructions carefully.
2. Please keep this user manual for later reference.

3. Please disconnect this equipment from any AC outlet before cleaning. Do not use liquid or spray detergents for cleaning. Use a damp cloth.
4. For pluggable equipment, the power outlet must be installed 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 could 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 over-voltage.
11. If any of the following situations arises, get the equipment checked by service personnel:
    a. The power cord or plug is damaged.
    b. Liquid has penetrated into the equipment.
    c. The equipment has been exposed to moisture.
    d. The equipment does not work well, or you cannot get it to work according to the user's manual.
    e. The equipment has been dropped and damaged.
    f. The equipment has obvious signs of breakage.

About This User Manual

This User Manual provides information about using the IP70 Mini-ITX SBC. The documentation set for the IP70 Mini-ITX SBC provides information for specific user needs, and includes:

- **IP70 Mini-ITX SBC User Manual** – contains detailed description on how to use the motherboard, its components and features.

Note:
Some pictures in this guide are samples and can differ from actual product.

Document Revision History

Version	Date	Note
1.0	3-Jan-2019	New document release.

Chapter 1: General Information

This chapter includes the IP70 Mini-ITX SBC background information.

1.1 Introduction

Thank you for choosing the IP70 Mini-ITX SBC. The IP70 Mini-ITX SBC is powered by Intel ® Pentium® N4200 Apollo Lake processor 1.10 GHz; up to 2.50 GHz with turbo boost technology and Intel® SOC chipset. The IP70 Mini-ITX SBC supports up to 8 GB of DDR3L 1866 MHz SO-DIMM system memory. High performance platform delivers the performance and high scalability cutting-edge embedded computing application.

In terms of peripheral connectivity, the IP70 Mini-ITX SBC has four serial ports (pin headers), four super-speed USB 3.0 connectors and four hi-speed USB 2.0 connectors (four pin headers). , IP70 Mini-ITX SBC supports expansion with two M.2 Slots, PCIE2.0. Designed for industrial applications, the IP70 Mini-ITX SBC supports 12V DC power input and operates in a wide temperature range -20°C ~ 60°C.

Abundant I/O connectors and expandability makes IP70 Mini-ITX SBC to be the right fit in the majority of industrial and commercial applications such as machine vision and control, gaming, POS, KIOSK systems, industrial automation, and others. Powerful processor in a Mini-ITX form factor meets the demanding performance requirements of modern Industrial IoT and Edge Computing applications.

1.2 Features

IP70 Mini-ITX SBC features:

- Mini ITX Form Factor (170 x 170 mm)
- Intel ® Pentium® N4200 Apollo Lake Processor 1.10 GHz, up to 2.50 GHz with turbo boost
- Intel® SOC Chipset
- Intel® HD Graphics 505, supports DirectX 12 and OpenGL4.3
- 2 × DDR3L 1866 MHz SO-DIMM (up to 8 GB)
- Intel® I210AT Gigabit-LAN Controller x 2
- 1 x M.2 Slot (for SSD), 1 x M.2 Slot (for Wi-Fi)
- 1 x PCIE2.0 (x1) slot (Optional)
- Operating temperature -20°C ~ 60°C

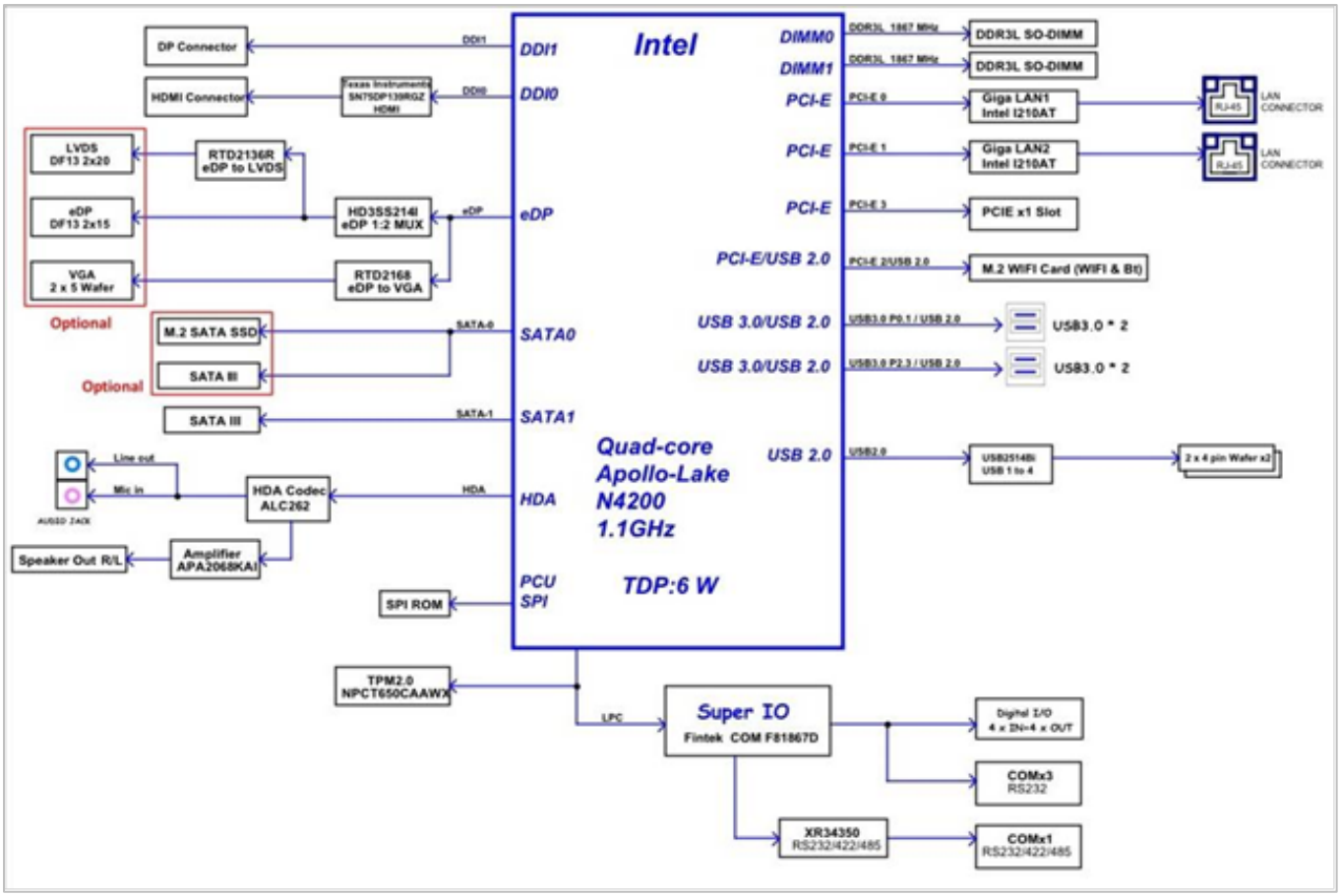
1.3 Hardware Specifications

Model Name	IP70 Mini-ITX SBC
System Specifications	
CPU	Intel® Pentium® N4200 Apollo Lake Processor 1.10 GHz, up to 2.50 GHz with turbo boost technology
System Memory	2 × DDR3L 1866 MHz SO-DIMM (max. 8GB)
BIOS	Insyde BIOS
Graphic	Intel® HD Graphics 505, supports DirectX 12 and OpenGL4.3
Audio Codec	Realtek HD codec
Ethernet	Intel® I210AT Gigabit-LAN Controller x 2
Display Specifications	
Display Interface	HDMI resolution up to 3840 x 2160 @ 30 Hz VGA resolution up to 1920 x 1200 @ 60 Hz DP interface, supports max. resolution 4096 x 2160 @60Hz LVDS S24 bit 1920 x 1200@60Hz
I/O Ports Specification	
External I/O	4 x USB 3.0 2 x RJ-45 for Giga LAN 1 x DP 1.2 1 x HDMI 1.4 1 x Audio Jack (Mic-in, Line-out) 1 x (+12V) DC-in Power Jack 1 x Clear CMOS Button 1 x Reset Button
Internal I/O	3 x RS-232 2x5 pin-header 1 x RS-232/422/485 2x5 pin-header 4 x USB 2.0 1 x LVDS by DF-13 40 pin connector 2 x SATA III (SATA2 is only available when M.2 SATA is not in use; SATA2 and M.2 SATA cannot be used concurrently.) 1 x SATA power by 2x4 pin wafer 2 x -pin-header for speaker(with Amplifier): Left, Right 1 x 14-pin pin-header for DIO 1 x 3-pin digital panel backlight brightness controller 1 x 7-pin inverter 1 x 2x2-pin DC-in 12V connector 2 x 2-pin wafer for +5V external power (Red) 1 x 2-pin wafer for 12V external power (Yellow) 1 x OSD membrane control 1 x eDP panel by JAE-FI-X30S-HF 30p connector (Optional) 1 x 10-pin wafer for VGA output(Optional)

Model Name	IP70 Mini-ITX SBC
Expansions Slot	1 x M.2 2242 KEY B. SATA Slot (for SSD) 1 x M.2 KEY E Slot (for Wi-Fi) 1 x PCIE2.0 (x1) slot (Optional)
Mechanical Specifications	
Dimensions	170 x 170 mm
Operating Temperature	-20°C ~ 60°C
Storage Temperature	-40°C ~ 70°C
Operating Humidity	10% ~ 95%, non-condensing
Power Management	
Power Input	+12V DC
Packing List	
Standard	IP70 Single Board Computer IP70 Manual & Driver DVD

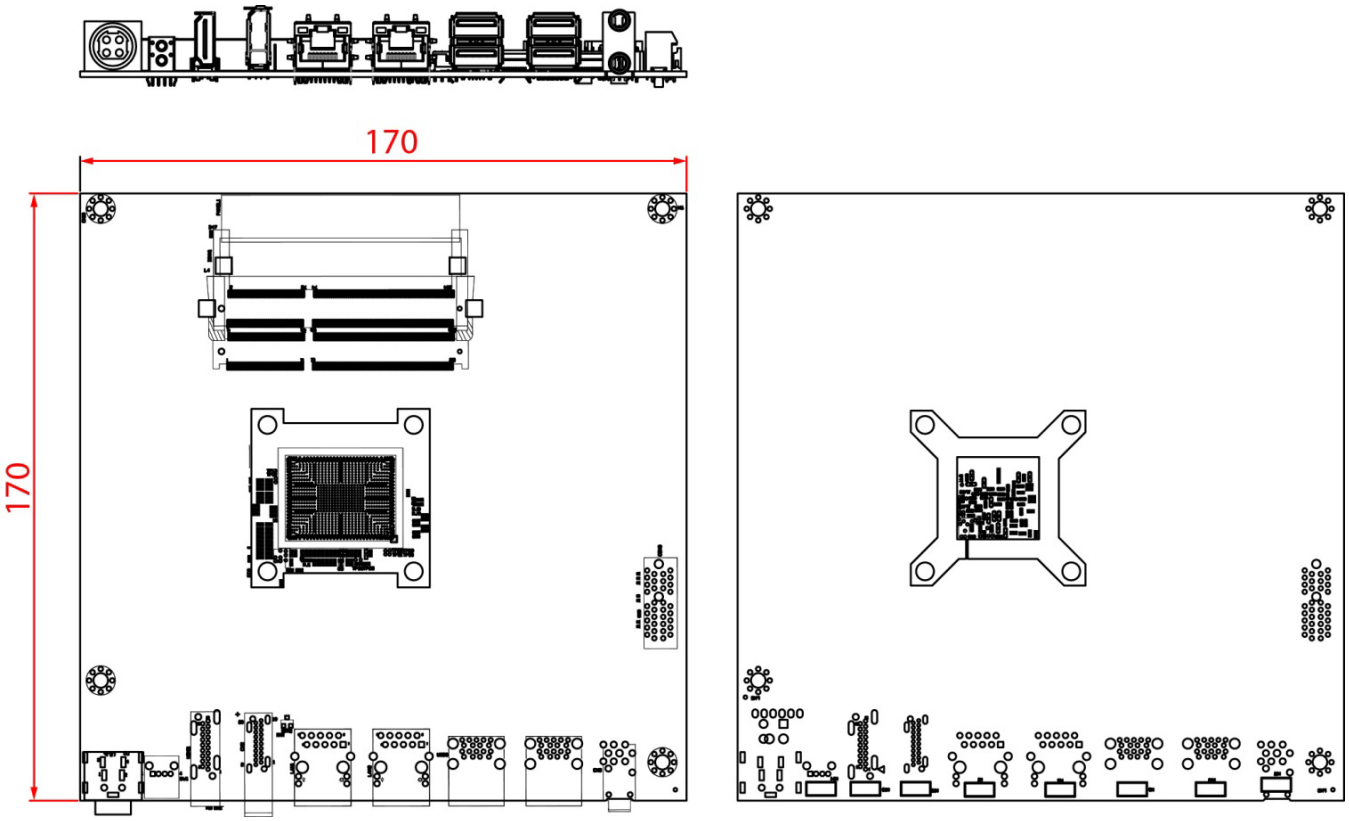
1.4 Functional Description

Function block (V100)



1.5 Dimensions

Board Dimensions (V100)



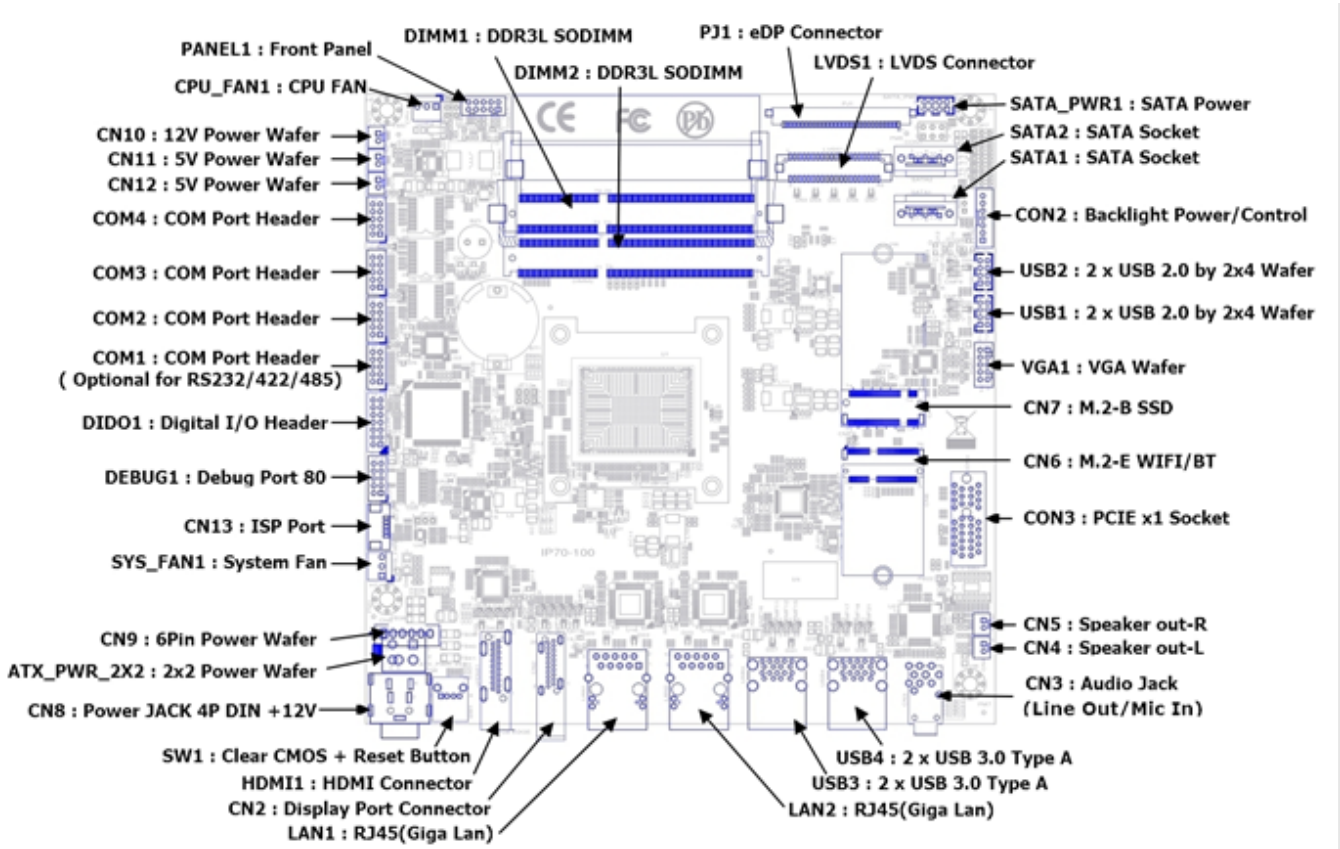
Chapter 2: Hardware Installation

This chapter provides information on how to use jumpers and connectors on the IP70 Mini-ITX SBC.

2.1 Motherboard Components

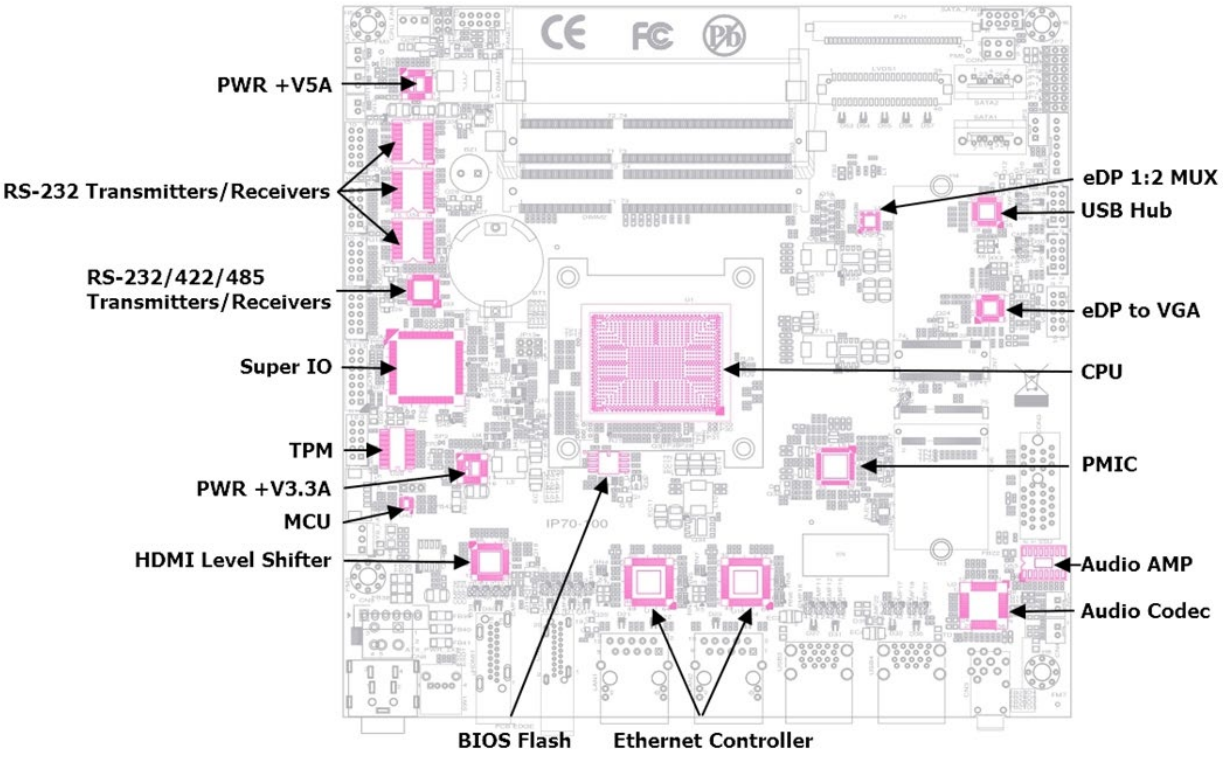
2.1.1 Component Side

PCB Top Layer (Top View)

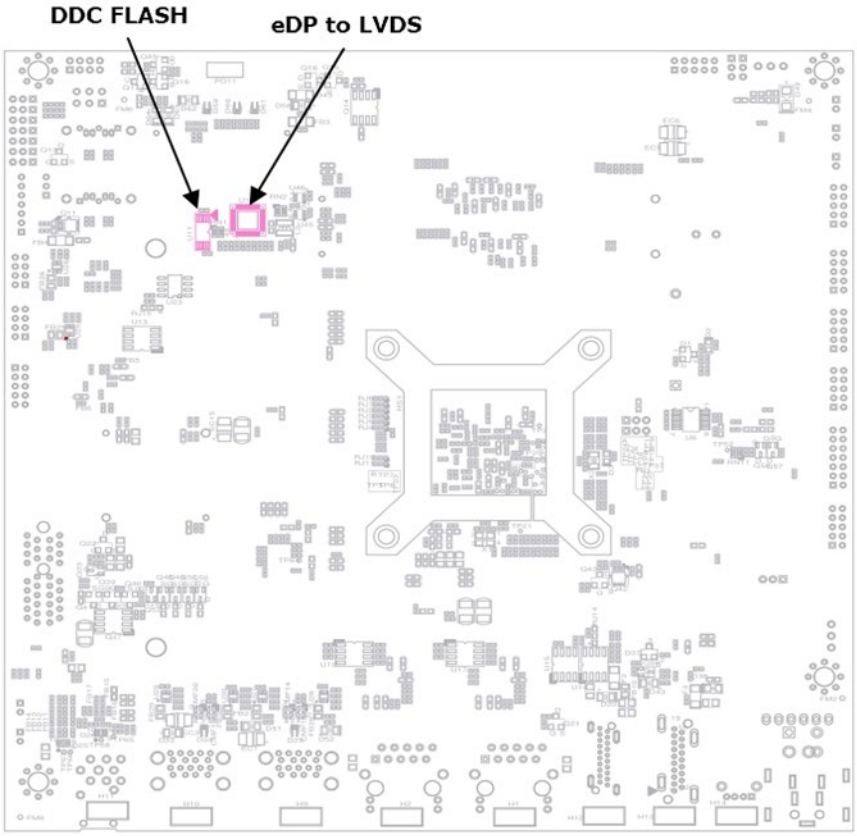


2.1.2 Key Component Location

PCB Top Layer (Top View)

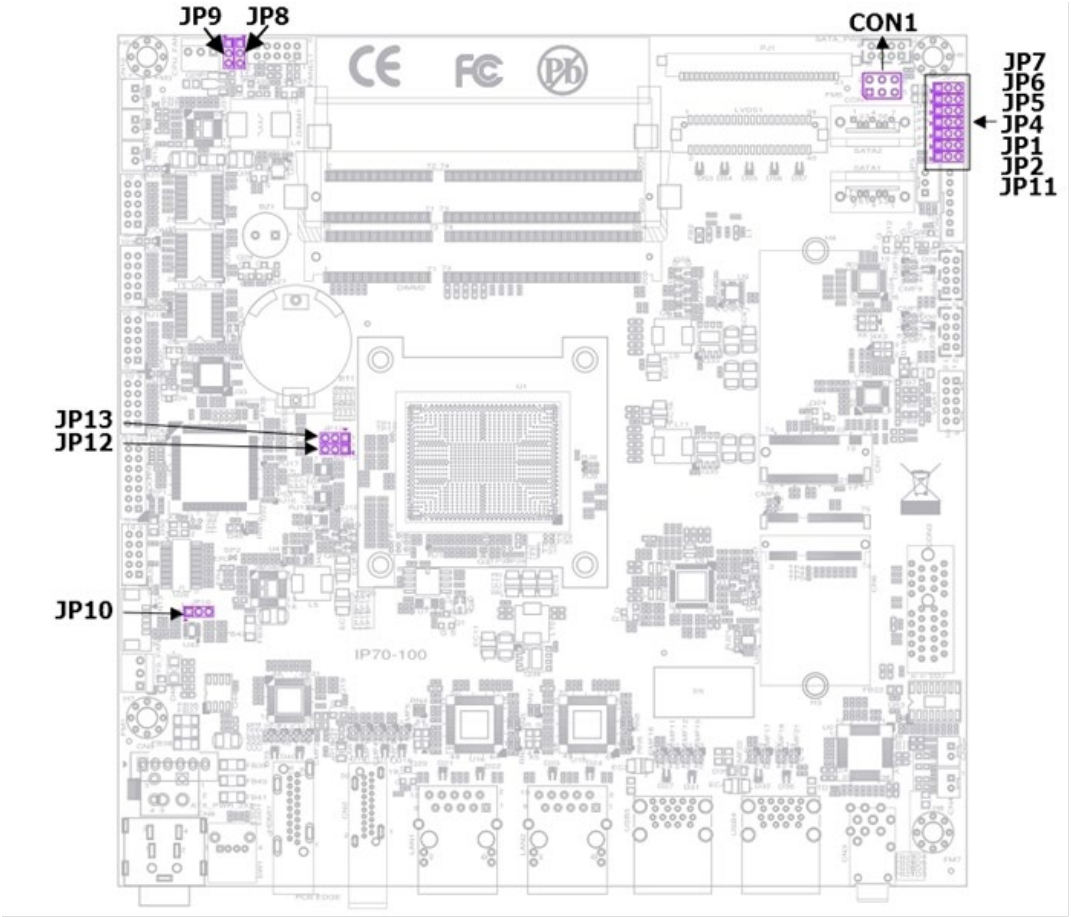


PCB Bottom Layer (Top View)



2.1.3 Jumper Location

PCB Top Layer (Top View)

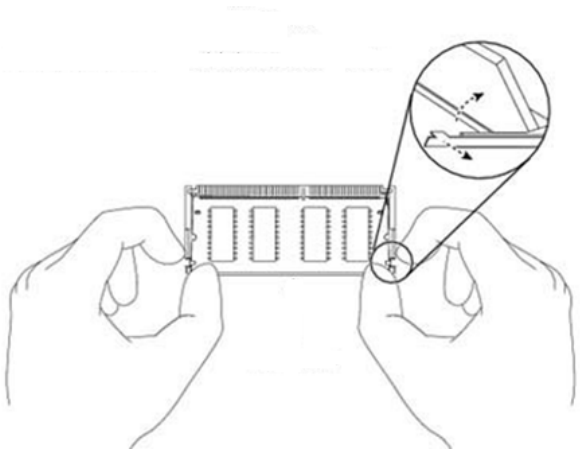


2.2 Memory Module (SO-DIMM) Installation

The IP70 Mini-ITX SBC has two 260-pin SO-DIMM slots. The socket supports DDR3L.

When installing the memory unit, please follow the steps below:

1. Firmly insert the SO-DIMM at an angle of about 30-degree into the slot. Align the SO-DIMM with the slot until it is fully inserted. The notch on the SO-DIMM should match the break on the slot.
2. Press downwards on SO-DIMM until the retaining clips at both ends fully snap closed and the SO-DIMM is properly seated.



Note: Pull tabs away with your thumbs, bracing your forefingers against the rails. The memory module will be released. Then raise the memory module to a vertical position.

Caution The SO-DIMM only fits in one correct orientation. It will cause permanent damage to the development board and the SO-DIMM if the SO-DIMM is forced into the slot at the incorrect orientation.

2.3 I/O Equipment Installation

2.3.1 Power Input Jack

The IP70 Mini-ITX SBC allows plugging 12V DC jack on the board without another power module converter under power consumption by Intel® Pentium® N4200 Apollo Lake Processor 1.10 GHz.

2.3.2 Serial COM Port

Four COM Port pin headers build in the motherboard (Only one optional COM port can support RS-422/485). **When an optional touch-screen is ordered with panel PC, the serial com port can connect to a serial or an optional touch-screen.*

2.3.3 HDMI

The IP70 Mini-ITX SBC has one HDMI port that can be connected to an external LCD monitor. Use HDMI cable to connect to an external LCD monitor, and connect the power cable to the outlet. The HDMI connector is a standard 19-pin HDMI connector.

2.3.4 Display Port

The Motherboard has one Display Port that can be connected to an external LCD monitor. Use the Display Port cable to connect to an external LCD monitor, and connect the power cable to the power outlet. The Display Port connector is a standard 20-pin DP connector.

2.3.5 Ethernet Interface

The IP70 Mini-ITX SBC is equipped with two Intel® I210AT Gigabit-LAN Controller PHY which is fully compliant with the PCI 10/100/1000 Mbps Ethernet protocol compatible. It is supported by major network operating systems. The Ethernet ports provide two standard RJ-45 jacks.

2.3.6 USB Port

Eight USB devices (four with pin headers) may be connected to the system though an adapter cable. Various adapters may come with USB ports. USB usually connect the external system to the system. The USB ports support hot plug-in connection. Whatever, you should install the device driver before you use the device.

2.3.7 Audio

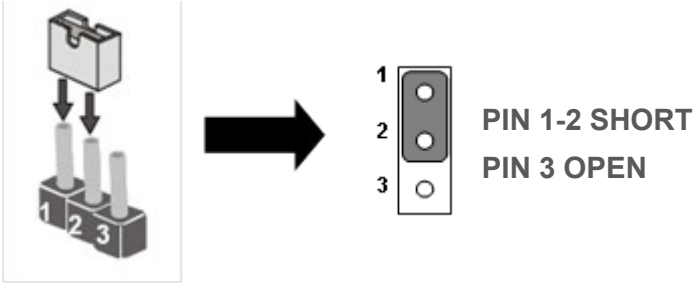
The Audio 7.1 channel capabilities are provided by a Realtek chipset supporting digital audio outputs. The audio interface includes two jacks: line-out and mic-in.

2.4 Jumper Settings

This section explains how to set jumpers for correct configuration of the motherboard.

Note: 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.

The jumper setting diagram is shown below. When the jumper cap is placed on both pins, the jumper is SHORT. The illustration below shows a 3-pin jumper; pins 1 and 2 are short. If you remove the jumper cap, the jumper is OPEN.



Caution

To avoid damaging the module, always turn off the power supply before setting jumpers or clearing CMOS.

Jumper List:

Label	Function	Note
JP1, JP2, JP11	Control Backlight Power On/Off	Header 3*1
JP4, JP5, JP6, JP7	Backlight Brightness Control	Header 3*1
CON1	Control Panel Power	Header 2*3
JP8, JP9	OSD Option	Header 3*1
JP10	PWM Control	Header 3*1
JP12, JP13	CLR CMOS/RTC	Header 3*1

2.4.1 Control Backlight Power On/Off

JP1				
Location	**Header Type**	**Description**	**Setting**	**Function**
JP1	Header 3*1	Inverter Voltage SEL	1-2 (Default)	+5V
			2-3	+12V
JP2				
Location	**Header Type**	**Description**	**Setting**	**Function**
JP2	Header 3*1	Inverter EN SEL	1-2 (Default)	Control to BLON
			2-3	Normal(Always)
JP11				
Location	**Header Type**	**Description**	**Setting**	**Function**
JP11	Header 3*1	BKL Control EN SEL	1-2 (Default)	LVDS Control
			2-3	eDP Control

2.4.2 Backlight Brightness Control

JP4				
Location	**Header Type**	**Description**	**Setting**	**Function**
JP4	Header 3*1	DC Mode Control	1-2	Control to VRD
			2-3 (Default)	Normal(For DC)
JP5				
Location	**Header Type**	**Description**	**Setting**	**Function**
JP5	Header 3*1	PWM LEVEL	1-2 (Default)	+3.3V
			2-3	+5V
JP6				
Location	**Header Type**	**Description**	**Setting**	**Function**
JP6	Header 3*1	Brightness CTL SEL	1-2 (Default)	DC Mode
			2-3	PWM Mode
JP7				
Location	**Header Type**	**Description**	**Setting**	**Function**
JP7	Header 3*1	Brightness CTL to VRD	1-2 (Default)	Normal Mode
			2-3	VRD Control

2.4.3 Control Panel Power

CON1				
Location	**Header Type**	**Description**	**Setting**	**Function**
CON1	Header 2*3	Panel Power SEL	1-2 (Default)	+3.3V
			3-4	+5V
			5-6	+12V

2.4.4 OSD Option

JP8				
Location	**Header Type**	**Description**	**Setting**	**Function**
JP8	Header 3*1	OSD Key Option	1-2	4 Key OSD
			2-3(Default)	Normal Mode (2 Key)
Location	**Header Type**	**Description**	**Setting**	**Function**
JP9	Header 3*1	OSD Key Option	1-2	4 Key OSD
			2-3(Default)	Normal Mode (2 Key)

2.4.5 PWM Control

JP10				
Location	**Header Type**	**Description**	**Setting**	**Function**
JP10	Header 3*1	VRD Brightness Function	1-2(Default)	Normal
			2-3	Reverse

2.4.6 CLR CMOS/RTC

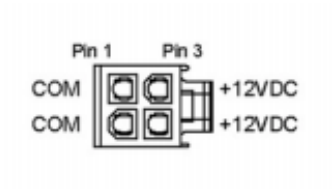
JP12				
Location	**Header Type**	**Description**	**Setting**	**Function**
JP12	Header 3*1	Clear CMOS Jumper	1-2(Default)	Normal
			2-3	Clear CMOS
JP13				
Location	**Header Type**	**Description**	**Setting**	**Function**
JP13	Header 3*1	Clear RTC Jumper	1-2(Default)	Normal
			2-3	Clear RTC

2.5 Mainboard Connectors

2.5.1 Internal Front Side Connectors

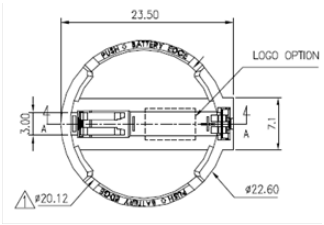
Label	Function	Note
ATX_PWR_2X2	2x2 Power Wafer	
BT1	RTC Battery Socket	
CN2	DisplayPort Connector	
CN3	Audio Jack	
CN4	Left Speaker	
CN5	Right Speaker	
CN6	M.2-E WIFI/BT	
CN7	M.2-B SSD	
CN8	Power Jack 4P DIN 12V	
CN9	6 Pin Power Wafer	
CN10	Power Output Wafer 12V	Yellow Wafer
CN11	Power Output Wafer 5V	Red Wafer
CN12	Power Output Wafer 5V	Red Wafer
CN13	ISP Port	
COM1,COM2, COM3, COM4	COM Port Header	
CON3	PCIE x1 Socket	
CON2	Backlight Power/Control	
CPU_FAN1	CPU FAN	
DEBUG1	Debug Port 80	
DIMM1,DIMM2	DDR3L_SODIMM	
DIDO1	Digital I/O Header	
JP3	VR KNOB	
HDMI1	HDMI Connector	
LAN1,LAN2	RJ45	
LVDS1	LVDS Connector	
PANEL 1	Front Panel	
PJ1	eDP Connector	
SATA1, SATA2	SATA Connector	
SW1	Clear CMOS + Reset Button	
SYS_FAN1	System FAN	
VGA1	VGA Wafer	
USB1, USB2	2 x USB 2.0 Wafer	2x4 Wafer
USB3, USB4	2 x USB 3.0 Type A	
SATA_PWR1	SATA Power	

2.5.1.1 ATX_PWR_2X2: 2x2 Power Wafer



Pin №	Signal Name
1	DC_GND
2	DC_GND
3	+12V
4	+12V

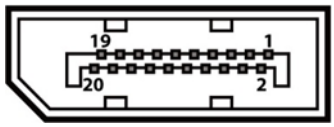
2.5.1.2 BT1: RTC Battery Socket



Pin №	Signal Name
1	BACKUP_VBAT
2	GND

2.5.1.3 CN2: DisplayPort Connector

IP70 Mini-ITX SBC has one Display Port 1.2 connector.



