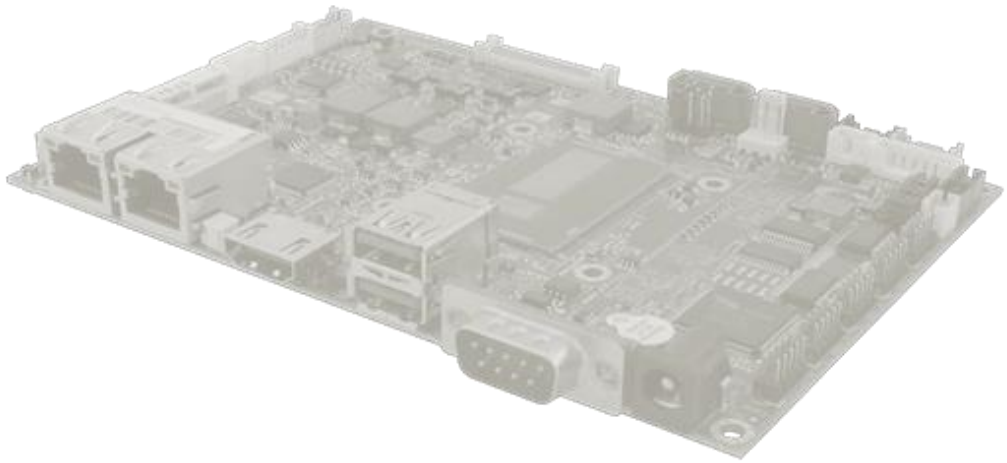
IK32 Motherboard

3.5” SBC with Intel® 7th Generation Dual Core i5 Processor, HDMI, LVDS, VGA, Dual Giga Ethernet, and M.2 Interface



User Manual

Document Version 1.0
Document Part No. 9171111K109A

Please read the instructions carefully before using this product, and save this manual for future use.

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 1W16Axxxxxxxx means October of year 2016.

Packing List

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

- IK32 Motherboard
- 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 IK32 Motherboard, its components and features.

NOTE:

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

Chapter 1: General Information

This chapter includes the IK32 Motherboard background information.

1.1 Introduction

Thank you for choosing the IK32 Motherboard. This motherboard can be integrated with Intel® Core i5-7200U Dual Core 2.5GHz (up to 3.1GHz) which offers a high-performance computing platform with low power consumption. The new motherboard supports 260-pin SO-DIMM DDR4 at speeds of 2133 MHz, up to 16GB. This motherboard supports Intel® Core™ processor: Intel® 7th Generation Core™ based on 64-bit, multi-core processor and built on 14-nanometer processor technology.

There is an advanced full set of I/O ports including two USB 3.2 Gen 1x1 (5Gbps), four USB 2.0, two LAN ports and audio jack for microphone, line-in and line-out. The motherboard is designed in 3.5” form factor and measures 146mm x 102mm.

Abundant I/O connectors and expandability makes IK32 Motherboard to be the right fit in the majority of industrial computer applications such as machine vision and control, gaming, POS, KIOSK systems, industrial automation, and others. Powerful processor in 3.5” form-factor meets the demanding performance requirements of modern industrial applications.

1.2 Features

IK32 Motherboard features:

- 3.5” Form Factor (146mm x 102mm)
- Intel® Core™ i5-7200U Processor
- Intel® SoC Integrated Chipset
- One DDR4-2133 SO-DIMM RAM
- Integrated Dual Gigabit Ethernet
- 2 x SATA III, 5 x COM, 4 x USB 2.0, 2 x USB 3.2 Gen 1x1 (5Gbps)
- 1 x M.2 2242 Key B slot (for SATA III SSD)
- 1 x M.2 2230 Key E slot (for PCIe + USB 2.0 wireless module)
- 1 x HDMI

1.3 Motherboard Specifications

	Model Name	
	IK32	
System Specifications	CPU	Intel® Core™ i5-7200U 2.5GHz, up to 3.1GHz
	Chipset	Intel® SoC Integrated
	System Memory	1 x DDR4 2133 SO-DIMM, Max. 16GB
	Storage	M.2 B Key 2242 SATA III (up to 512 GB)
	BIOS	Insyde H20 BIOS
	Graphic Controller	Intel® HD Graphics 620
	Graphic Resolution	HDMI Mode: 4096x2304@ 24Hz eDP Mode: 4096x2304@ 60Hz
	LCD Interface	Dual-channel 18/24-bit LVDS Up to 1920x1200 @ 60Hz
	Audio Codec	Realtek HD Audio Codec
	LAN	2 x Intel® Ethernet controller
	Rear I/O	2 x RJ-45 1 x RS-232/RS422/RS485 2 x USB 3.2 Gen 1x1 (5Gbps) 1 x HDMI (HDMI 1.4) 1 x DC-in Power Jack (+12V)
I/O Ports Specification	Internal I/O	1 x LVDS / 40-pin(2x20) DF-13 connector 1 x eDP / 30-pin(2x15) DF-13 connector 1 x VGA / 10-pin(2x5) (1920 x 1200 @60Hz) 2 x SATA III 2 x SATA Power 2 x USB 2.0 Wafer (4 Ports) 1 x Digital I/O (12-bit GPIO) / 14-pin (2x7) 1 x Power-input / 2-pin 1 x +12V for external power (Yellow) / 2-pin 1 x +5V for external power (Red) / 2-pin 1 x +3.3V for external power (Blue) / 2-pin 1 x Fan / 3-pin 1 x Brightness control /3-pin 1 x VR/Software brightness switch jumper/3-pin 1 x PWM/DA brightness switch jumper/3-pin 1 x 3.3V/5V PWM Level switch jumper/3-pin

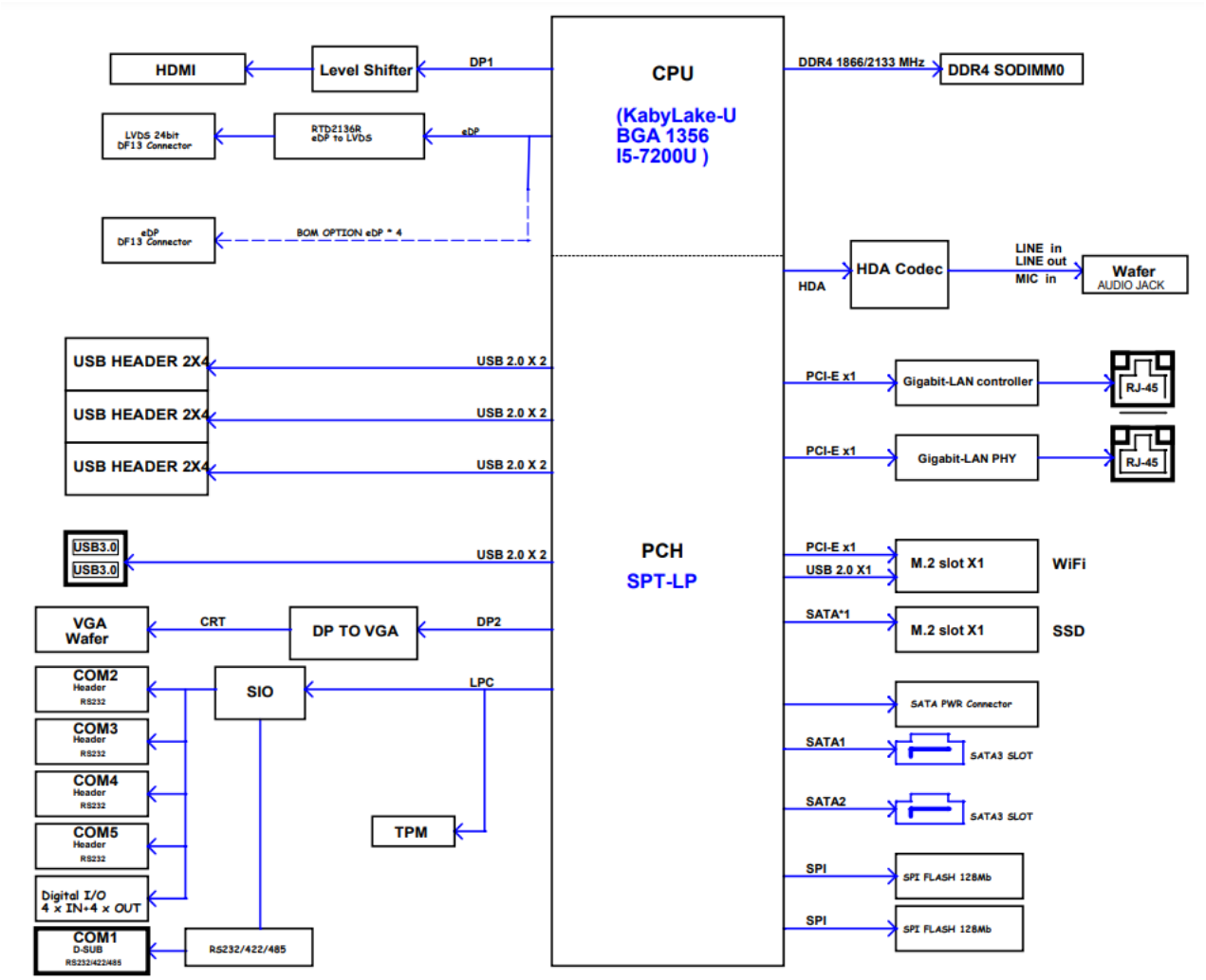
		1 x Panel inverter / 7-pin 1 x Front panel / 10-pin(2x5) 2 x Speaker with Amp. / 2-pin 1 x Audio (Mic-in / Line-in / Line-out) / 12-pin(2x6) 5 x Serial Ports/ 10-pin(2x5) 1 x RTC Battery / 2-pin
	Expansions Slot	1 x M.2 Key E slot (for PCIe + USB 2.0 wireless module) 1 x M.2 Key B slot (for SATA III SSD)
Mechanical Specifications	Dimensions	146 x 102 mm / 5.7 x 4 inches (3.5" Form Factor)
Environment Considerations	Operating Temp.	0°C ~ 60°C
	Storage Temp.	-20°C ~ 60°C
	Operating Humidity	10~95% RH@40°C, non-condensing
Power Management	Power Input	12V 2.5ϕ DC-IN Power Jack
	Power Consumption	15W
Packing List	Standard	IK32 Motherboard IK32 Manual & Driver CD

NOTE:

1. Accessories and Integrated Options may vary depending on your configuration. The product shown in this document is a standard model. For diagrams that contain customized or optional I/O, please contact the Winmate Sales Team for more information.
2. All specifications are subject to change without prior notice.

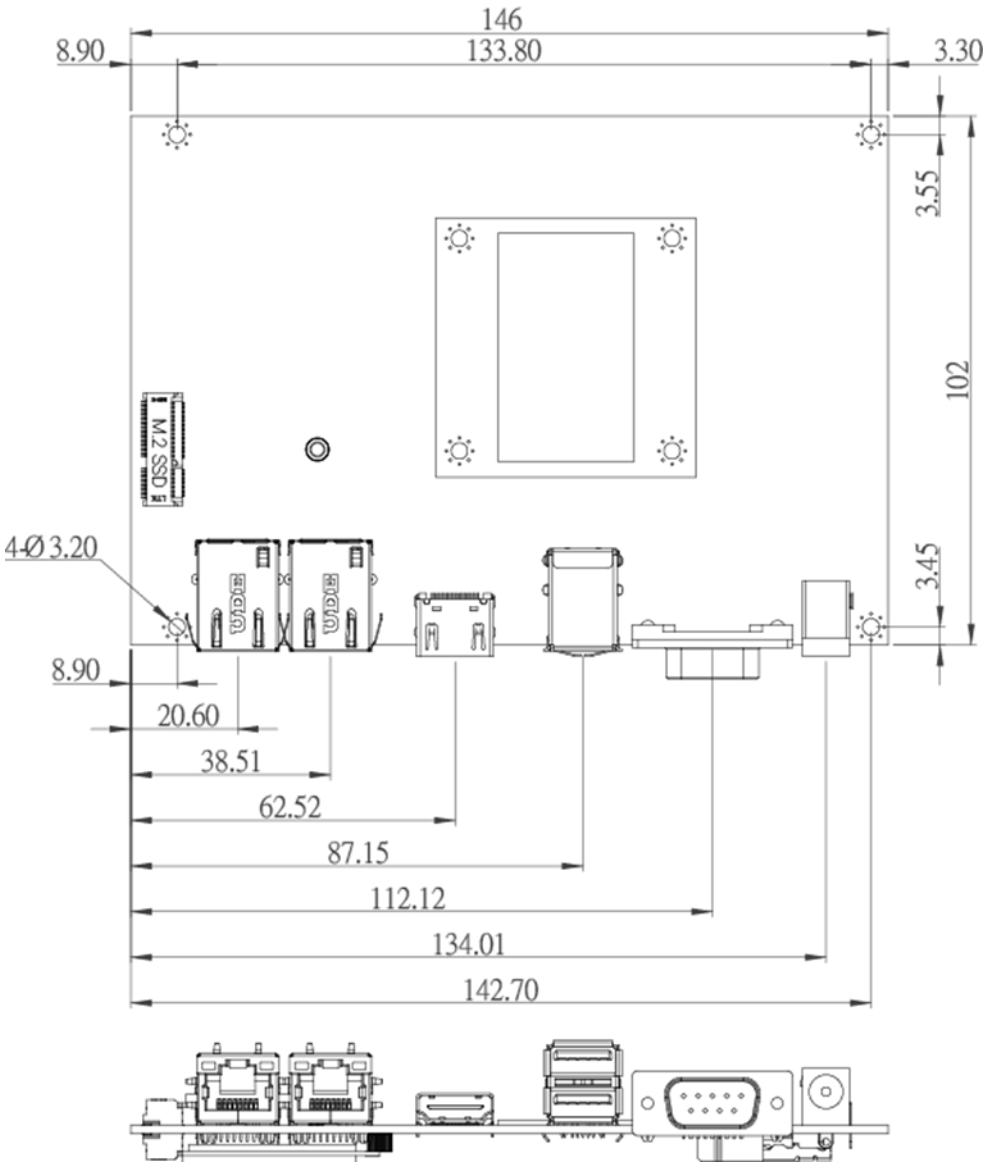
1.4 Functional Description

IK32 Motherboard Function Block



1.5 Physical Description

IK32 Motherboard Dimensions

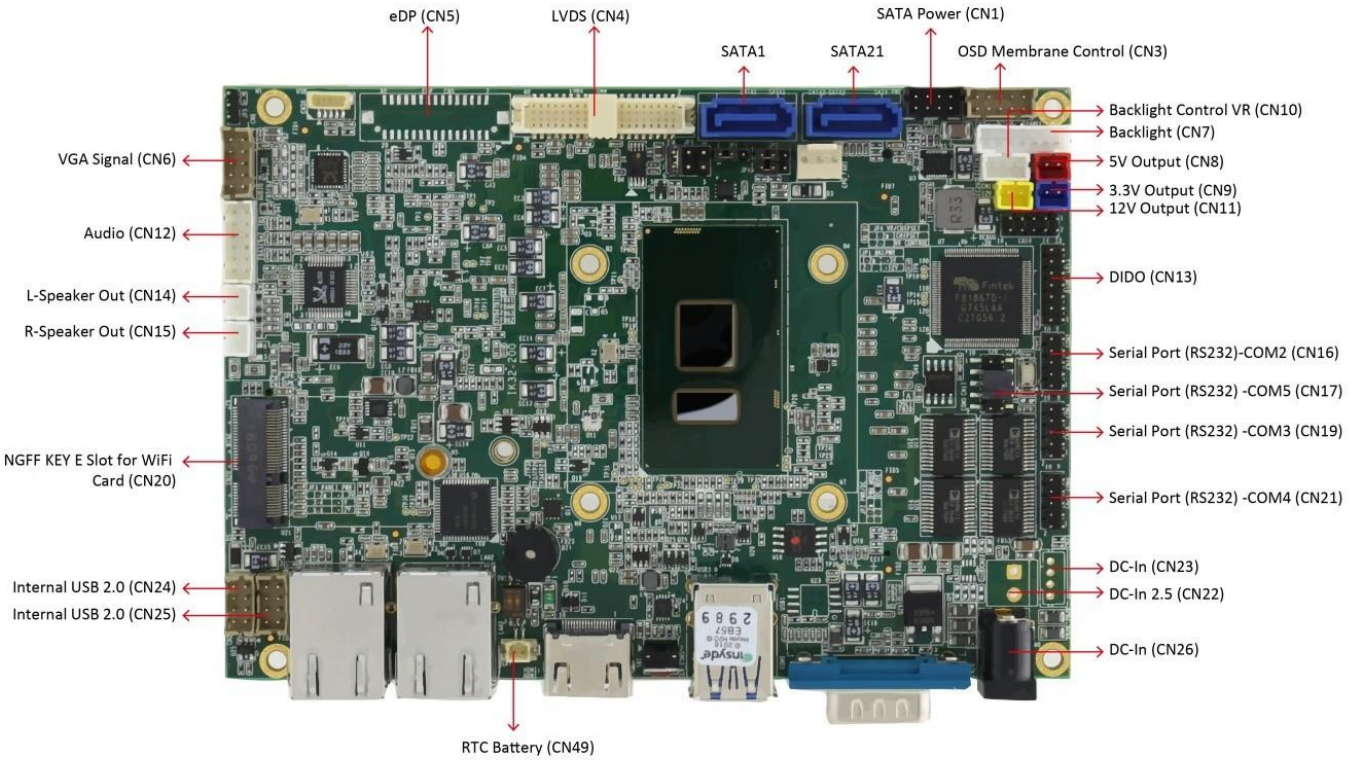


Chapter 2: Hardware Installation

This chapter provides information on how to use jumpers and connectors on the IK32 Motherboard. Be cautious while working with these modules. Carefully read the content of this chapter in order to avoid any damages.

2.1 Mainboard Connectors and Pin Assignment

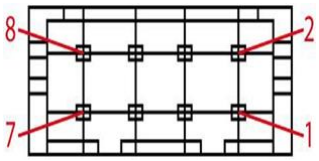
2.1.1 Component Side Connectors



The table below lists component side motherboard jumpers and connectors.