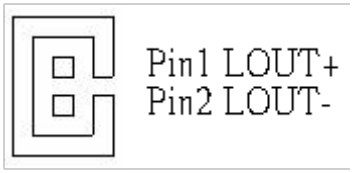
Pin №	Signal Name	Pin №	Signal Name
1	Lane 0+	2	GND
3	Lane 0-	4	Lane 1+
5	GND	6	Lane 1-
7	Lane 2+	8	GND
9	Lane 2-	10	Lane 3+
11	GND	12	Lane 3-
13	AUX_EN_N	14	GND
15	AUX+	16	GND
17	AUX-	18	Hot Plug
19	GND	20	+3.3V

2.5.1.4 CN3: Audio Jack

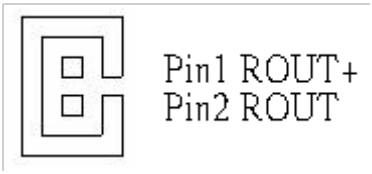
IP70 Mini-ITX SBC has two stereo audio ports with phone jack connectors, one is Line-out, and the other one is Mic-in.

Color	Signal Name
1	Line-out
2	Mic-in

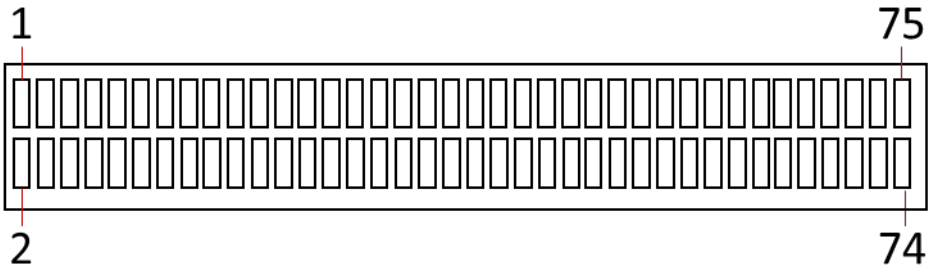
2.5.1.5 CN4: Left Speaker



2.5.1.6 CN5: Right Speaker



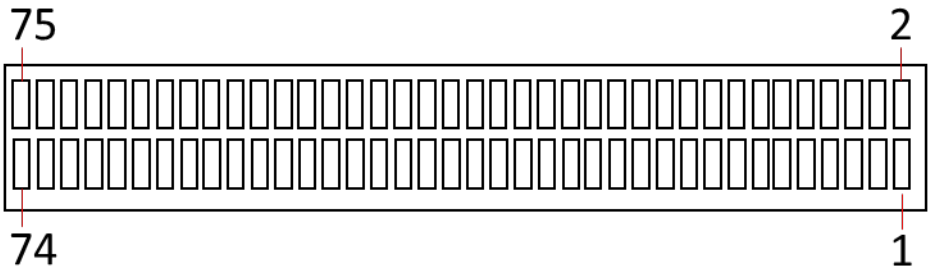
2.5.1.7 CN6: M.2-E WIFI/BT



Pin №	Signal Name	Pin №	Signal Name
1	GND	2	+3.3V
3	USB+	4	+3.3V
5	USB-	6	NC
7	GND	8	NC
9	NC	10	NC
11	NC	12	NC
13	NC	14	NC
15	NC	16	NC
17	NC	18	GND
19	NC	20	NC
21	NC	22	NC
23	NC	24	KEY
25	KEY	26	KEY
27	KEY	28	KEY
29	KEY	30	KEY
31	KEY	32	NC
33	GND	34	NC
35	PCIE_TXP0	36	NC
37	PCIE_TXN0	38	NC
39	GND	40	NC
41	PCIE_RXP0	42	NC
43	PCIE_RXN0	44	NC
45	GND	46	NC
47	CLK_PCIE_SLOT_P	48	NC
49	CLK_PCIE_SLOT_N	50	NGFF_WIFI_SUSCLK
51	GND	52	WIFI_RST#
53	CLKREQ_WIFI#	54	BT_EN

55	PCIE_WAKE#	56	WIFI_EN_R
57	GND	58	SMB_DATA_WIFI
59	NC	60	SMB_CLK_WIFI
61	NC	62	NGFF_SMB_ALERT
63	GND	64	NC
65	NC	66	NC
67	NC	68	NC
69	GND	70	NC
71	NC	72	+3.3V
73	NC	74	+3.3V
75	GND		

2.5.1.8 CN7: M.2-B SSD

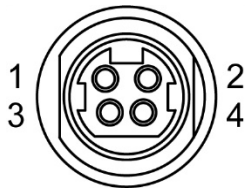


Pin №	Signal Name	Pin №	Signal Name
1	GND	2	+3.3V
3	GND	4	+3.3V
5	PERN3	6	NC
7	PERP3	8	NC
9	GND	10	SSD_LED
11	PETN3	12	KEY
13	KEY	14	KEY
15	KEY	16	KEY
17	KEY	18	KEY
19	KEY	20	NC
21	GND	22	NC
23	PETN2	24	NC
25	PETP2	26	NC
27	GND	28	NC
29	PERN1	30	NC
31	PERP1	32	NC
33	GND	34	NC
35	PETN1	36	NC
37	PETP1	38	SATA1_DEVSLP
39	GND	40	NC
41	PERP0/SATA_RX+	42	NC

43	PERN0/SATA_RX-	44	NC
45	GND	46	NC
47	PETN0/SATA_TX-	48	NC
49	PETP0/SATA_TX+	50	SSD_SATA_PERST#
51	GND	52	SSD_SATA_CLKREQ#
53	REFCLKN	54	SSD_SATA_PEWAKE#
55	REFCLKP	56	NC
57	GND	58	NC
59	NC	60	NC
61	NC	62	NC
63	NC	64	NC
65	NC	66	SIM_DET
67	NC	68	SSD_SATA_SUS_CLK
69	PCIE_SSD_PEDET	70	+3.3V
71	GND	72	+3.3V
73	GND	74	+3.3V
75	GND		

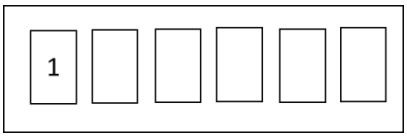
2.5.1.9 CN8: Power Jack 4P DIN 12V

The DC power input for the IP70 Mini-ITX SBC allows a voltage input of 12V DC.



Pin №	Signal Name	Pin №	Signal Name
1	12VDC	2	GND
3	12VDC	4	GND

2.5.1.10 CN9: Pin Power Wafer

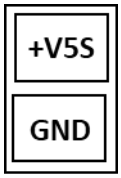


Pin №	Signal Name
1	DC_IN
2	DC_IN
3	DC_IN
4	DC_GND
5	DC_GND
6	DC_GND

2.5.1.11 CN10: Power Output Wafer 12V

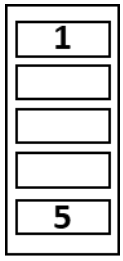
Yellow

2.5.1.12 CN11, CN12: Power Output Wafer 5V



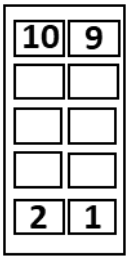
Red

2.5.1.13: CN13: ISP Port



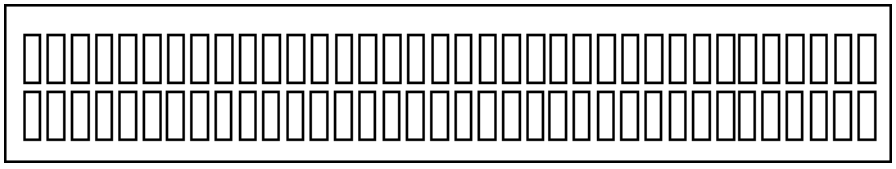
Pin №	Signal Name
1	+3.3V
2	C2DAT
3	C2CK
4	RESET#
5	GND

2.5.1.14 COM1, COM2, COM3, COM4: COM Port Header



Pin №	Signal Name	Pin №	Signal Name
1	DCD	2	DSR
3	SIN	4	RTS
5	SOUT	6	CTS
7	DTR	8	RI
9	GND	10	COM_PWR

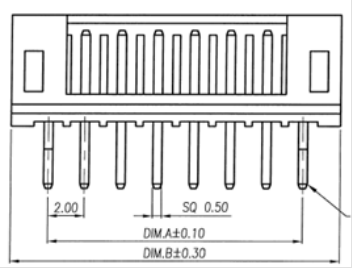
2.5.1.15 CON3: PCIE x1 Socket



Pin №	Signal Name	Pin №	Signal Name
A1	PCIESLOT_PRSNT#1	B1	+12V
A2	+12V	B2	+12V
A3	+12V	B3	+12V
A4	GND	B4	GND
A5	NC	B5	SMCLK
A6	NC	B6	SMDAT
A7	NC	B7	GND
A8	NC	B8	+3.3V
A9	+3.3V	B9	NC
A10	+3.3V	B10	+3.3V
A11	PWRGD	B11	WAKE#

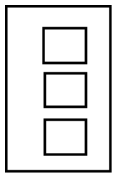
A12	NC	B12	NC
A13	PCIE_REFCLK+	B13	GND
A14	PCIE_REFCLK-	B14	PCIE_TX+
A15	GND	B15	PCIE_TX-
A16	PCIE_RX+	B16	GND
A17	PEIC_RX-	B17	CLKREQ_PCIEX1#
A18	GND	B18	GND

2.5.1.16 CON2: Backlight Power/Control



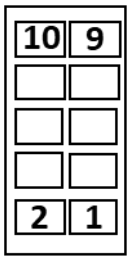
Pin №	Signal Name
1	BKL_PWR
2	BKL_PWR
3	BKL_PWR
4	GND
5	BRIGHT
6	GND
7	BLON_5V

2.5.1.17 CPU_FAN1: CPU FAN



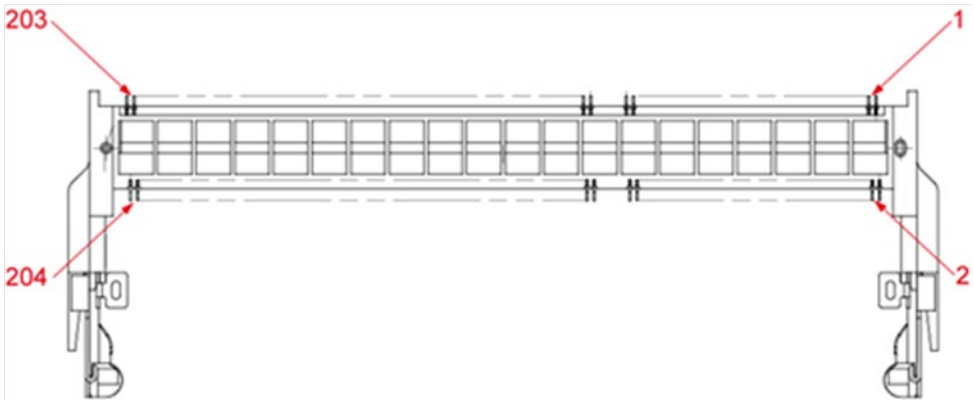
Pin 1 GND
Pin 2 +12 V
Pin 3 SENSE

2.5.1.18 DEBUG1: Debug Port 80

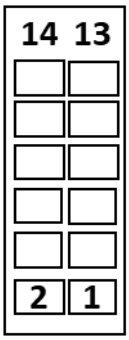


Pin №	Signal Name	Pin №	Signal Name
1	LPC_AD0	2	+3.3V
3	LPC_AD1	4	GND
5	LPC_AD2	6	LPC_FRAME#
7	LPC_AD3	8	GND
9	BUF_PLTRST_N	10	CLK_LPC_Port80

2.5.1.19 DIMM1,DIMM2 : DDR3L_SODIMM



2.5.1.20 DIDO1: Digital I/O Header



Pin №	Signal Name	Pin №	Signal Name
1	GND	2	DIO_5V
3	DOUT3	4	DOUT1
5	DOUT2	6	DOUT0
7	DIN3	8	DIN1
9	DIN2	10	DIN0
11	GPIO_IN0	12	GPIO_OUT0
13	GPIO_IN1	14	GPIO_OUT1

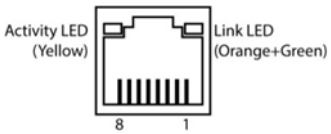
2.5.1.21 HDMI1: HDMI Connector

Use HDMI 1.4a connector to connect the IP70 Mini-ITX SBC to an external monitor.

Pin №	Signal Name	Pin №	Signal Name
1	TMDS_DATA2+	2	GND
3	TMDS_DATA2-	4	TMDS_DATA1+
5	GND	6	TMDS_DATA1-
7	TMDS_DATA0+	8	GND
9	TMDS_DATA0-	10	TMDS_CLOCK+
11	GND	12	TMDS_CLOCK-
13	CEC	14	NC
15	DDC_CLOCK	16	DDC_DATA
17	GND	18	5V
19	Hot Plug Detect		

2.5.1.22 LAN1, LAN2: RJ45

IP70 Mini-ITX SBC has two Ethernet connectors located on the front. Ethernet ports provide a standard RJ45 10/100/1000 Mbps jack connector with LED indicators on the front side to show its Active/ Link status and Speed status.

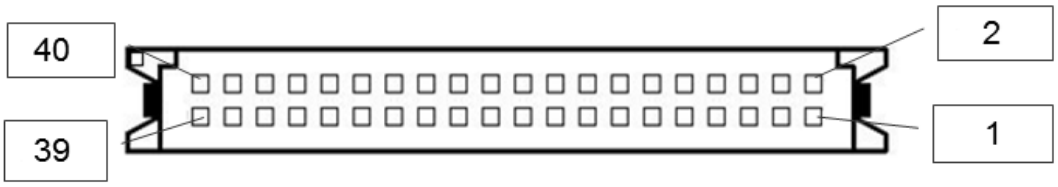


10/100 Mbps- Green

1G Mbps – Orange

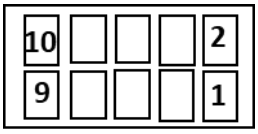
Pin №	Signal Name	Pin №	Signal Name
1	TX1+	2	TX1-
3	TX2+	4	TX2-
5	TX3+	6	TX3-
7	TX4+	8	TX4-

2.5.1.23 LVDS1:LVDS Connector



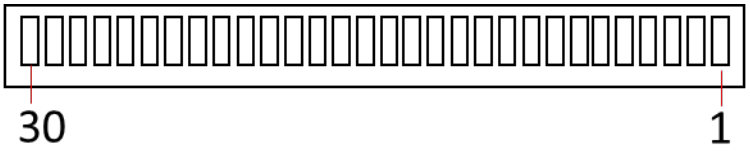
Pin №	Signal Name	Pin №	Signal Name
1	LCDVDD	2	LVDS0_TX0_N
3	LCDVDD	4	LVDS0_TX0_P
5	LCDVDD	6	LVDS0_TX1_N
7	GND	8	LVDS0_TX1_P
9	GND	10	LVDS0_TX2_N
11	GND	12	LVDS0_TX2_P
13	GND	14	LVDS0_CLK_N
15	GND	16	LVDS0_CLK_P
17	GND	18	LVDS0_TX3_N
19	GND	20	LVDS0_TX3_P
21	GND	22	LVDS1_TX0_N
23	GND	24	LVDS1_TX0_P
25	GND	26	LVDS1_TX1_N
27	GND	28	LVDS1_TX1_P
29	GND	30	LVDS1_TX2_N
31	GND	32	LVDS1_TX2_P
33	GND	34	LVDS1_CLK_N
35	GND	36	LVDS1_CLK_P
37	GND	38	LVDS1_TX3_N
39	GND	40	LVDS1_TX3_P

2.5.1.24 PANEL1: Front Panel



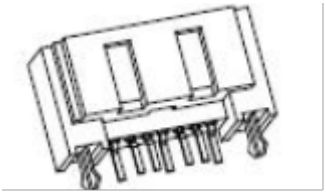
Pin №	Signal Name	Pin №	Signal Name
1	+5V	2	+3.3V
3	GND	4	SATA_LED#
5	PWRBTN_N	6	GND
7	ADJ+	8	RSTBTN
9	ADJ-	10	+5V

2.5.1.25 PJ1: eDP Connector



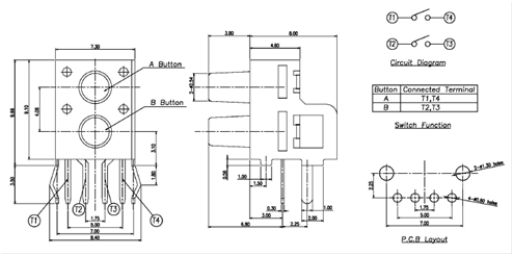
Pin №	Signal Name
1	BKL_PWR
2	BKL_PWR
3	BKL_PWR
4	BKL_PWR
5	BRIGHT
6	BLON_5V
7	GND
8	GND
9	GND
10	GND
11	NC
12	eDP_HPD
13	eDP_AUX-
14	eDP_AUX+
15	eDP_TX3_D-
16	eDP_TX3_D+
17	GND
18	GND
19	eDP_TX2_D-
20	eDP_TX2_D+
21	eDP_TX1_D-
22	eDP_TX1_D+
23	eDP_TX0_D-
24	eDP_TX0_D+
25	GND
26	GND
27	NC
28	NC
29	LCDVDD
30	LCDVDD

2.5.1.26 SATA1, SATA2: SATA Connector



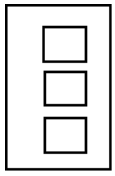
Pin №	Signal Name
1	GND
2	SATA_TX-
3	SATA_TX+
4	GND
5	SATA_RX-
6	SATA_RX+
7	GND

2.5.1.27 SW1: Clear CMOS + Reset Button



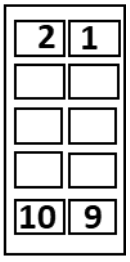
Pin №	Signal Name
1	GND
2	GND
3	RESET
4	RTC CLR CMOS

2.5.1.28 SYS_FAN1: System FAN



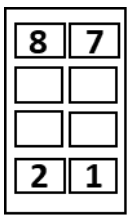
Pin 1 GND
Pin 2 +12 V
Pin 3 SENSE

2.5.1.29 VGA1: VGA Wafer



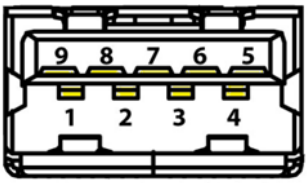
Pin №	Signal Name	Pin №	Signal Name
1	VGA_SDA	2	VGA_5V
3	VGA_SCL	4	VGA_RED
5	VGA_HSYNC_R	6	VGA_GREEN
7	VGA_VSYNC_R	8	VGA_BLUE
9	GND	10	GND

2.5.1.30 USB1, USB2: 2 x USB 2



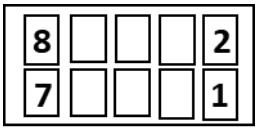
Pin №	Signal Name	Pin №	Signal Name
1	USB1_PWR	2	USB2_PWR
3	USB1_D-	4	USB2_D-
5	USB1_D+	6	USB2_D+
7	GND	8	GND

2.5.1.31 USB3, USB4: 2 x USB 3.0 Type A



Pin №	Signal Name	Pin №	Signal Name
1	+5V	2	USB_D-
3	USB_D+	4	GND
5	STDA_SSRX-	6	STDA_SSRX+
7	GND_DRAIN	8	STDA_SSTX-
9	STDA_SSTX+		

2.5.1.32 SATA_PWR1: SATA Power



Pin №	Signal Name	Pin №	Signal Name
1	+12V	2	+12V
3	GND	4	GND
5	GND	6	GND
7	+5V	8	+5V

Chapter 3: Insyde H20 BIOS Setup

This chapter describes the different settings available in the INSYDE BIOS that comes with the board. This chapter offers information on the Award BIOS installation utility.

3.1 How and When to Use BIOS Setup

To enter the BIOS setup, you need to connect an external USB keyboard, external monitor and press Del key when the prompt appears on the screen during start up. The prompt screen shows only few seconds so need press Del key quickly.

Important: Updated BIOS version may be published after the manual released. Check the latest version of BIOS on the website.

You may need to run BIOS setup utility for reasons listed below:

1. Error message on screen indicates to check BIOS setup
2. Restoring the factory default settings.
3. Modifying the specific hardware specifications
4. Necessity to optimize specifications

BIOS Navigation Keys

The following keys are enabled during POST:

Key	Function
Del	Enters the BIOS setup menu.
F7	Display the boot menu. Lists all bootable devices that are connected to the system. With cursor ↑and cursor ↓and by pressing <ENTER>, select the device used for the boot.
Pause	Pressing the [Pause] key stops the POST. Press any other key to resume the POST.

The following Keys can be used after entering the BIOS Setup.

Key	Function
F1	Help
F5/ F6	Change Values
F9	Setup Defaults
F10	Save & Exit
Esc	Exit
Enter	Select SubMenu
↑/ ↓	Select Item
← / →	Select Item

For items marked ► press **<Enter>** for more options.

Note:

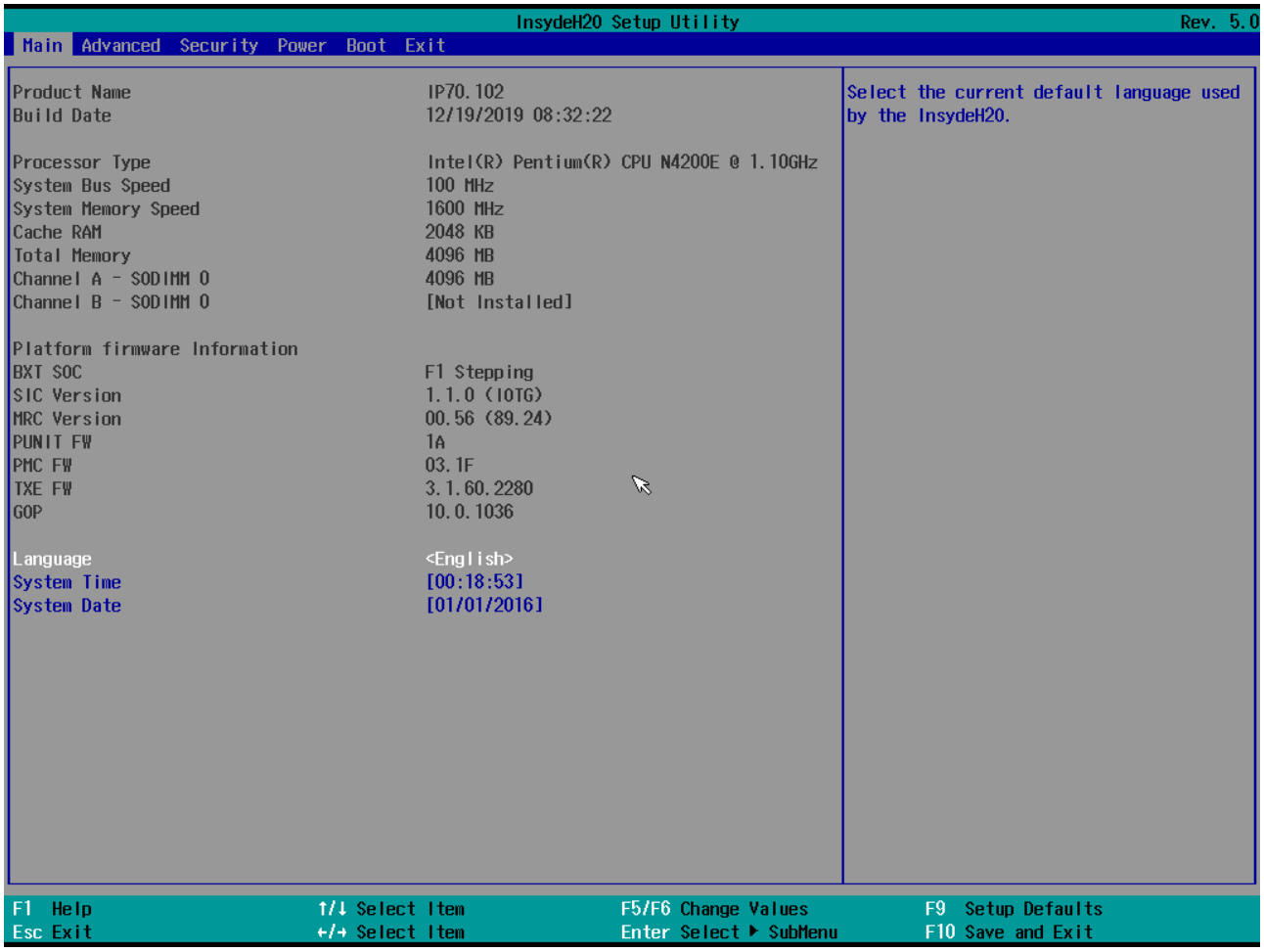
You can press the F1, F2, F3, F4, –/+, and Esc keys by connecting a USB keyboard to your computer.

3.2 BIOS Functions

3.2.1 Main Menu

The Main menu displays the basic information about yoursystem including BIOS version, processor RC version, system language, time, and date.

When you enter BIOS setup, the first menu that appears on the screen is the main menu.It contains the system information including BIOS version, processor RC version, system language, time, and date.



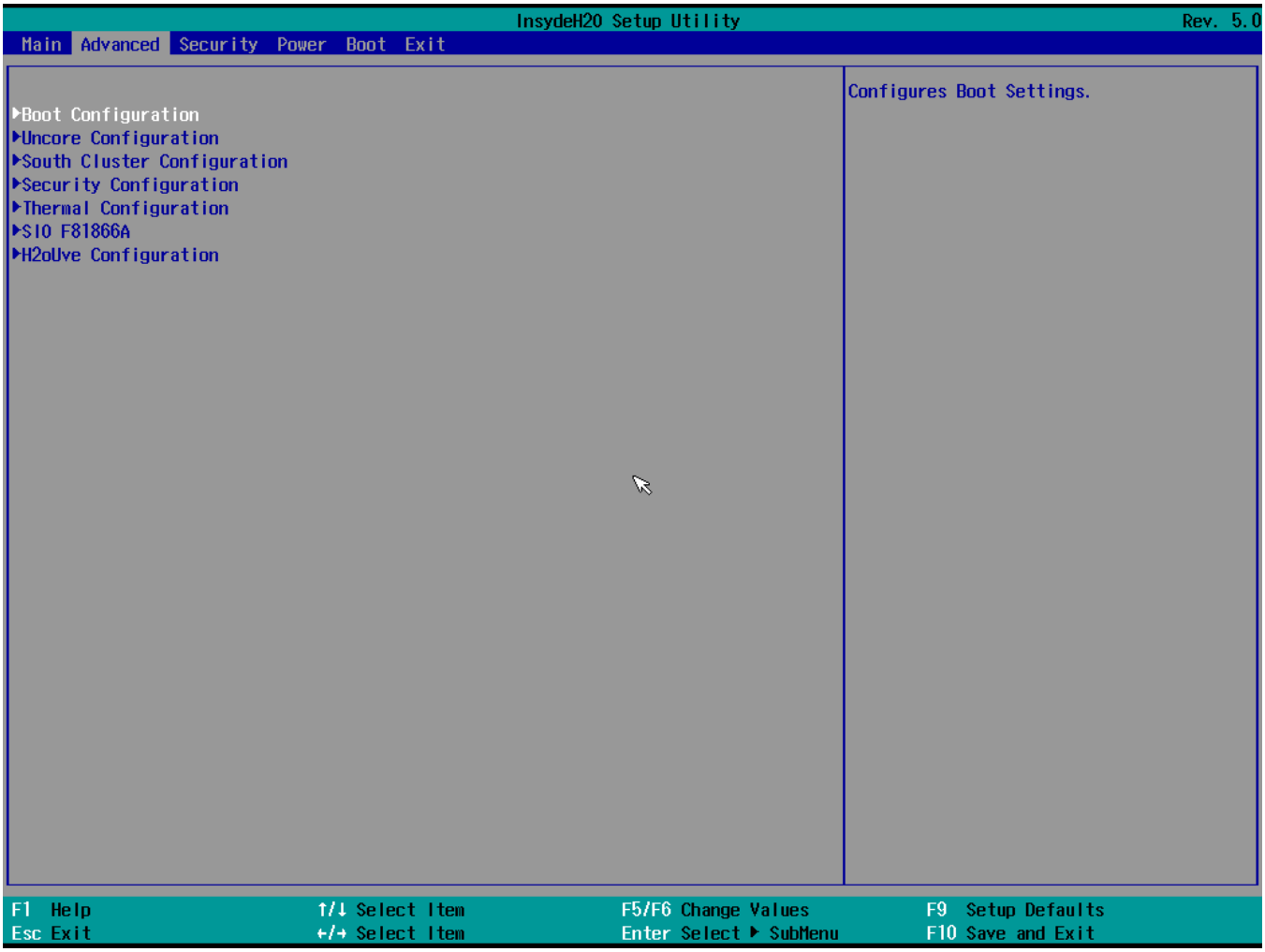
BIOS Setting	Description	Setting Option	Effect
Language	Displays the system language. [English] is set up by default.	Adjustment of the language	Set the language in other language. The language in this device is English.
System Time	This is current time setting. The time is maintained by the battery when the device is turned off.	Date and time changes.	Set the time in the format: [hh/mm/ss]
System Date	This is current date setting.	Date and time changes.	Set the date in the format [mm/dd/yyyy];

3.2.2 Advanced

Select the Advanced Tab from the setup menu to enter the advanced BIOS setup screen. You can select any of the items on the left frame of the screen to go to the sub menu for the item, such as CPU Configuration. You can use the <Arrow> keys enter all advanced BIOS setup options. The advanced BIOS setup menu is shown below. The submenus described on the following pages.

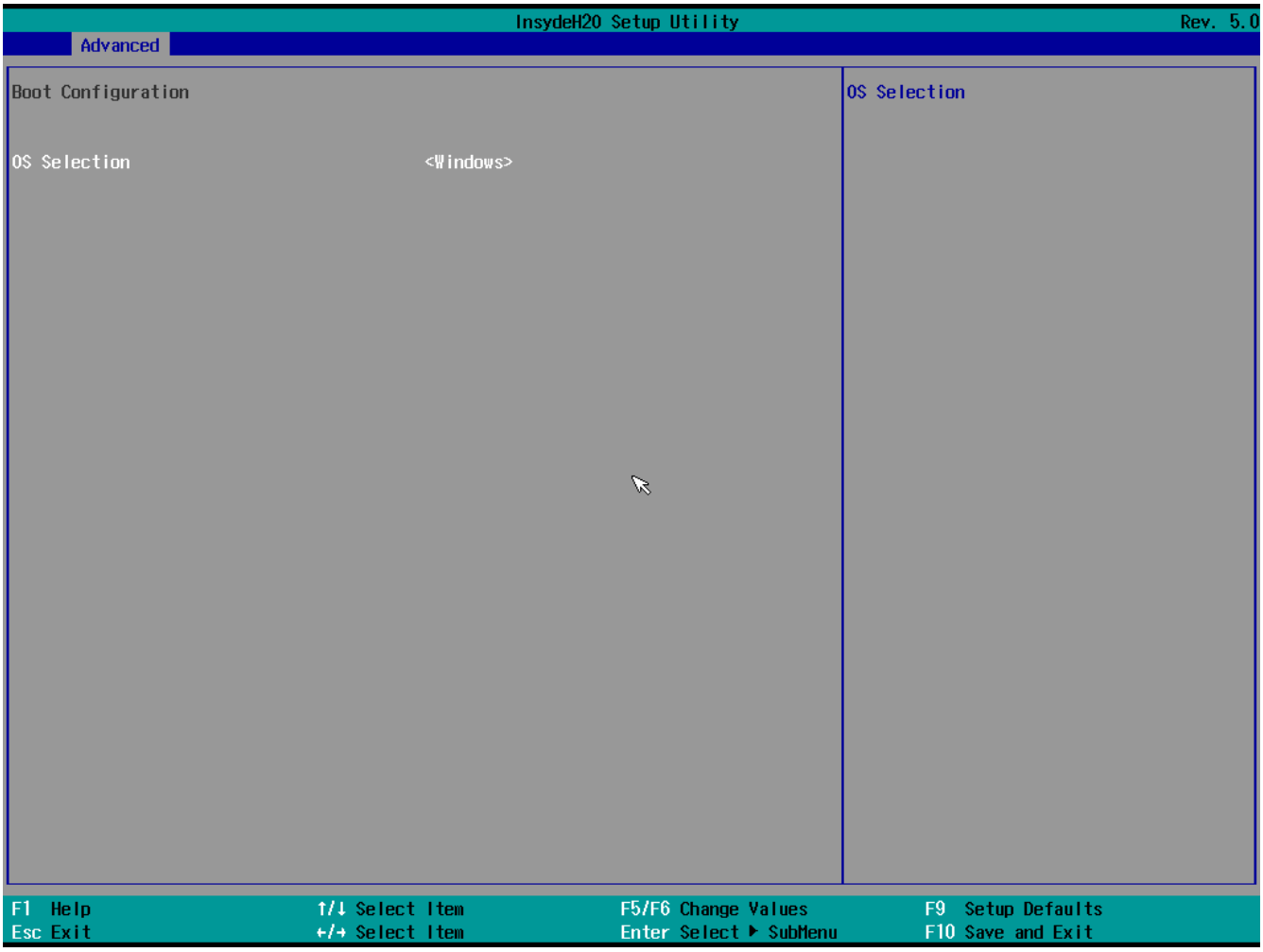
Caution

Handle advanced BIOS settings page with caution. Any changes can affect the operation of your computer.