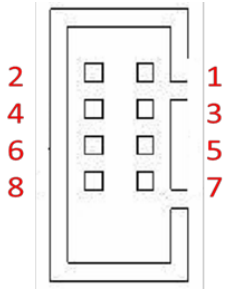
Connectors		
Label	**Function**	**Note**
CN1	SATA Power	2x4 wafer, pitch 2.0mm
CN3	OSD Membrane Control	2x5 wafer, pitch 2.0mm
CN4	LVDS	2x20 wafer, pitch 1.25mm
CN5	eDP	2x15 wafer, pitch 1.25mm
CN6	VGA Signal	2x5 header, pitch 2.0mm
CN7	Backlight	1x7 wafer, pitch 2.0 mm
CN8	5V Output	1x2 wafer, pitch 2.0 mm
CN9	3.3V Output	1x2 wafer, pitch 2.0 mm
CN10	Backlight Control VR	1x3 wafer, pitch 2.0mm
CN11	12V Output	1x2 wafer, pitch 2.0 mm
CN12	Audio	2x6 wafer, pitch 2.0mm
CN13	GPIO	2x7 wafer, pitch 2.0mm
CN14	L-Speaker Out	1x2 wafer, pitch 2.0 mm
CN15	R-Speaker Out	1x2 wafer, pitch 2.0 mm
CN16	Serial Port (RS232)-COM2	2x5 header, pitch 2.0mm
CN17	Serial Port (RS232) -COM5	2x5 header, pitch 2.0mm
CN19	Serial Port (RS232) -COM3	2x5 header, pitch 2.0mm
CN20	NGFF KEY E Slot for WiFi Card	NGFF KEY E
CN21	Serial Port (RS232) -COM4	2x5 header, pitch 2.0mm
CN22	DC-In	1x2P wafer, pitch 3.96mm
CN23	DC-In	1x4 header, pitch 2.0mm
CN24	USB 2.0	2x4 wafer, pitch 2.0 mm
CN25	USB 2.0	2x4 wafer, pitch 2.0 mm
CN26	DC-In 2.5	3p 2.5-5.5ψ DC Jack
CN27	NGFF KEY B for SSD	NGFF KEY B Slot
J2	LAN LED For F65EAC BOX	1x4 wafer, pitch 1.0mm
CN49	RTC Battery	2P wafer, pitch 1.25 mm
CPU_FAN1	CPU Fan	3P wafer, pitch 2.54mm

2.1.1.1 CN1: SATA Power



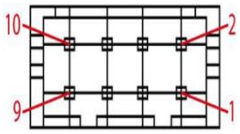
Pin №	Signal Name	Pin №	Signal Name
1	+12V	2	+12V
3	GND	4	GND
5	GND	6	GND
7	+5V	8	+5V

2.1.1.2 CN24, CN25 Internal USB 2.0



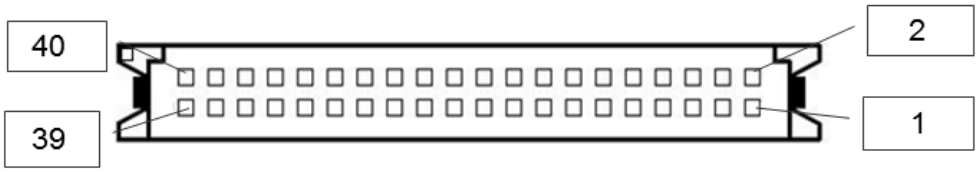
Pin №	Signal Name	Pin №	Signal Name
1	+5V	2	+5V
3	USB_D-	4	USB_D-
5	USB_D+	6	USB_D+
7	GND	8	GND

2.1.1.3 CN3: OSD Membrane Control



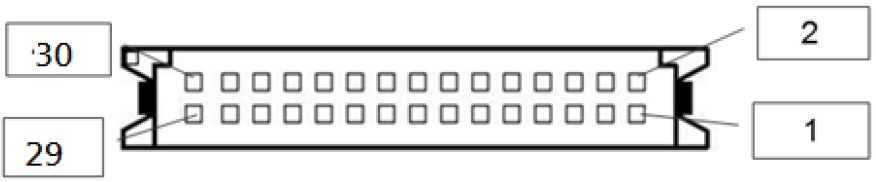
Pin №	Signal Name	Pin №	Signal Name
1	+5V	2	+3.3V
3	GND	4	SATA_LED#
5	PWRBTN#	6	GND
7	Backlight_ADJ+	8	FP_RST_N
9	Backlight_ADJ-	10	+5V

2.1.1.4 CN4: LVDS Connector



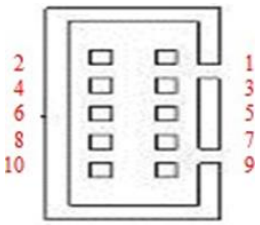
Pin №	Signal Name	Pin №	Signal Name
1	LCDVDD	2	LVDS0_TX0_N
3	LCDVDD	4	LVDS0_TX0_P
5	LCDVDD	6	LVDS0_TX1_N
7	GND	8	LVDS0_TX1_P
9	GND	10	LVDS0_TX2_N
11	GND	12	LVDS0_TX2_P
13	GND	14	LVDS0_CLK_N
15	GND	16	LVDS0_CLK_P
17	GND	18	LVDS0_TX3_N
19	GND	20	LVDS0_TX3_P
21	GND	22	LVDS1_TX0_N
23	GND	24	LVDS1_TX0_P
25	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

2.1.1.5 CN5: eDP Connector



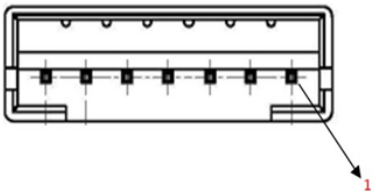
Pin №	Signal Name	Pin №	Signal Name
1	EMB_AUXN	2	SMB_DATA_MAIN
3	EMB_AUXP	4	SMB_DATA_CLK
5	GND	6	GND
7	DP_TXN3_C	8	+VCC_EDP_BKLT
9	DP_TXP3_C	10	+VCC_EDP_BKLT
11	GND	12	+VCC_EDP_BKLT
13	DP_TXN2_C	14	GND
15	DP_TXP2_C	16	GND
17	GND	18	GND
19	DP_TXN1_C	20	GND
21	DP_TXP1_C	22	LCDVDD
23	GND-	24	LCDVDD
25	DP_TXN0_C	26	LCDVDD
27	DP_TXP0_C	28	LCDVDD
29	GND	30	+VCC_EDP_BKLT

2.1.1.6 CN6: VGA Signal



Pin №	Name	Pin №	Name
1	DDC_DATA	2	+5V
3	DDC_CLOCK	4	RED
5	Horizontal Sync	6	GREEN
7	Vertical Sync	8	BULE
9	GND	10	GND

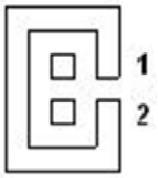
2.1.1.7 CN7: Backlight Connector



Pin №	Name	Pin №	Name
1	Backlight Power	2	Backlight Power
3	Backlight Power	4	GND
5	Brightness Adjust	6	GND
7	Brightness Enable		

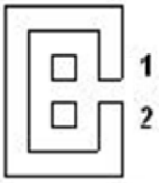
Note: *Please refer to JP1 settings to select Power Rating.*

2.1.1.8 CN8: 5V Output



Pin №	Signal Name
1	+5V
2	GND

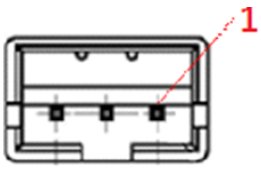
2.1.1.9 CN9: 3.3V Output



Pin №	Name
1	+3.3V
2	GND

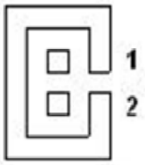
2.1.1.10 CN10: Backlight Control VR

VR Knob



Pin №	Signal Name
1	+V5S
2	VRD_ADC
3	GND

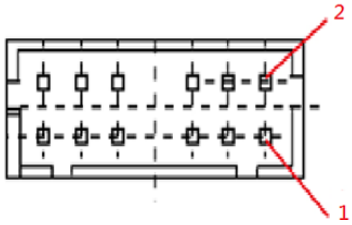
2.1.1.11 CN11: 12V Output



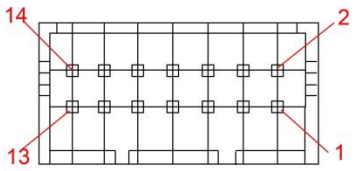
Pin №	Name
1	+12V
2	GND

2.1.1.12 CN12: Audio

Pin №	Signal Name	Pin №	Signal Name
1	LINE_OUT_R	2	LINE_OUT_L
3	+5V	4	GND
5	LINE_IN_R	6	LINE_IN_L
7	MIC_R	8	MIC_L
9	GND	10	LINE_OUT_JACK DET
11	MIC_JACK DET	12	LINE_IN_JACK DET

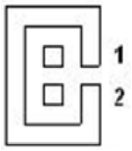


2.1.1.13 CN13: GPIO



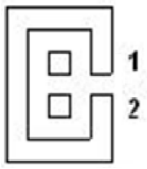
Pin №	Signal Name	Pin №	Signal Name
1	GND	2	DIO_5V
3	DOUT3	4	DOUTT1
5	DOUT2	6	DOUTT0
7	DINT3	8	DINT1
9	DINT2	10	DINT0
11	GPIO53_IN0	12	GPIO56_OUT0
13	GPIO54_IN1	14	GPIO57_OUT1

2.1.1.14 CN14: L-Speaker Out



Pin №	Signal Name	Pin №	Signal Name
1	LOUT+	2	LOUT-

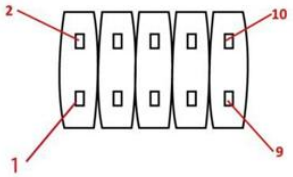
2.1.1.15 CN15: R-Speaker Out



Pin №	Signal Name	Pin №	Signal Name
1	ROUT+	2	ROUT-

2.1.1.16 CN16, CN17, CN19, CN21: Serial Ports

CN16 Serial Port (RS232)-COM2
CN17 Serial Port (RS232) -COM5
CN19: Serial Port (RS232) -COM3
CN21: Serial Port (RS232) –COM4



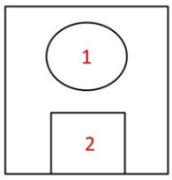
Pin №	Signal Name	Pin №	Signal Name
1	DCD	2	DSR
3	RXD	4	RTS
5	TXD	6	CTS
7	DTR	8	RI
9	GND	10	IO_PWR

Note: *IO_PWR: default is 5V, optional 3.3V*

2.1.1.17 CN20: NGFF KEY E Slot

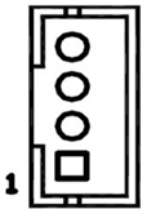
IK32 has NGFF KEY E slot for Wireless module.

2.1.1.18 CN22: DC-In



Pin №	Signal Name	Pin №	Signal Name
1	DC_IN	2	GND
3	GND		

2.1.1.19 CN23: DC-In



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

2.1.1.20 CN26: DC-In 2.5

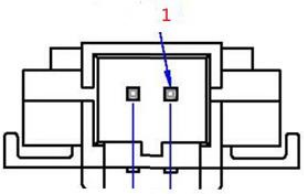
Pin №	Signal Name	Pin №	Signal Name
1	+12V	2	GND

2.1.1.21 CN27: NGFF KEY B for SSD

IK32 M.2 NGFF KEY B connector supports M.2 SSD application:

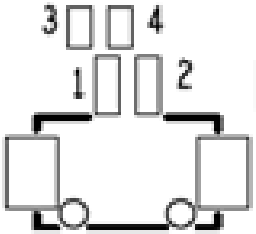
- SATA SSD

2.1.1.22 CN49: RTC Battery



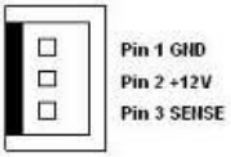
Pin №	Signal Name	Pin №	Signal Name
1	GND	2	+.3.3V

2.1.1.23 J2: LAN LED Wafer for F65EAC BOX



Pin №	Signal Name	Pin №	Signal Name
1	+3.3VM_LAN	2	LAN1_Traffic LED
3	LAN2_VDD33	4	LAN2_Traffic LED

2.1.1.24 CPU_FAN1: CPU FAN



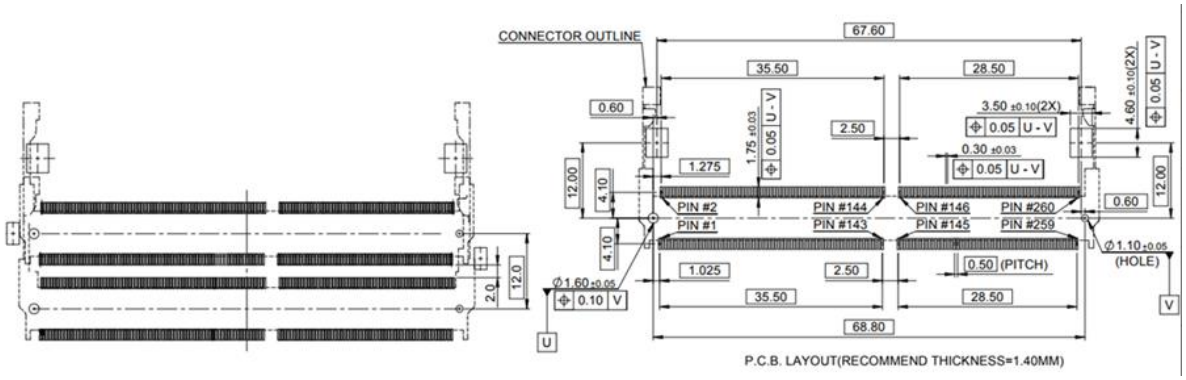
Pin №	Signal Name	Pin №	Signal Name
1	GND	2	+12V
3	SENSE		

2.1.2 Solder Side Connectors

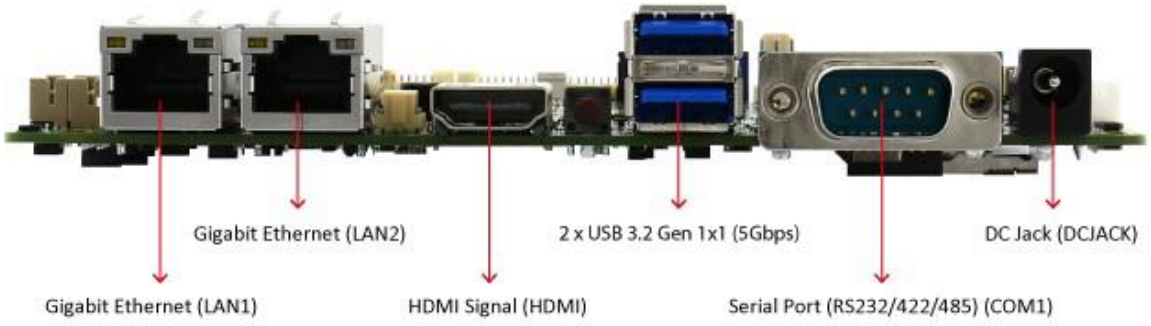
The tables below list solder side motherboard jumpers and connectors.

Label	Function	Note
Connector		
J1	DDR4 (RAM)	260 pin, SODIMM slot
CN27	SSD Connector m.2 SSD (SSD)	M.2 SSD connector

2.1.2.1 J1B:DDR4



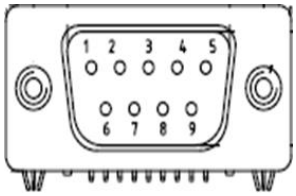
2.1.3 External I/O Side Connectors



The table below lists external I/O side motherboard jumpers and connectors.

Label	Function	Note
Connector		
COM1	Serial port (RS232/422/485)	D-Sub9 (Male)
DCJACK	DC Jack	2.5 DC Jack
HDMI	HDMI 1.4 Signal	HDMI Type A
LAN1	Gigabit Ethernet	RJ45+LED
LAN2	Gigabit Ethernet	RJ45+LED
USB	2 x USB 3.2 Gen1 x1 (5Gbps)	USB Type A

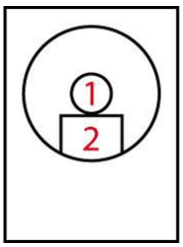
2.1.3.1 COM1: D-Sub 9 (Male)



Pin №	RS232	RS422	RS485
1	DCD	TxD-	D-
2	RXD	TxD+	D+
3	TXD	RxD+	NC
4	DTR	RxD-	NC
5	GND	GND	GND
6	DSR	NC	NC
7	RTS	NC	NC
8	CTS	NC	NC
9	RI	NC	NC

Note: *Refer to BIOS to change serial COM port settings.*

2.1.3.2 DCJACK: 2.5' DC Jack

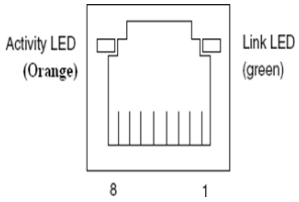


Pin №	Signal Name	Pin №	Signal Name
1	DC_IN	2	GND

2.1.3.3 HDMI: HDMI 1.4 Type A

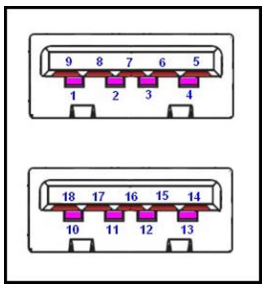
Pin №	Signal Name	Pin №	Signal Name
1	HDMI_DET	2	NC
3	HDMI_D2P	4	GND
5	HDMI_D2M	6	HDMI_D1P
7	GND	8	HDMI_D1M
9	HDMI_D0P	10	GND
11	HDMI_D0M	12	HDMI_CLKP
13	GND	14	HDMI_CLKM
15	HDMI_CEC_OUT	16	GND
17	DDC_CLOCK	18	DDC_DATA
19	+5V	20	GND

2.1.3.4 LAN1/ LAN2: Gigabit Ethernet



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

2.1.3.5 USB3.2 Gen 1x1 (5Gbps)



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+	10	+5V
11	USB_D-	12	USB_D+
13	GND	14	STDA_SSRX-
15	STDA_SSRX+	16	GND
17	STDA_SSTX-	18	STDA_SSTX+

2.2 Memory Module (SO-DIMM) Installation

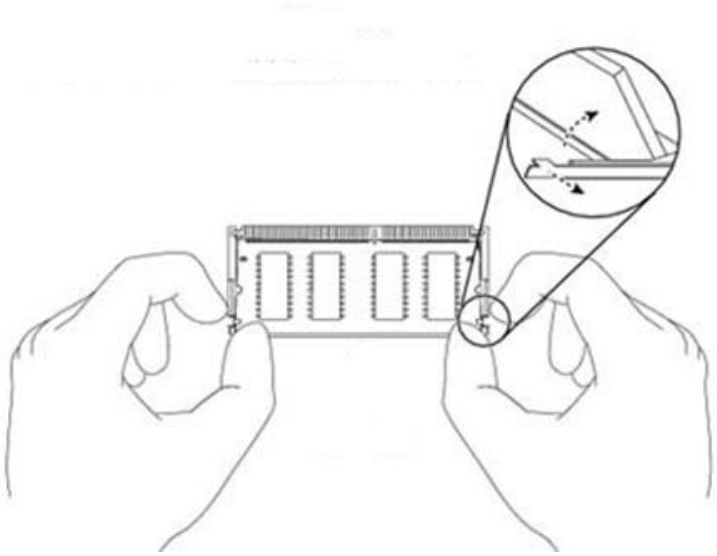
The IK32 SBC Motherboard has two 260-pin SODIMM slot. The socket supports DDR4.

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 12V DC in

The IK32 Motherboard allows plugging 12V DC-IN jack on the board without another power module converter under power consumption by Intel® 7th Generation Core i5 Processor.

2.3.2 Serial COM Port

Three RS-232 connectors build-in the rear I/O. One optional COM port supports RS-422/ 485. When an optional touch-screen ordered with PPC, serial COM port can be connected to a serial or an optional touch-screen. You can change serial COM port setting through BIOS.

2.3.3 External HDMI

The Motherboard has one HDMI port that can be connected to an external LCD monitor by HDMI cable, and it also needs to be connected to the outlet by power cable. The HDMI connector is a standard 19-pin Type A connector.

2.3.4 Ethernet Interface

The Motherboard is equipped with Intel® Gigabit-LAN Controller. It is supported by major network operating systems. The Ethernet ports provide two standard RJ-45 jacks.

2.3.5 USB Ports

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

2.3.6 Audio

The High-Definition Audio Codec capabilities are provided by a Realtek chipset supporting digital audio outputs. The audio interface includes three jacks: line-in, line-out and mic-in

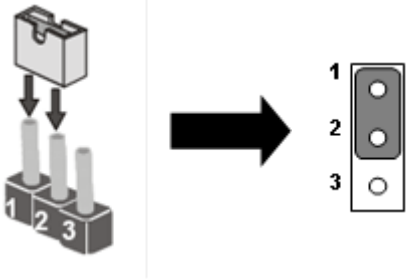
2.4 Jumper Settings

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.



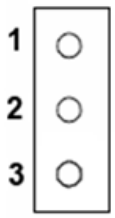
PIN 1-2 SHORT
PIN 3 OPEN

CAUTION

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

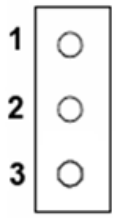
Jumpers		
Label	Function	Note
JP1	Backlight Power Selector	1x3 header, pitch 2.0mm
JP2	PWM/DC Mode Control Selector	1x3 header, pitch 2.0mm
JP3	Panel Power Selector	2x3 header, pitch 2.54mm
JP4	VR/Chipset Control Selector	1x3 header, pitch 2.0mm
SW1	Clear CMOS	1x3 header, pitch 2.0mm

2.4.1 JP1: Backlight Power Selector



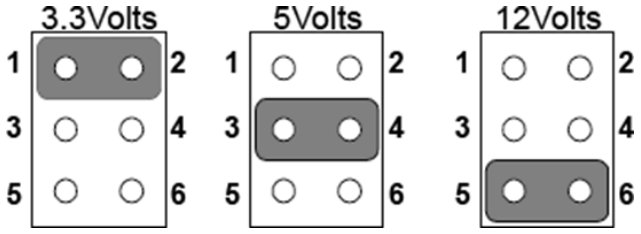
Setting	Function
1-2 (Default)	+5V
2-3	+12V

2.4.2 JP2: PWM/DC Mode Control Selector



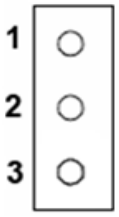
Setting	Function
1-2(Default)	PWM Mode
2-3	DC Mode

2.4.3 JP3: Panel Power Selector



Setting	Function
1-2 (Default)	+3.3V
3-4	+5V
5-6	+12V

2.4.4 JP4: VR/Chipset Control Selector



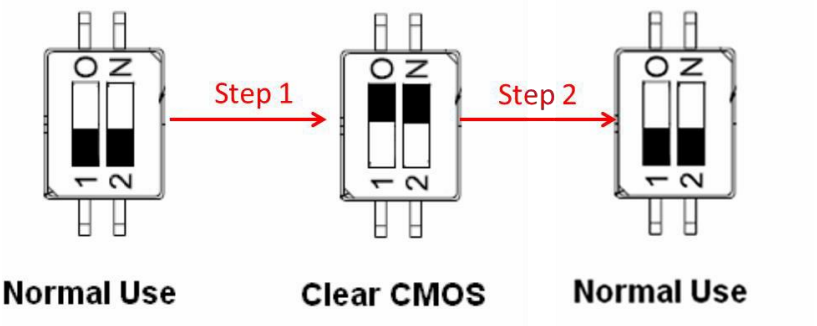
Setting	Function
1-2(Default)	VR Control
2-3(Default)	Chipset

2.4.5 SW1: Clear CMOS

Please follow the instructions below to change CMOS settings. Remember to set jumper back to Normal before turning on the power supply.

CAUTION

TURN OFF the power supply before setting Clear CMOS.



Step 1: To set the jumper to “clear” position, switch 1 to 0, 2 to N.

Step 2: To set the jumper to “normal” position, switch 0 to 1, N to 2.

Chapter 3: INSYDE H20 BIOS Setup

This chapter provides information on how to use BIOS setup, its functions and menu.

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

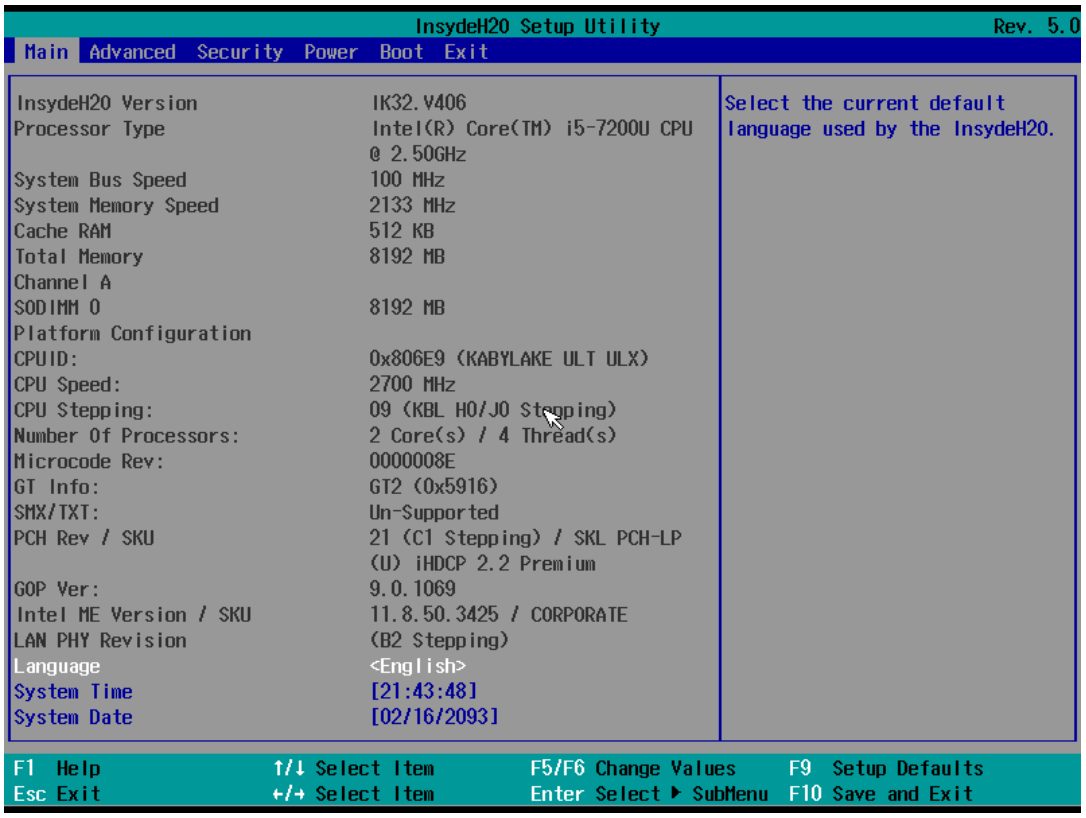
NOTE:
You can press the F1, F2, F3, F4, –/+, and Esc keys by connecting a USB keyboard to your computer.

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

3.2 BIOS Functions

3.2.1 Main Menu

The Main menu displays the basic information about your system 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.



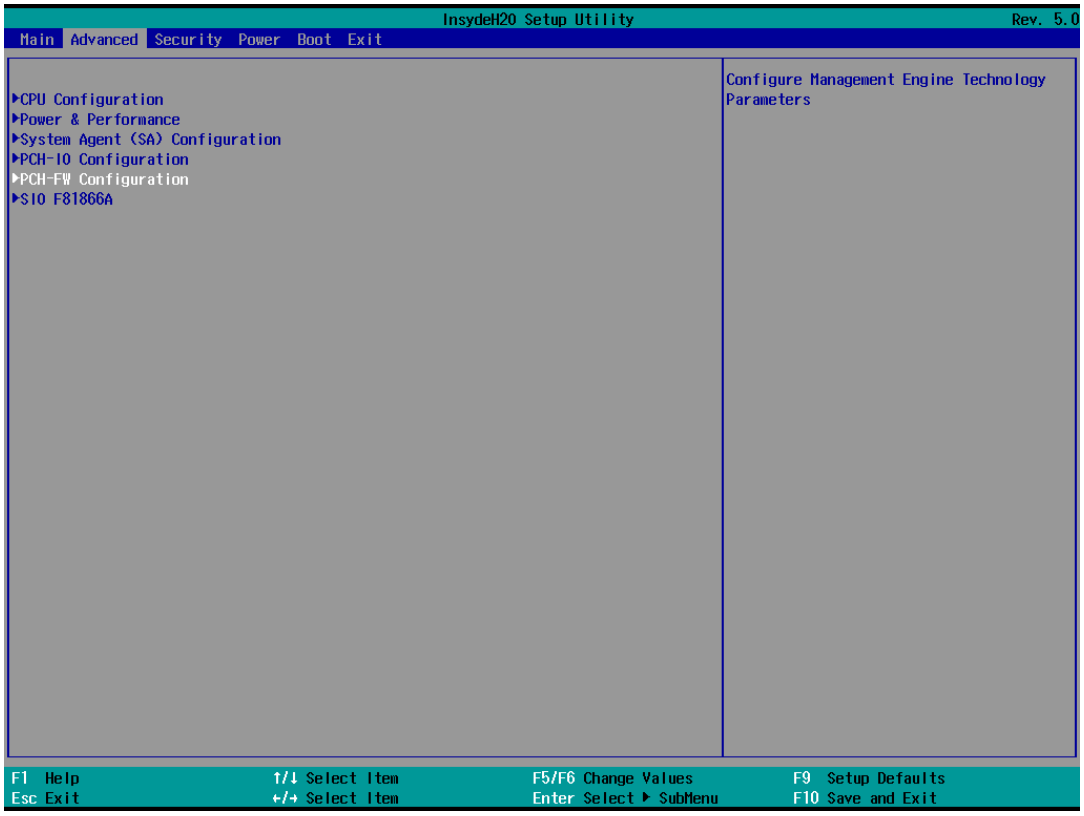
BIOS Setting	Description	Setting Option	Effect
Language	Displays the system language. [English] is set up by default.	Adjustment of the language	Set the language in other language. The language in this device is English.
System Time	This is current time setting. The time is maintained by the battery 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.

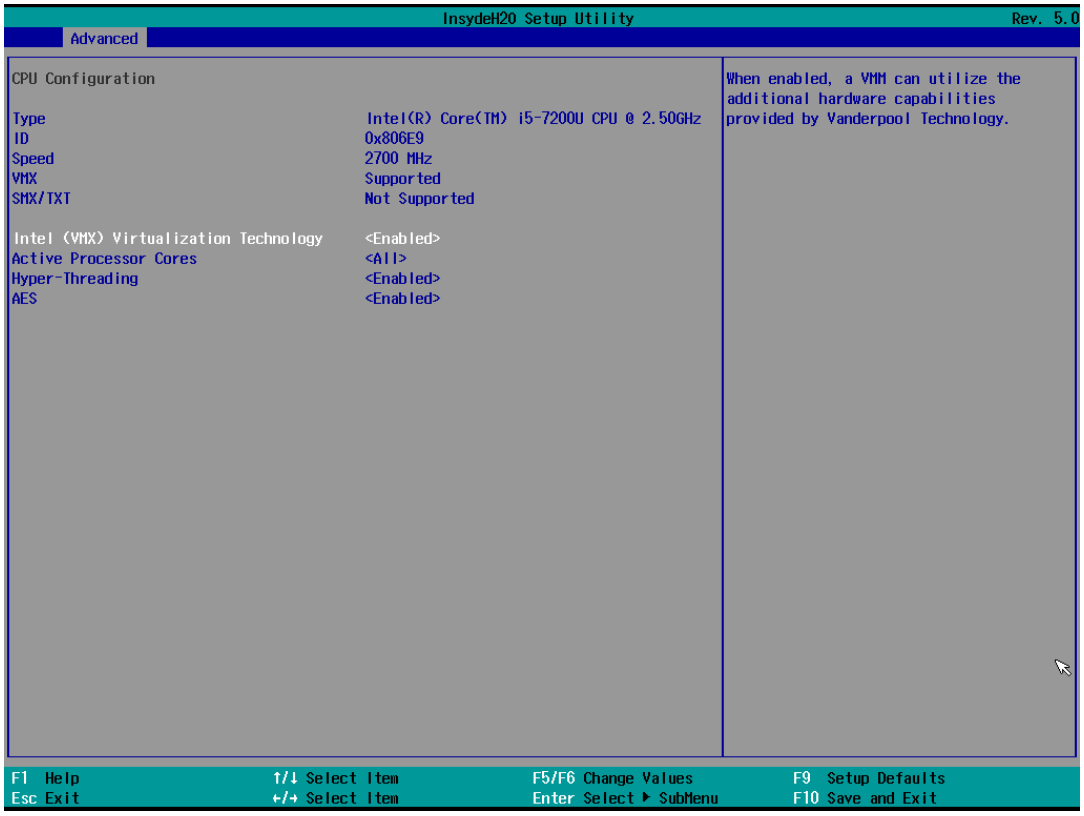
CAUTION

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



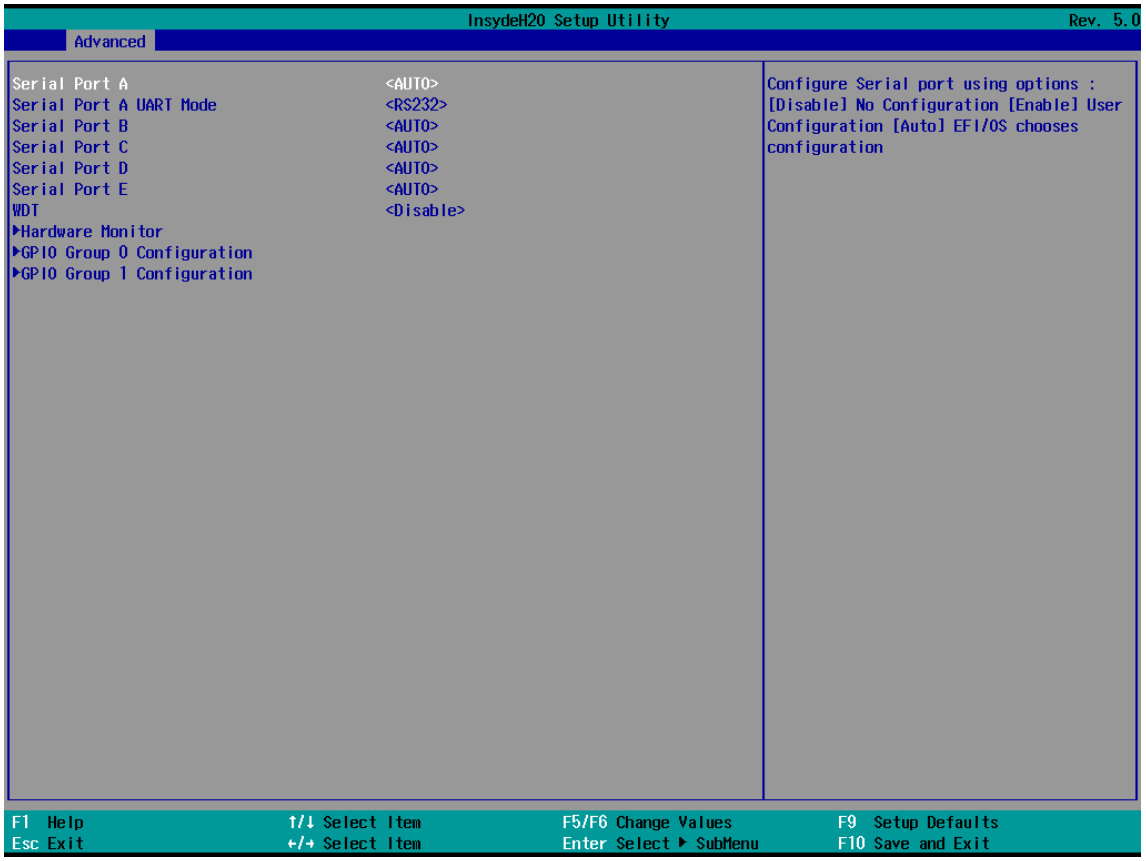
BIOS Setting	Description	Setting Option	Effect
CPU Configuration	Configures Trusted Computing parameters	Enter	Opens submenu
Power & Performance	Configures Power & Performance parameters	Enter	Opens submenu
System Agent Configuration	Configures System Agent Configuration parameters	Enter	Opens submenu
PCH-OI Configuration	Configures PCH-OI parameters	Enter	Opens submenu
PCH-FM Configuration	Configures PCH-FM parameters	Enter	Opens submenu
SIO F81866A	Configures SIO F81866A parameters	Enter	Opens submenu

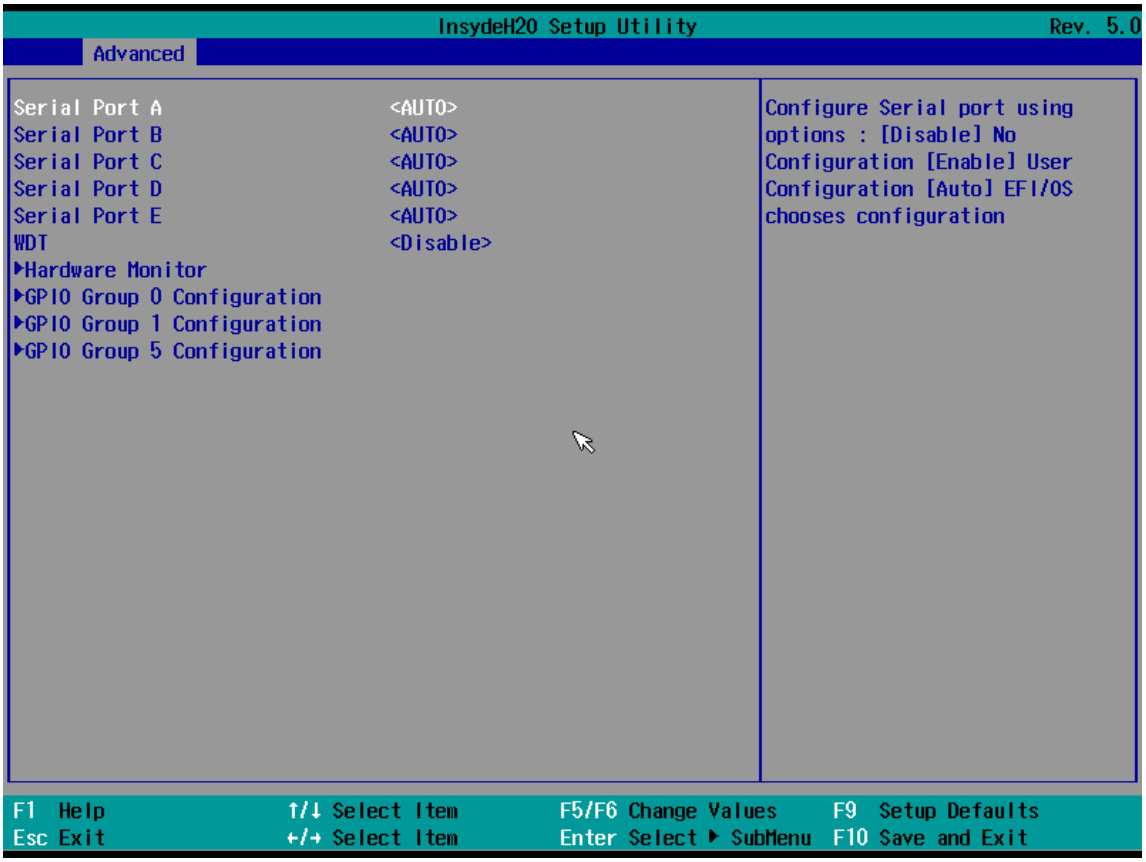
3.2.2.1 CPU Configuration

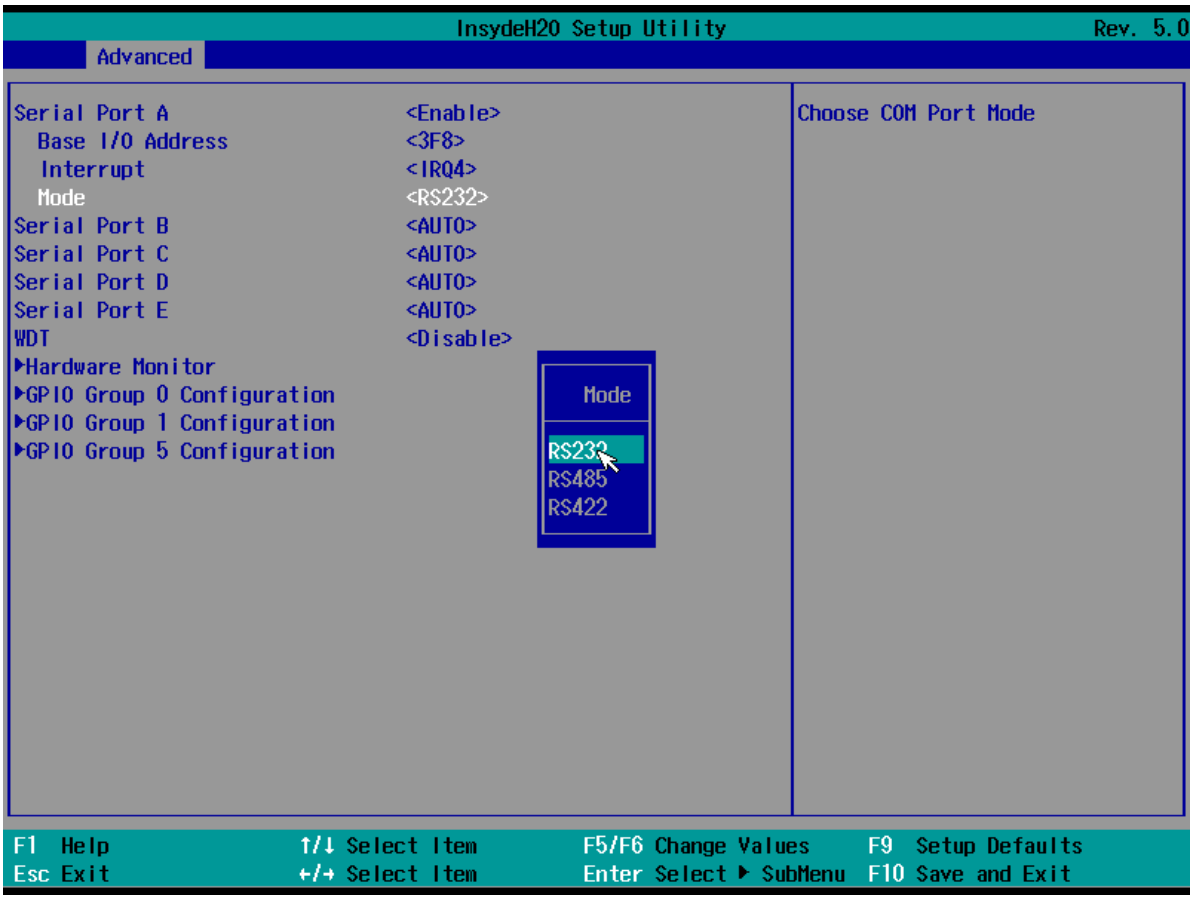


BIOS Setting	Description	Setting Option	Effect
Intel (VMM) Virtualization Technology	Enable or disable Intel Virtualization Technology.	Enable/Disable	When enabled, a VMM can utilize the additional hardware capabilities provided by Vanderpool Technology.
Active Processor Cores	Number of core to enable in each processor package	All / 1 / 2/ 3	Select number of core to enable in each processor package
Hyper Threading	Intel Hyper-Threading Technology allows a single processor to execute two or more separate threads concurrently.	Enable / Disable	Enable or disable Hyper Threading
AES	Enable or disable AES (Advanced Encyption Standard)	Enable/Disable	Enable or disable AES