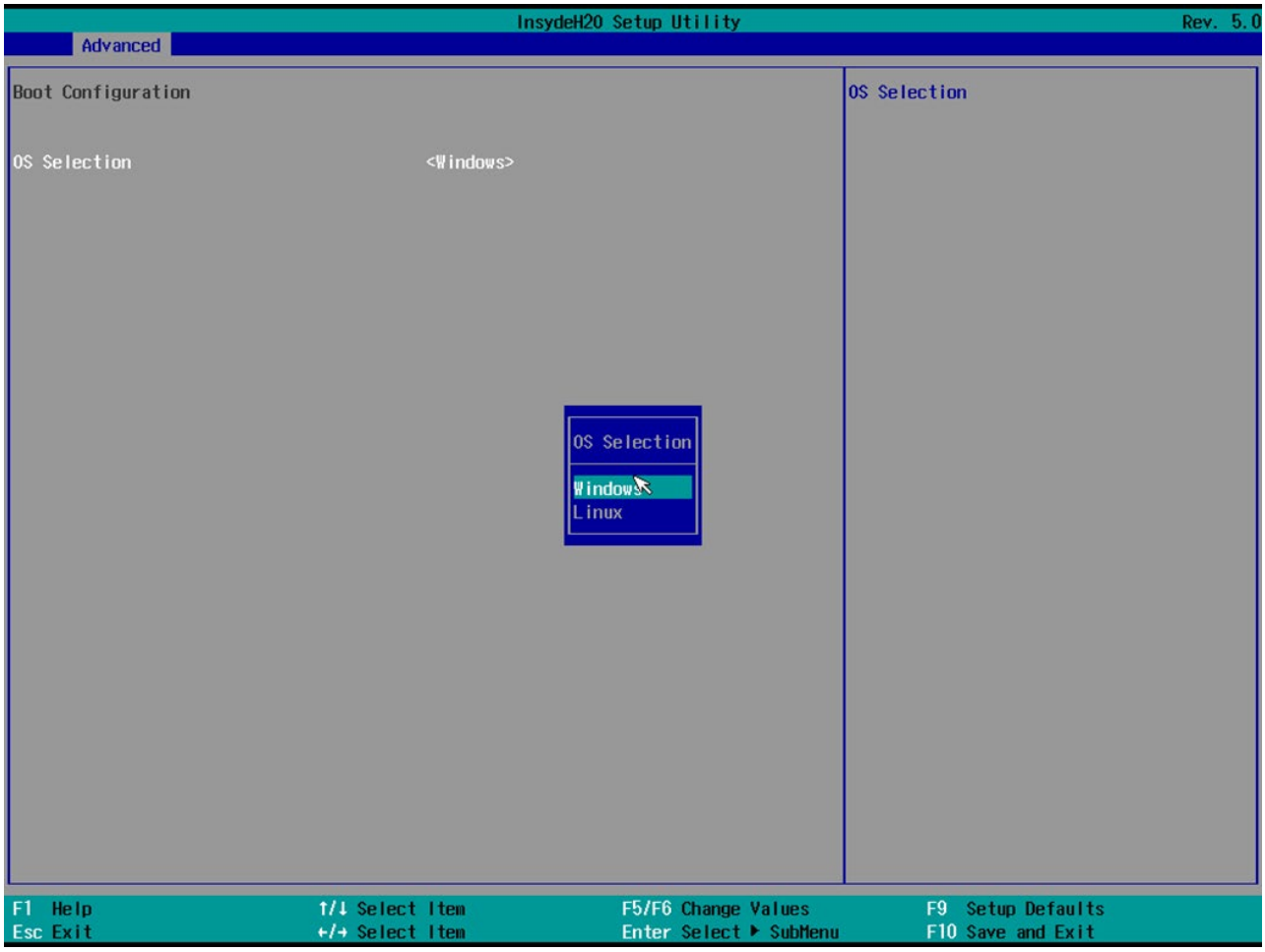


BIOS Setting	Description	Setting Option	Effect
Boot Configuration	Configures Boot setting.	Enter	Opens submenu
Uncore Configuration	Configures Uncore setting.	Enter	Opens submenu
South Cluster Configuration	Configures South Cluster setting.	Enter	Opens submenu
Security Configuration	Configures Security setting.	Enter	Opens submenu
SIO F81866A	Configures SIO F81866A setting.	Enter	Opens submenu
H2OuVe Configuration	Configures H2OuVe setting.	Enter	Opens submenu

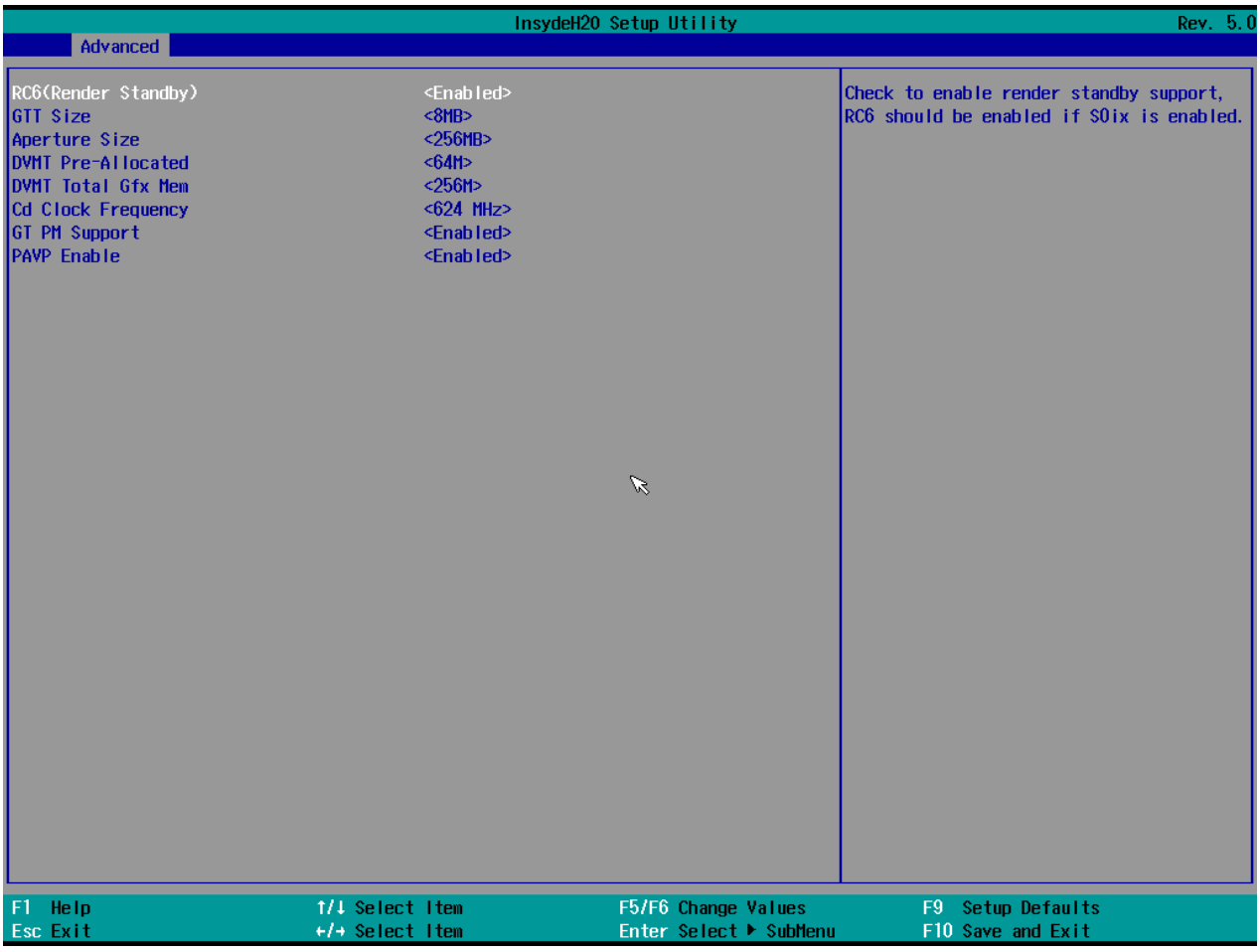
3.2.2.1 Boot Configuration



BIOS Setting	Description	Setting Option	Effect
OS Selection	OS Selection	Enter	Opens submenu

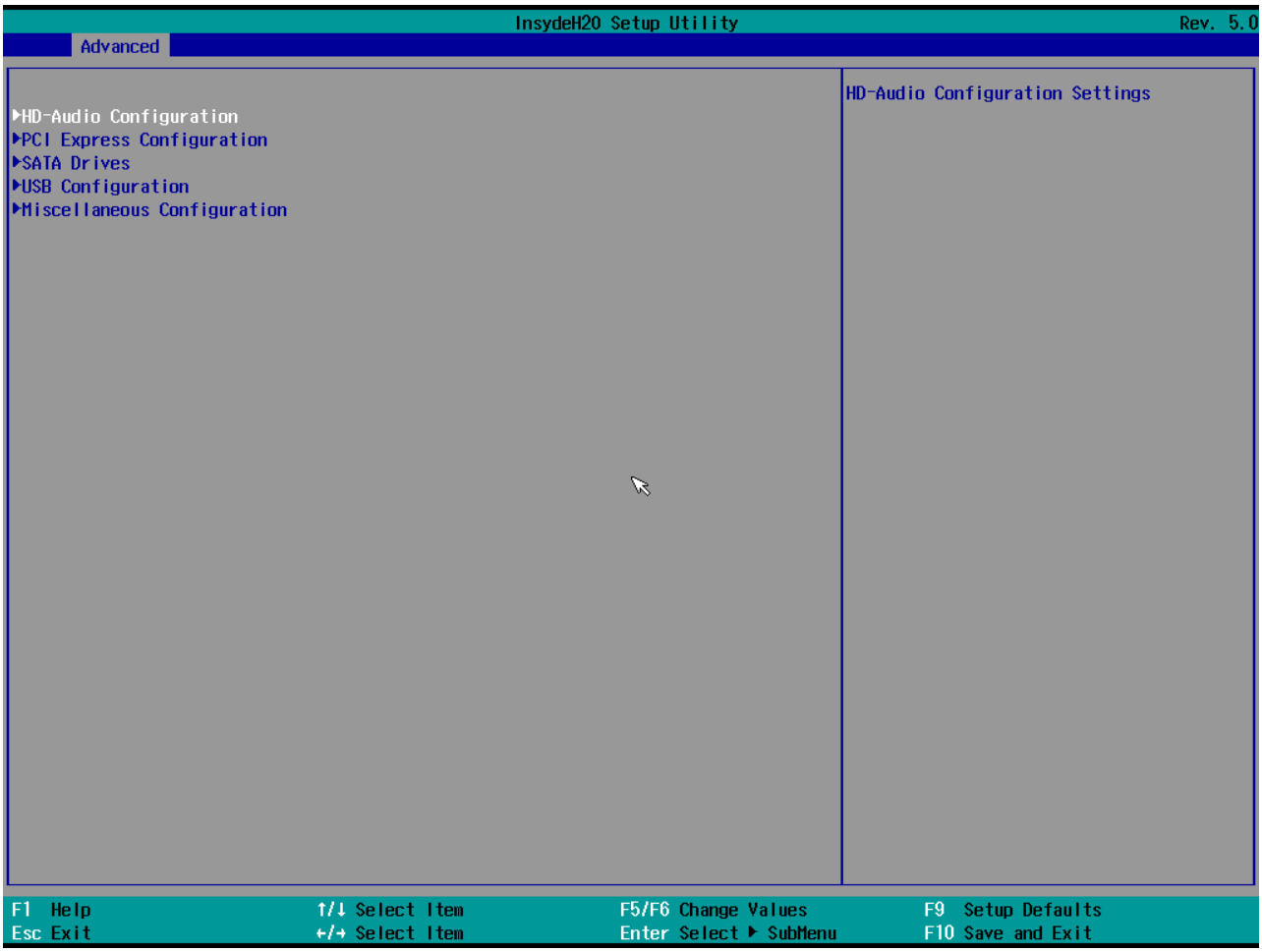


3.2.2.2 Uncore Configuration



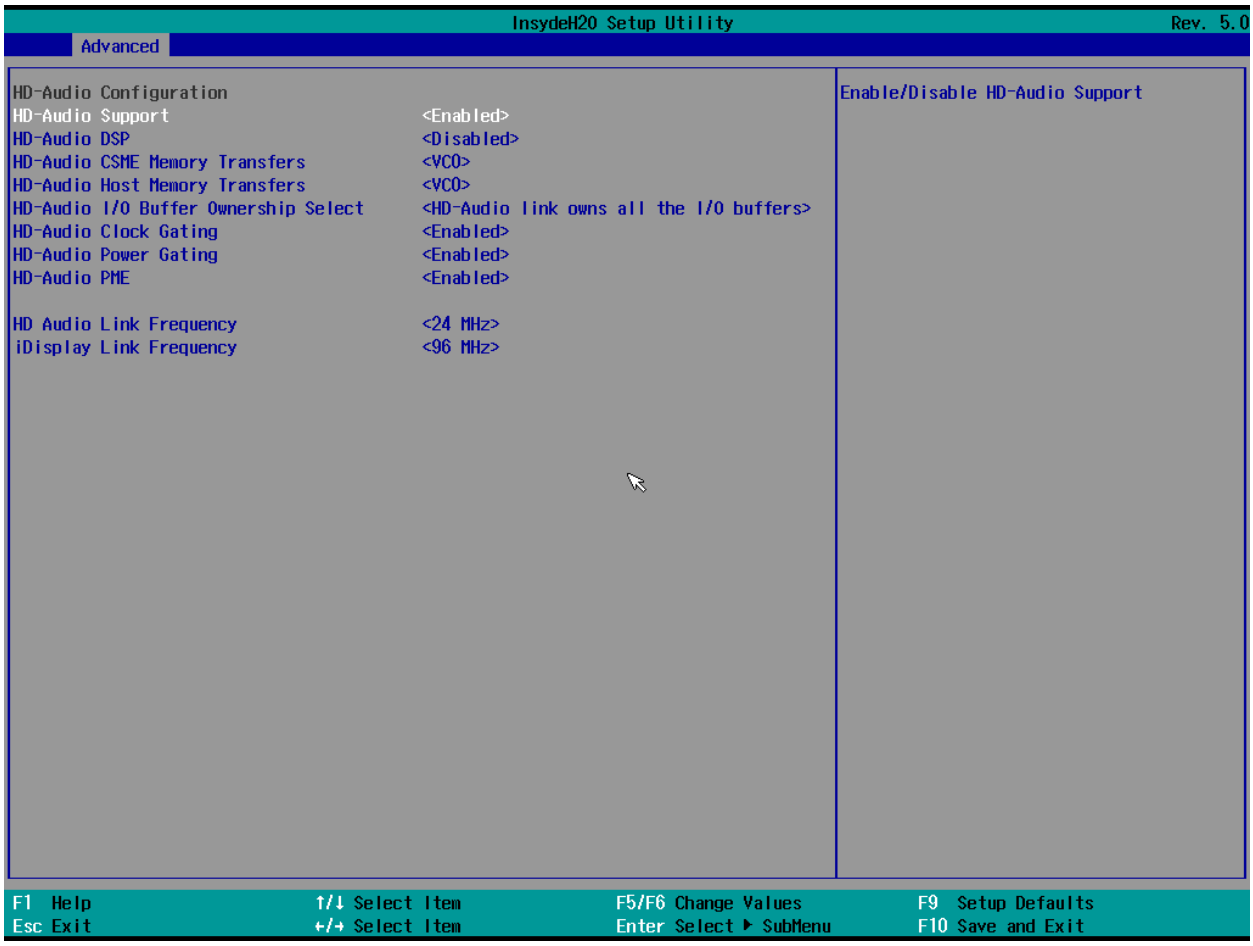
BIOS Setting	Description	Setting Option	Effect
RC6 (Render Standby)	Check to enable render standby support, R6C should be enabled if S0ix is enabled.	Enable/ Disabled RC6 (Render Standby)	Enable/ Disabled RC6 (Render Standby)
GTT Size	Select the GTT size.	2 MB/ 4 MB/ **8 MB**	Select the GTT size.
Apperture Size	Select the Aperture size.	256 MB	Select the Aperture size.
DVMT Pre-Allocated	Select DVMT Pre-Allocated.	**64 M**/ 96 M/ 128M/ 160M / 192M/ 224M/ 256M/ 288M/ 320M/ 352M/ 384M/ 416M/ 448M/ 480M/ 512M	Select DVMT 5.0 Pre-Allocated (Fixed) Graphics Memory size used by the Internal Graphics Device.
DVMT Total Gfx Mem	Select DVMT Total Gfx Mem.	128M/ **256 M**/ MAX	Select DVMT 5.0 total memory size used by the Internal Graphics Device.
Cd Clock Frequency	Select Cd Clock Frequency.	144 MHz/ 288 MHz/ 384MHz/ 576MHz/ **624 MHz**	Select the highest Cd Clock frequency supported by the platform
GT PM Support	Configure GT PM Support settings.	Enabled/ Disabled	Enable/ Disable GT PM Support
PAVP Enable	Enable/ Disable PAVP	Enabled/ Disabled	Enable/ Disable PAVP

3.2.2.3 South Cluster Configuration



BIOS Setting	Description	Setting Option	Effect
HD-Audio Configuration	HD-Audio Configuration settings.	Enter	Opens submenu
PCI Express Configuration	PCI Express Configuration settings.	Enter	Opens submenu
SATA Drives	SATA Drives settings.	Enter	Opens submenu
USB Configuration	USB Configuration settings.	Enter	Opens submenu
Miscellenaus Configuration	Miscellenaus Configuration settings.	Enter	Opens submenu

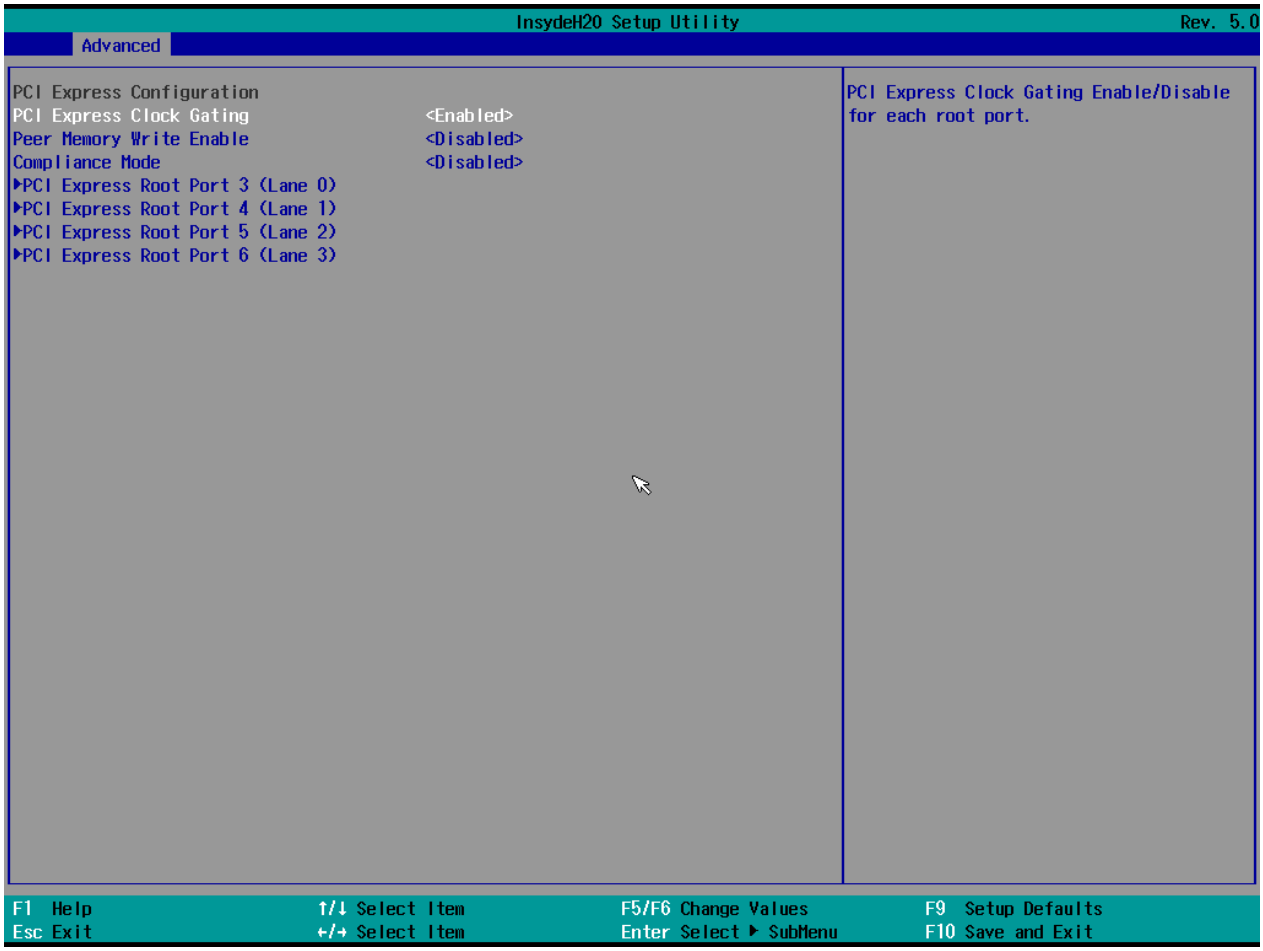
3.2.2.3.1 HD-Audio Configuration



BIOS Setting	Description	Setting Option	Effect
HD-Audio Support	HD-Audio Support settings	Enabled/ Disabled	Enable/ Disable HD Audio support
HD-Audio DSP	HD-Audio DSP settings	Enabled/ Disabled	Enable/ Disable HD-Audio DSP
HD-Audio CSME Memory Transfer	HD-Audio CSME Memory Transfer settings	VC0	HD-Audio CSME Memory Transfer settings
HD-Audio Host Memory Transfer	HD-Audio Host Memory Transfer settings	VC0	HD-Audio Host Memory Transfer settings
HD-Audio I/O Buffer Ownership Select	Select HD-Audio I/O Buffer Ownership	HD-Audio link owns all the I/O buffer	Select HD-Audio I/O Buffer Ownership
HD-Audio Clock Gating	HD-Audio Clock Gating settings	Enabled/ Disabled	Enable/ Disable HD-Audio Clock Gating
HD-Audio Power Gating	HD-Audio Power Gating settings	Enabled/ Disabled	Enable/ Disable HD-Audio Power Gating
HD-Audio PME	HD-Audio PME settings	Enabled/ Disabled	Enable/ Disable HD-Audio PME
HD-Audio Link Frequency	HD-Audio Link Frequency settings.	24 MHz	HD-Audio Link Frequency settings.

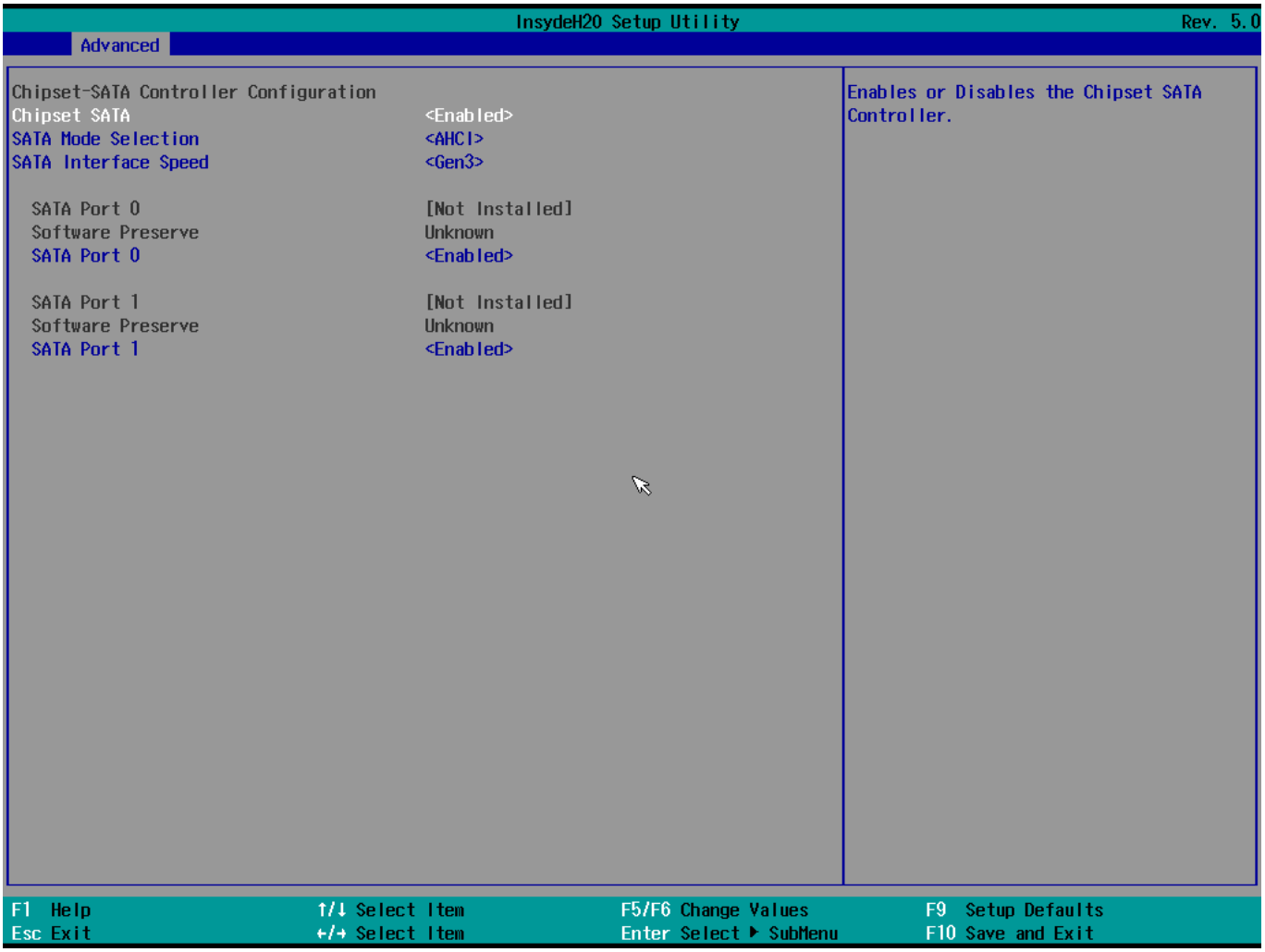
Display Link Frequency	Select Display Link Frequency settings.	96 MHz	Select Display Link Frequency settings.

3.2.2.3.2 PCIE Express Configuration



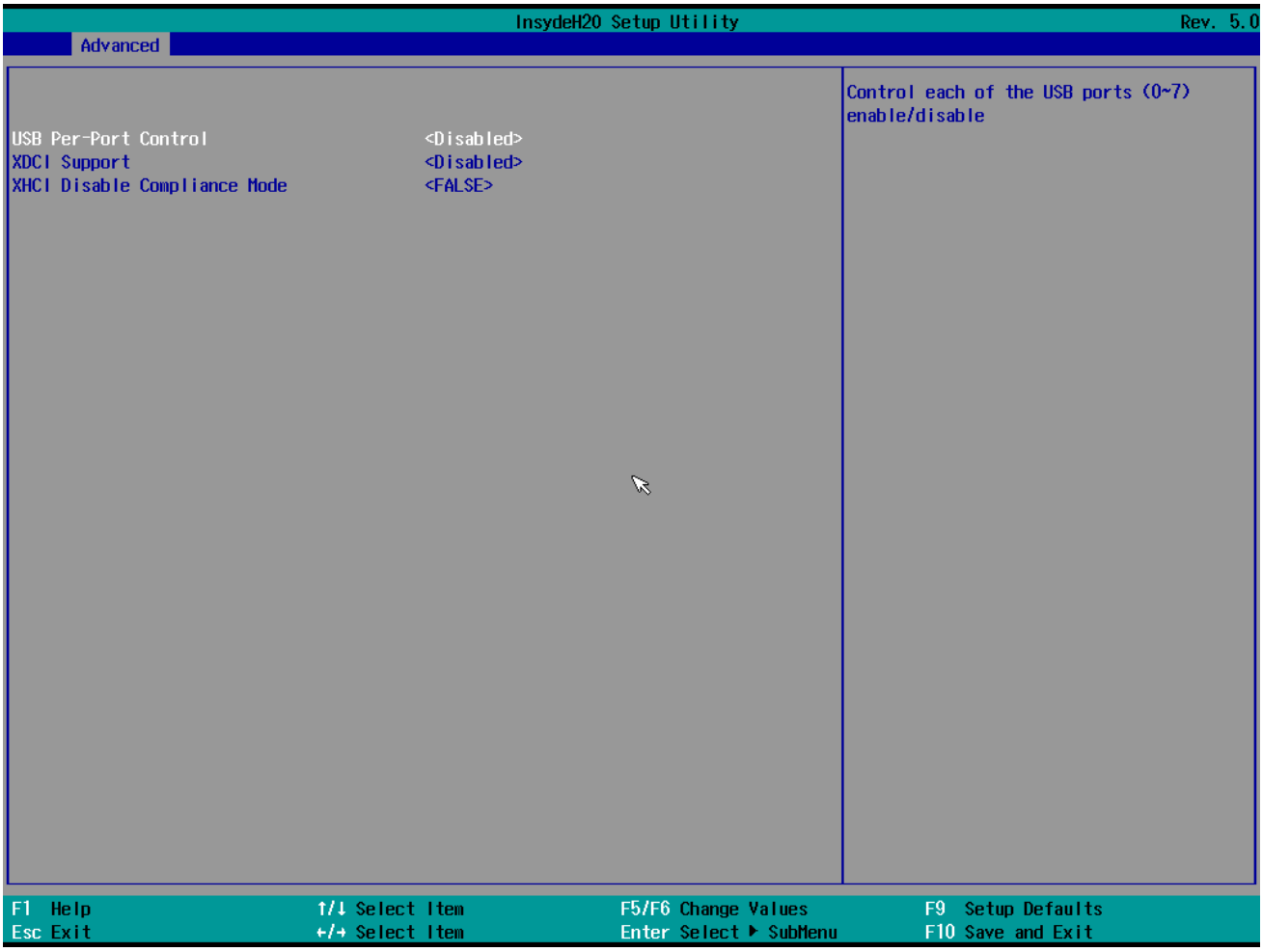
BIOS Setting	Description	Setting Option	Effect
PCI Express Clock Gating	PCI Express Clock Gating Enable/ Disable for each root port	Enabled/ Disabled	Enable/ Disable PCI Express Clock Gating for each root port
Peer Memory Write Enable	Enable Peer Memory Write	Enabled/ Disabled	Enable/ Disable Peer Memory Write
Compliance Mode	Enable Compliance Mode	Enabled/ Disabled	Enable/ Disable Compliance Mode
PCI Express Root Port 3~6 (Lane 0~3)	Control the PCI Root Port.	Enter	Opens submenu. Auto: To disable unused root port automatically for the most optimum power saving. Enable: Enable PCIe Root Port. Disable: Disable PCIe Root Port.

3.2.2.3.3 Chipset-SATA Controller Configuration



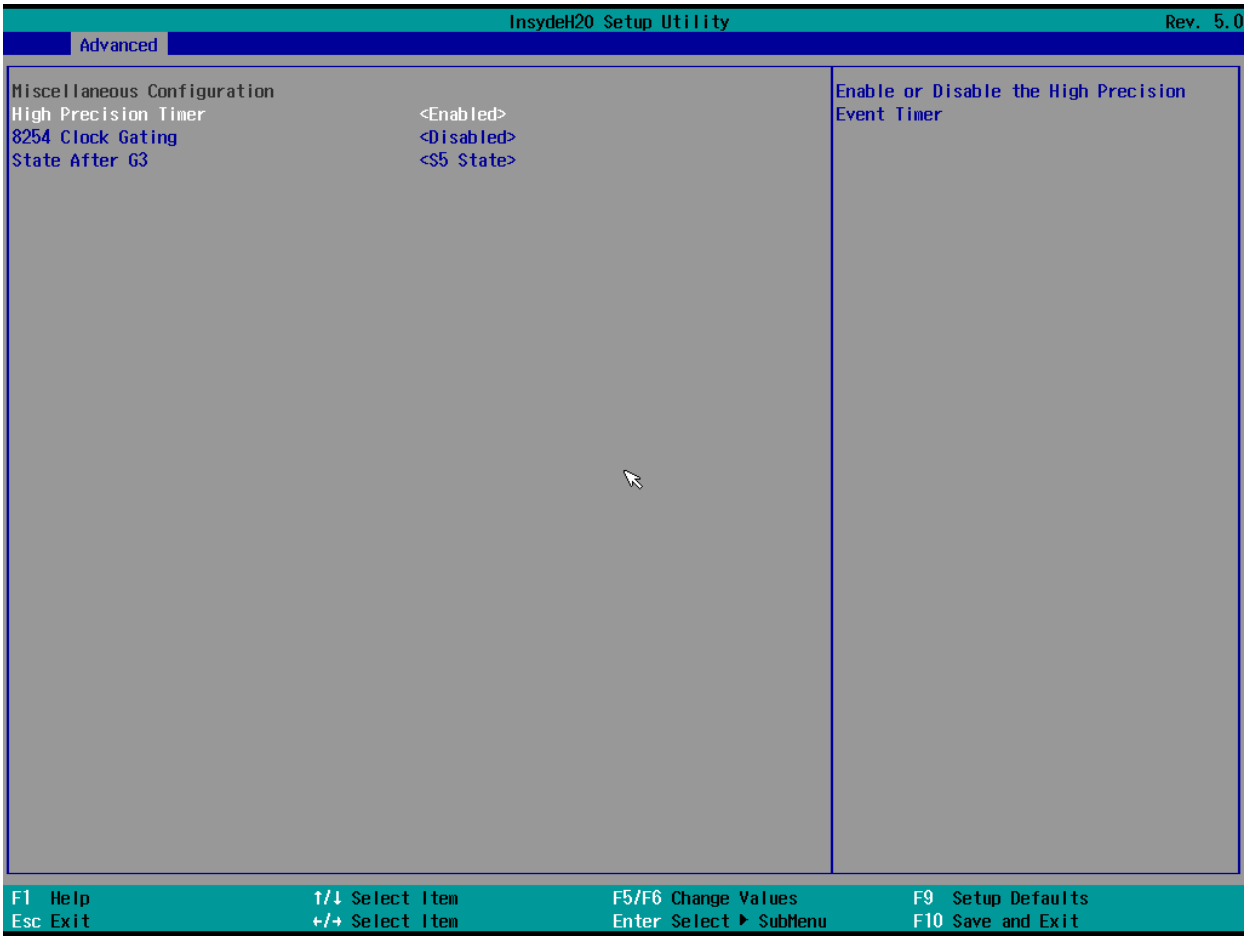
BIOS Setting	Description	Setting Option	Effect
Chipset SATA	Chipset SATA Controller. Settings.	Enabled/ Disabled	Enable or Disable the Chipset SATA Controller.
SATA Mode Selection	Select SATA Mode. When you activate AHCI mode, it increases the speed of access to files in memory devices and improves overall performance of your computer	AHCI	AHCI for a system using SATA disks (non-RAID)
		RAID	RAID to create an Intel Matrix RAID
		Disabled	Disable both AHCI/ RAID functions
SATA Interface Speed	Select SATA Interface Speed	Gen3	
SATA Port 0	SATA Port 0 settings.	Enabled/ Disabled	Enable or Disable SATA Port 0
SATA Port 1	SATA Port 1 settings.	Enabled/ Disabled	Enable or Disable SATA Port 1

3.2.2.3.4 USB Pre-Port Control



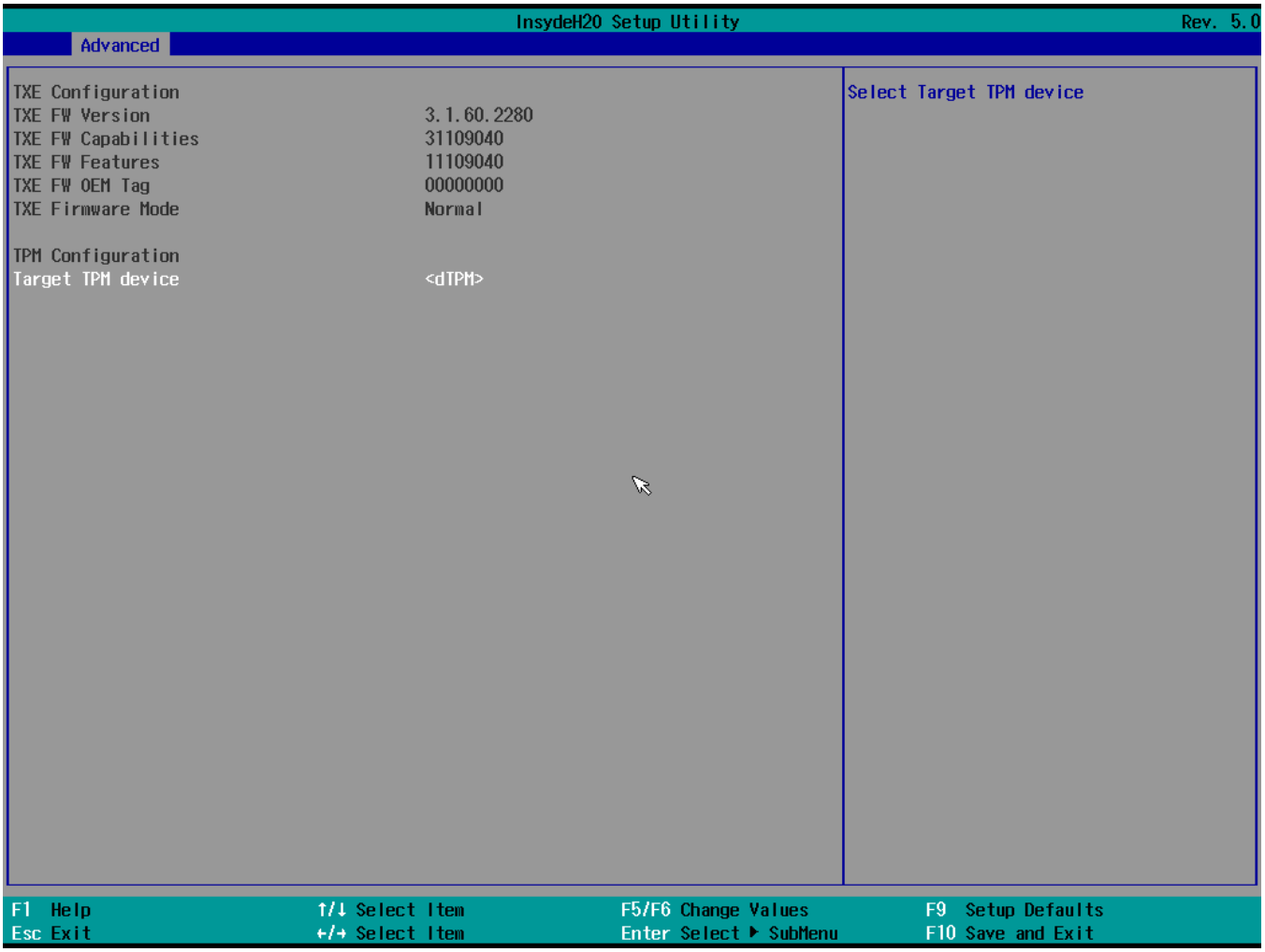
BIOS Setting	Description	Setting Option	Effect
USB Per-Port Control	USB Per-Port Control a settings.	Enabled/ Disabled	Control each of the USB ports (0~7) enable/ disable.
XDCI Support	Allows you to enable or disable xDCI (USB OTG Device).	Enabled/ Disabled	Enable or Disable XDCI Support
XHCI Disable Compliance Mode	Option to disable Compliance Mode.	FALSE	Default is FALSE to not disable Compliance Mode.
		TRUE	Set TRUE to disable Compliance Mode.

3.2.2.3.5 Miscellaneous Control



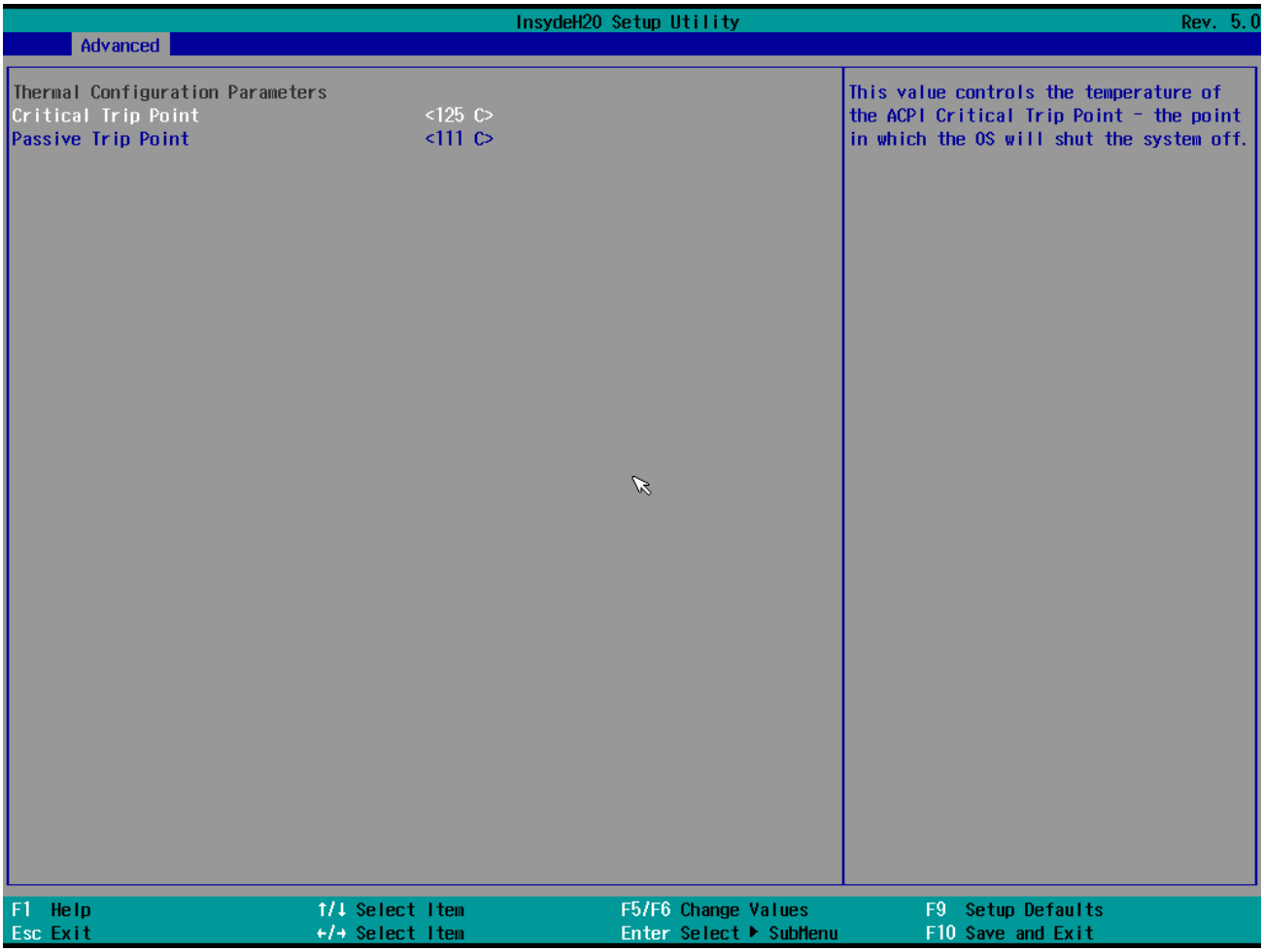
BIOS Setting	Description	Setting Option	Effect
High Precision Timer	High Precision Timer settings	Enabled/ Disabled	Enable or Disable the High Precision Event Timer
8254 Clock Gating	8254 Clock Gating	Enabled/ Disabled	Enable or Disable 8254 Clock Gating
State After G3	Specify what state to go to when power is re-applied after a power failure (G3 state)	S0	System will boot directly as soon as power applied.
		S5	System keeps in power-off state until power button is pressed.

3.2.2.3.6 TXE Configuration



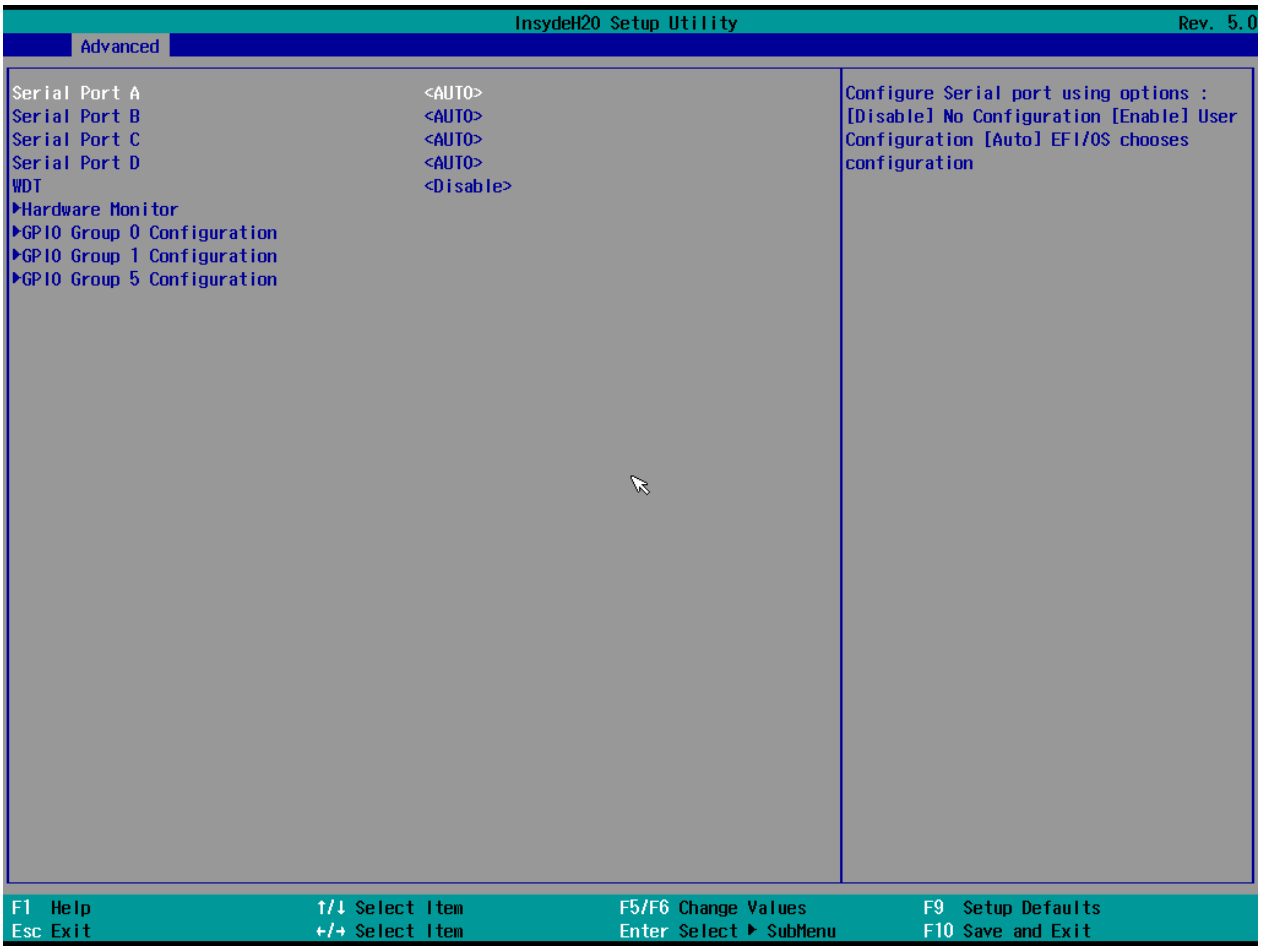
BIOS Setting	Description	Setting Option	Effect
Target TPM Device	Select Target TPM Device	dTPM	Select Target TPM Device

3.2.2.3.7 Thermal Configuration Parameters



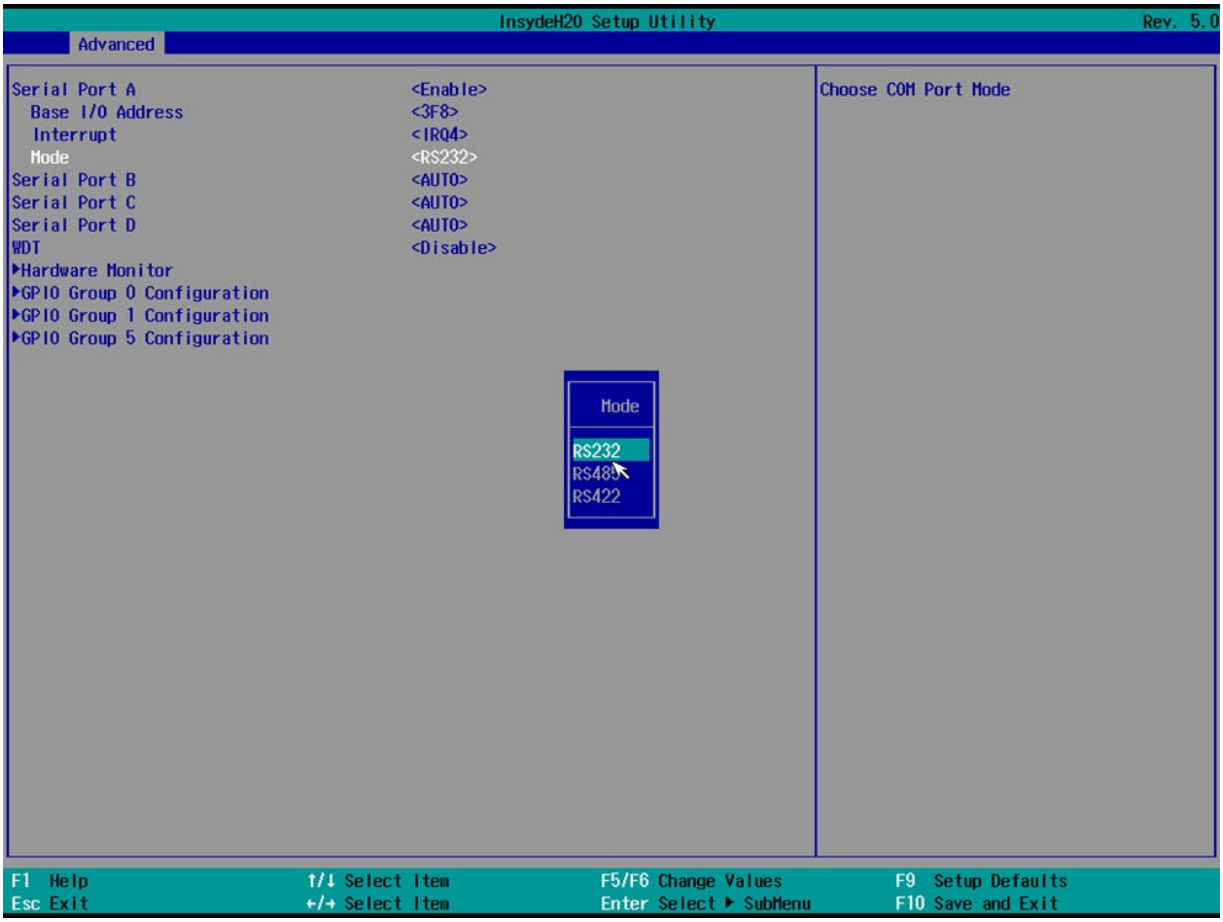
BIOS Setting	Description	Setting Option	Effect
Critical Trip Point	This value controls the temperature of the ACPI Critical Trip Point – the point in which the OS will shut down the system.	125 C	Select the point in which the OS will shut down the system.
Passive Trip Point	This value controls the temperature of the ACPI Passive Trip Point – the point in which CPU is slowed down in order to cool.	111 C	Select the point in which CPU is slowed down in order to cool..

3.2.2.3.8 Serial Port



BIOS Setting	Description	Setting Option	Effect
Serial Port A~ D	Configure serial port settings.	Enabled	User configuration
		Disabled	No configuration
		Auto	EFI/ OS chooses configuration
WDT	WDT count mode and counter settings.	Enabled/ Disabled	Enable or disable WDT. Select WDT settings.
Hardware Monitor	Hardware Monitor settings.	Enter	Open sub-menu
GPIO Group 0~5 Configuration	GPIO Group 0~5 Configuration	Enter	Open sub-menu

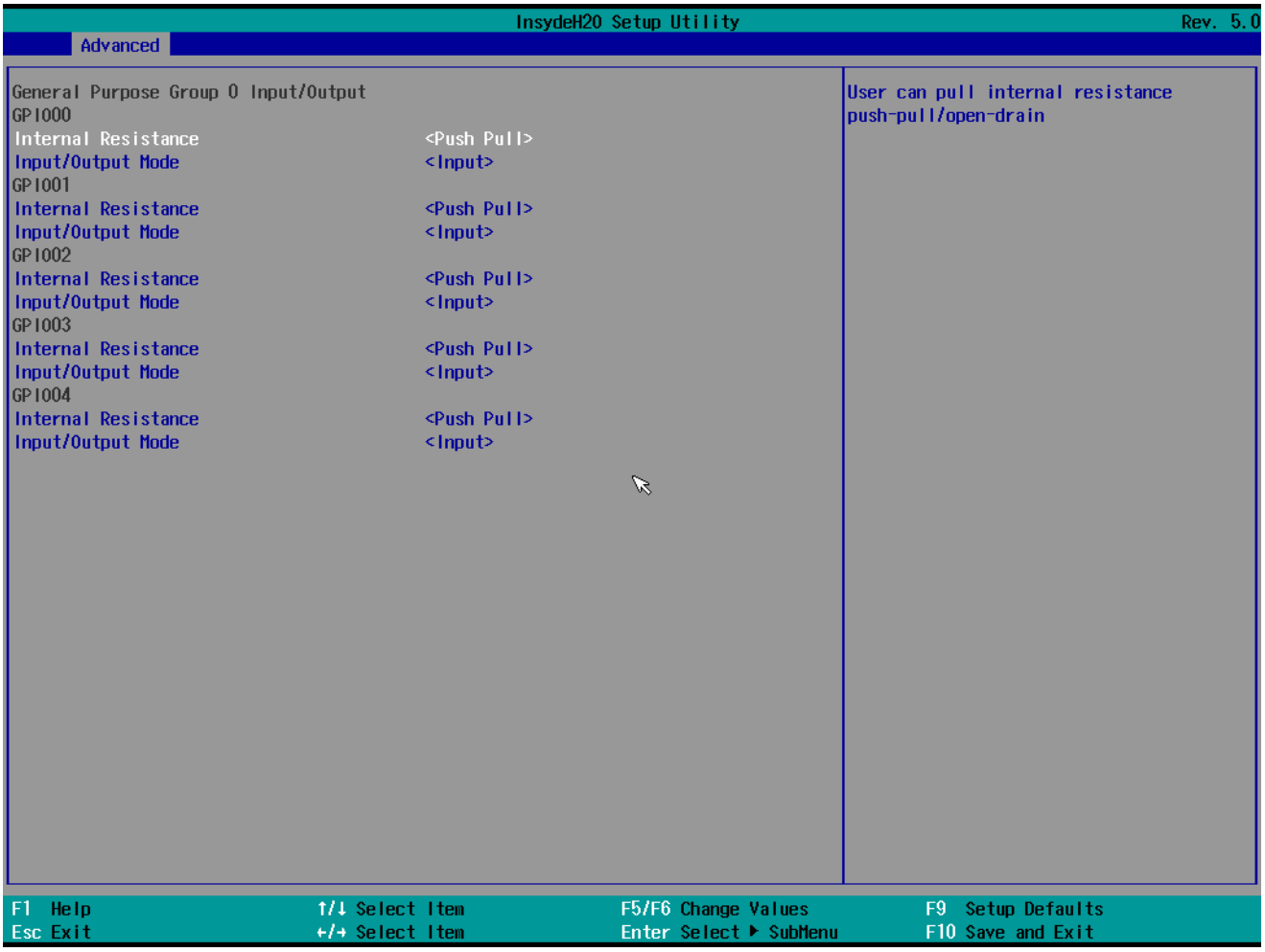
Serial Port Mode Settings: RS232, RS485, RS422



3.2.2.3.9 Hardware Monitor

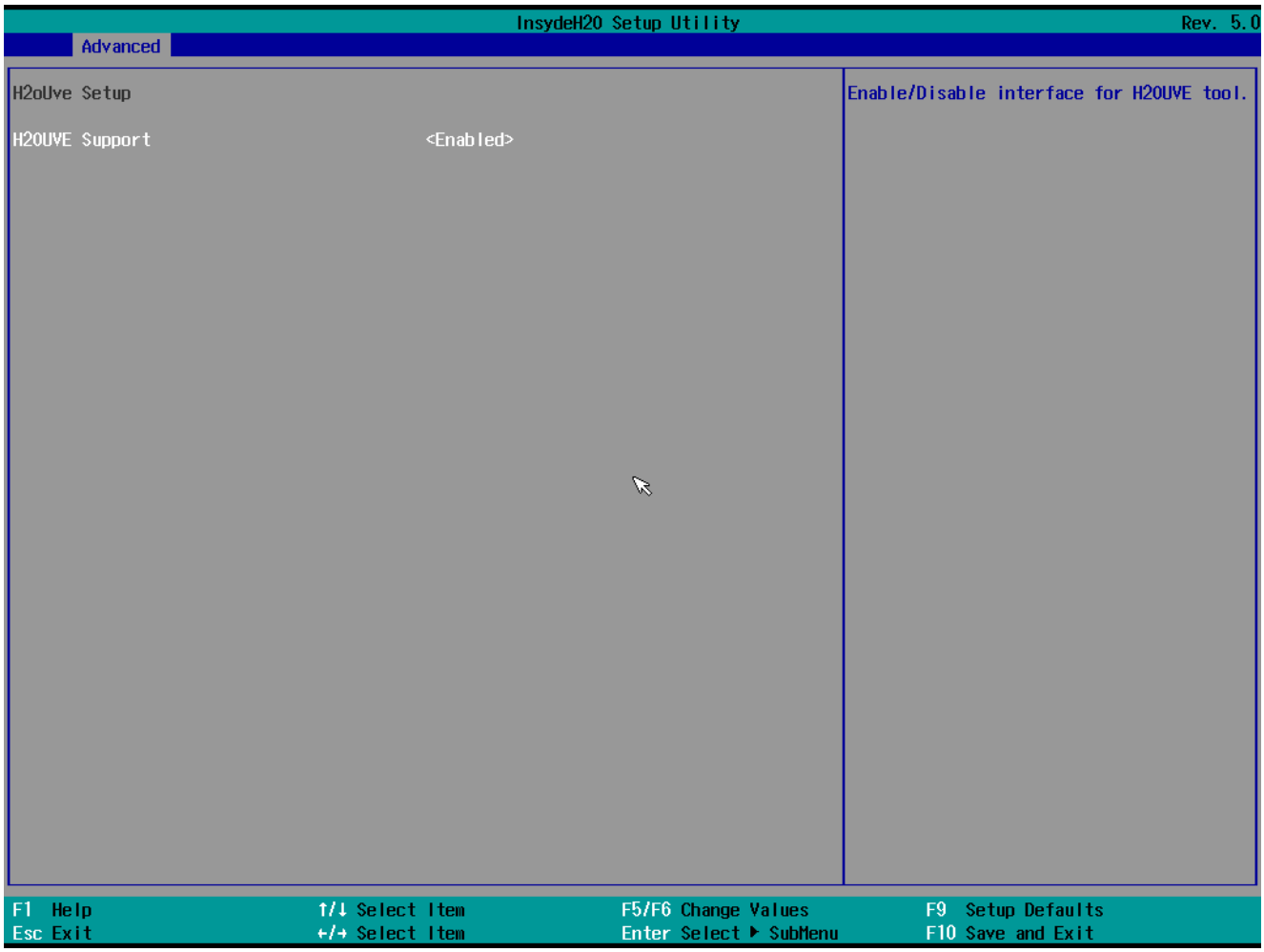
BIOS Setting	Description	Setting Option	Effect
Fan Mode	Select Fan Mode	Manual	Select Manual to manually configure fan's operating speed.
		Linear	In Linear settings the voltage applied to the fan is variable.
		Stage	Stage fan control mode.

3.2.2.3.10 General Purpose Group 0 Input/ Output



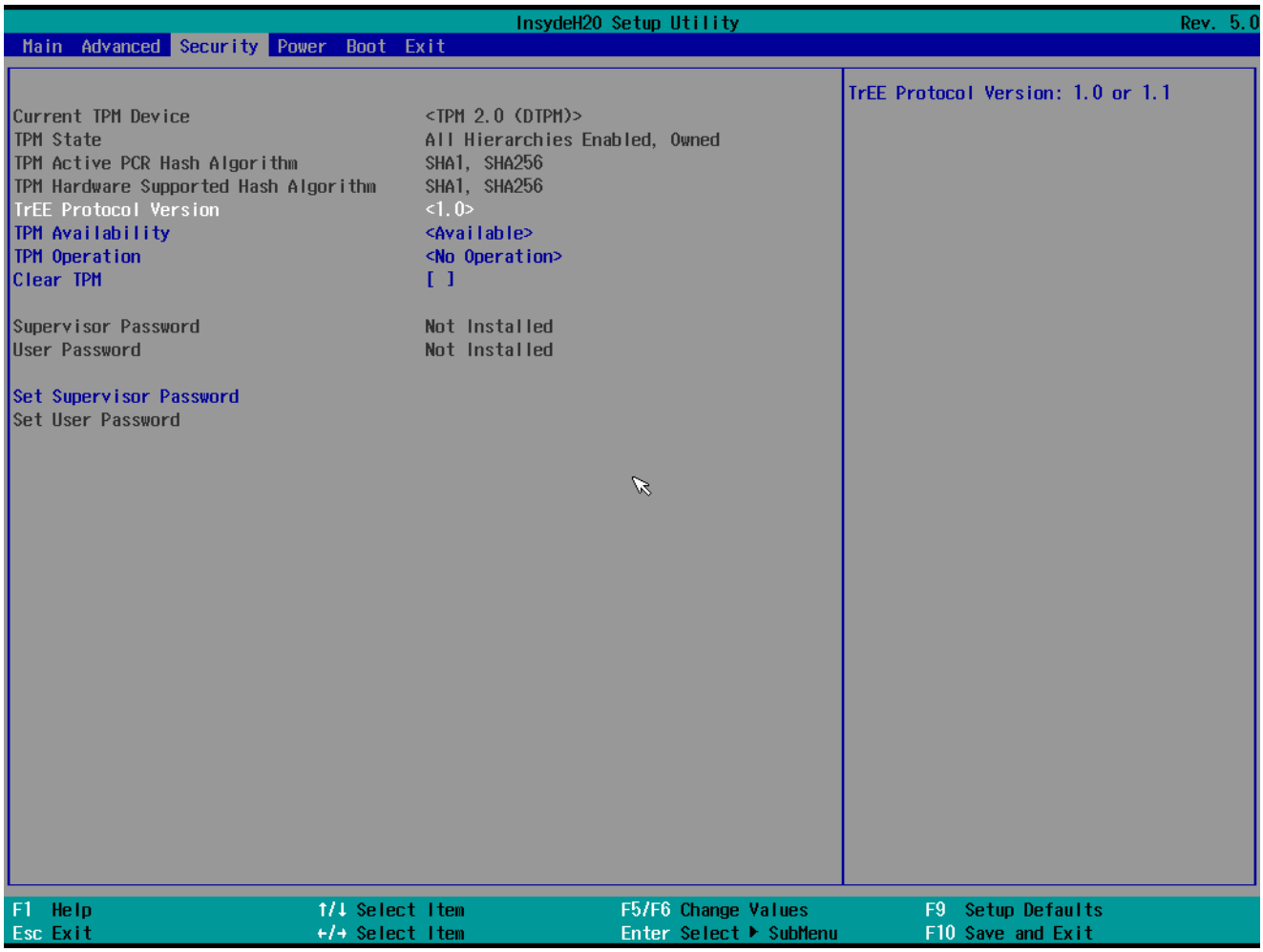
BIOS Setting	Description	Setting Option	Effect
Internal Resistance	Internal Resistance settings	Push Pull	User can pull internal resistance push-pull
		Open Drain	User can pull internal resistance open drain
Input/ Output Mode	Select Input/ Output Mode	Input	Set the GPI0 pin input
		Output	Set the GPI0 pin output

3.2.2.3.11 H2oUve Setup



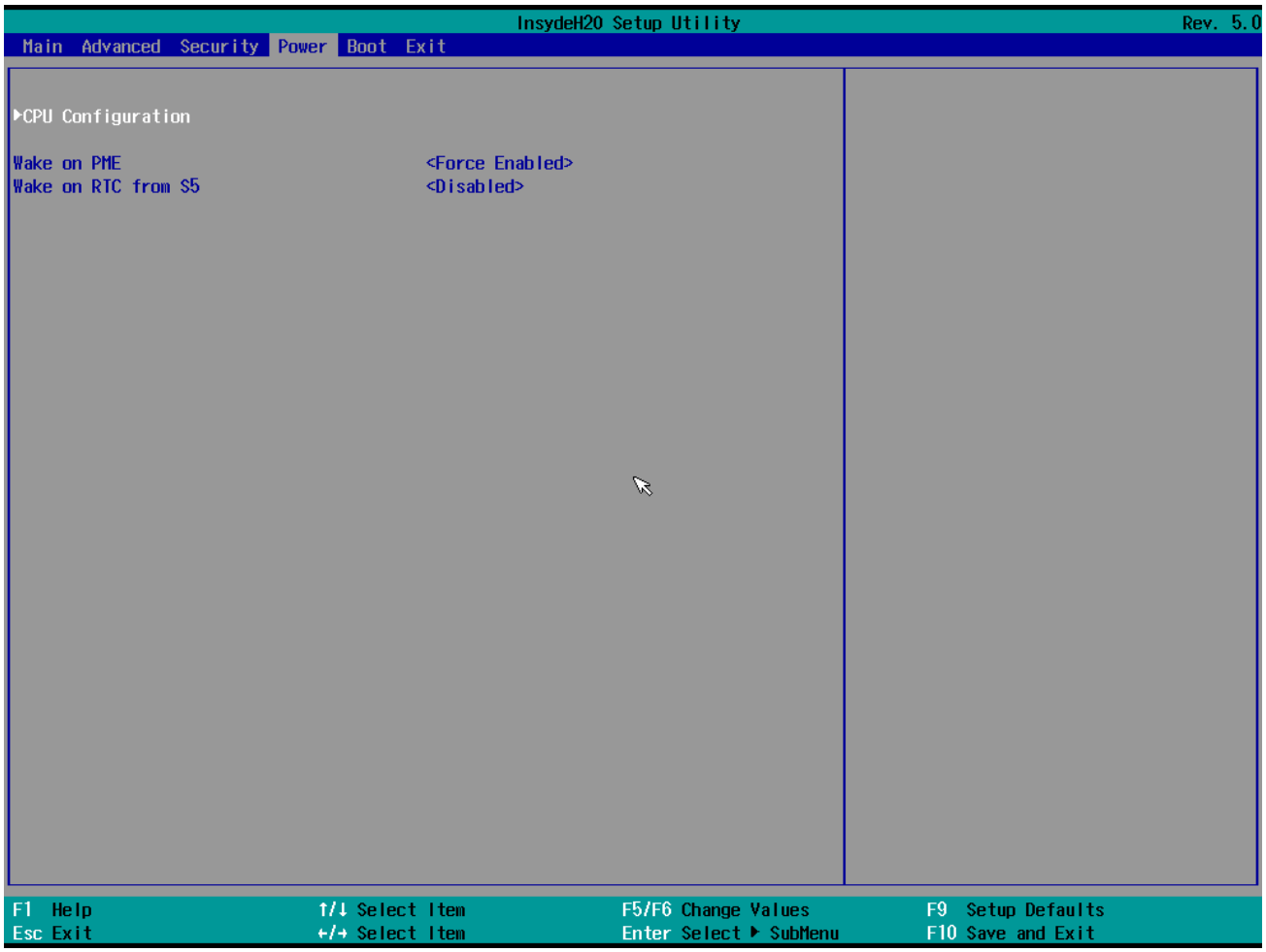
BIOS Setting	Description	Setting Option	Effect
H2oUve Support	H2oUve Support settings	Enabled/ Disabled	Enable or Disable interface for H2oUve tool

3.2.3.Security



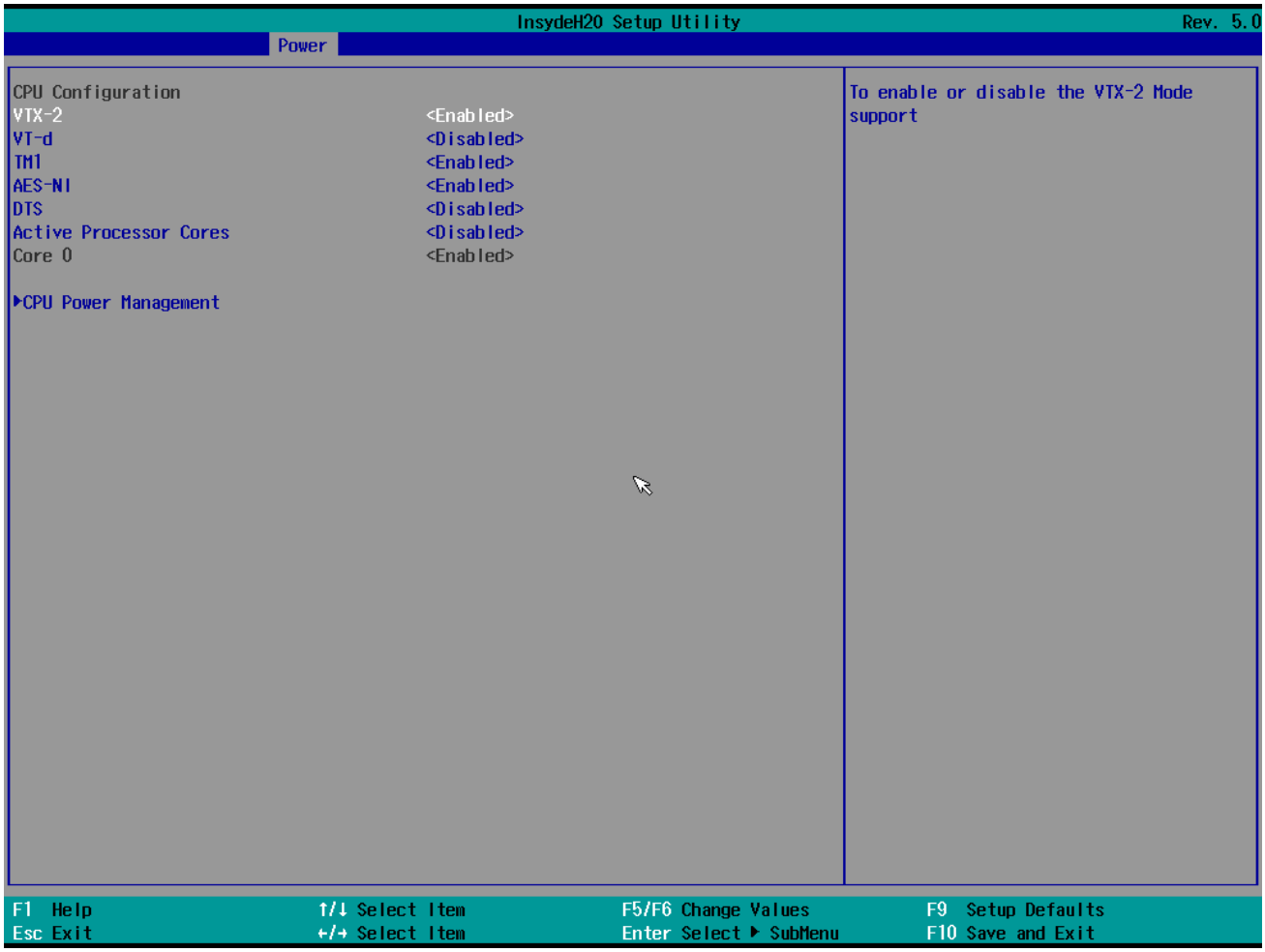
BIOS Setting	Description	Setting Option	Effect
TrEE Protocol Version	TrEE Protocol Version: 1.0 or 1.1	1.0 or 1.1	
TPM Availability	TPM Availability	Available	
TPM Operation	TPM Operation	No operation	
Clear TPM	Clear TPM		
Set Supervisor Password	Set Supervisor Password	Custom-setting	Set Supervisor Password