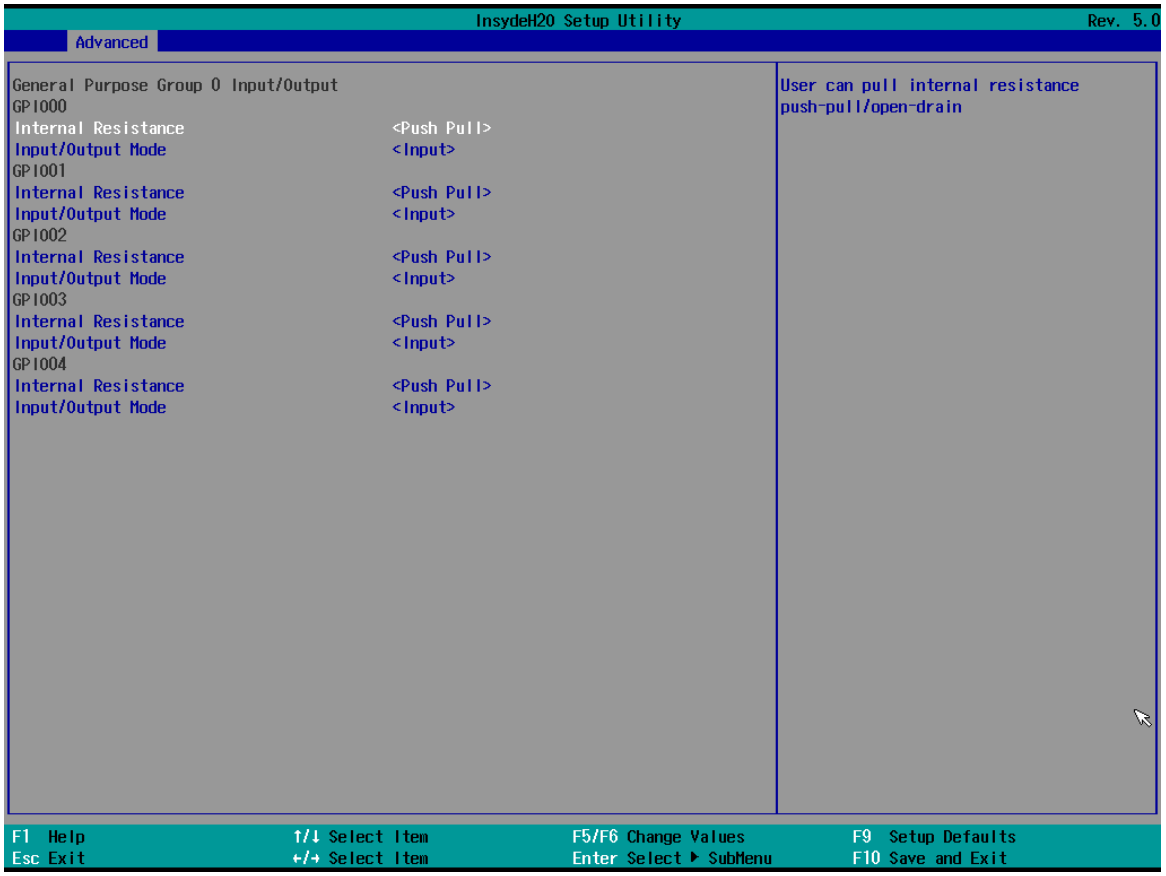
3.2.2.2 Super I/O Configuration

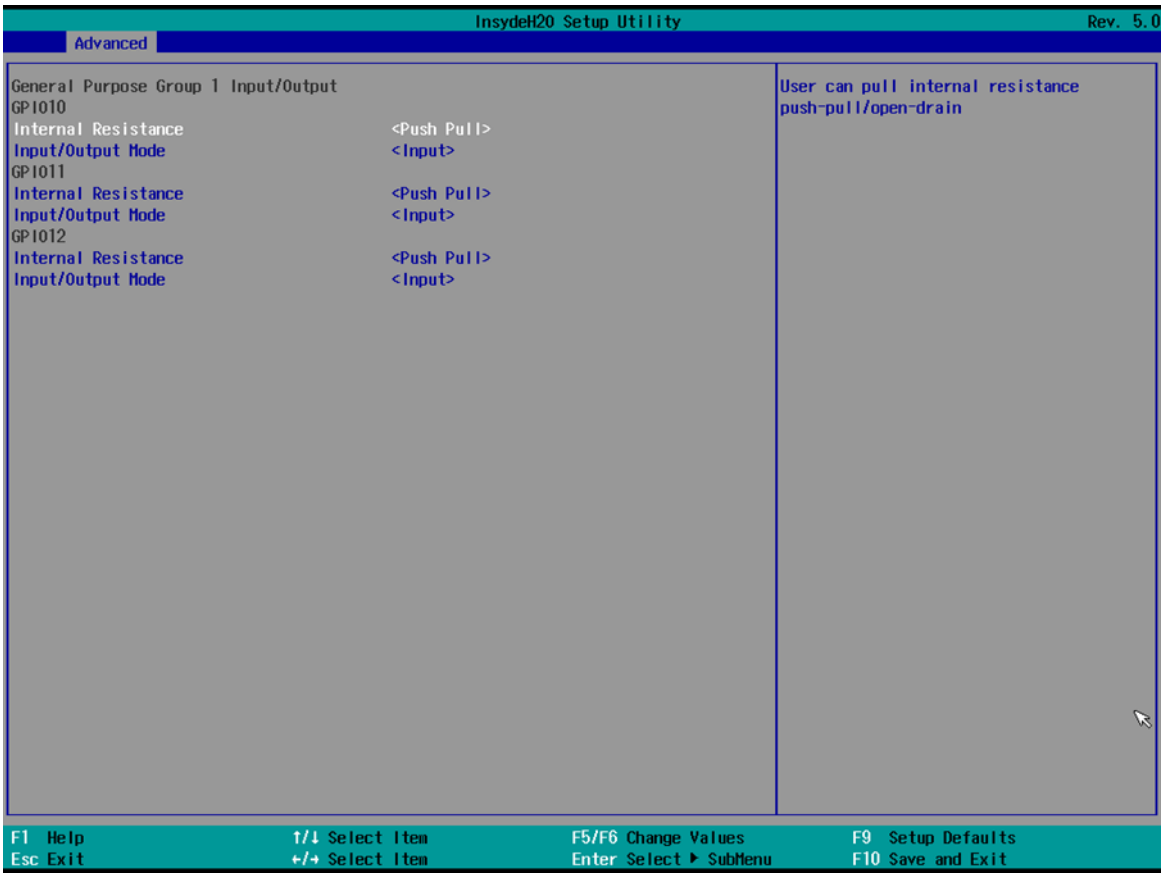





InsydeH20 Setup Utility
Rev. 5.0
Advanced
Serial Port A
<Enable>
Base I/O Address
<3F8>
Interrupt
<IRQ4>
Mode
<RS232>
Serial Port B
<AUTO>
Serial Port C
<AUTO>
Serial Port D
<AUTO>
Serial Port E
<AUTO>
WDT
<Disable>
▶Hardware Monitor
▶GPIO Group 0 Configuration
▶GPIO Group 1 Configuration
▶GPIO Group 5 Configuration
Choose COM Port Mode
Mode
RS232
RS485
RS422
F1 Help
↑/↓ Select Item
F5/F6 Change Values
F9 Setup Defaults
Esc Exit
←/→ Select Item
Enter Select ▶ SubMenu
F10 Save and Exit

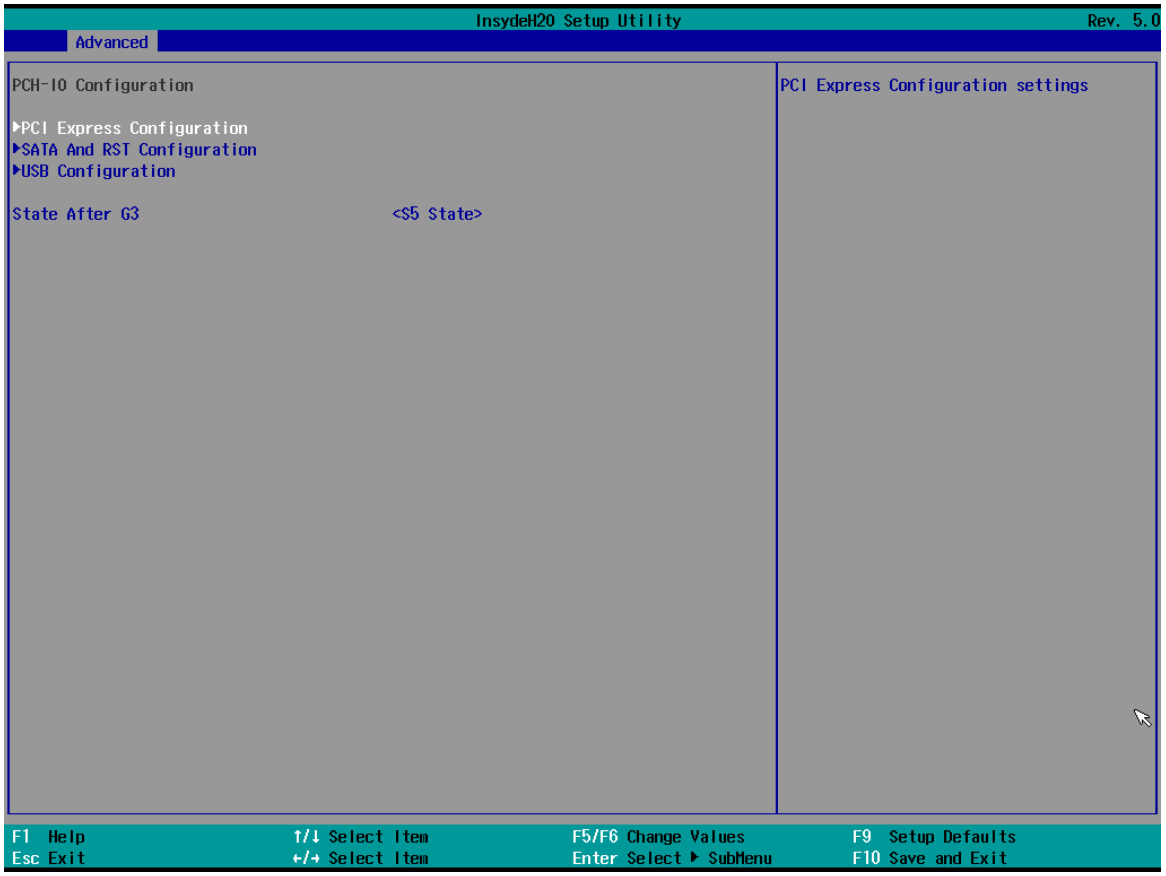
3.2.2.3 GPIO Configuration





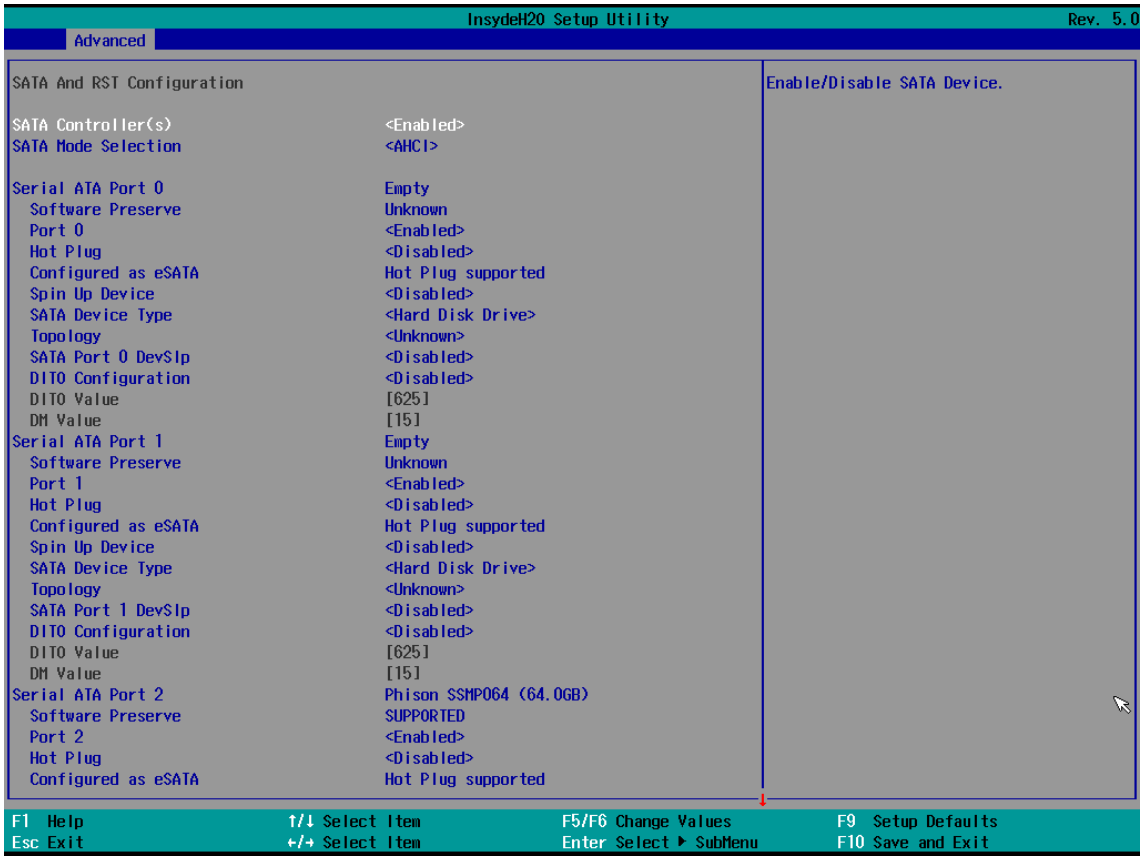
3.2.2.4 Hardware Monitor

3.2.2.5 PCH-IO Configuration

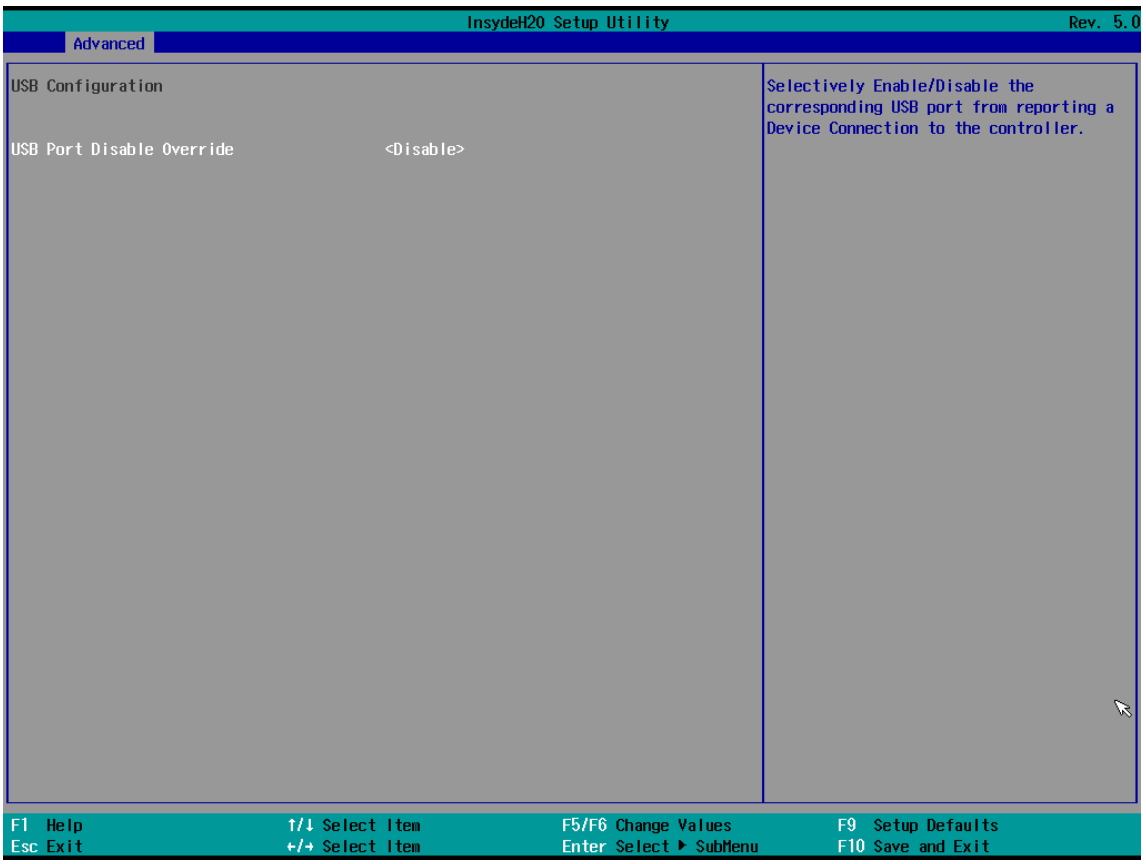


BIOS Setting	Description	Setting Option	Effect
PCI Express Configuration	PCI Express clock gating enable/disable for each root port.	Enter	Opens sub-menu
SATA And RST Configuratuion	Enable/ Disable SATA device	Enter	Opens sub-menu
USB Configuration	Selectively enable/ disable the corresponding USB port from reporting a Device Connection to the controller.	Enter	Opens sub-menu
State After G3	System power state setting	S0 State S5 State	

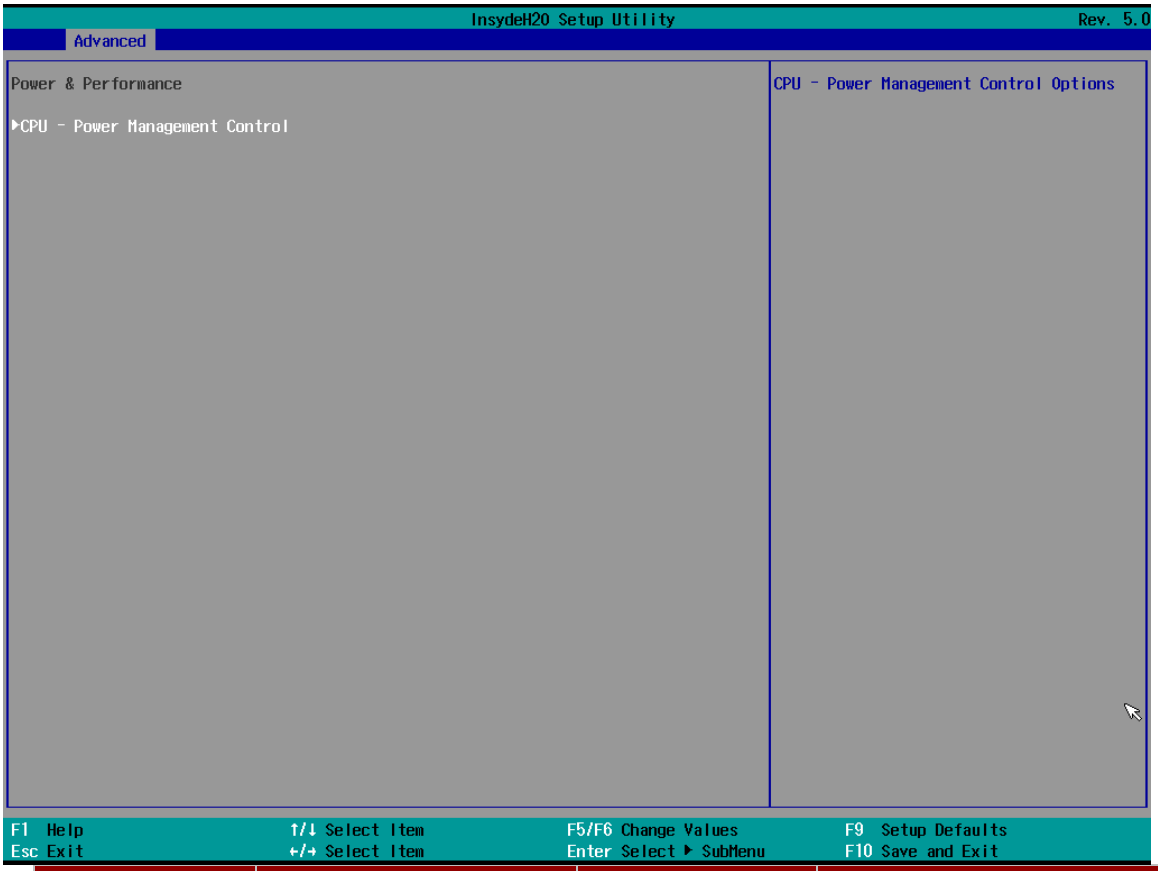
3.2.2.6 SATA and RST Configuration



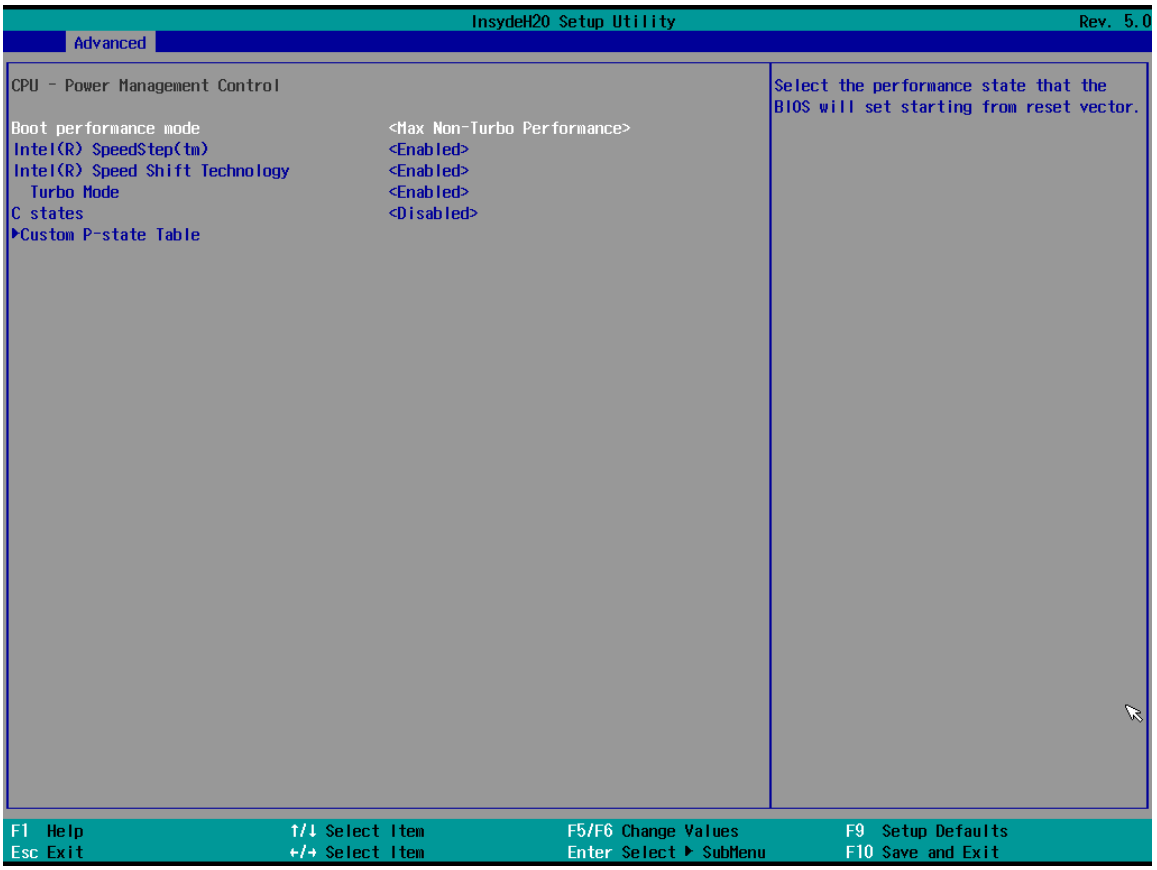
3.2.2.7 USB Configuration

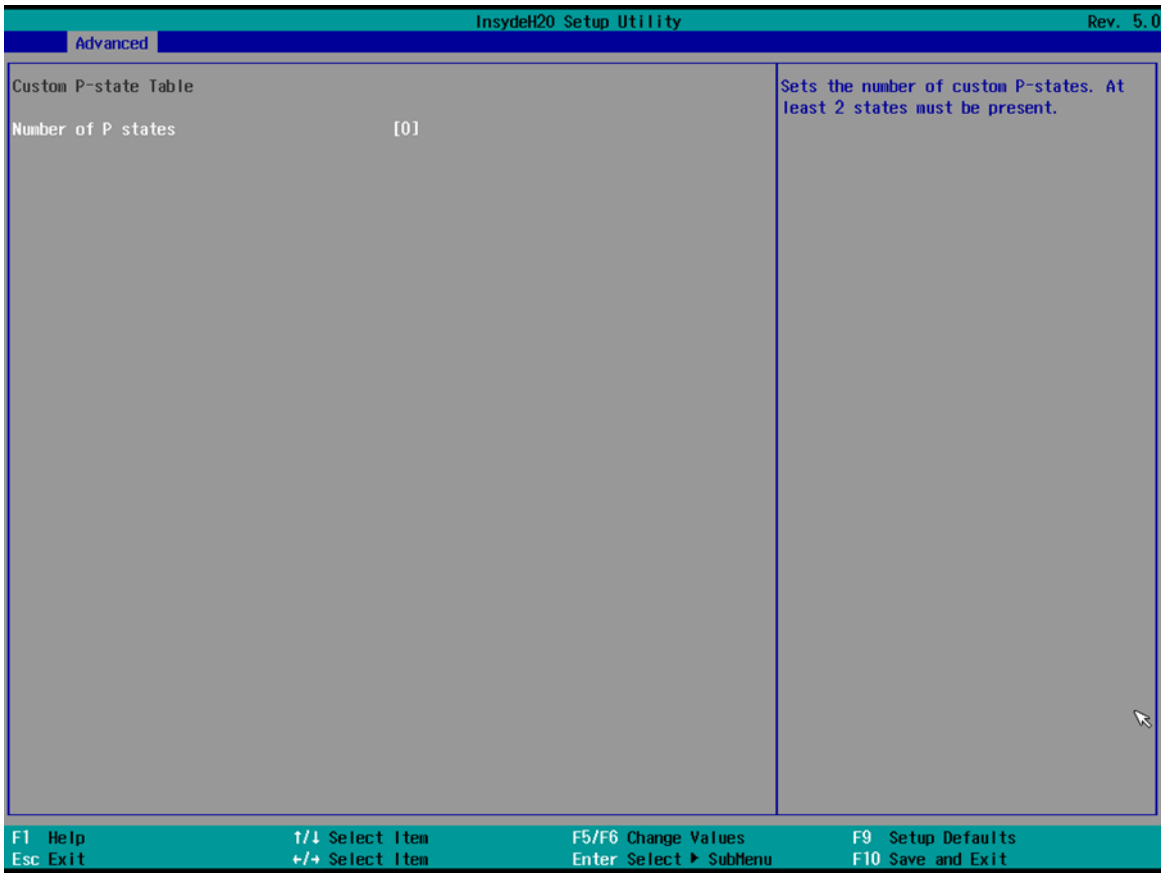


3.2.2.8 Power & Performance



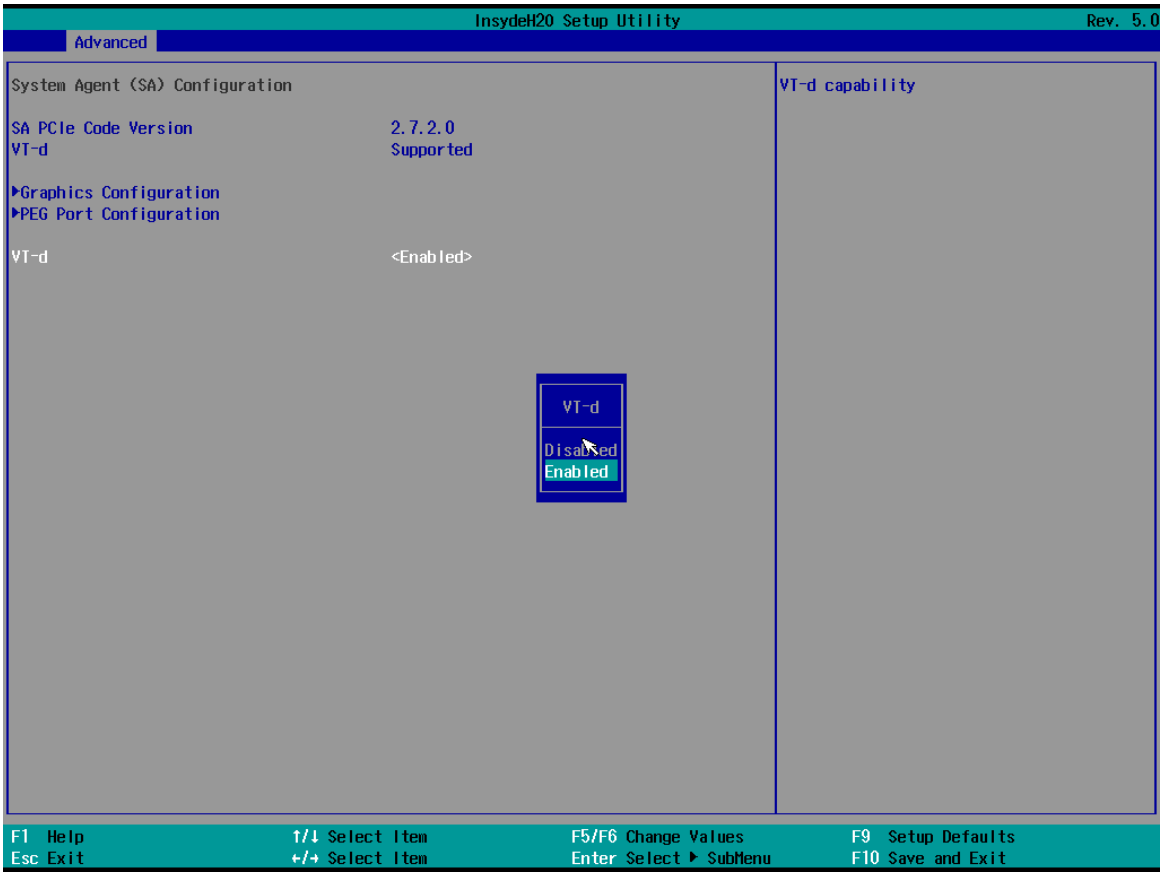
BIOS Setting	Description	Setting Option	Effect
CPU – Power Management Control	Configure CPU – Power Management parameters	Enter	Opens sub-menu


InsydeH20 Setup Utility
Rev. 5.0
Advanced
CPU - Power Management Control
Boot performance mode
<Max Non-Turbo Performance>
Intel(R) SpeedStep(tm)
<Enabled>
Intel(R) Speed Shift Technology
<Enabled>
Turbo Mode
<Enabled>
C states
<Disabled>
▶Custom P-state Table
Select the performance state that the BIOS will set starting from reset vector.
F1 Help
↑/↓ Select Item
F5/F6 Change Values
F9 Setup Defaults
Esc Exit
←/→ Select Item
Enter Select ▶ SubMenu
F10 Save and Exit


InsydeH20 Setup Utility
Rev. 5.0
Advanced
Custom P-state Table
Number of P states
[0]
Sets the number of custom P-states. At least 2 states must be present.
F1 Help
↑/↓ Select Item
F5/F6 Change Values
F9 Setup Defaults
Esc Exit
←/→ Select Item
Enter Select ▶ SubMenu
F10 Save and Exit

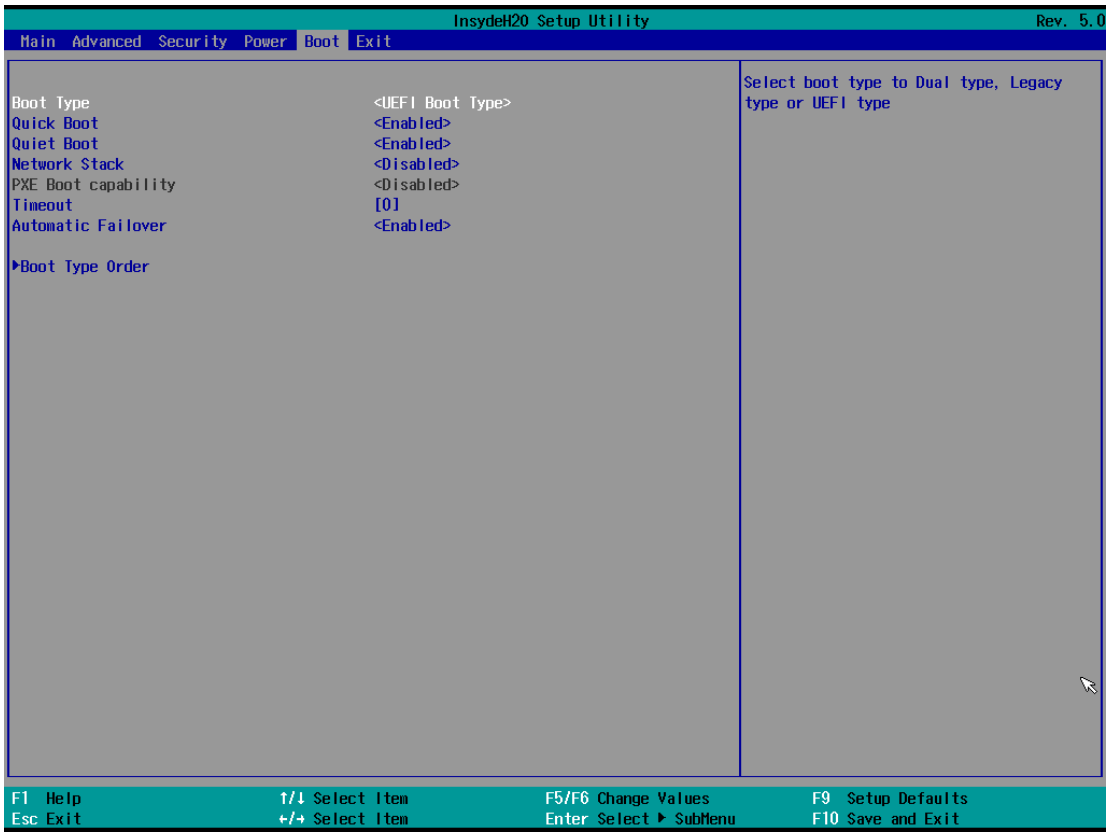
BIOS Setting	Description	Setting Option	Effect
Boot Performance Mode	Configure Boot Performance Mode parameters	-Max non-turbo performance -Max battery -Turbo Performance	Select the performance state that the BIOS will set starting from reset vector
Intel Speed Step (ta)	Configure Intel Speed Step (ta) parameters	Enabled/ Disabled	Allows more than two frequency ranges to be supported
Intel Speed Shift Technology	Configure Intel Speed Shift Technology parameters	Enabled/ Disabled	Enable/ Disable Intel Speed Shift Technology support. Enabling will expose the CPP v2 interface to allow for hardware-controlled P- states
-Turbo Mode	*Enable or disable Turbo Mode*	*Enabled/ Disabled*	*Enable/ Disable processor Turbo Mode (requires EMTTM enabled too). Auto means enabled, unless max turbo ratio is bigger than 16 – SKL AO W/A*
C states	Enable or disable C states	Enabled/ Disabled	Enable/ Disable CPU Power Management. Allows COU to go to C states when it is not 100% utilized
Custom P-state Table	Configure Custom P-state Table parameters	Enter	Enters sub-menu
-Number of P-states	*Select the number of custom P-states.*	*[Number]*	*Set the number of custom P-states. At least 2 states must be present*

3.2.2.9 Vt-d



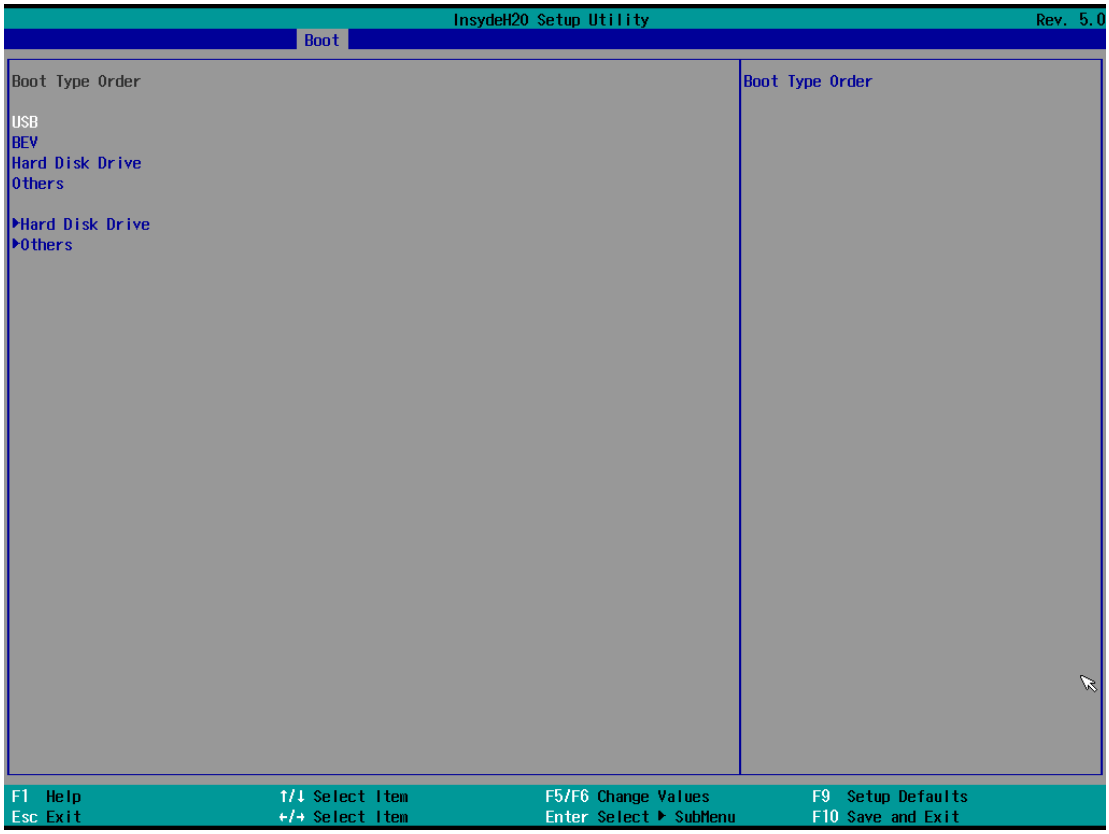
BIOS Setting	Description	Setting Option	Effect
Vt-d	Intel® Virtualization Technology for Directed I/O	Enabled Disabled	Vt-d capability

3.2.3 Boot



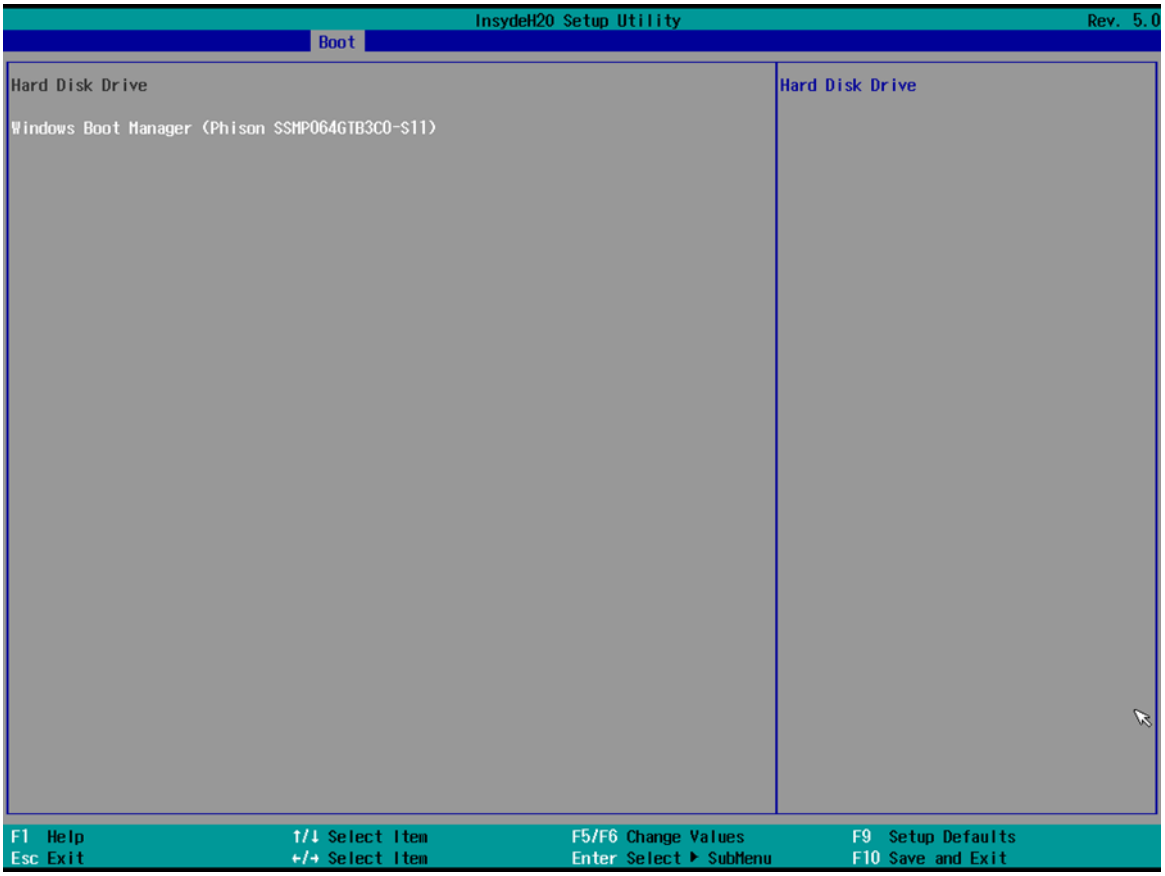
BIOS Setting	Description	Setting Option	Effect
Boot Type	Boot Type configuration	UEFI Boot Type	Select boot type to Dual type, Legacy type or UEFI type
Quick Boot	Quick Boot configuration	Enabled Disabled	Allows InsydeH20 to skip certain tests while booting. This will decrease the time needed to boot the system
Quiet Boot	Quiet Boot configuration	Enabled Disabled	Disable or enable booting in text Mode.
Timeout	Timeout	[Value]	Timeout settings
Automatic Failover		Enable	If boot to default device fail, it will directly try to boot next device
		Disable	If boot to default device fail, it will pop warning message then go to firmware UI
Boot Type Order	Boot Type Order	Enter	Opens sub-menu