3.2.4 Power



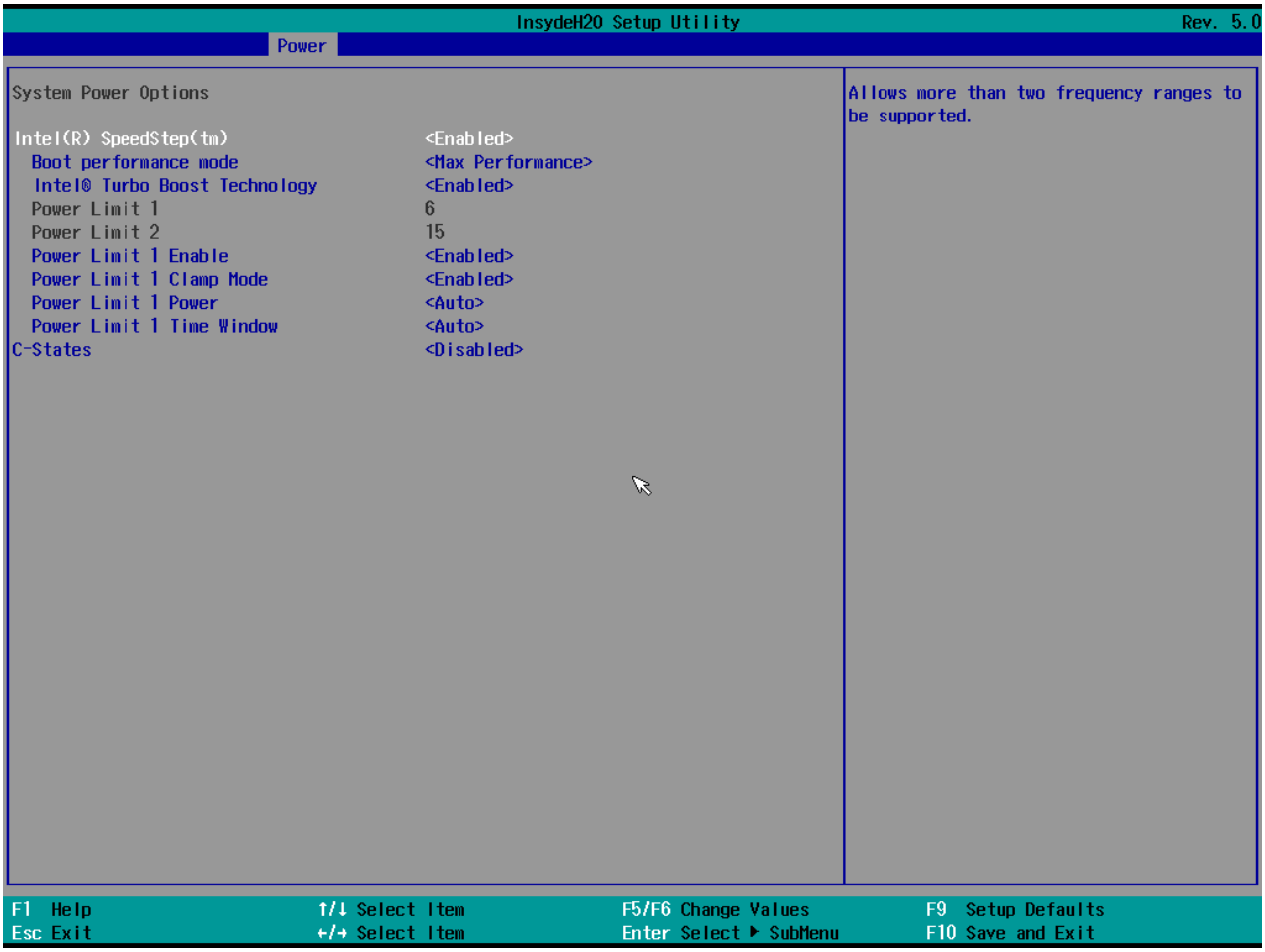
BIOS Setting	Description	Setting Option	Effect
CPU Configuration	CPU Configuration settings	Enter	Opens sub-menu
Wake on PME	Wake on PME settings	Disabled/ Enabled by OS/ Force Enable	Determines the action taken when the system power is off and a PCI Power Management wake up event occurs
Wake on RTC from S5	Wake on RTC from S5 state settings	Disabled/ By Every Day/ By Every Month/ By Sleep Time	Wake on RTC from S5 state, By Day of Month, Fixed Time of every day, By Sleep Time or By OS Utility

3.2.4.1 CPU Configuration



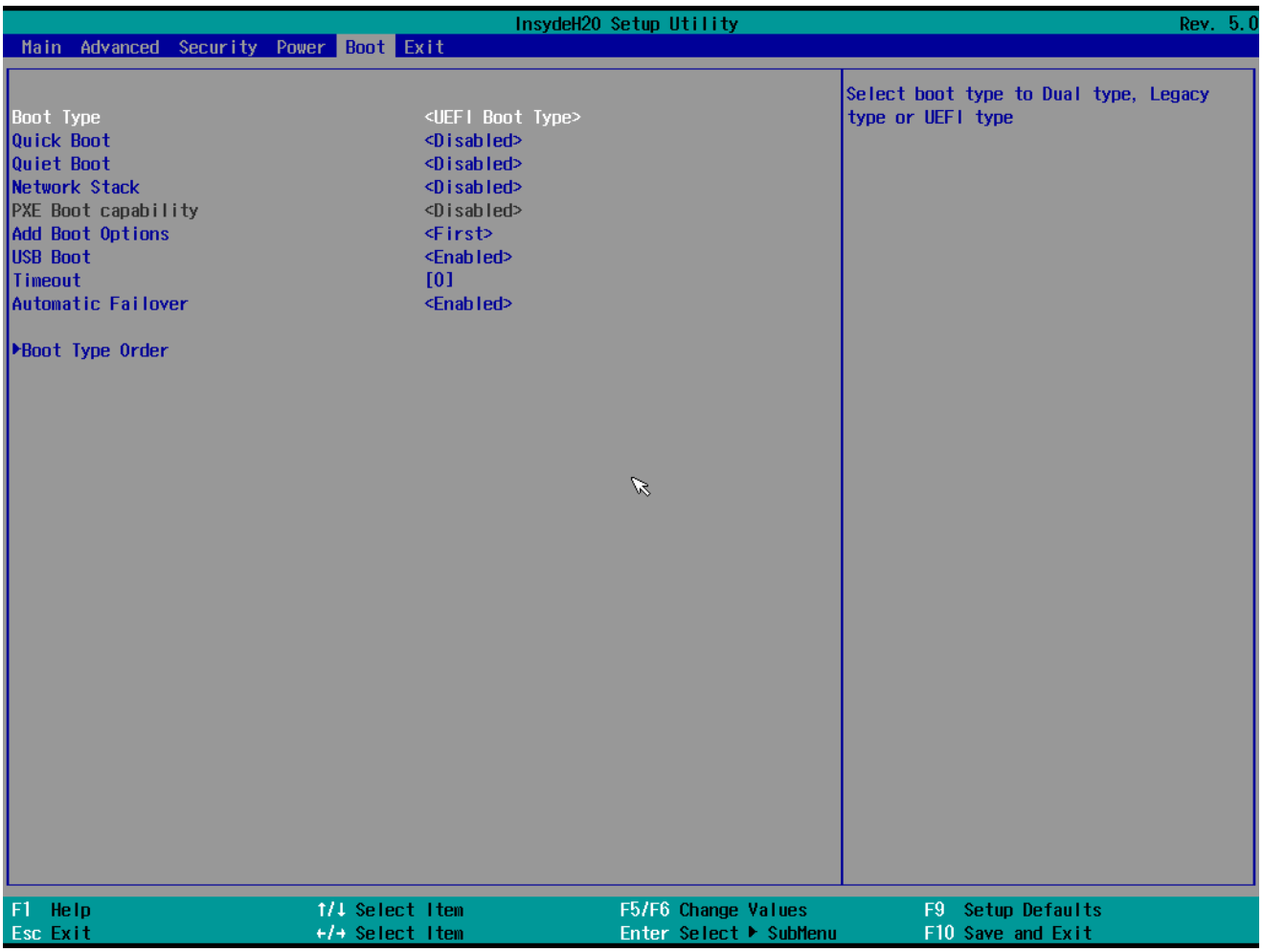
BIOS Setting	Description	Setting Option	Effect
VTX2	VTX2 mode support settings	Enabled/ Disabled	To enable or disable VTX2 mode support
VT-d	VT-d support settings	Enabled/ Disabled	To enable or disable VT-d support
TM1	TM1 support settings	Enabled/ Disabled	To enable or disable TM1 support
AES-N1	AES-N1 support settings	Enabled/ Disabled	To enable or disable AES-N1 support
DTS	DTS support settings	Enabled/ Disabled	To enable or disable DTS support
Active Processor Core	Active Processor Core support settings	Enabled/ Disabled	To enable or disable Active Processor Core
CPU Power Management	CPU Power Management settings	Enter	Opens sub-menu

3.2.4.2 System Power Options



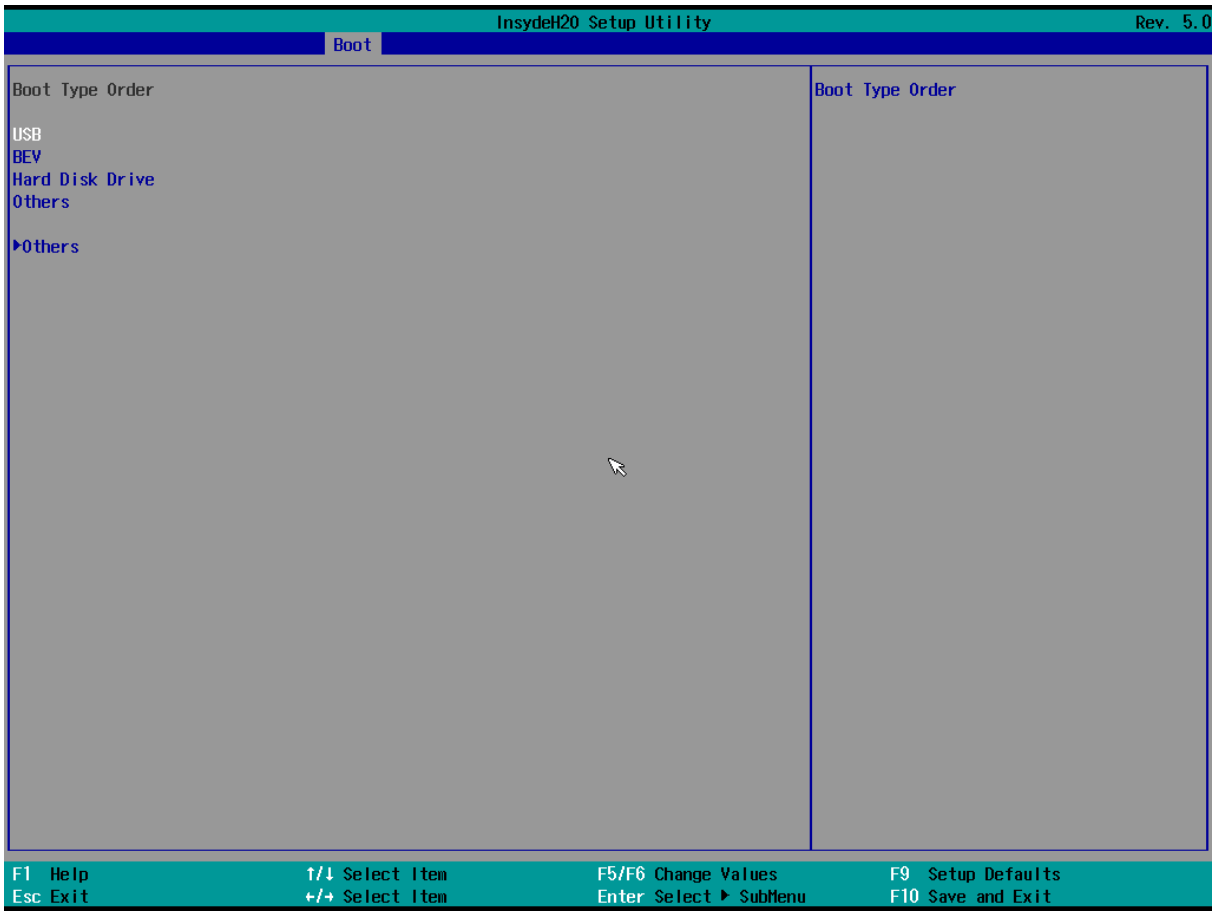
BIOS Setting	Description	Setting Option	Effect
Intel SpeedStep	Intel SpeedStep settings	Enabled/ Disabled	Allows more than two frequency ranges to be supported
Intel Turbo Boost Technology	Intel Turbo Boost Technology settings	Max Performance	Enabled-Enables the logical processor cores on processors supporting hyper threading technology.
Power Limit 1 Enable	Allows changing the power limit settings	Enabled	
Power Limit 1 Clamp Mode	Allows changing the Power Limit 1 Clamp Mode settings	Enabled	
Power Limit 1 Power	Allows changing the power limit Power settings	Auto	
Power Limit 1 Time Window	Allows changing the power limit Time Window settings	Auto	
C-States	C-States power saving states settings	Disabled	C-states are idle power saving states.

3.2.5 Boot

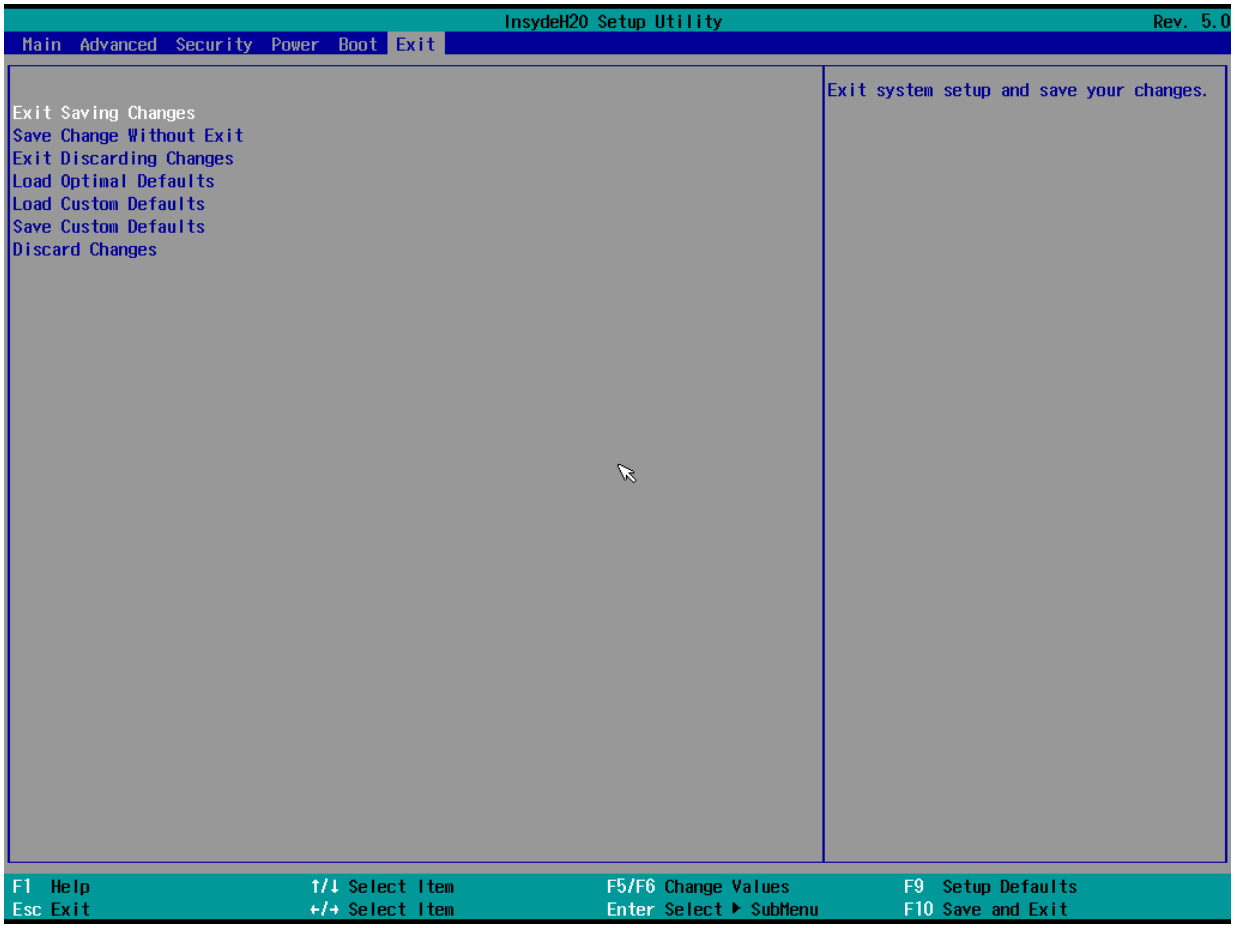


BIOS Setting	Description	Setting Option	Effect
Boot Type	Select Boot Type	Dual/ Legacy/ UEFI	Select boot type to Dual type, Legacy type or UEFI type.
Quick Boot	Quick Boot settings	Enabled/ Disabled	Enable or disable Quick Boot
Quiet Boot	Quiet Boot settings	Enabled/ Disabled	Enable or disable Quiet Boot
Network Stack	Network Stack settings	Enabled/ Disabled	Enable or disable Network Stack
Add Boot Options	Add Boot Options	First	
USB Boot	USB Boot settings	Enabled/ Disabled	Enable or disable USB Boot
Timeout	Timeout settings	0	
Automatic Failover	Automatic Failover settings	Enabled/ Disabled	Enable or disable Automatic Failover
Boot Type Order	Select Boot Type Order	Enter	Opens sub-menu

3.2.5.1 Boot Type Order



3.2.6 Exit



BIOS Setting	Description	Setting Option	Effect

Exit Saving Setting	Exit Saving Setting	Enter	Exit system and save your changes
Exit Saving Setting	Exit Saving Setting	Enter	Save change without exit
Exit Saving Setting	Exit Saving Setting	Enter	Edit discarding changes
Load Optimal Defaults	Load Optimal Defaults	Enter	Load optimal defaults
Save Custom Defaults	Save Custom Defaults	Enter	Save custom defaults
Discard Changes	Discard Changes	Enter	Discard you changes

3.3 Using Recovery Wizard to Restore Computer

Note: Before starting the recovery process, make sure to backup all user data. The data will be lost after the recovery process.

Important: Before starting the recovery process, remove any expansion card.

To enable quick one-key recovery procedure:

1. Connect the computer to the power source. Make sure the computer stays plugged in to power source during the recovery process.
2. Turn on the computer, and when the boot screen shows up, press **F6** to initiate the Recovery Wizard.
3. The following screen shows the Recovery Wizard. Click **Recovery** button to continue.

4. A warning message about data loss will show up. Make sure the data is backed up before recovery, and click **Yes** to continue.

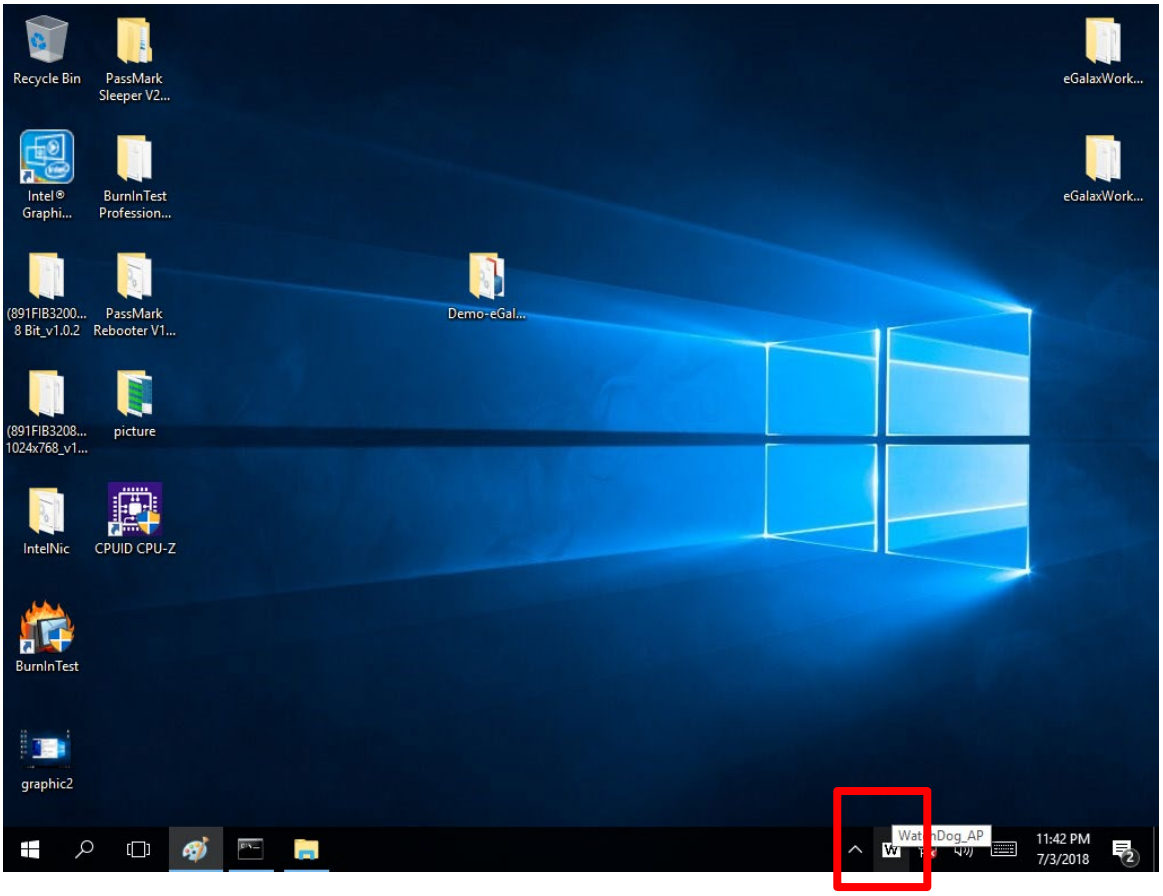
5. Wait the recovery process to complete. During the recovery process, a command prompt will show up to indicate the percent of recovery process complete. The system will restart automatically after recovery completed.

3.4 How to Enable Watchdog

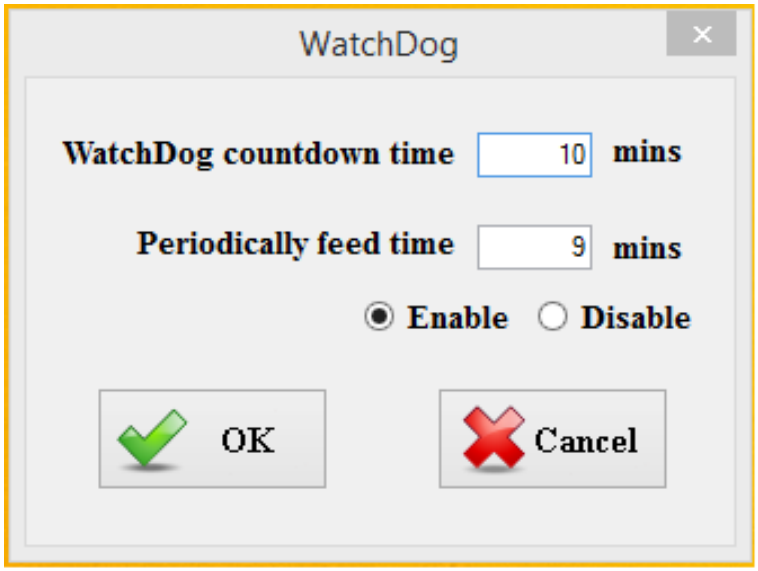
To enable Watchdog, you need to download Winmate Watchdog utility. Find more information on Watchdog in “Watchdog Guide” that you can download from Winmate Download Center or File Share. Refer to the User Manual for more details.

To enable watchdog in Watchdog AP follow the instructions below:

1. On the right bottom side of the desktop screen, click **triangle button** to show hidden icons.
2. lick W icon to open Watchdog utility.



3. In Watchdog utility window set countdown time and periodically feed time, or disable watchdog.



Example:

Every 10 min watchdog will monitor the system, in case any error occurs the system will restart automatically when the countdown time reaches 0.

Every 9 min watchdog timer will be reset to 10 min.

Setting	Description
Watchdog Countdown Time	The system automaticity restarts when this countdown time reaches zero. *Default: 10 min*
Periodically Feed Time	To set a cycle time to automatically reset watchdog timer. *Default: 9 min*
Enable / Disable	Enable or disable watchdog. *Default: Enable*

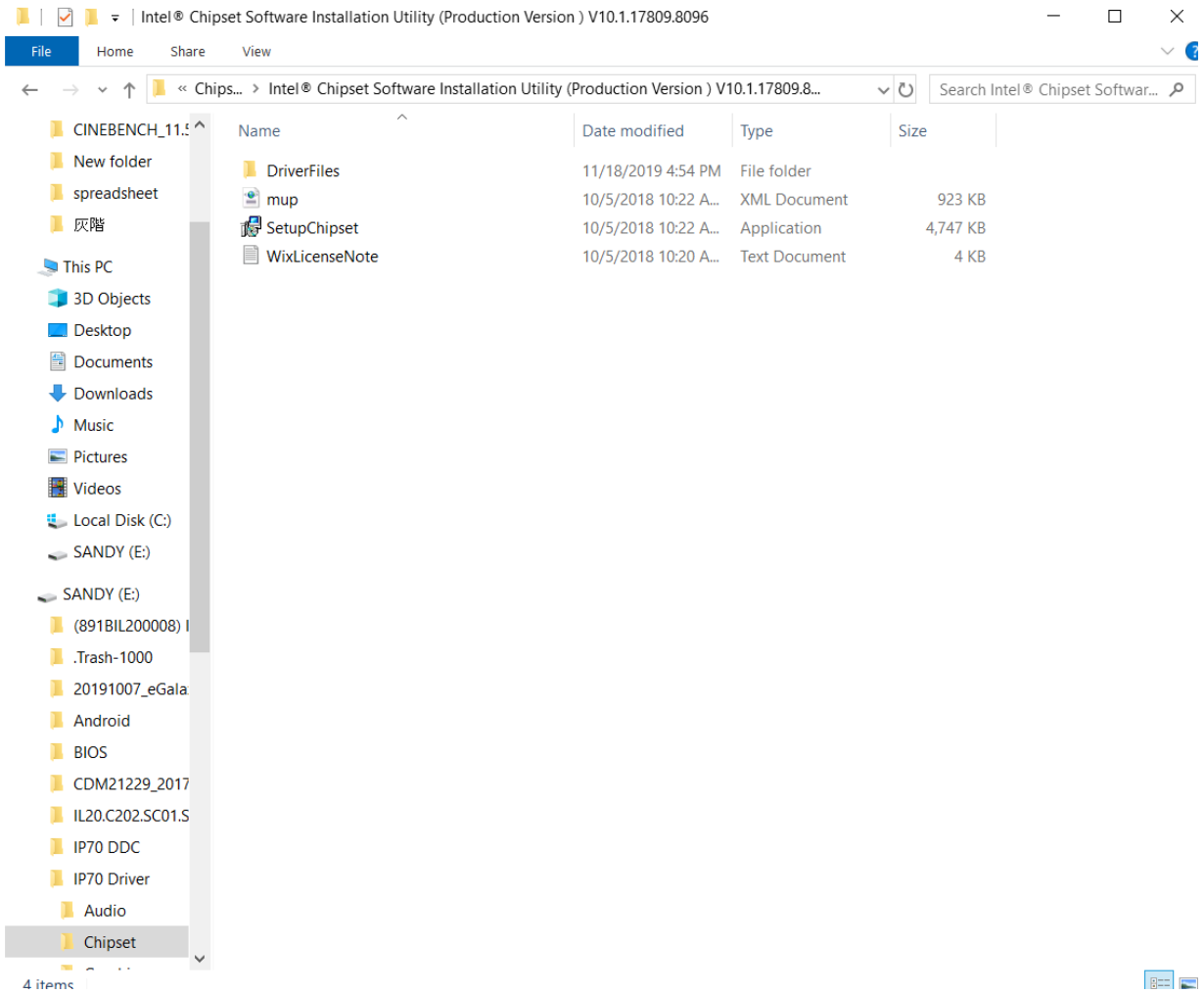
Chapter 4: Driver Installation

This chapter contains driver installation instructions for the IP70 Mini-ITX SBC.

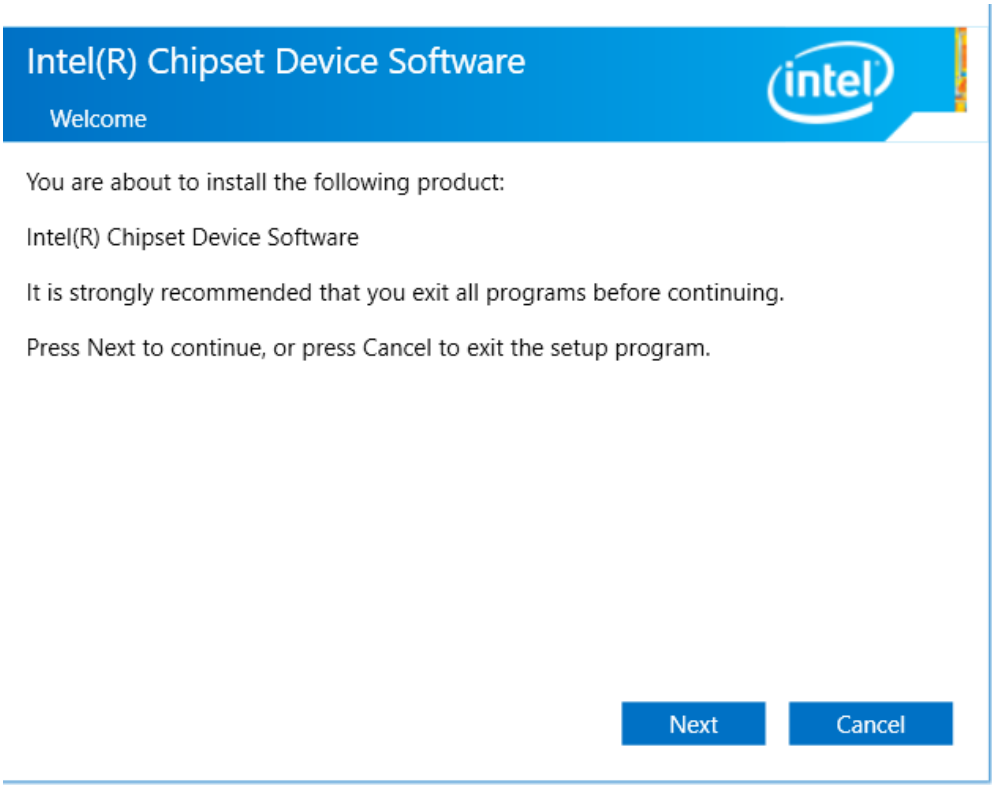
4.1 Chipset Driver

Follow instructions below to install Chipset driver.

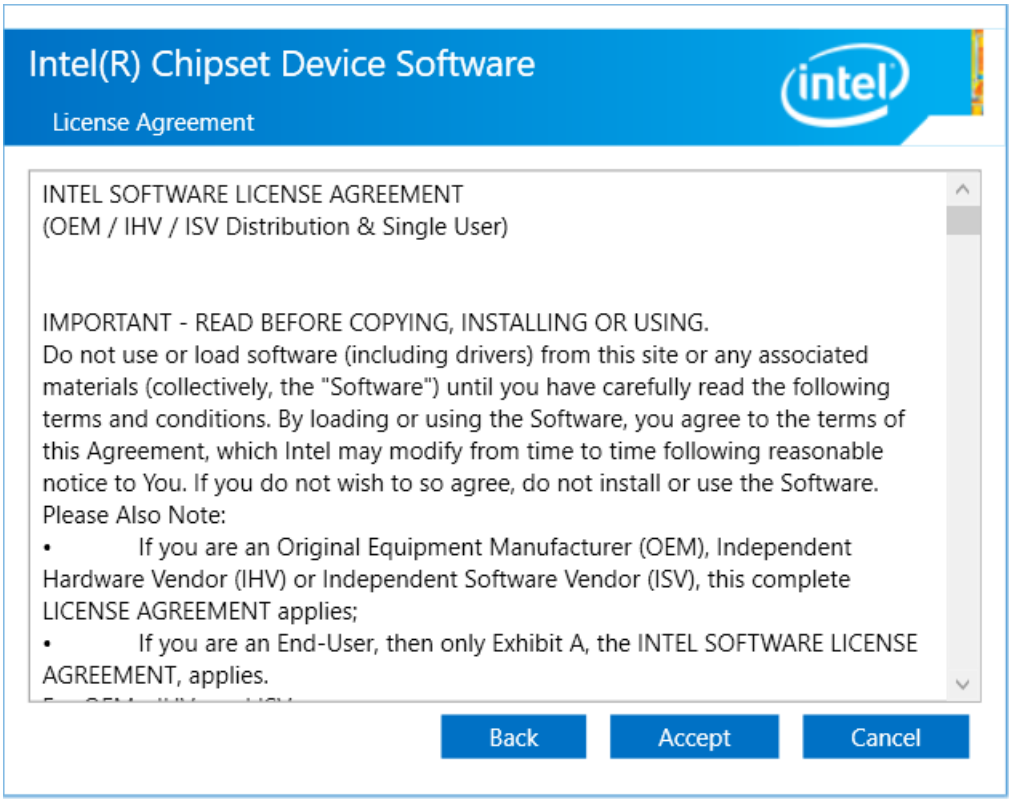
1. Open the Driver CD (included in the package) and select **Chipset** driver.



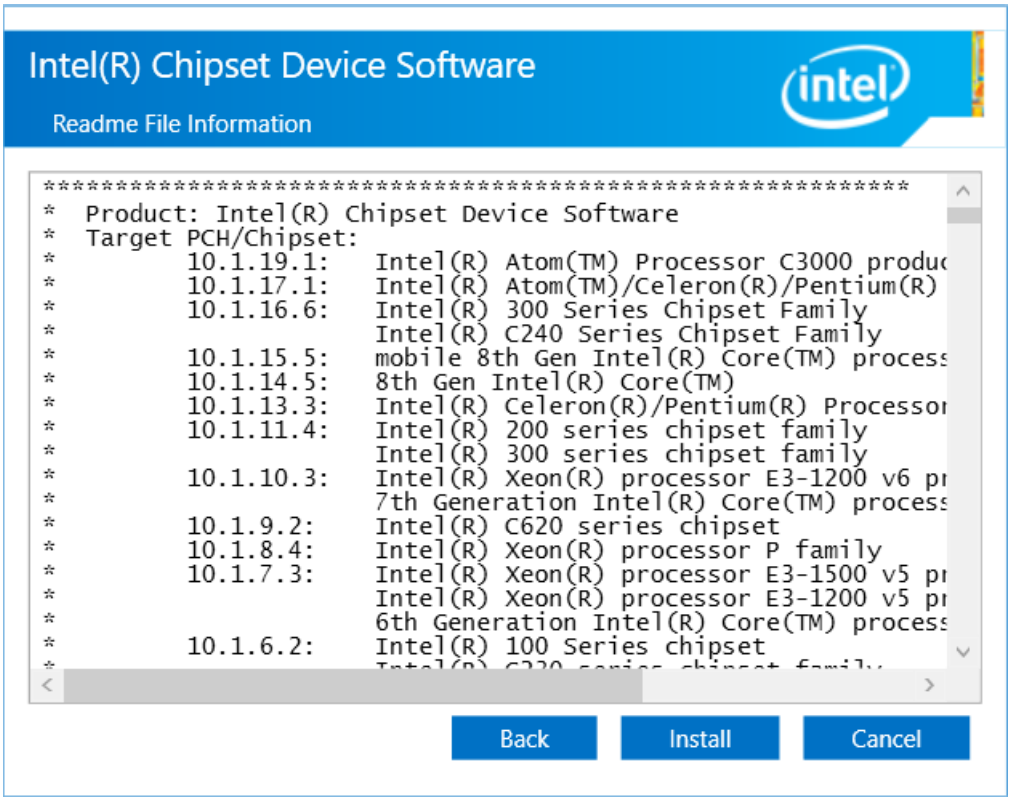
2. Installation window will pop up, select **Next**.



3. Select **Accept** to agree with the terms of license agreement.



4. Check the ReadMe file information, select **Install** to continue.

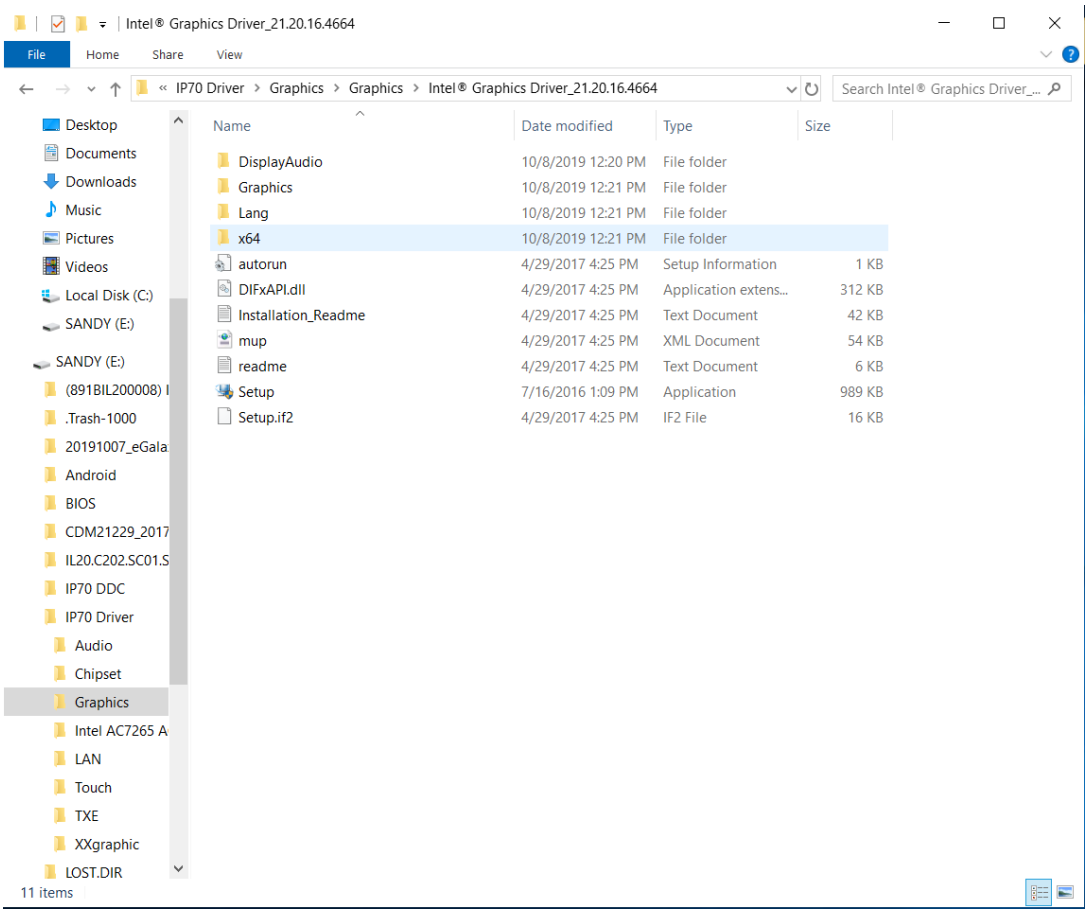


5. Wait for the driver to be installed. When installation completed, select **Restart Now** to restart your computer.

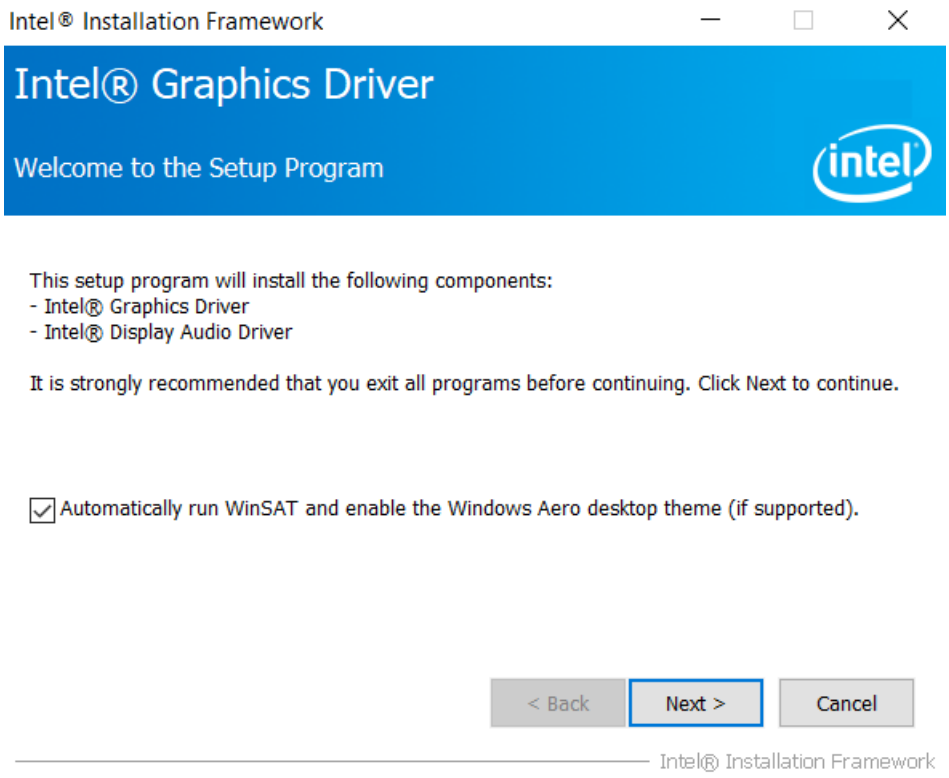
4.2 Graphics Driver

Follow instructions below to install Graphic driver.

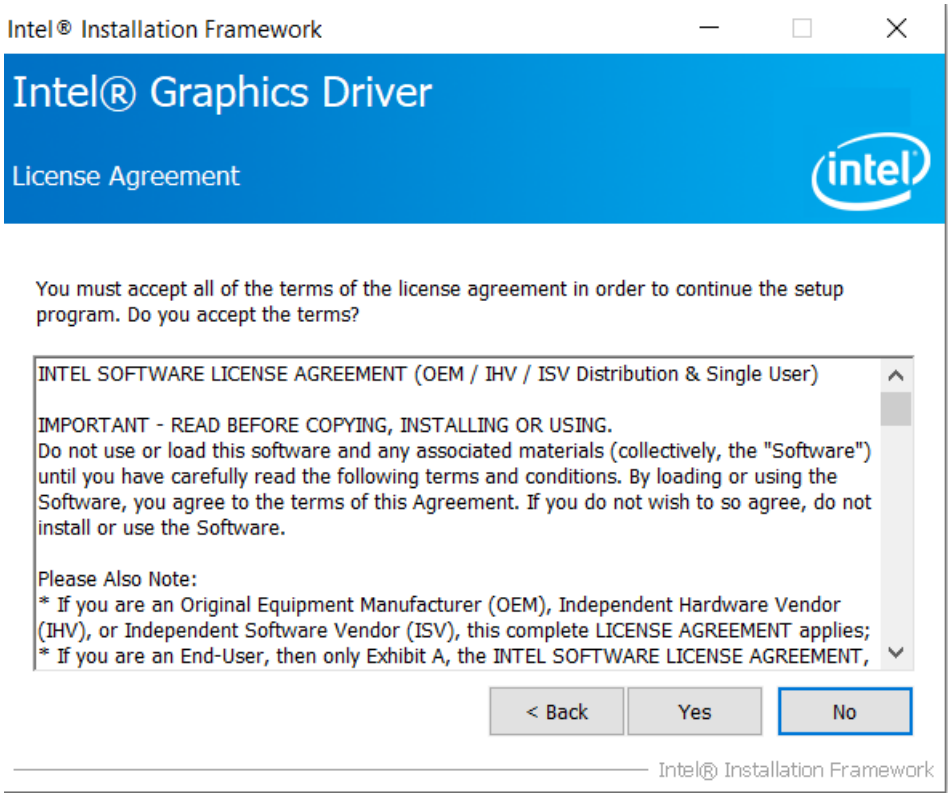
1. Open the Driver CD (included in the package) and select **Graphics** driver.



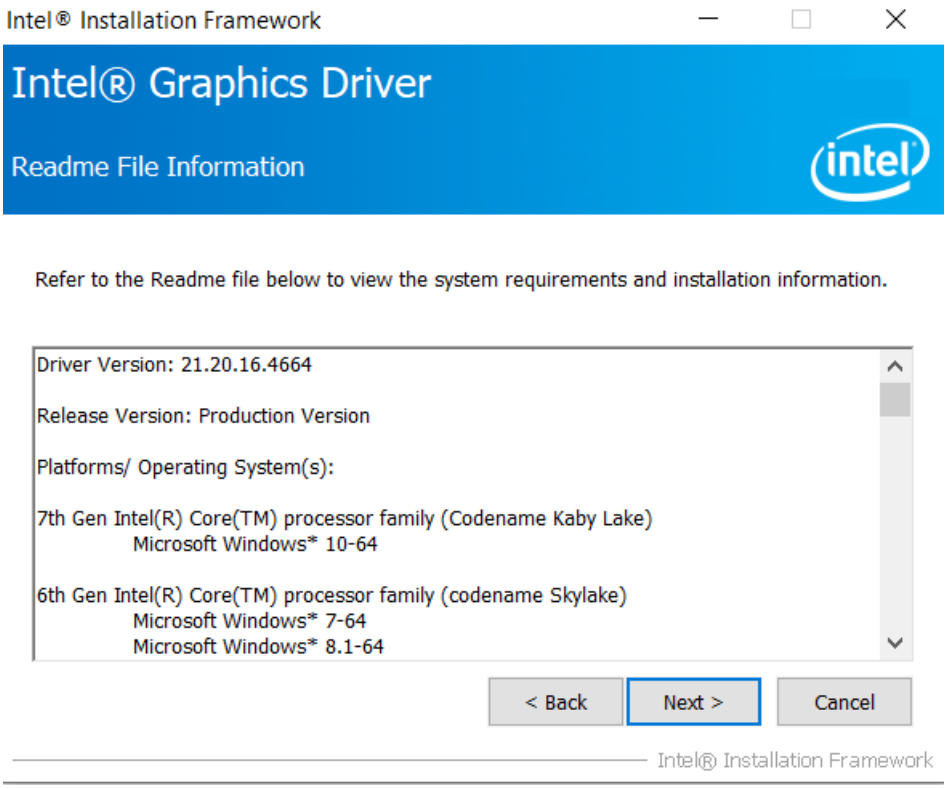
2. Installation window will pop up, select **Next**.



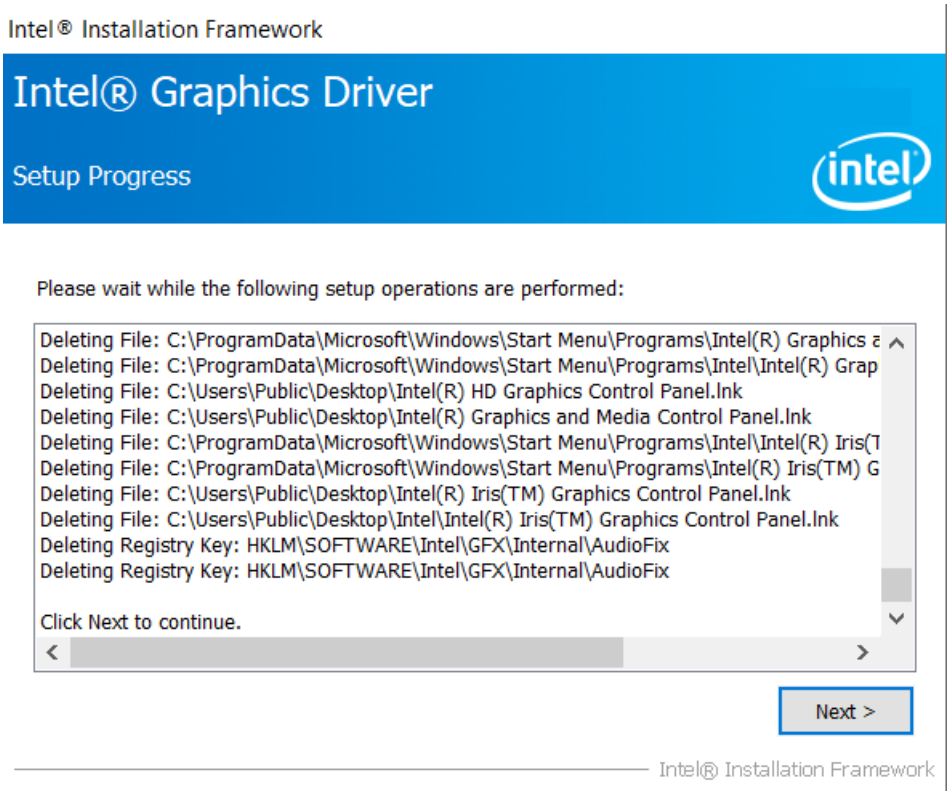
3. Select **Accept** to agree with the terms of license agreement.



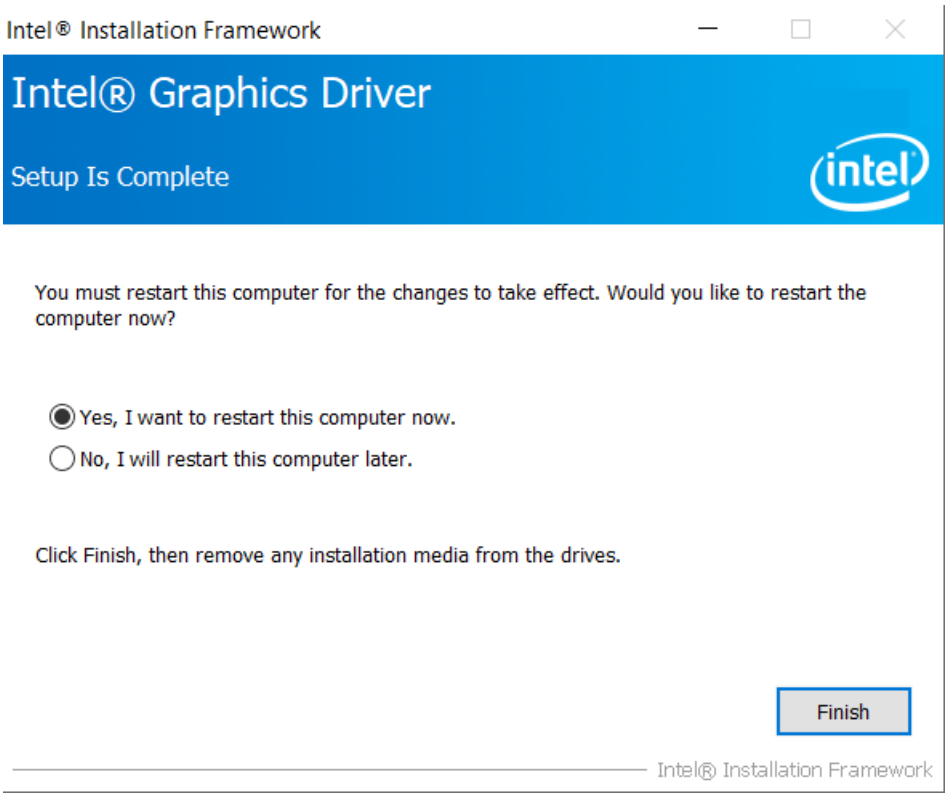
4. Check the ReadMe file information, select **Next** to continue.



5. Wait for the driver to be installed.



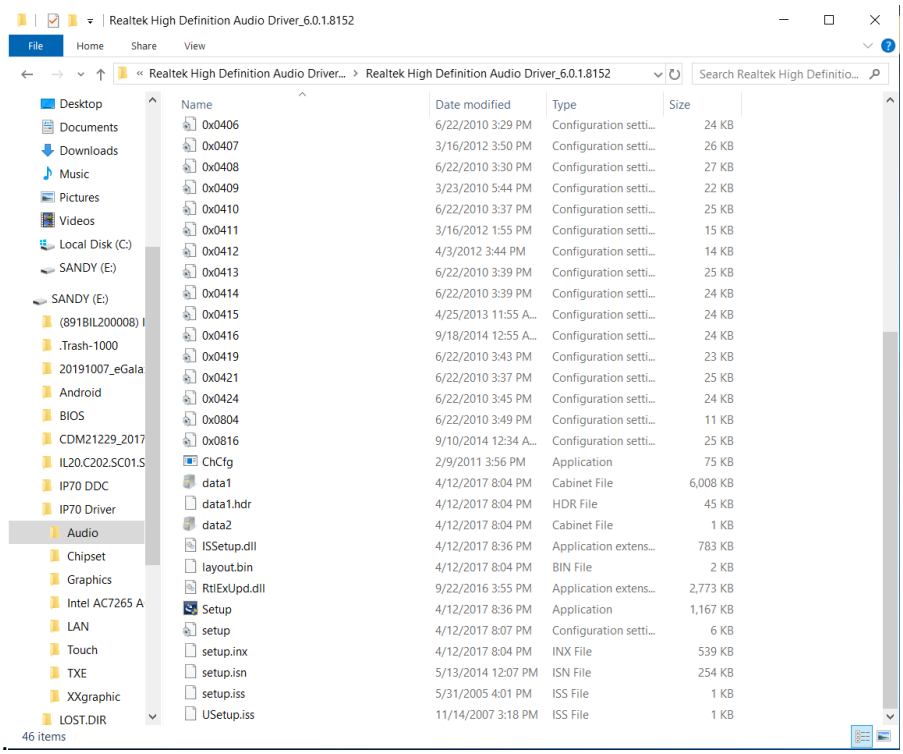
6. When installation is completed, select "**Yes, I want to restart this computer now**", and click **Finish**.



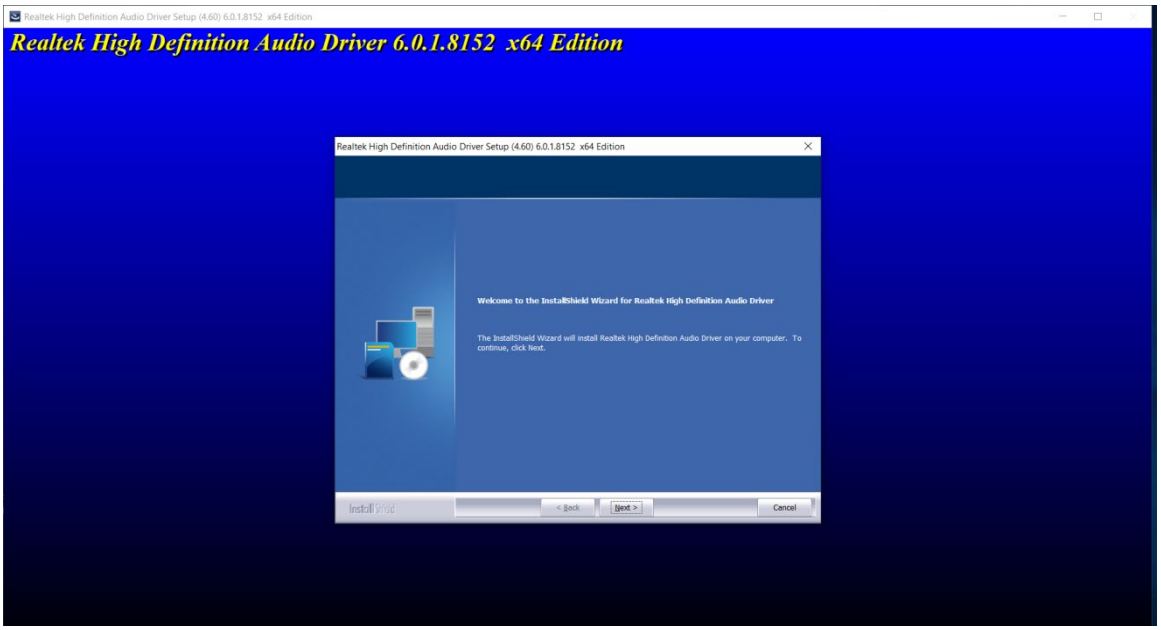
4.3 Audio Driver

Follow instructions below to install Audio Driver.

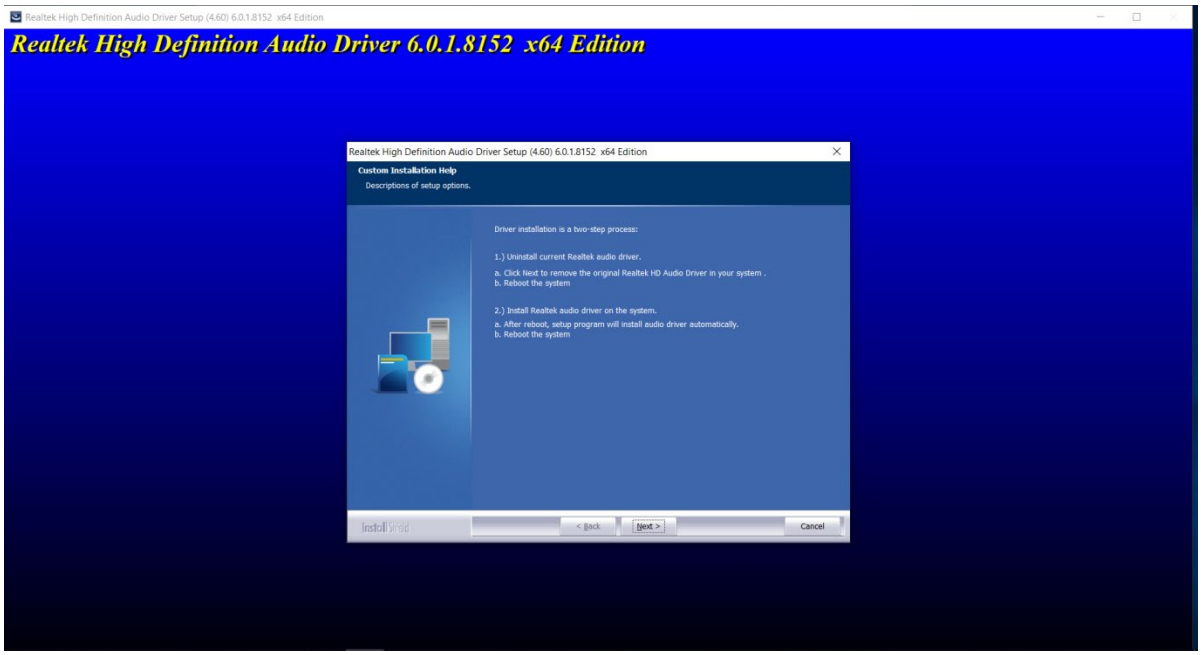
1. Open the Driver CD (included in the package) and select **Audio** driver.



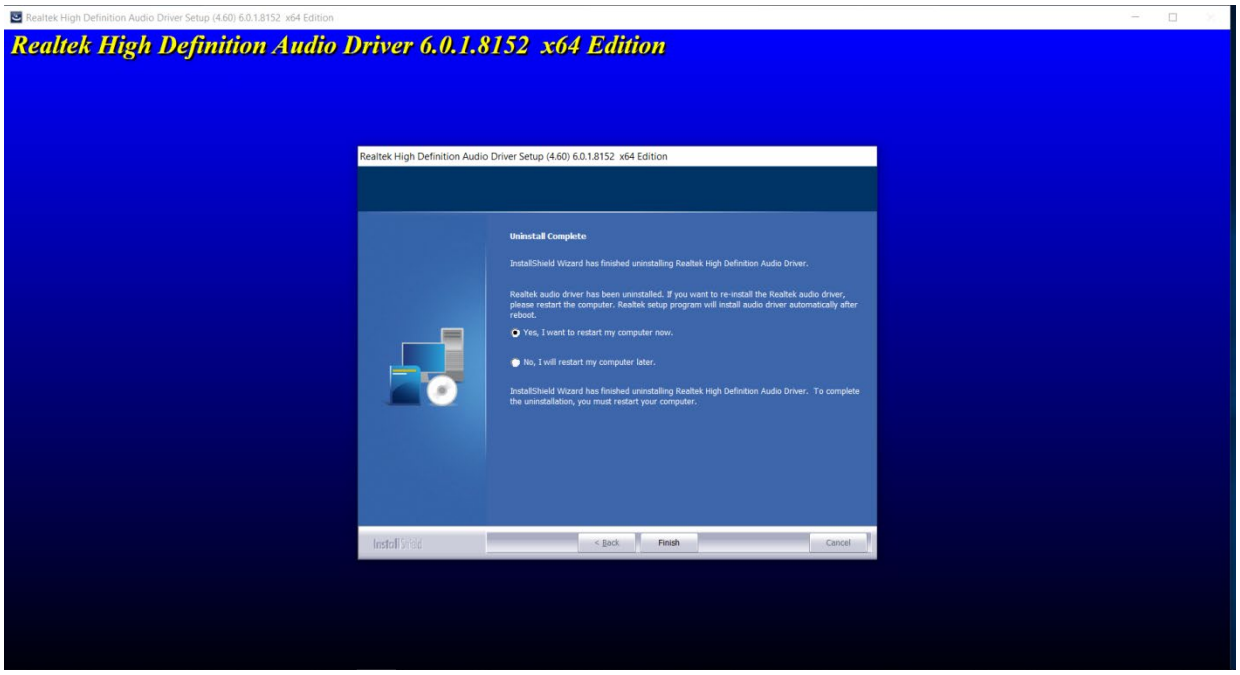
2. Select **Next** to start the installation.



3. Select **Next** to proceed.



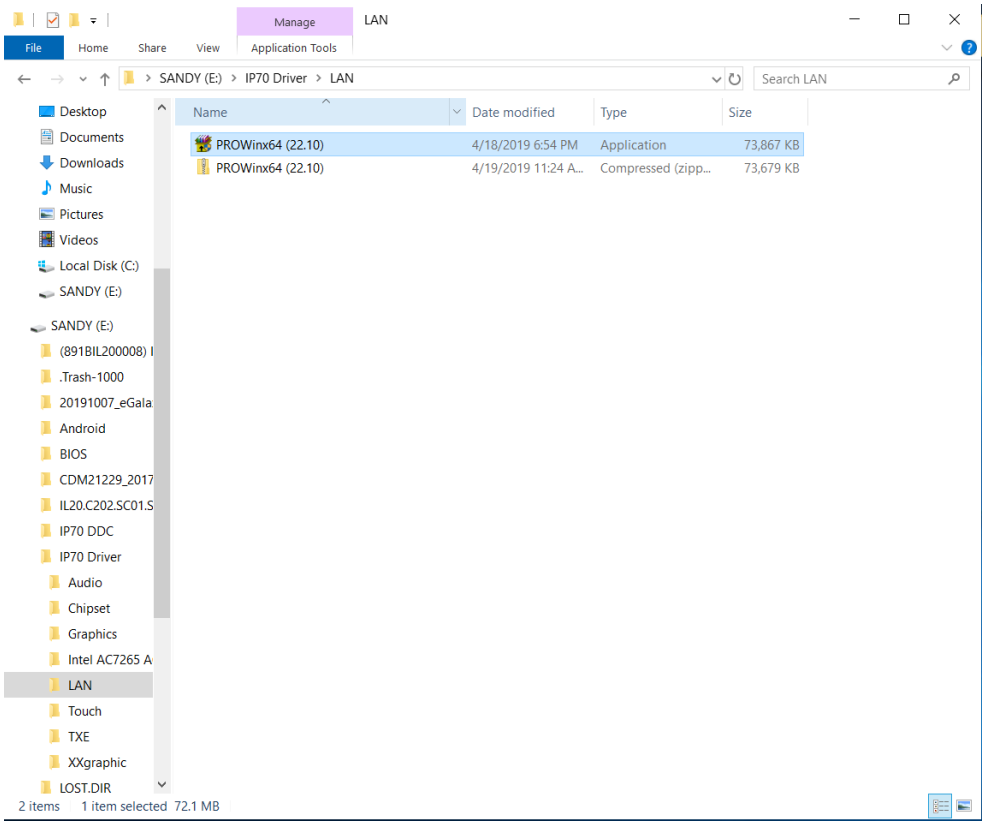
4. When installation is completed, select "**Yes, I want to restart this computer now**", and click **Finish**.



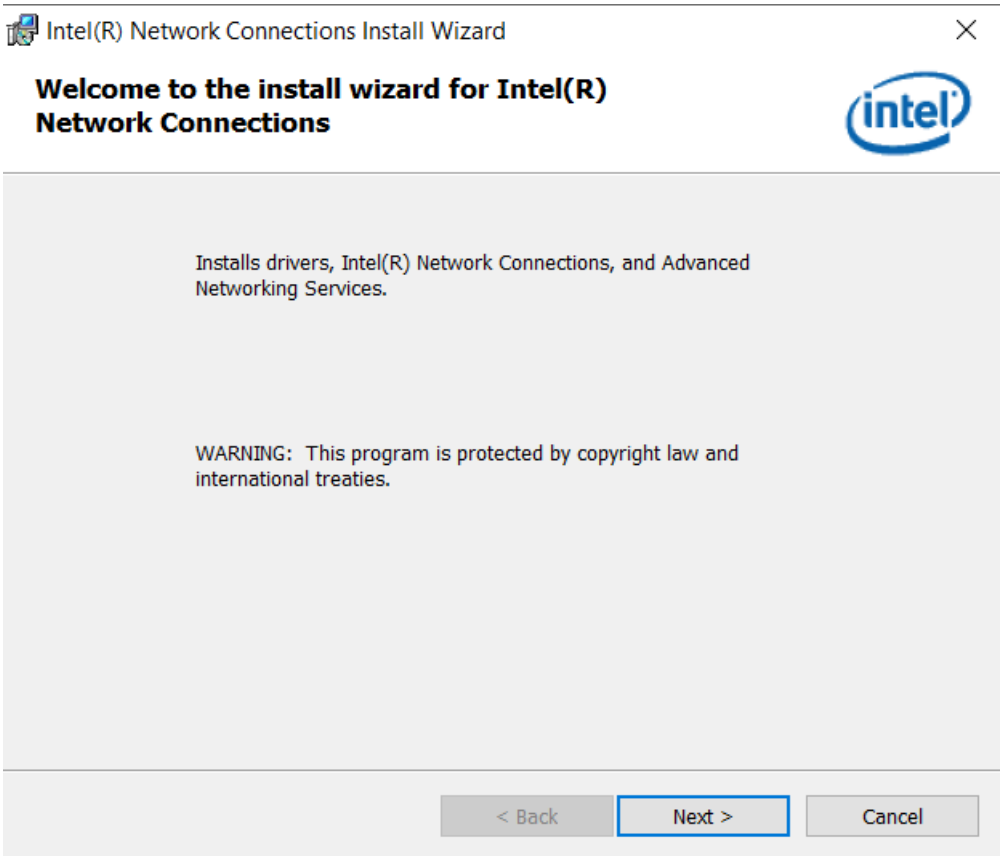
4.4 LAN Driver

Follow instructions below to install **LAN** driver.

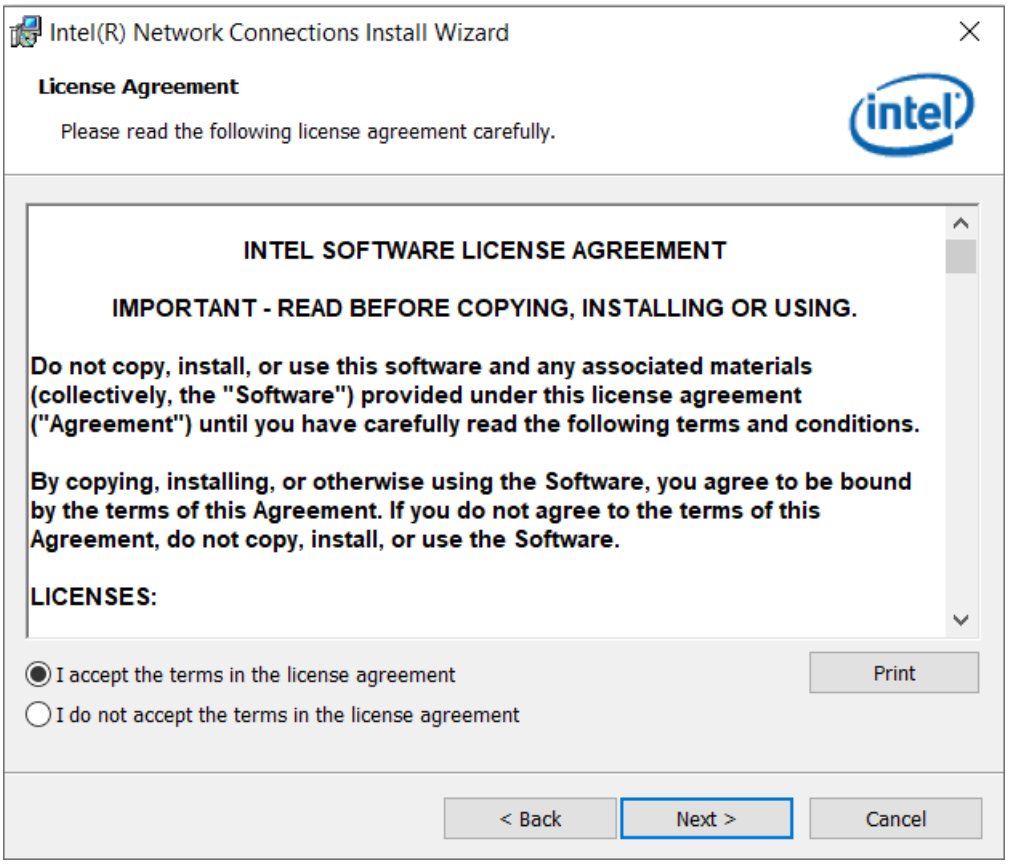
1. Open the Driver CD (included in the package) and select **LAN** driver.