3.2.3.1 Boot Type Order

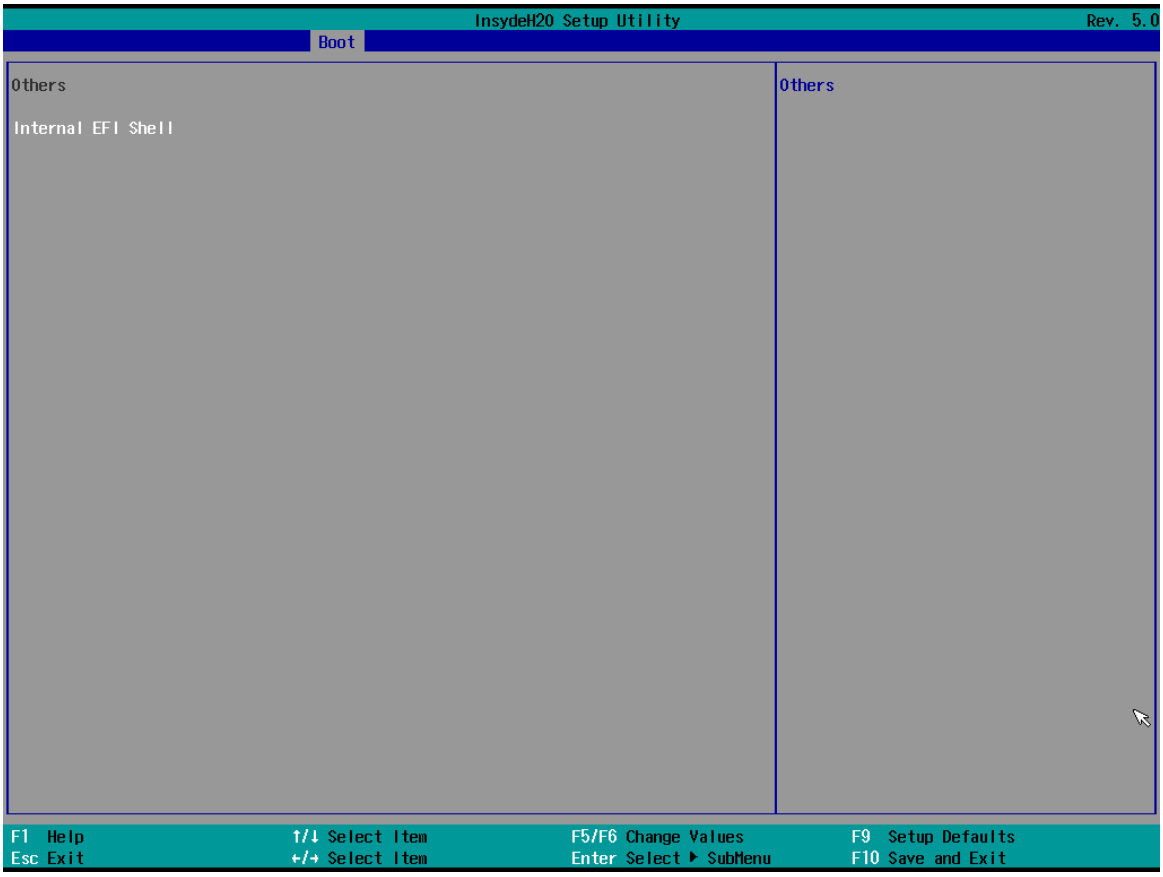


BIOS Setting	Description	Setting Option	Effect
Hard Disk Type	Hard Disk Type configuration	Enter	Opens Sub-menu
Others	Other configuration	Enter	Opens Sub-menu

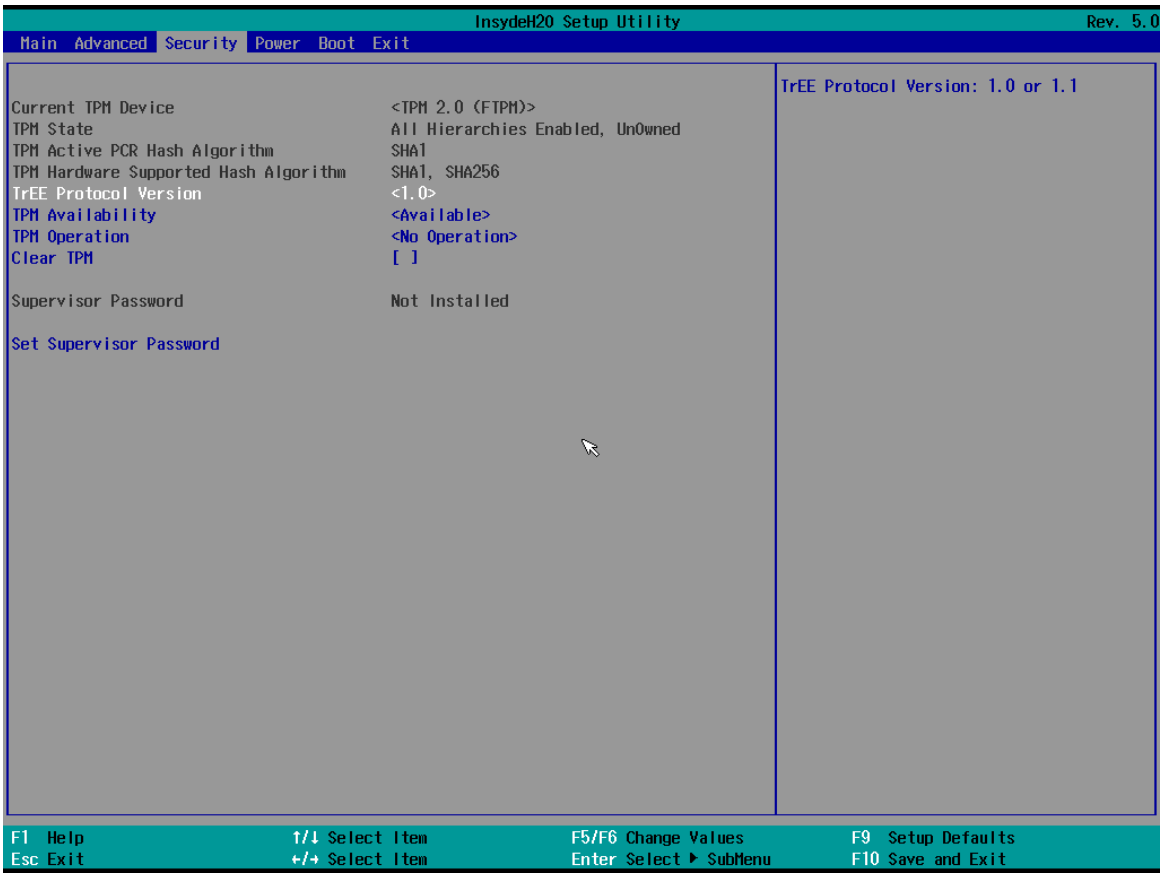
3.2.3.1.1 Hard Disk Type



3.2.3.1.2 Others

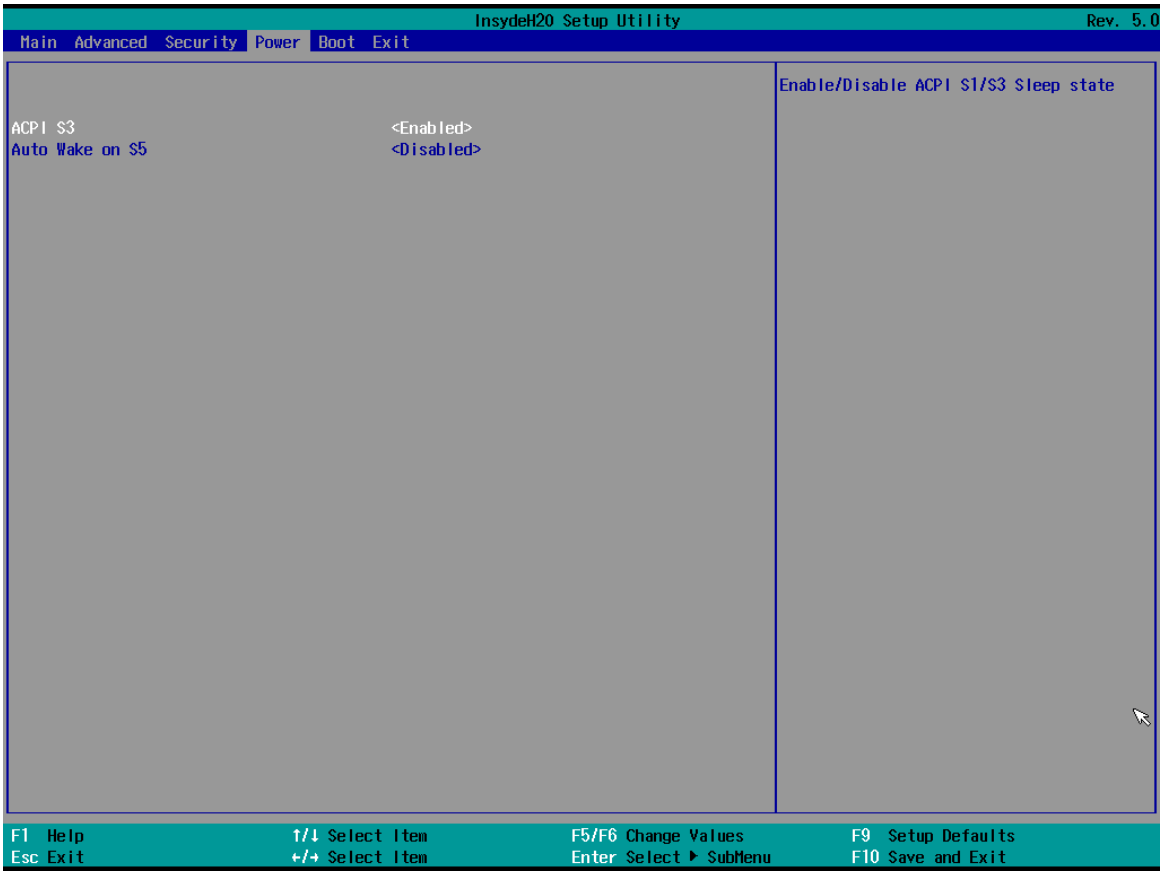


3.2.3 Security



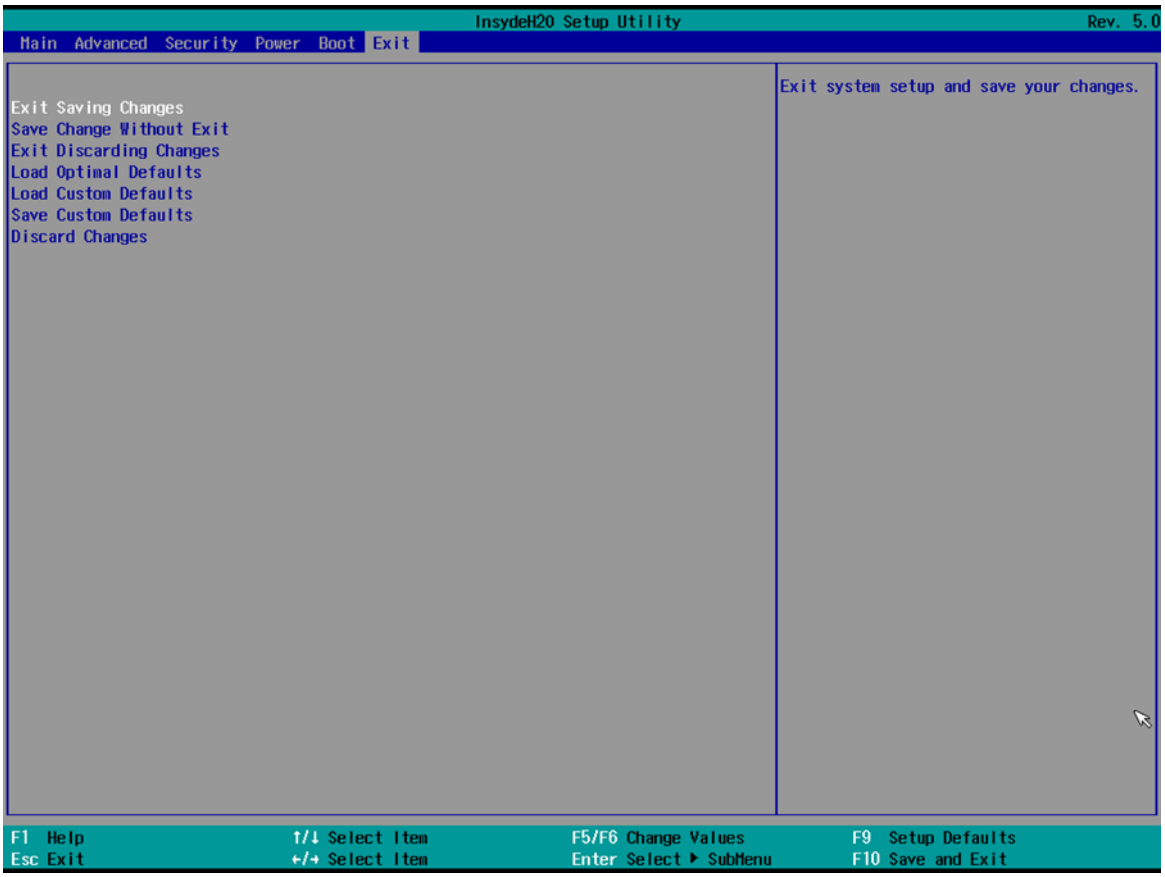
BIOS Setting	Description	Setting Option	Effect
TrEE Protocol Version	Choose TrEE Protocol Version	1.0 1.1	TrEE Protovol Version: 1.0 or 1.1
TPM Availability	TPM Availability configuration	Available Hidden	When hidden don't exposes TPM to 0
TPM Operation	TPM Operation configuration	[ ]	Select one of the supported operation to change TPM2state
Clear TPM	Clear TPM configuration	[ ]	Select to Clear TPM
Set Supervisor Password	Set Supervisor Password	Enter New password	Install or Change the password and the length of password must be greater than one character

3.2.4 Power



BIOS Setting	Description	Setting Option	Effect
ACPI S3	ACPI S3 configuration	Disabled Enabled	Enable/ Disable ACPI S1/S3 Sleep state
Auto Wake on S5	Auto Wake on S5 configuration	Disabled By Every Day By Every Month	Auto Wake on S5, by Day or Month or fixed time of every day

3.2.5 Exit


InsydeH20 Setup Utility
Rev. 5.0
Main Advanced Security Power Boot Exit
Exit Saving Changes
Save Change Without Exit
Exit Discarding Changes
Load Optimal Defaults
Load Custom Defaults
Save Custom Defaults
Discard Changes
Exit system setup and save your changes.
F1 Help
Esc Exit
↑/↓ Select Item
←/→ Select Item
F5/F6 Change Values
Enter Select ▸ SubMenu
F9 Setup Defaults
F10 Save and Exit

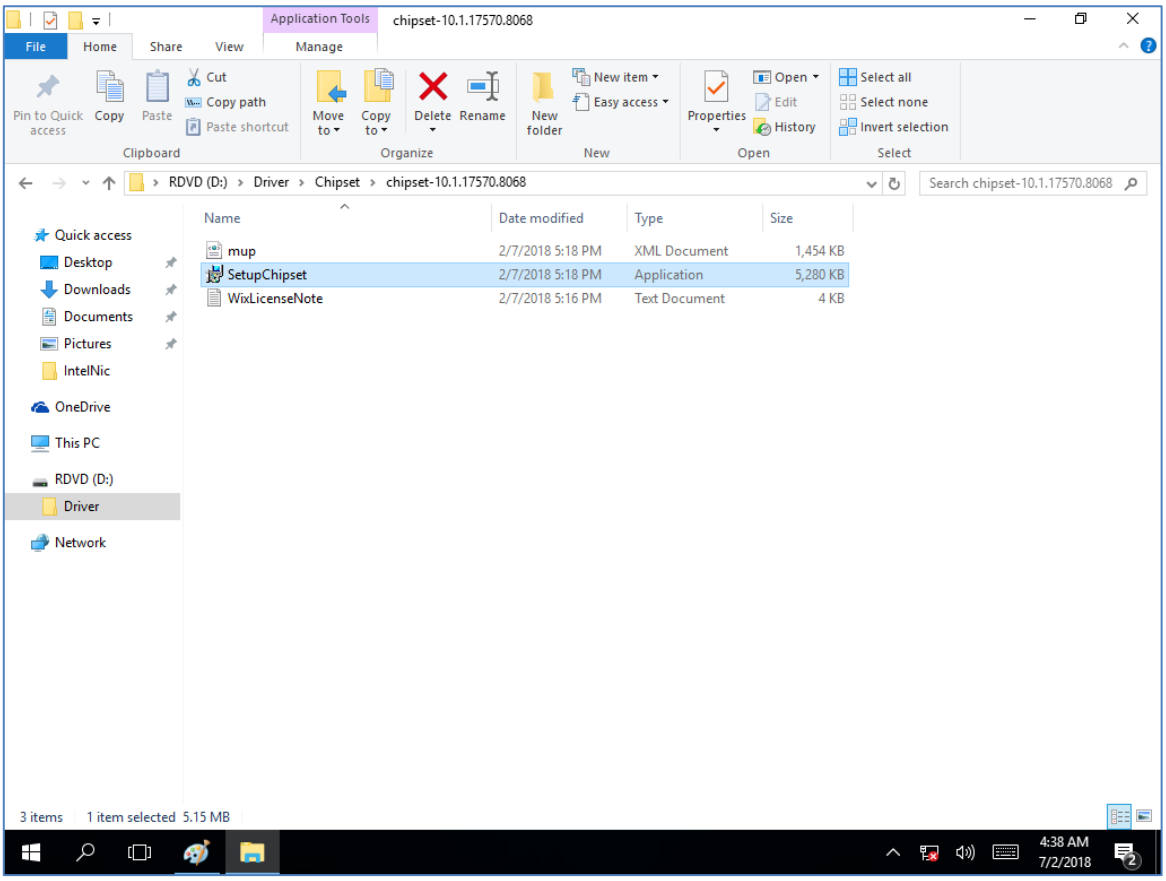
Chapter 4: Driver Installation

This chapter contains driver installation guide. Follow the instructions below to complete the installation. You will quickly complete the installation. This chapter provides instructions on how to install drivers on the IK32 Motherboard.

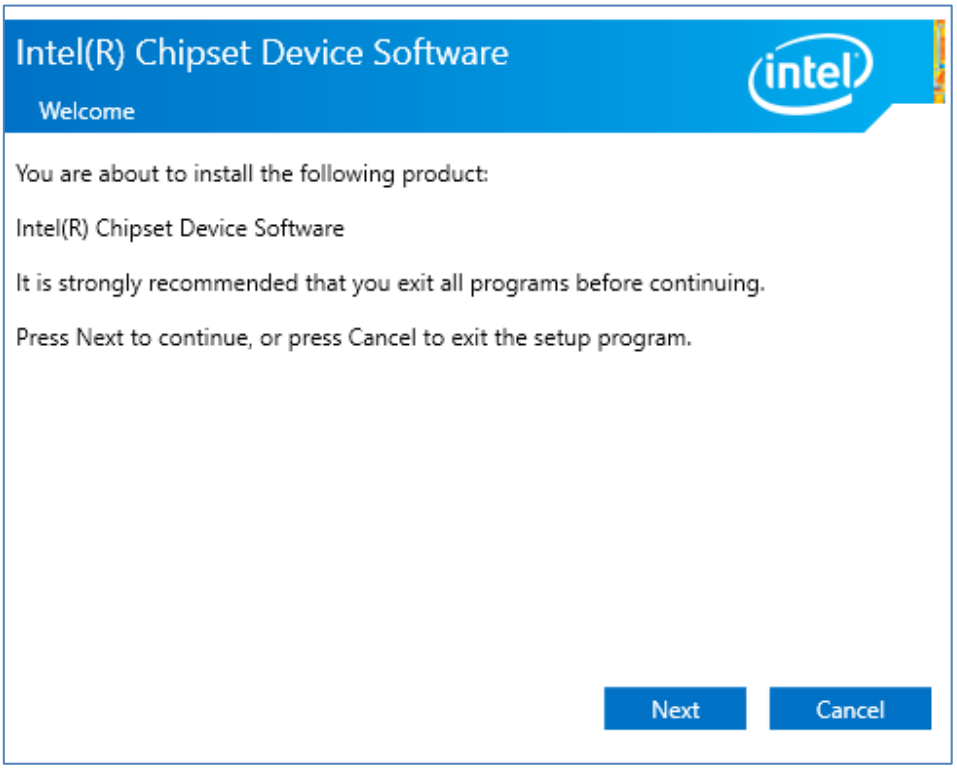
4.1 Chipset Driver

Follow instructions below to install Chipset driver.

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



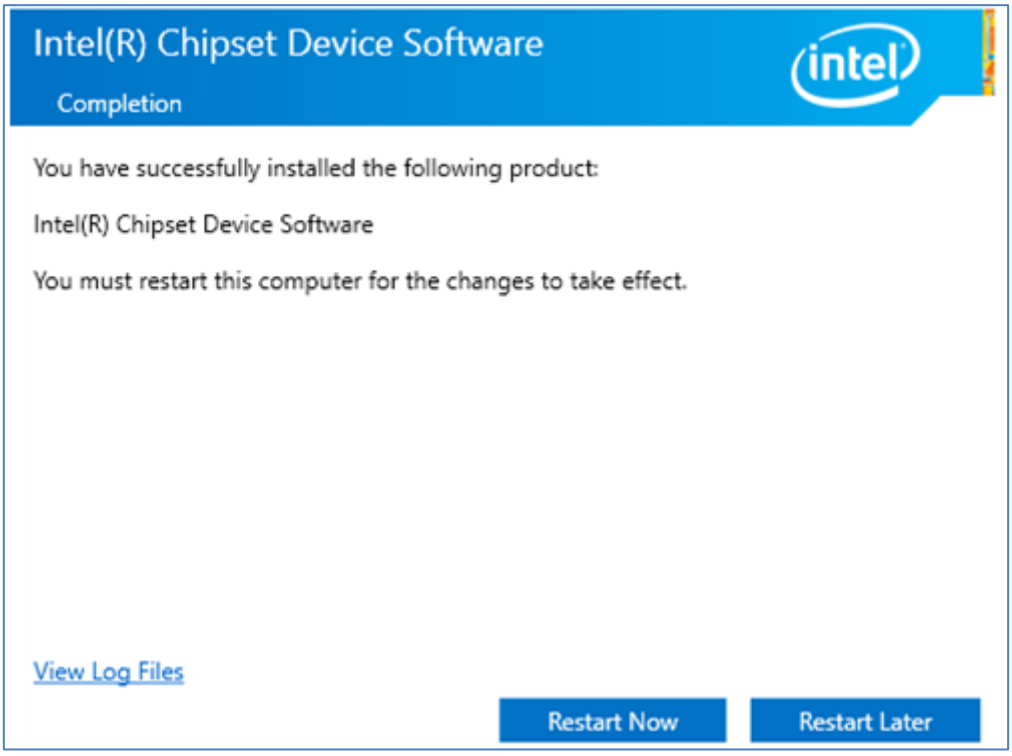
2. Installation window will pop up, select **Next**.



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

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

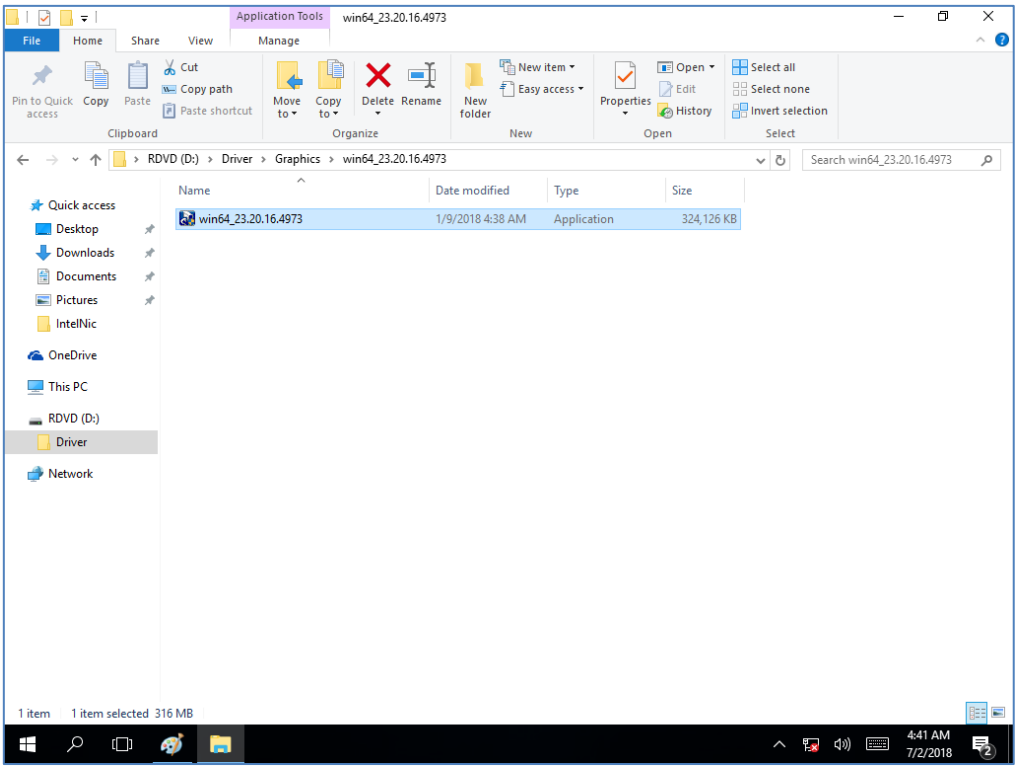
5. Wait for the driver to be installed. When installation completed, select **Restart Now** to restart your computer.



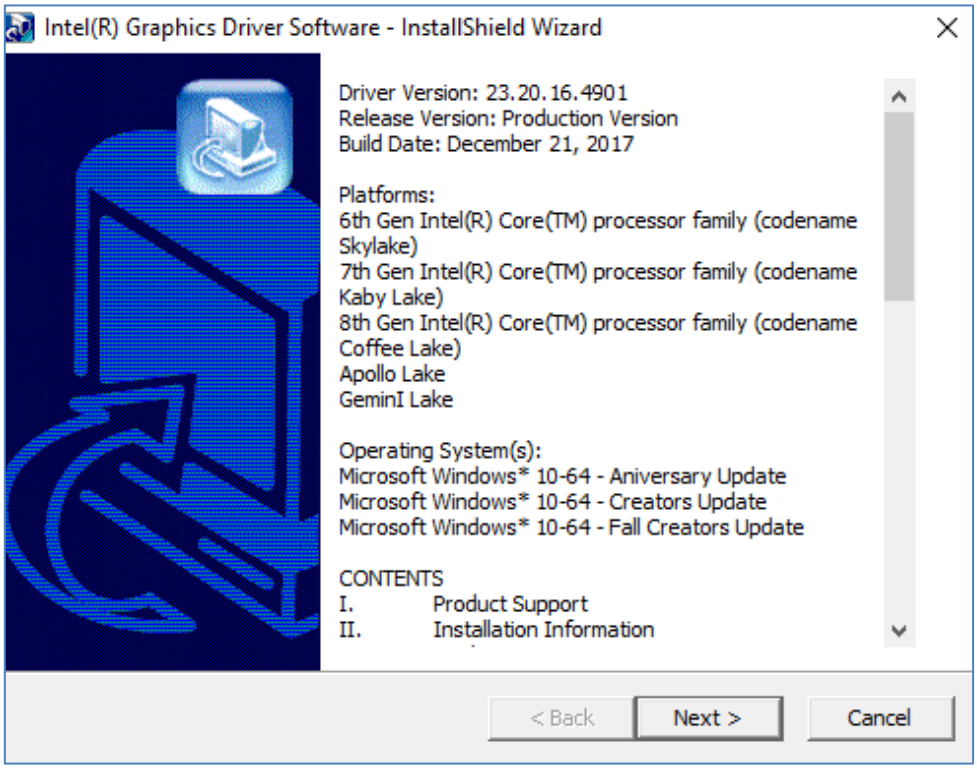
4.2 Graphic Driver

Follow instructions below to install Graphic driver.

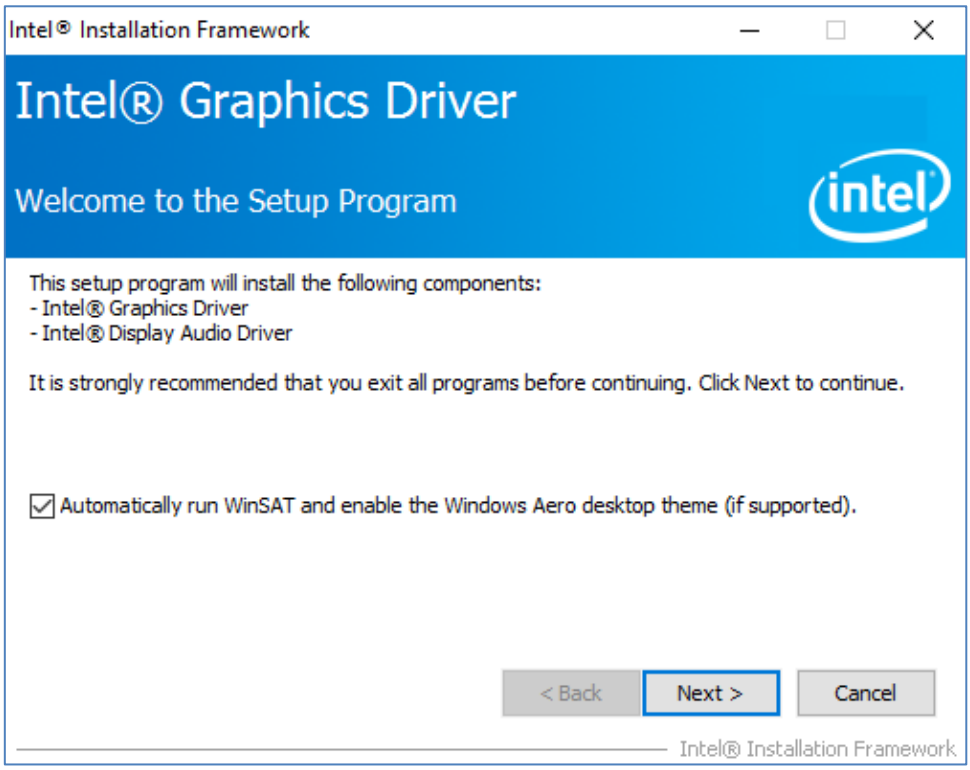
1. Open the Driver CD (included in the package) and select **Graphic** driver.

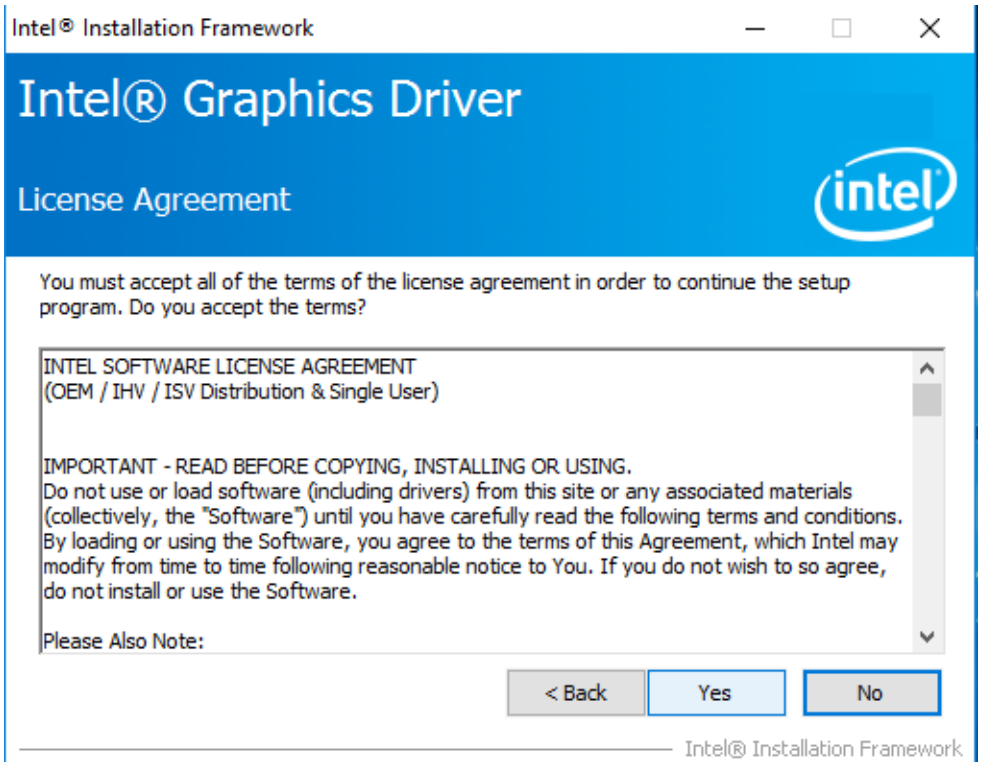


2. Installation window will pop up, select **Next**.

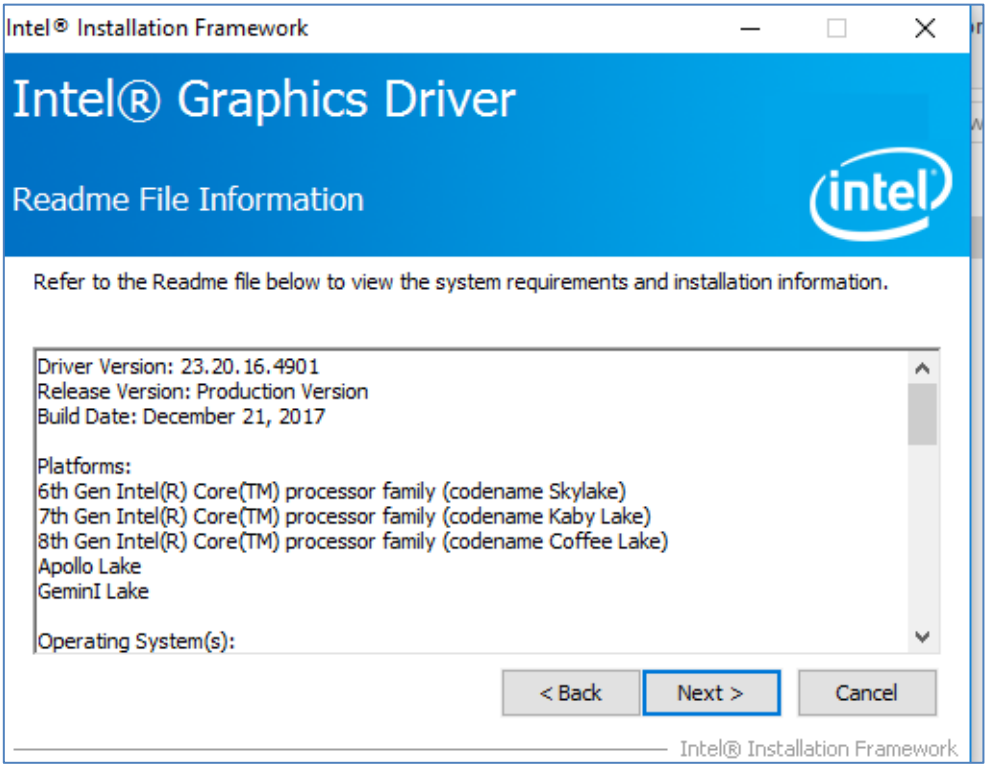


3. Select Accept to agree with the terms of license agreement.

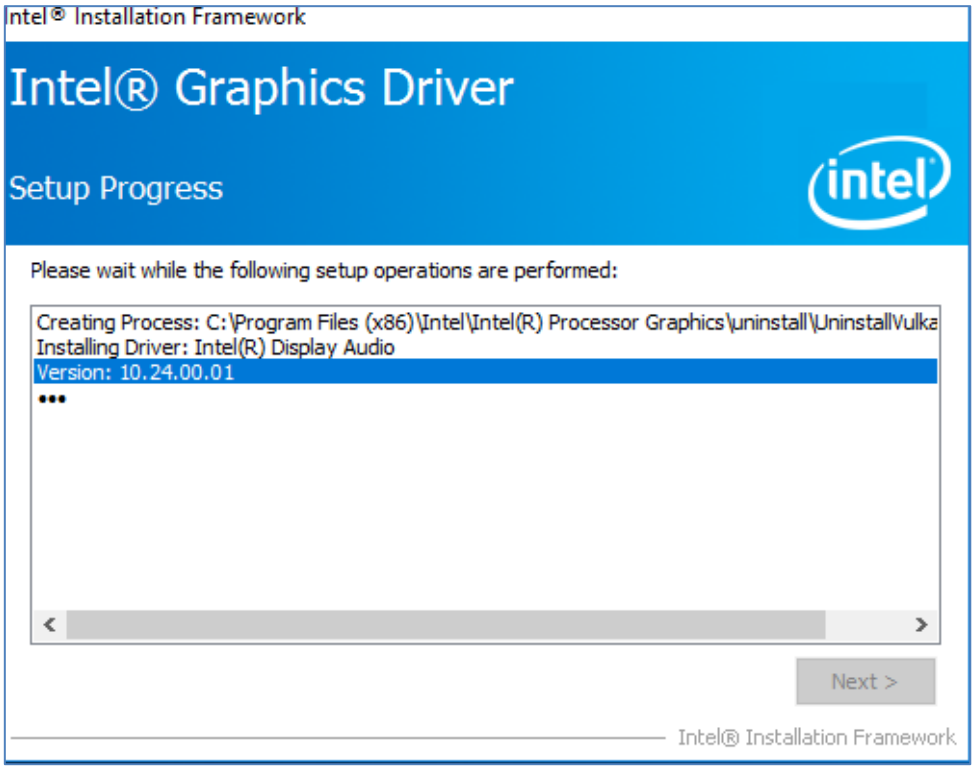




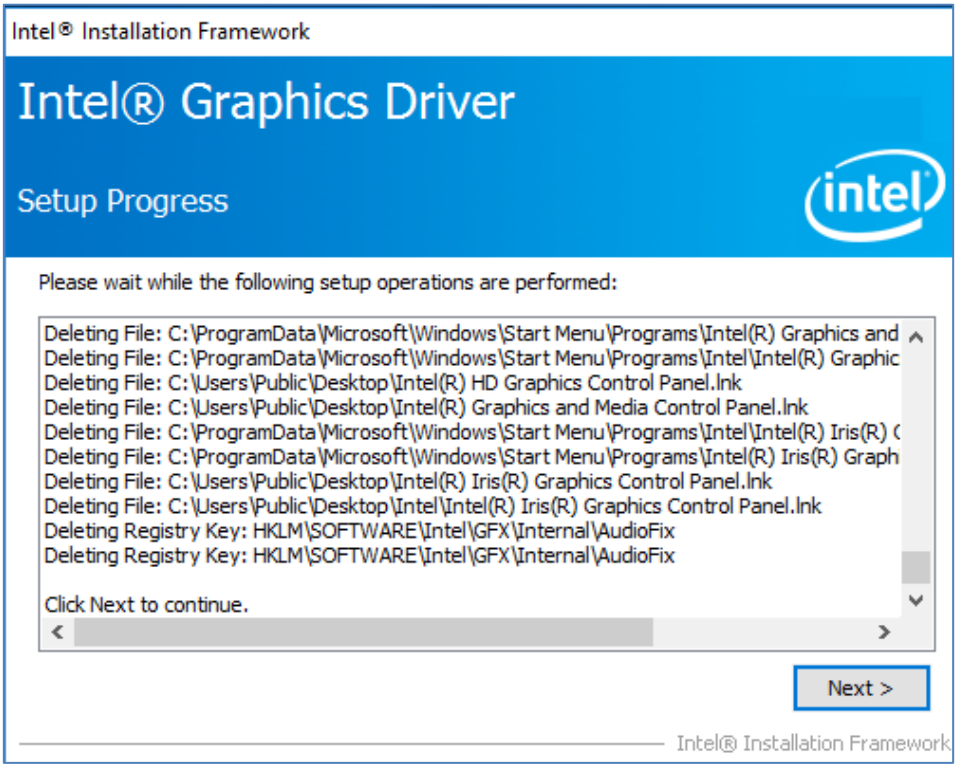
4. Check the ReadMe file information, select **Next** to continue.



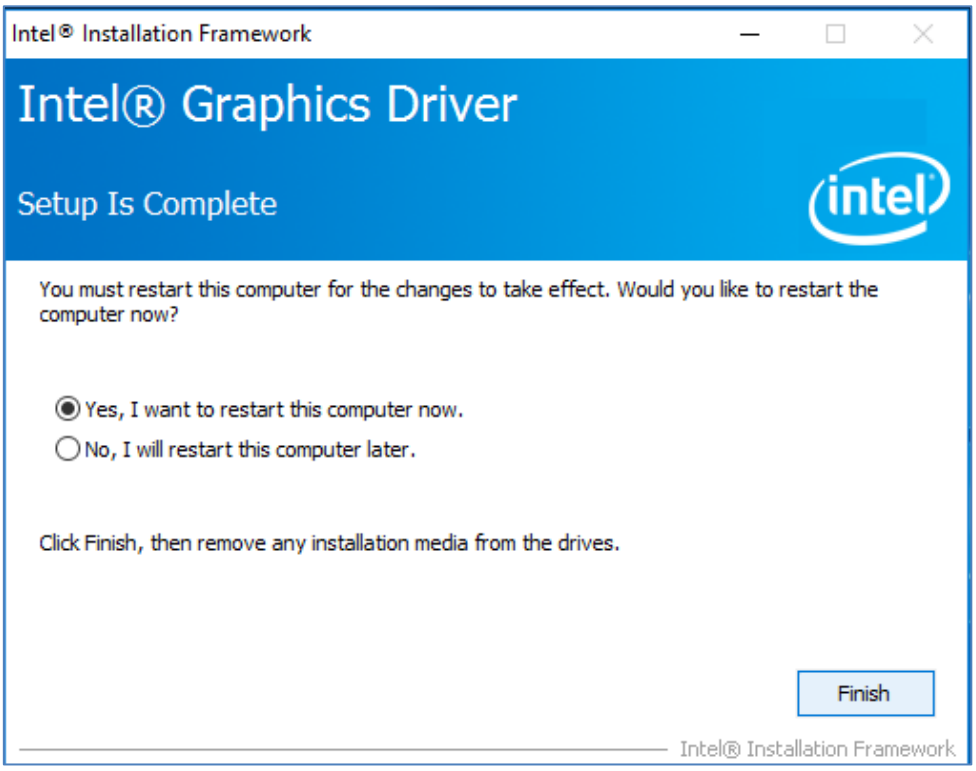
5. Wait for the driver to be installed.