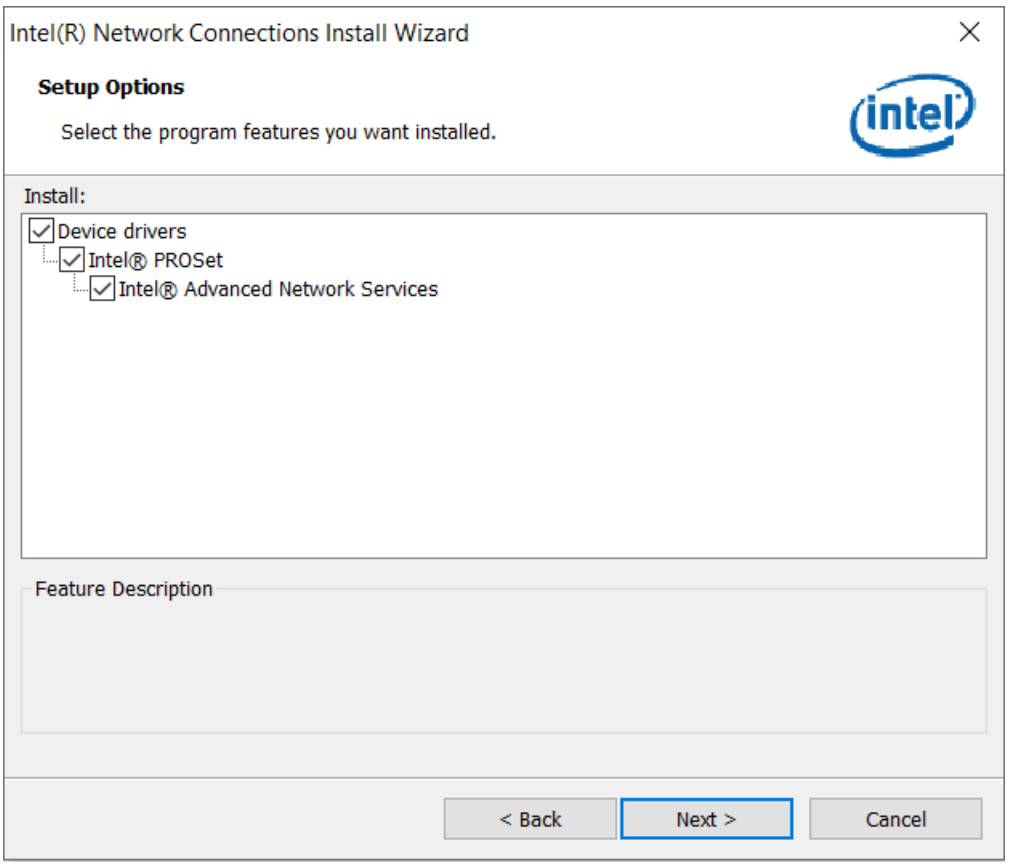
2. Select **Next** to continue.



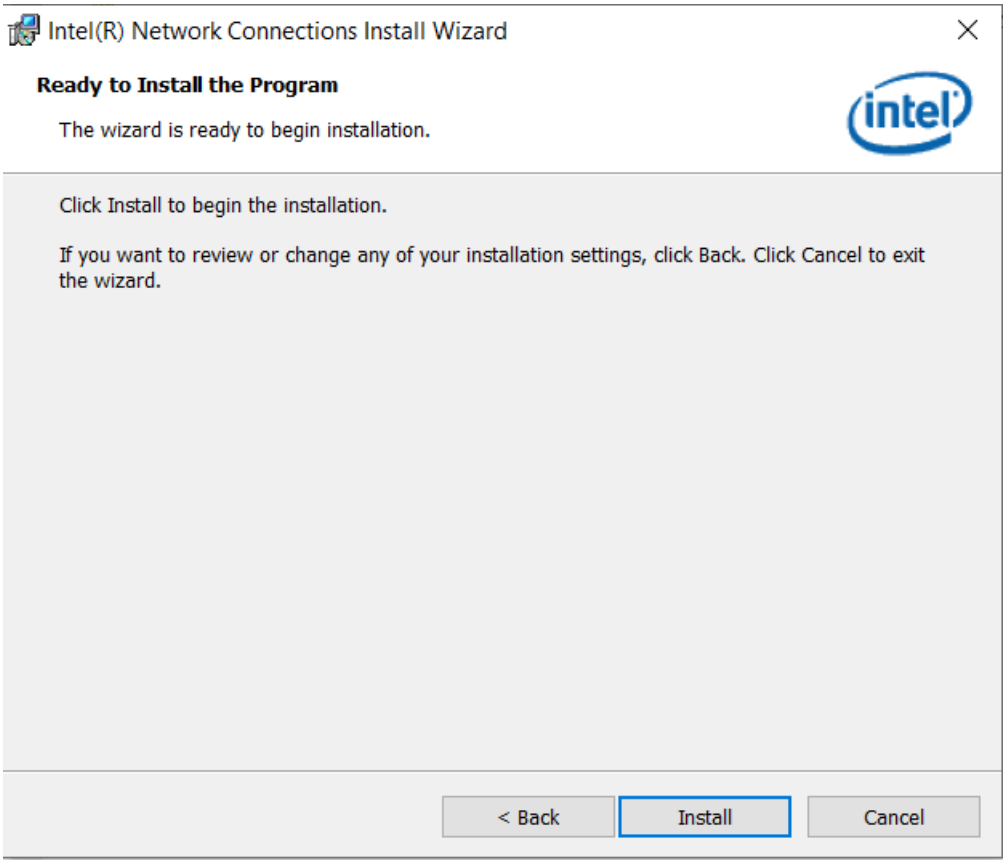
3. Read the license agreement, and then select **Next**.



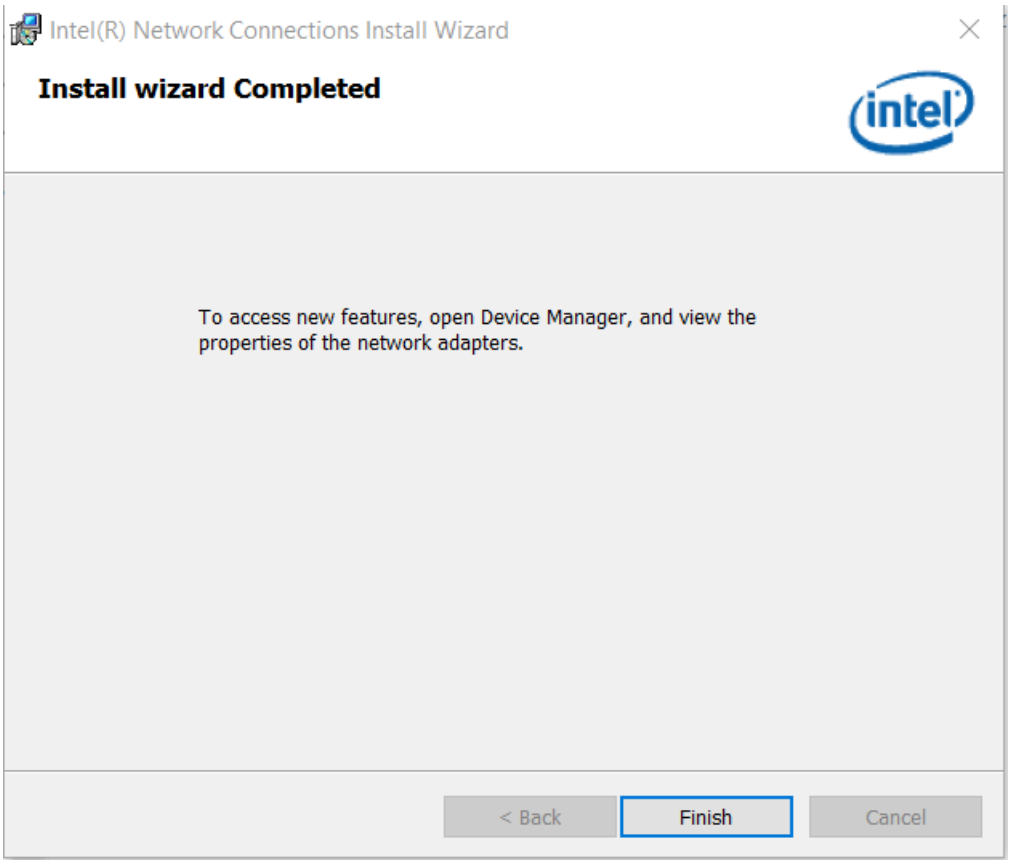
4. System displays the installed packages, select **Next**.



5. Confirm the installation, select **Install** to start the installation.



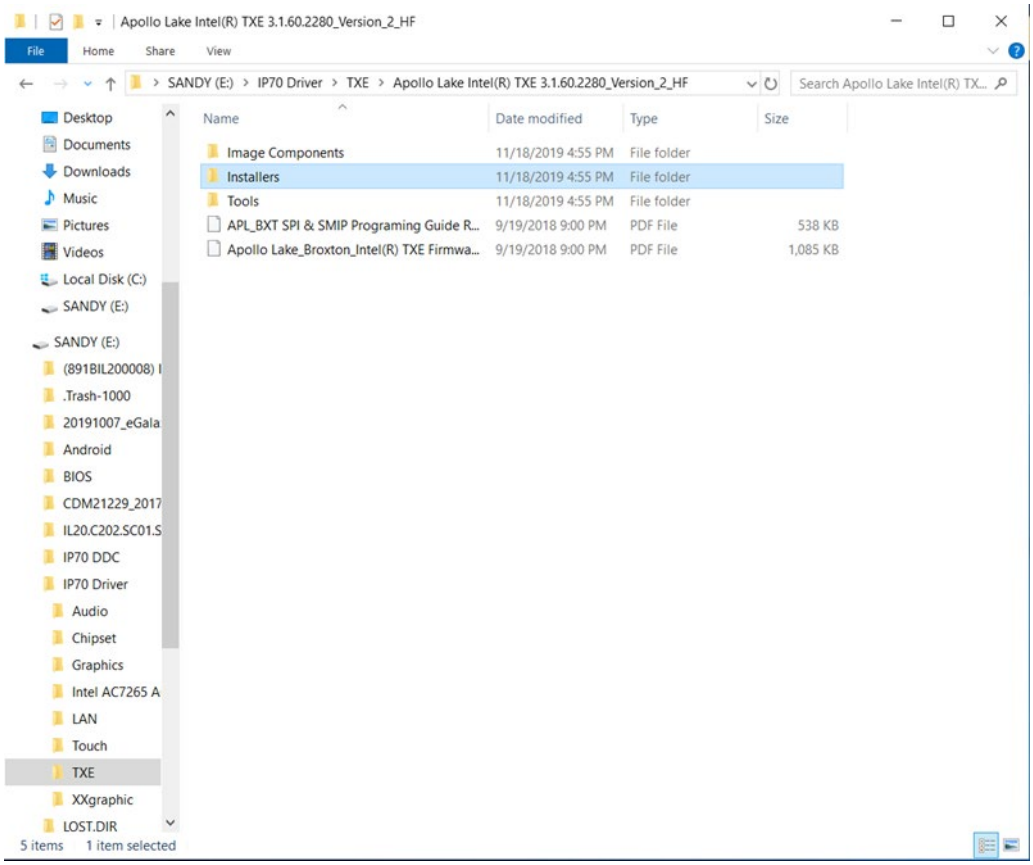
6. When installation is completed, select **Finish** to close the window.

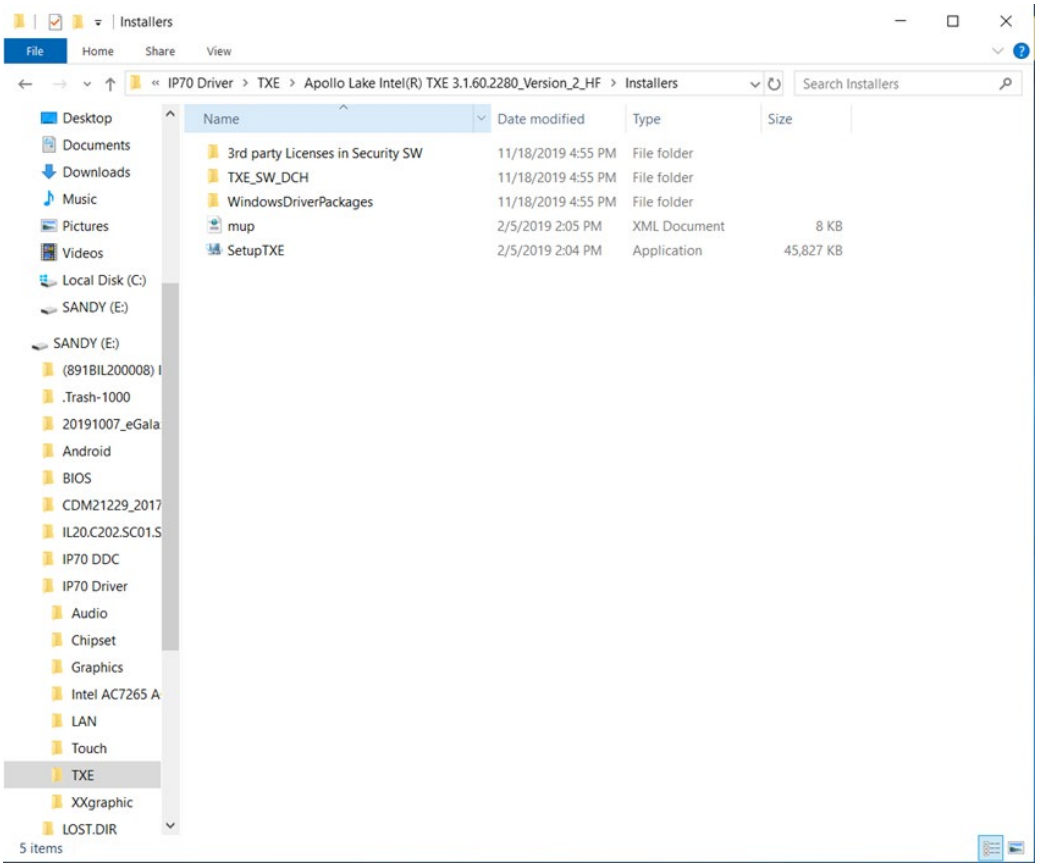


4.5 TXE Driver Installation

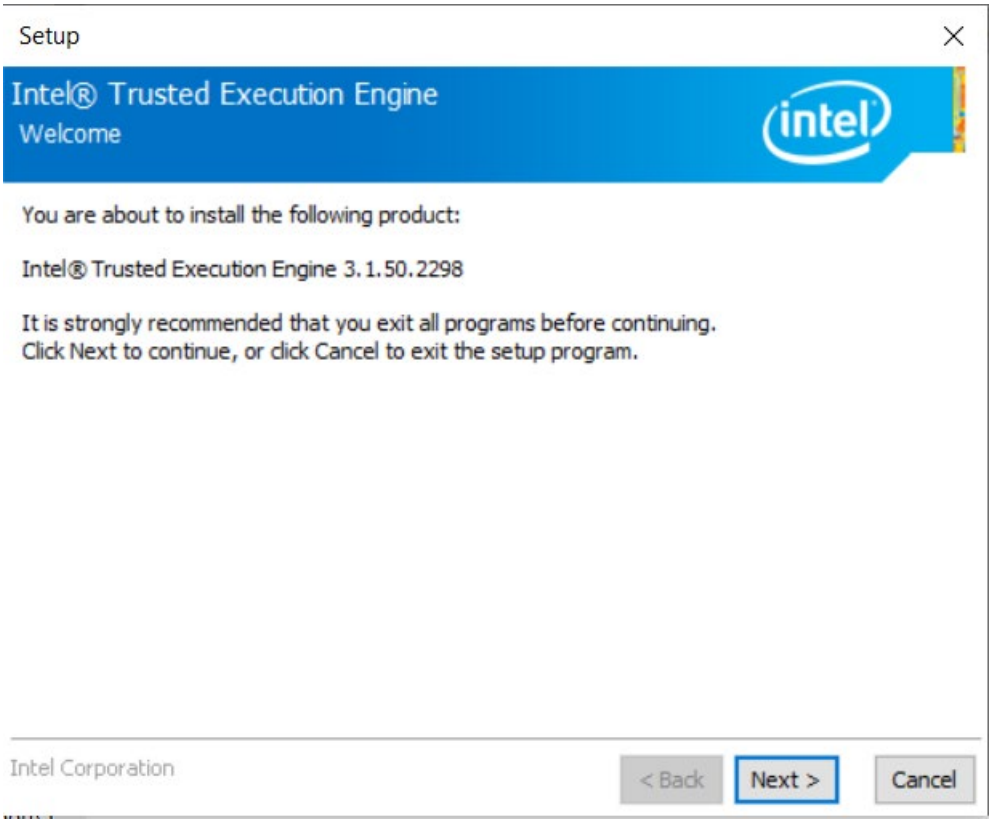
Follow instructions below to install **TXE** driver.

1. Open the Driver CD (included in the package) and select **TXE** driver.

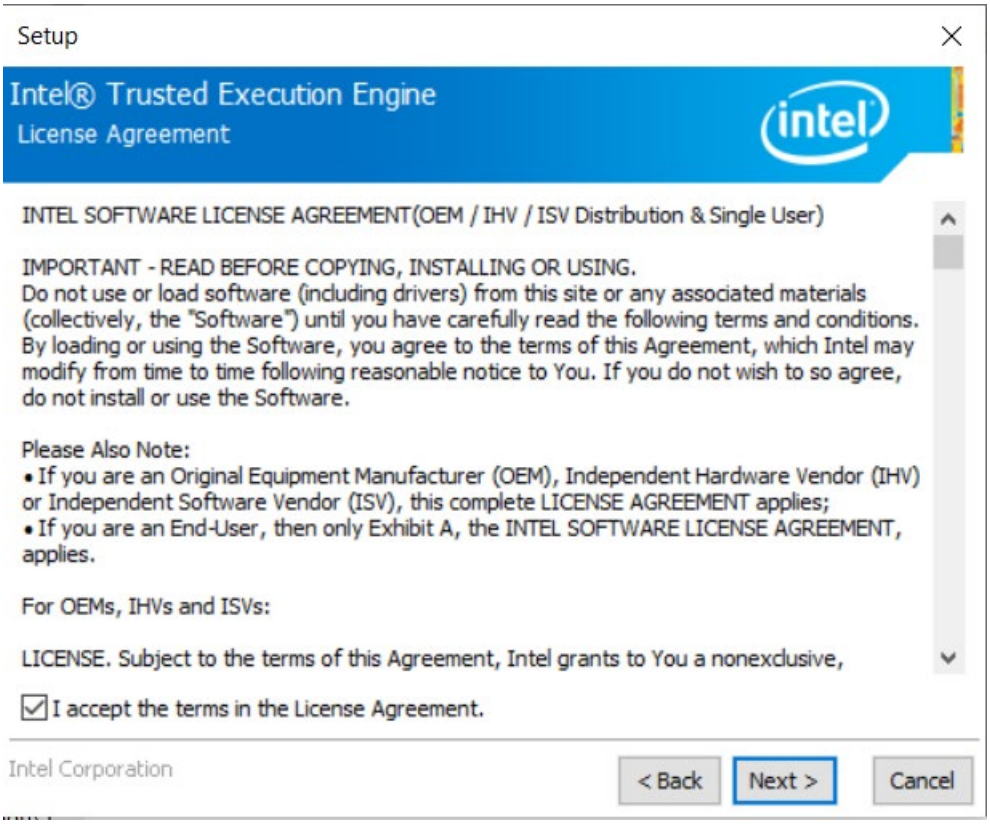




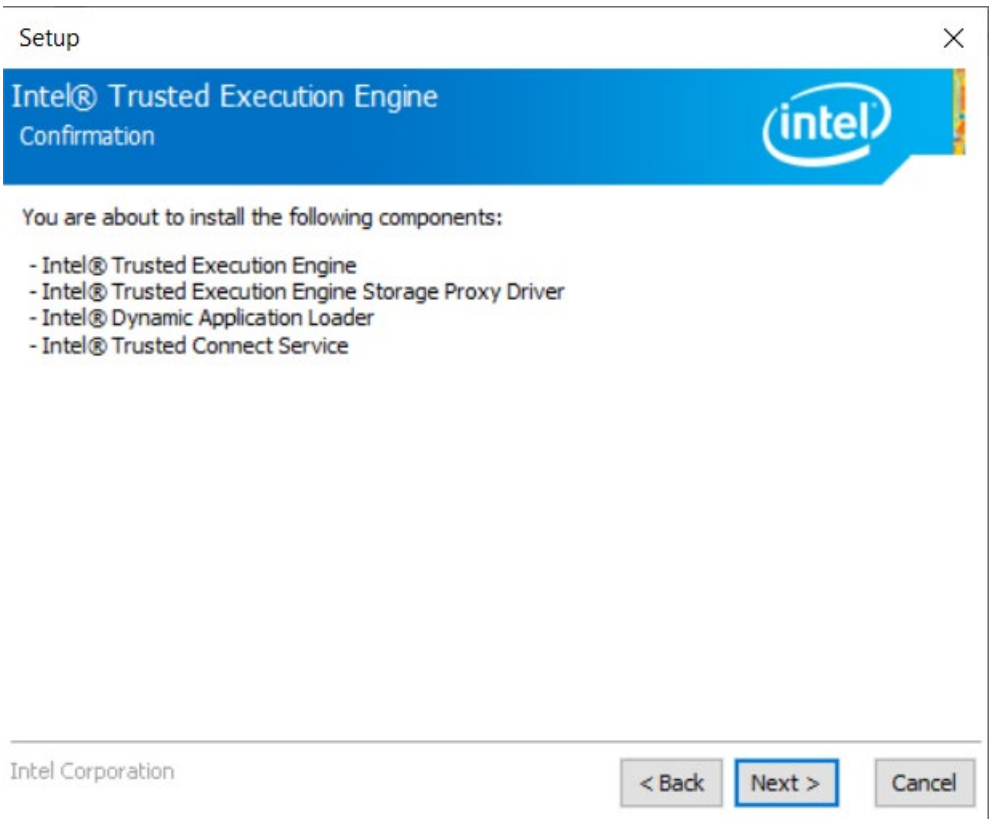
2. Select **Next** to continue.



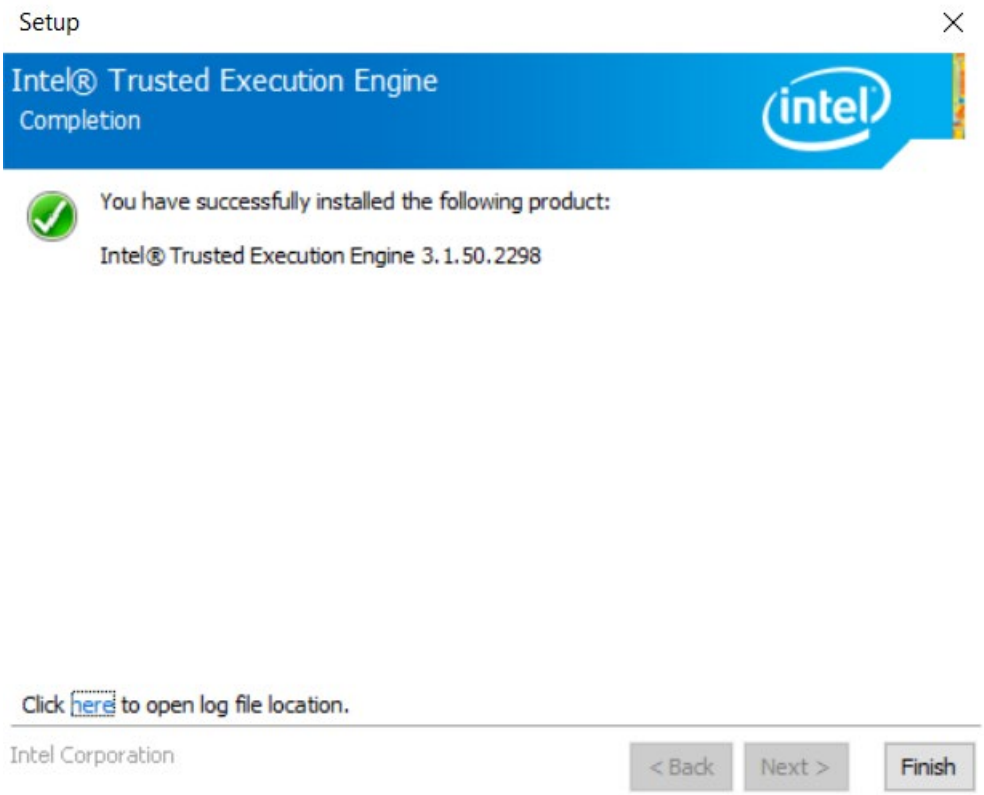
3. Read the license agreement, and then select **Next**.



4. System displays the installed packages, select **Next**.



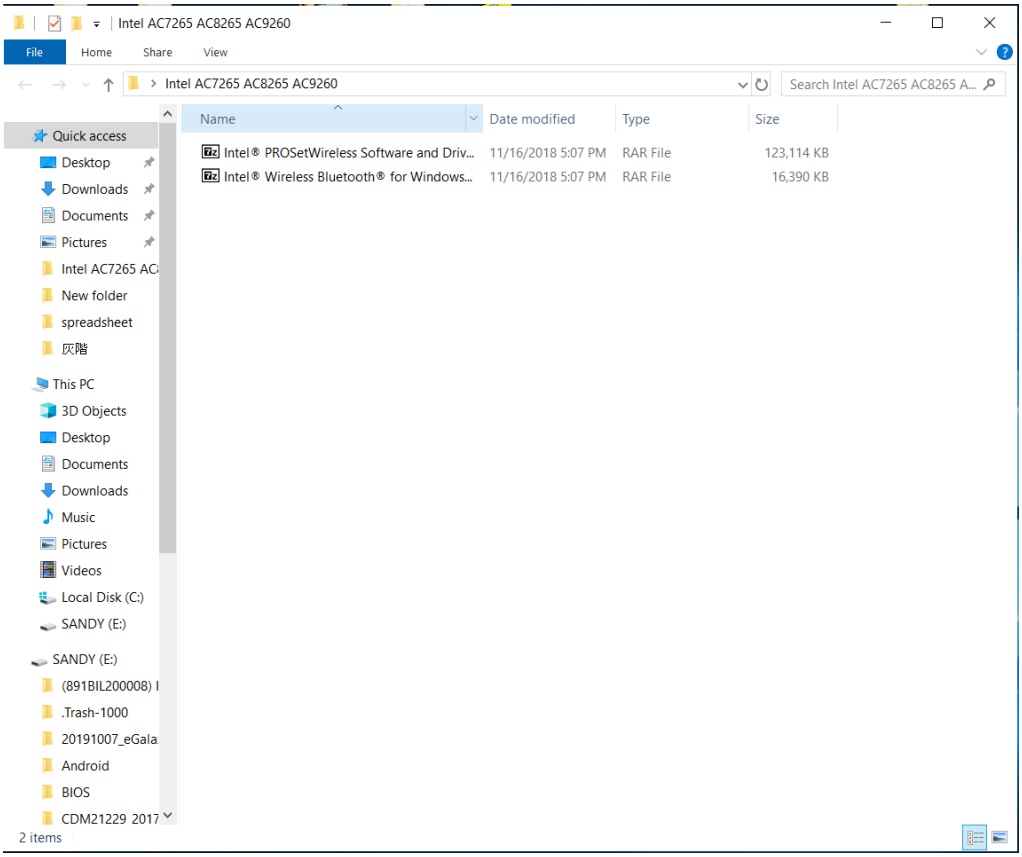
5. When installation is completed, select **Finish** to close the window.

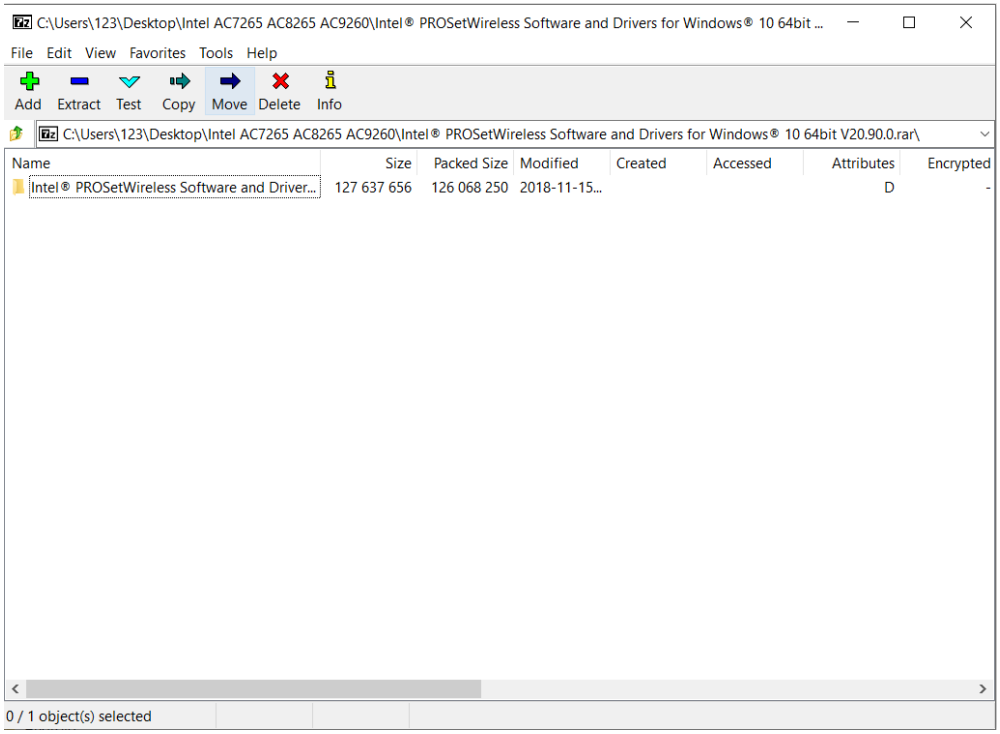


4.5 Wireless Bluetooth Driver

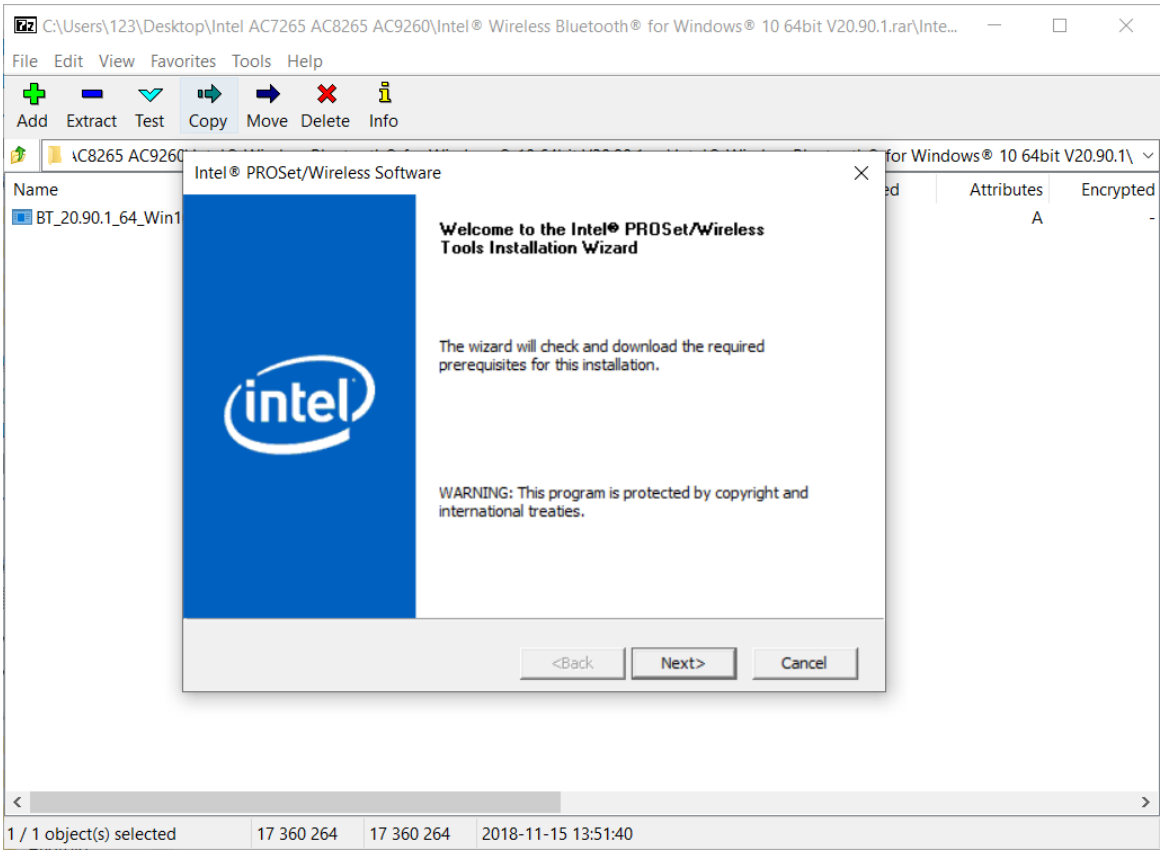
Follow instructions below to install **Intel AC7265/ AC865/ AC9260** driver.

1. Open the Driver CD (included in the package) and select **Intel AC7265/ AC865/ AC9260** driver.

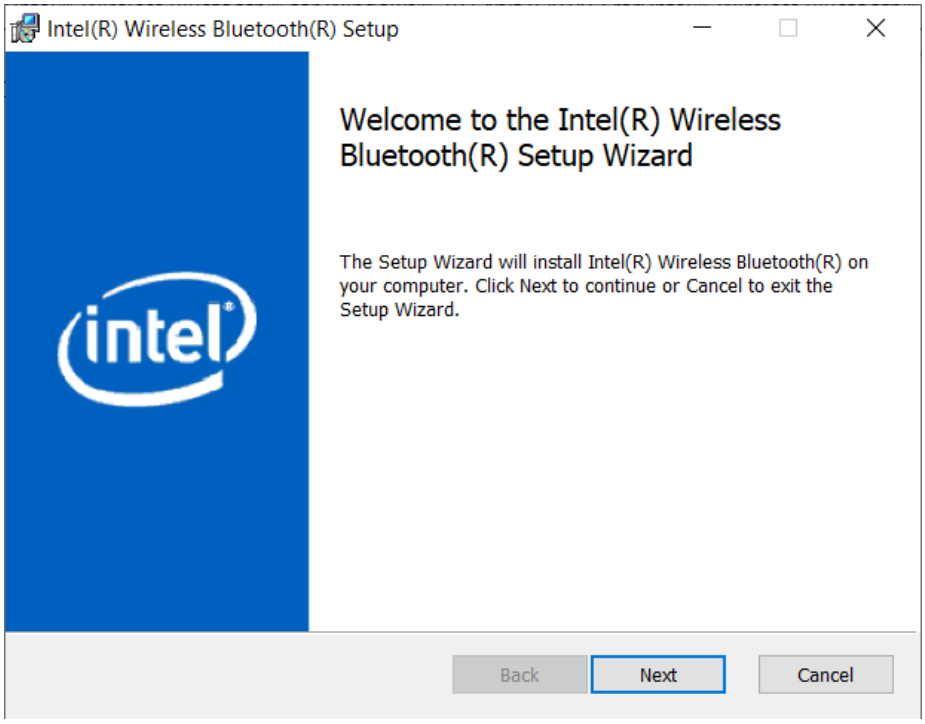




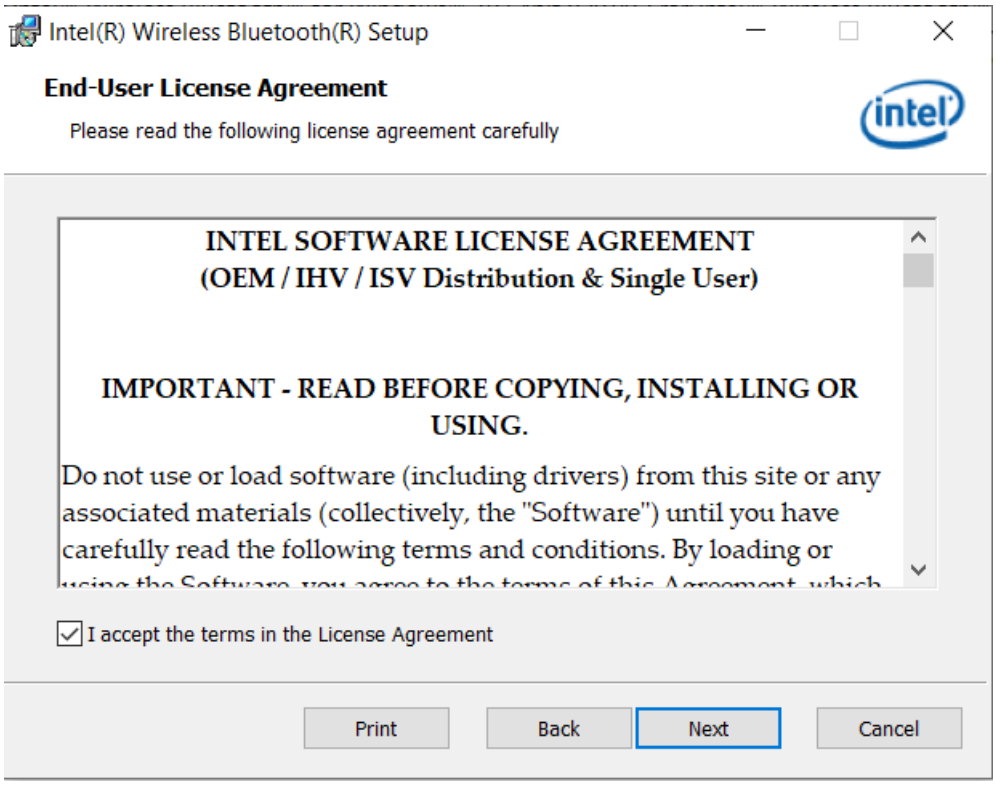
2. Select **Next** to continue.



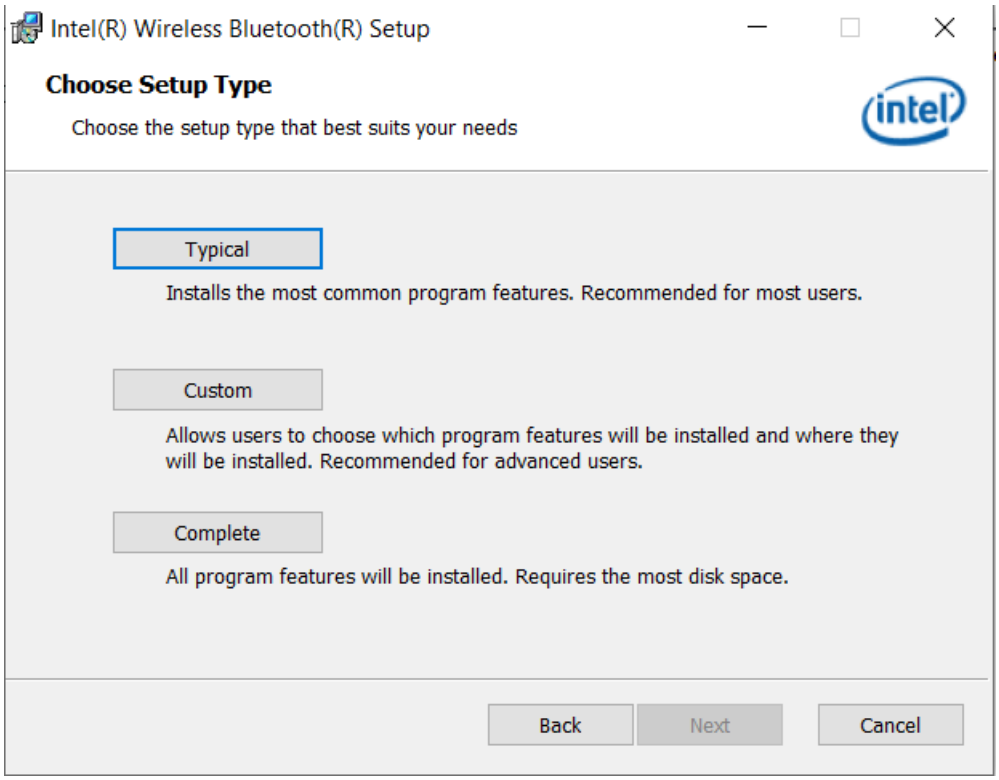
3. Select **Next** to continue.



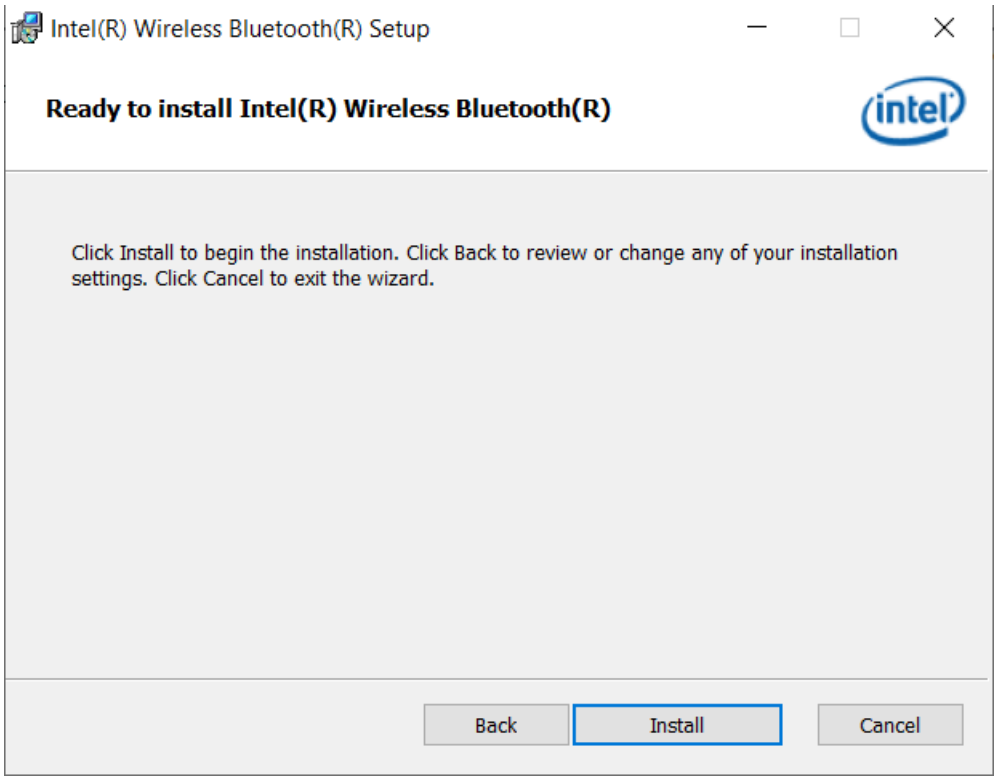
4. Read the license agreement, and then select **Next**.



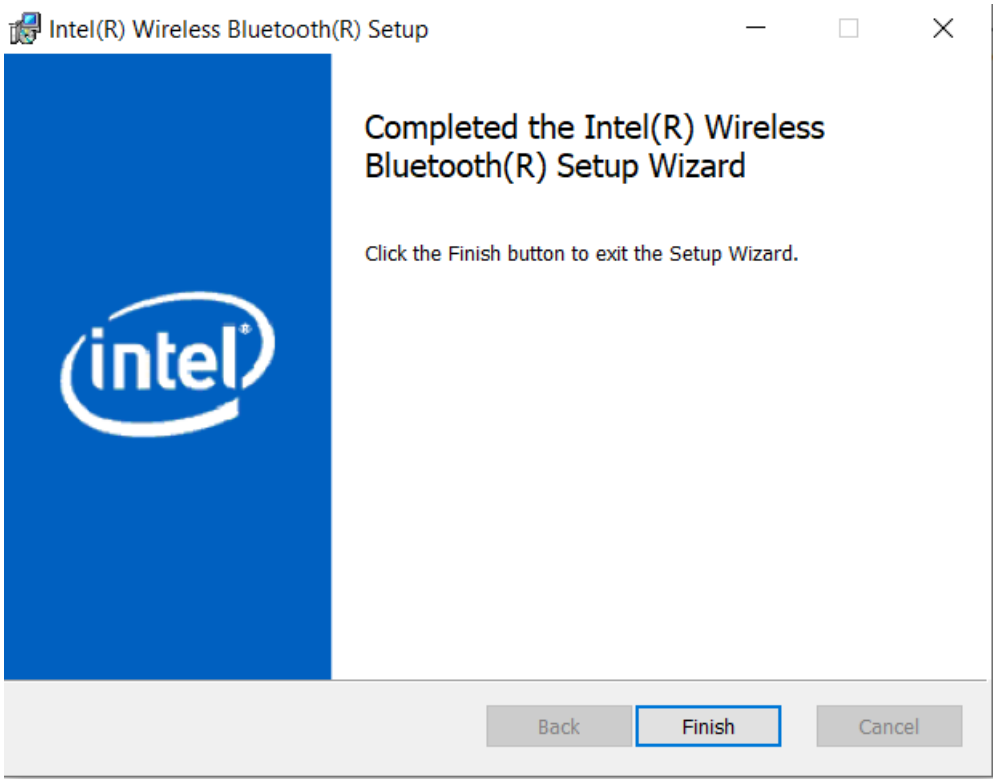
5. Choose setup type, and click **Next** to continue.



6. Click **Install** to start installation process.



7. When installation is completed, select **Finish** to close the window.

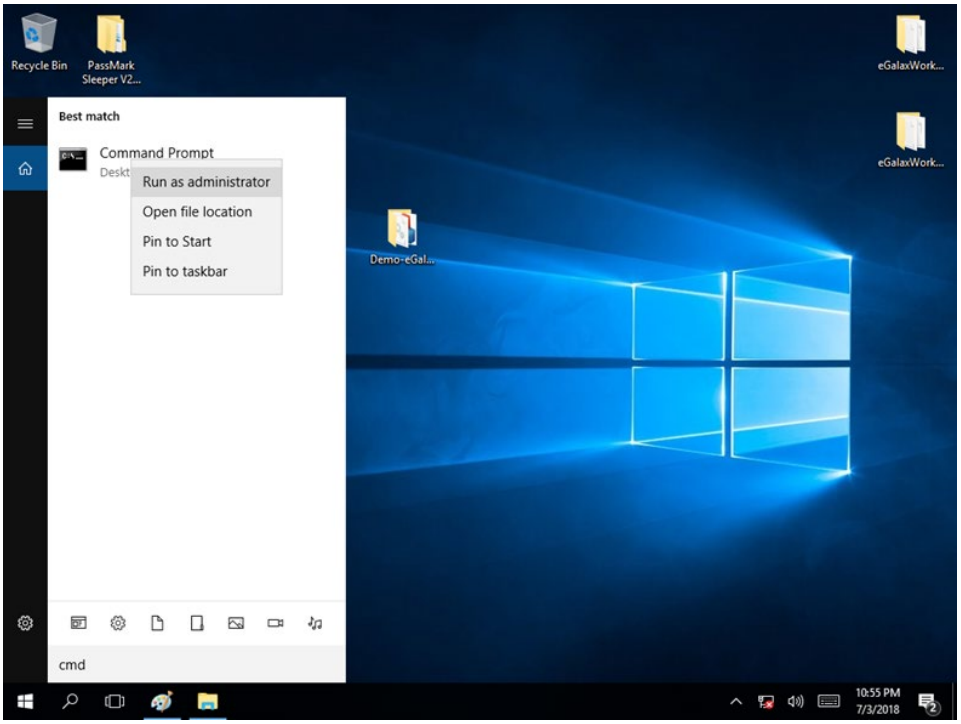


4.6 Watchdog Driver Installation

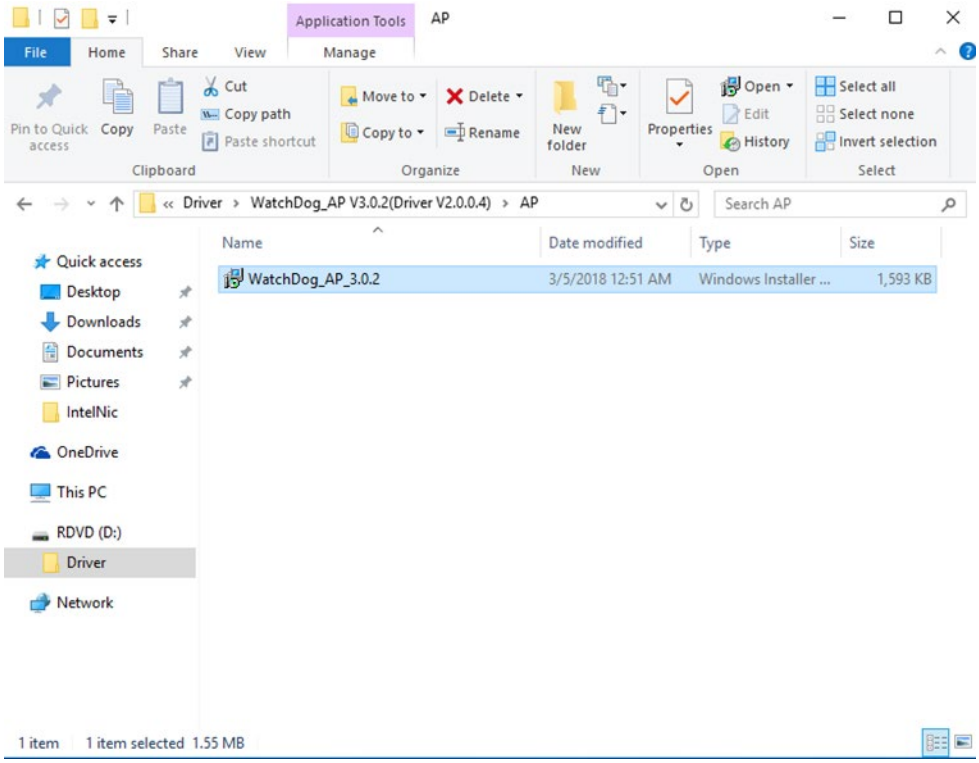
For more details about Winmate Watchdog, please download Watchdog Guide from Winmate Downloads Center here.

Follow instructions below to install **Watchdog** driver.

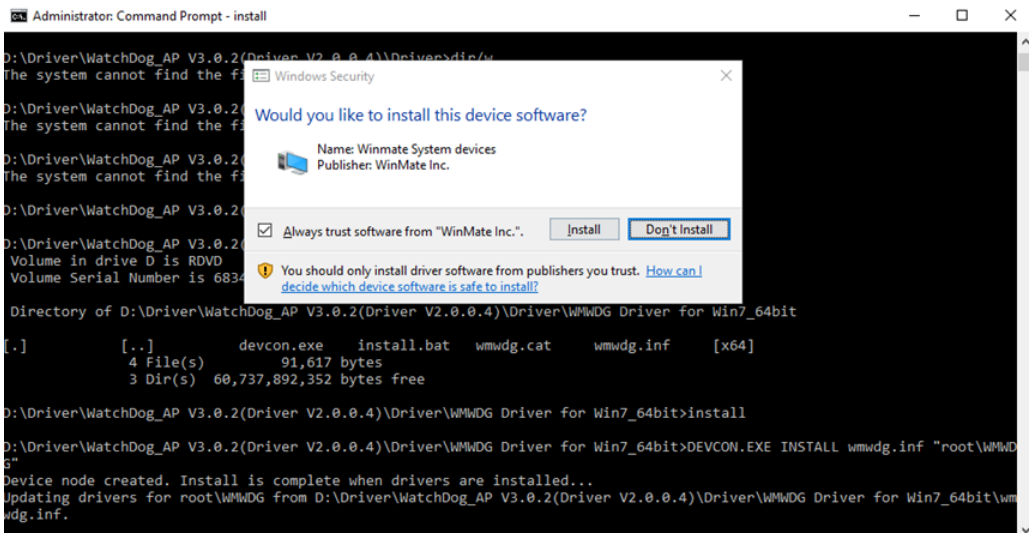
1. Type “cmd” in the run box then the cmd.exe will appear in programs.



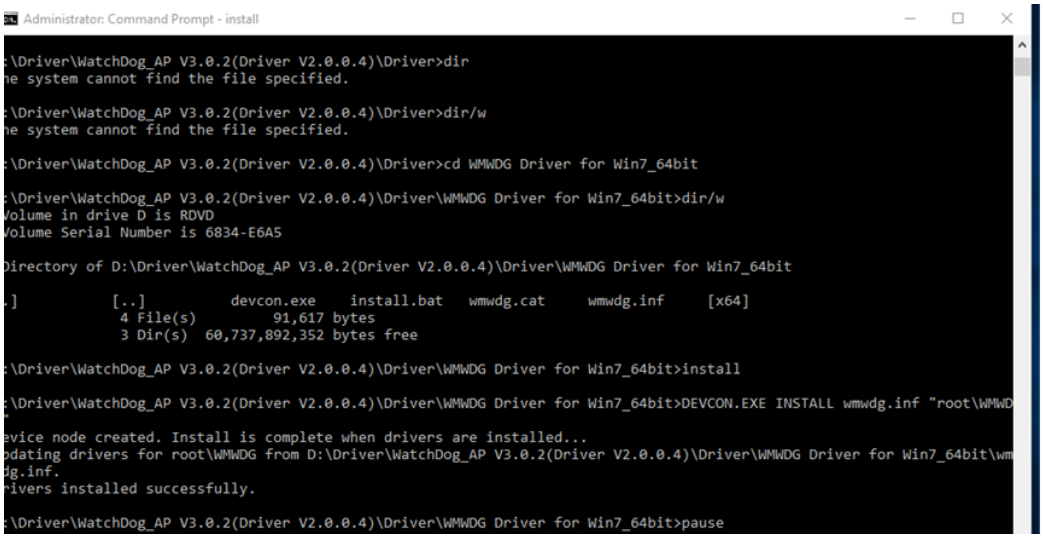
2. Right click on the cmd.exe and click on “Run as administrator” to start
3. Open the Driver CD (included in the package) and select Watchdog driver.



4. When Windows Security dialog appear, select **install** to continue the Installation.



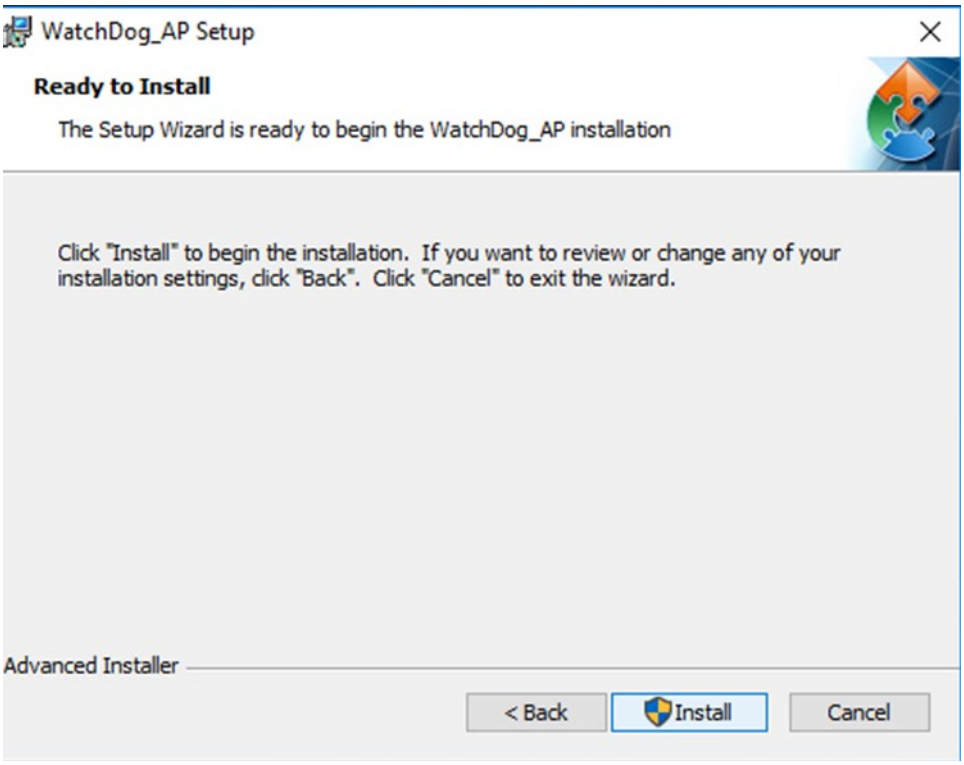
5. Wait for installation to complete. When installation is complete, press any key to close.



6. Open the Driver CD (included in the package) and select **Watchdog AP**.

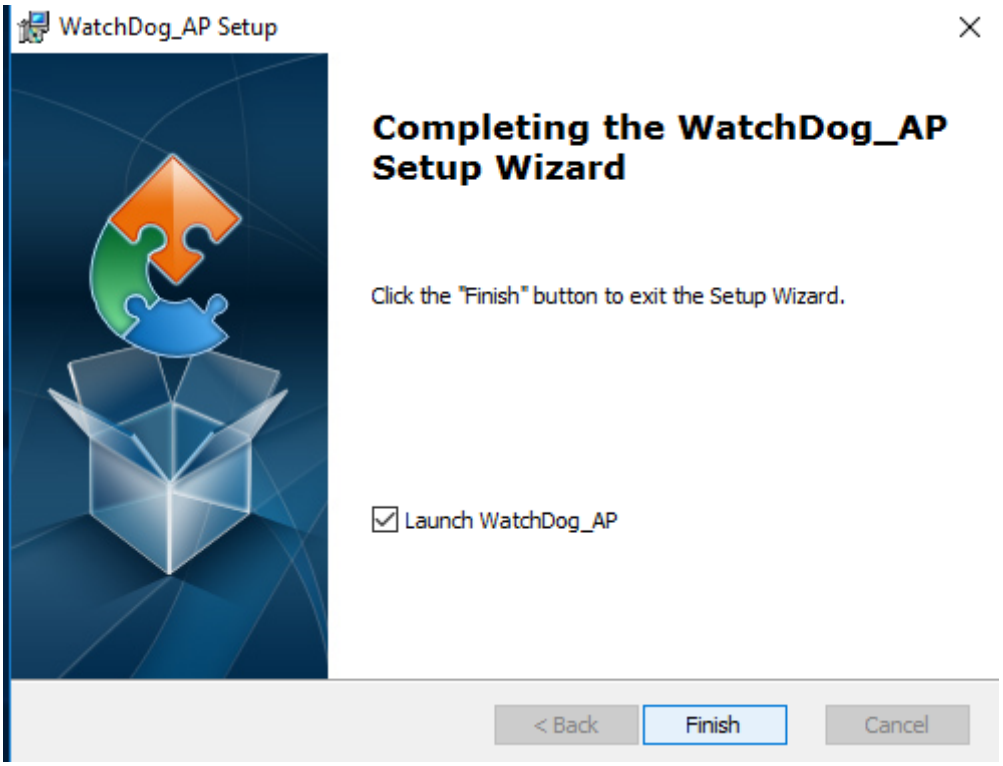
7. Select **Next**.

8. The installed storage location is displayed, select **Next** to continue.



9. Select **Next** to start the installation.

10. When installation is completed, select **Finish** to close the window.

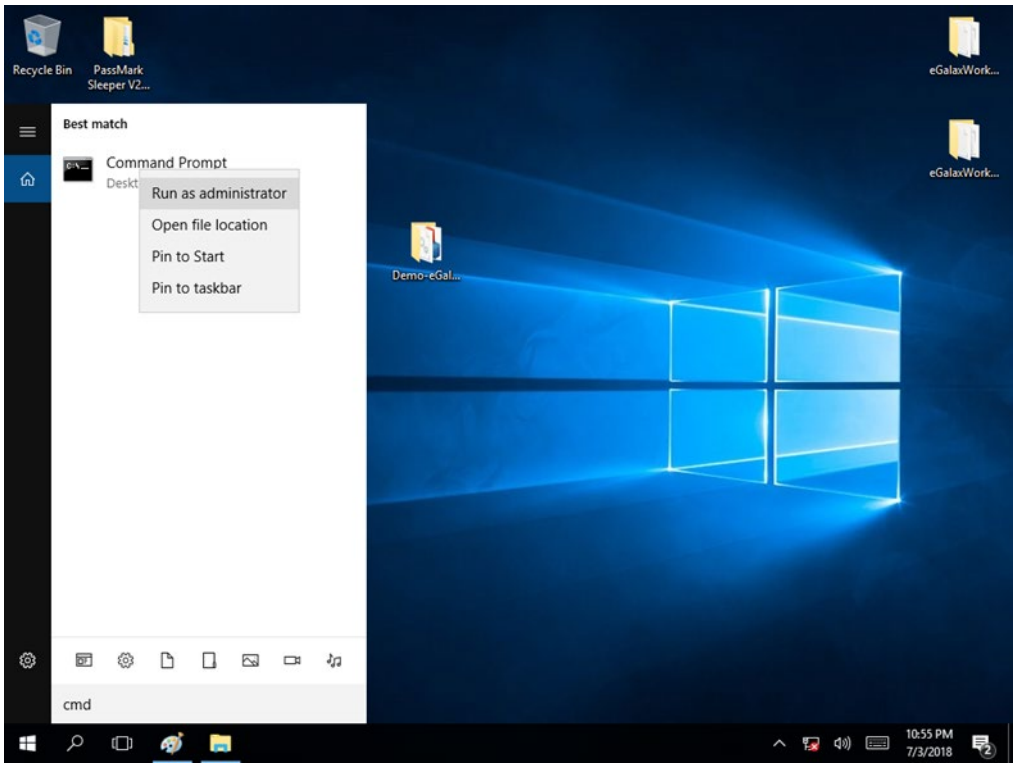


4.7 Digital IO Driver Installation

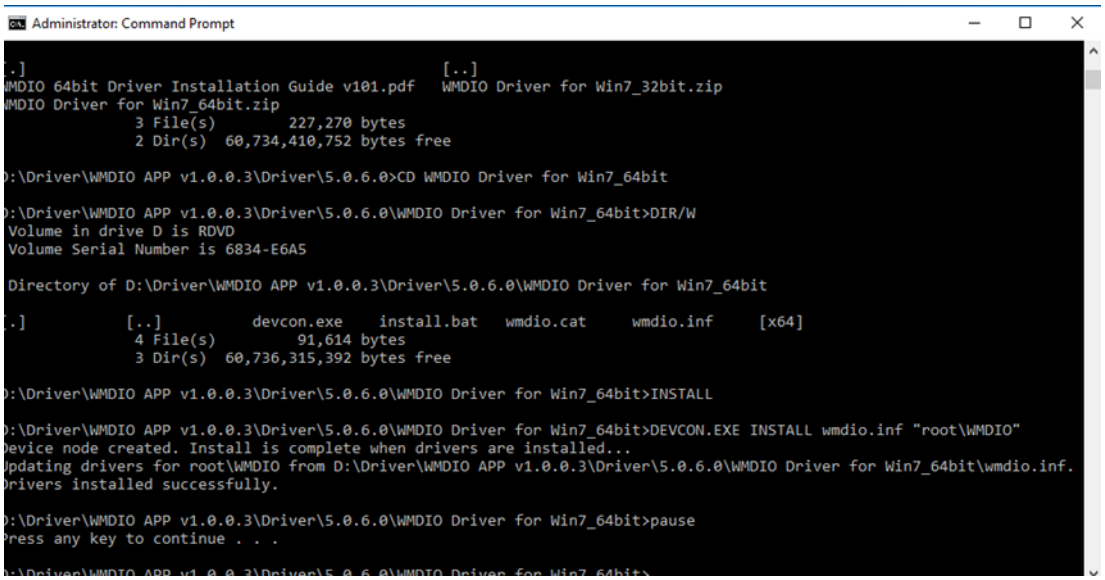
For more details about Winmate Watchdog, please download Digital IO Guide from Winmate Downloads Center:

Follow instructions below to install **Digital IO** river.

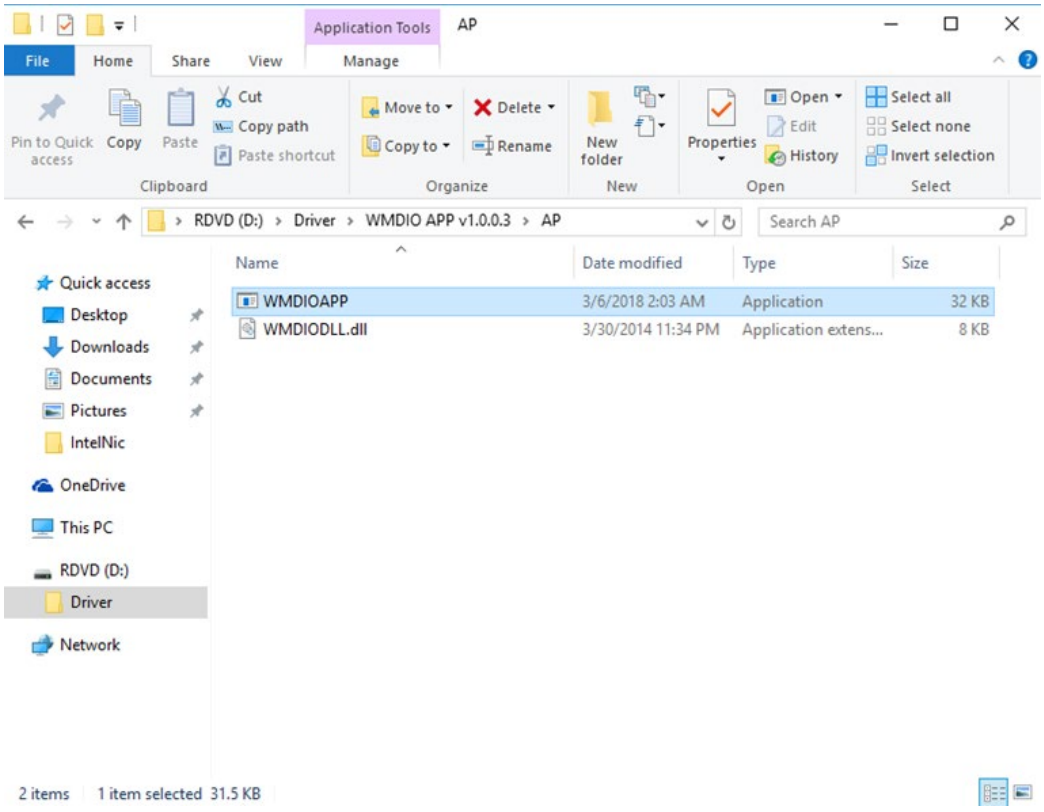
1. Type “cmd” in the run box then the cmd.exe will appear in programs.
2. Right click on the cmd.exe and click on “Run as administrator” to start

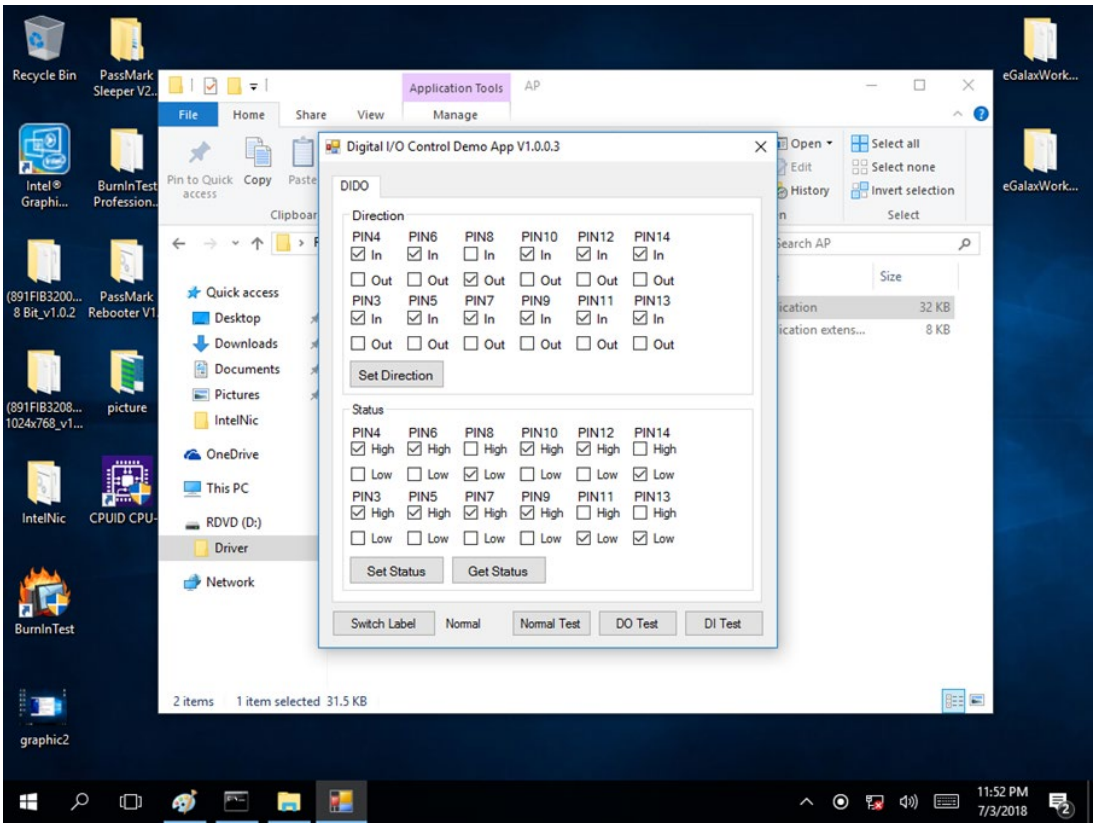


3. Open the Driver CD (included in the package) and select Digital IO driver.
4. When Windows Security dialog appear, select **install** to continue the Installation.
5. Wait for installation to complete. When installation is complete, press any key to close.



6. Open the Driver CD (included in the package) and select **Digital IO AP**.





Chapter 5: Technical Support

This chapter contains directory to technical support.

5.1 Technical Support

Free technical support is available from our engineers every business day. We are always ready to give advice on application requirements or specific information on the installation and operation of any of our products. If any problem occurs immediately contact us.

5.2 Drivers

The list of drivers available for IP70 Mini-ITX SBC:

Item	Driver
1	Chipset Driver
2	Graphics Driver
3	Audio Driver
4	LAN Driver
5	TXE Driver
6	Watchdog Driver/AP
7	Digital IO Driver/AP

To find the Drivers, please refer to the Driver CD that comes in the package or contact us.

5.3 Software Development Kit (SDK)

The list of SDK available for IP70 Mini-ITX SBC.

Item	File Type	Description
1	SDK	Watchdog SDK
2	SDK	Digital IO SDK

To find the SDK, please refer to the Driver CD that comes in the package or contact us.

NOTE

Winmate Inc.
9F, No.111-6, Shing-De Rd., San-Chung District,
New Taipei City 24158, Taiwan, R.O.C
www.winmate.com