6. Select **Next** to continue.



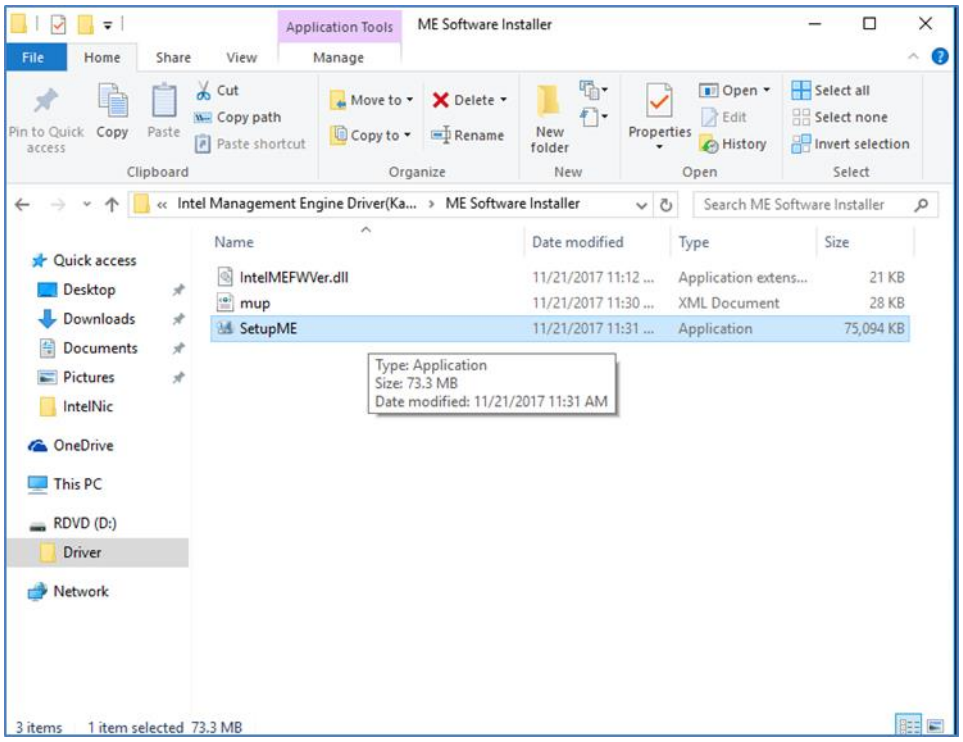
7. After installation is completed, select "**Yes, I want to restart this computer now**", and click **Finish**.



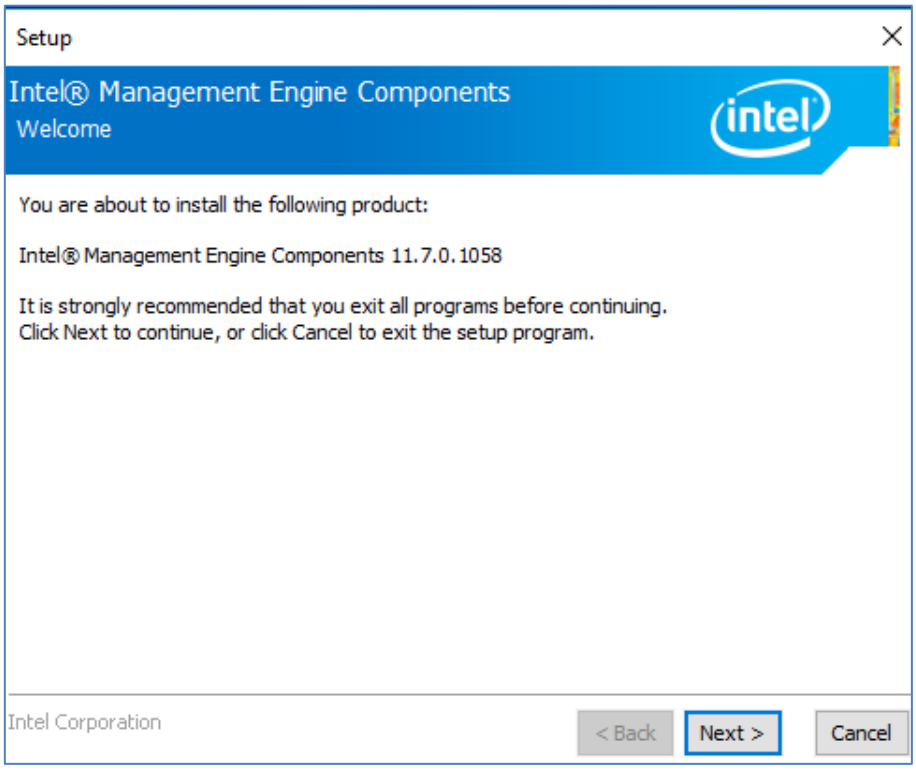
4.3 Management Engine (ME)

Follow instructions below to install Management Engine (ME).

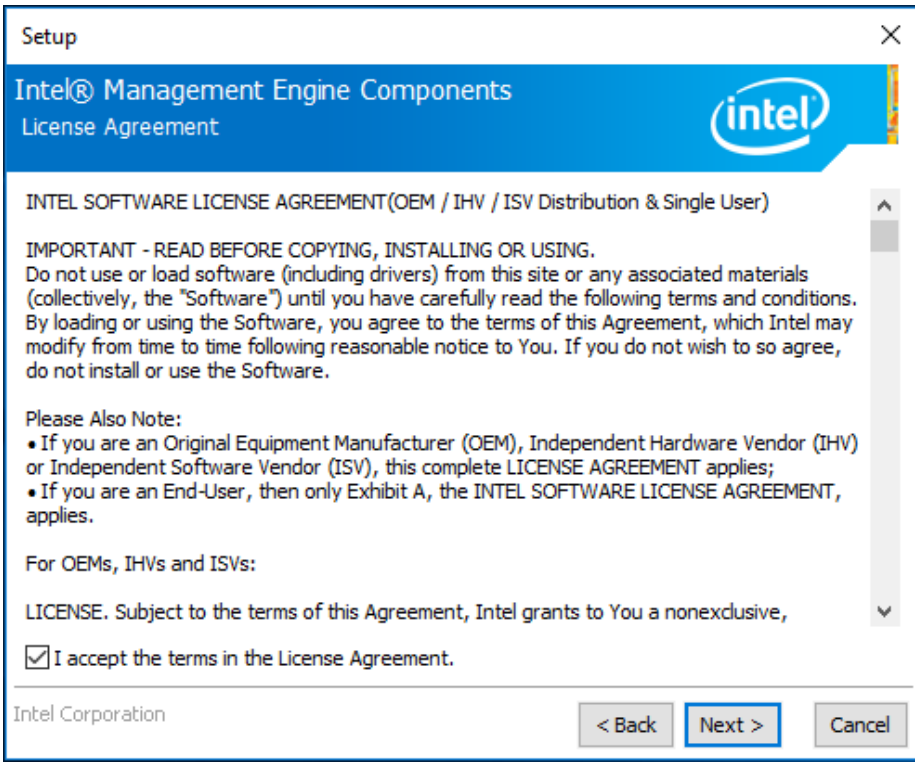
1. Open the Driver CD (included in the package) and select **ME** driver.



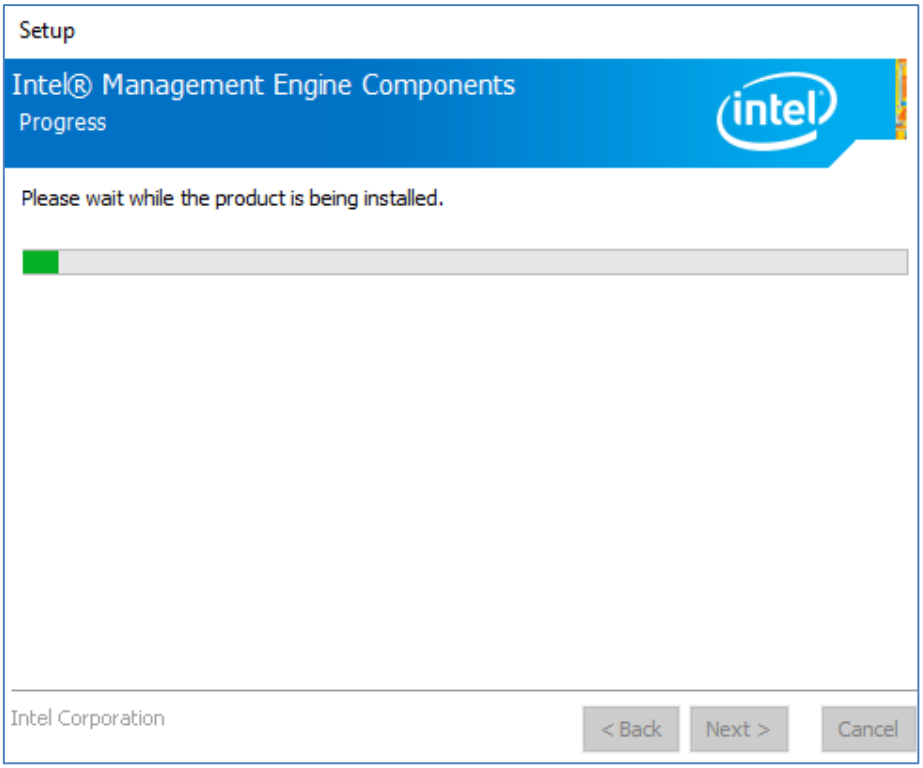
2. Select **Next** to start the installation.



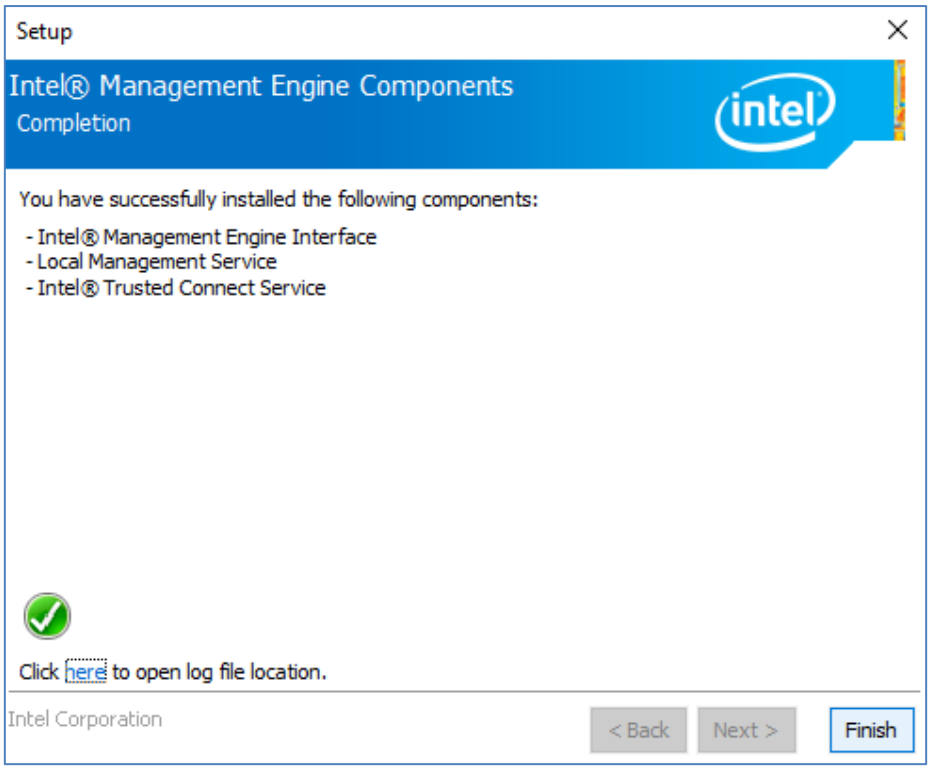
3. Select **Next** to agree with the terms of license agreement.



4. Wait for the driver to be installed.



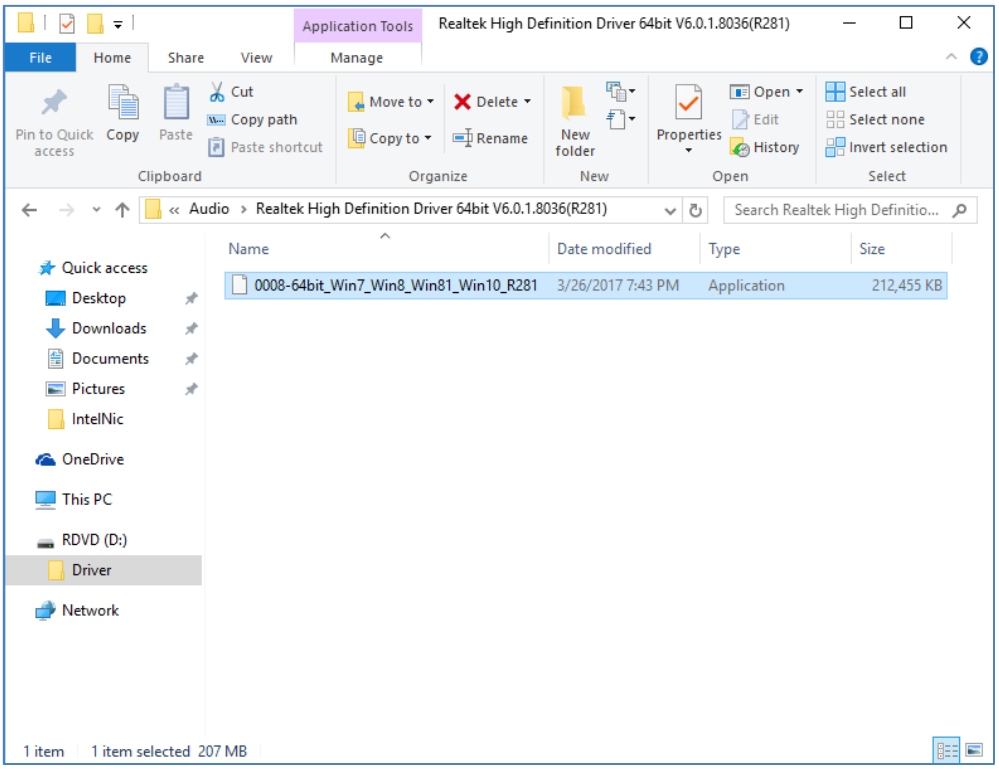
5. When installation completed, select **Finish** complete installation.



4.4 Audio Driver

Follow instructions below to install Audio driver.

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



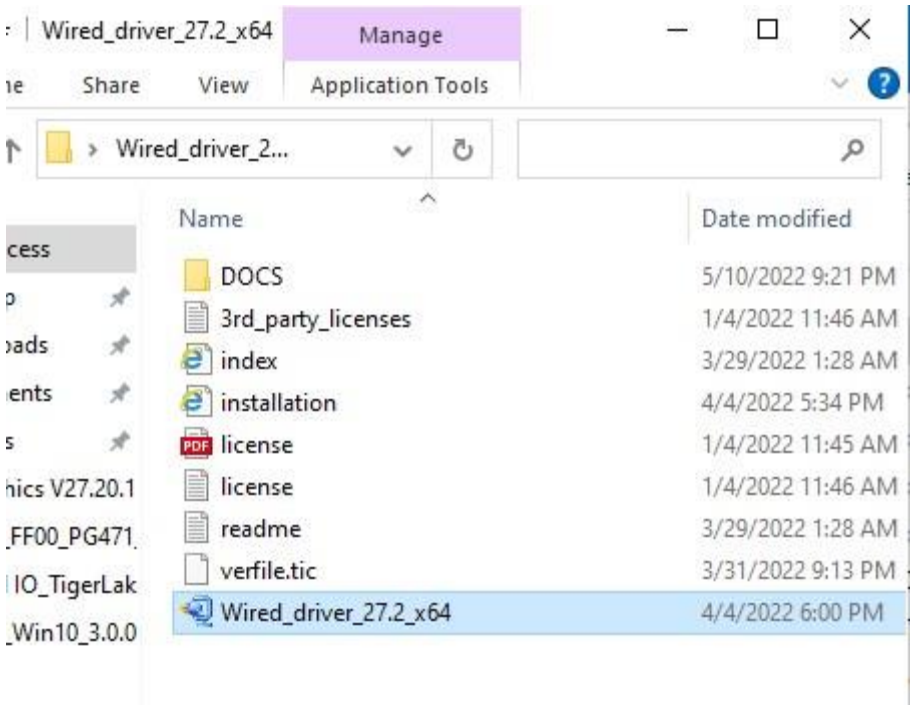
2. Select **Next** to continue.

3. When installation completed, select **Finish** complete installation.

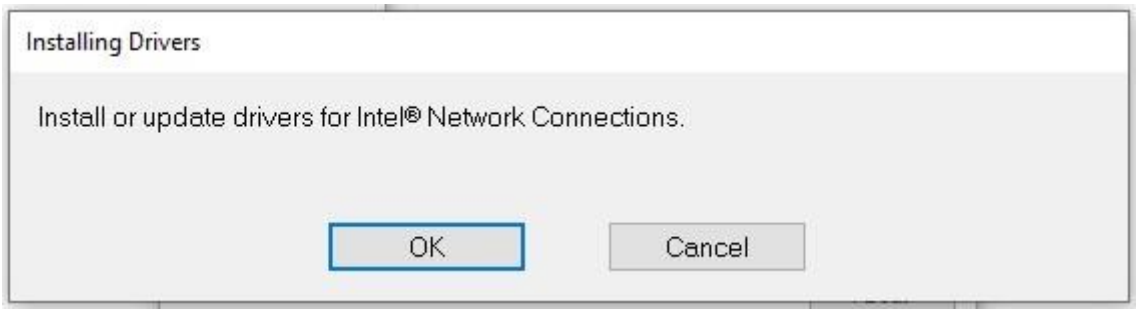
4.5 Ethernet Driver

The Users must make sure which operating system you are using in the IK32-300 Motherboard before installing the Ethernet drivers. Follow the steps below to complete the installation of the Intel® LAN drivers. You will quickly complete the installation.

1. Insert the DVD that comes with the motherboard. Open the file LAN and click on the Setup file to install driver.



2. Click **OK**.



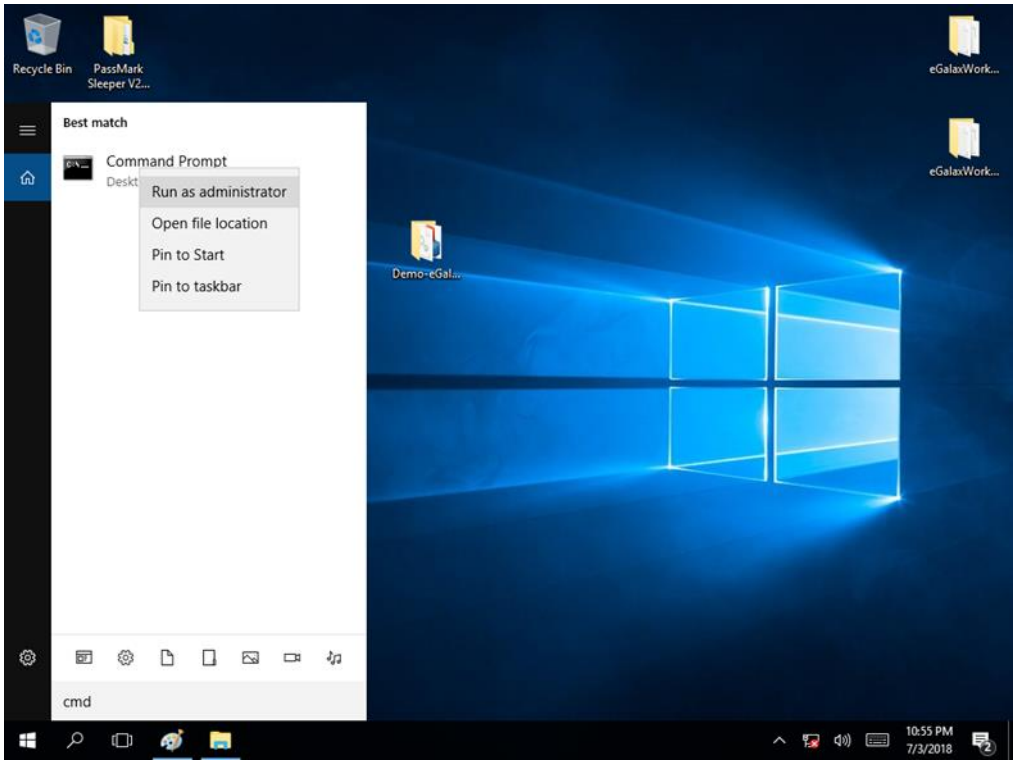
3. After the installation is completed, click **Close**.

4.6 Watchdog Driver Installation

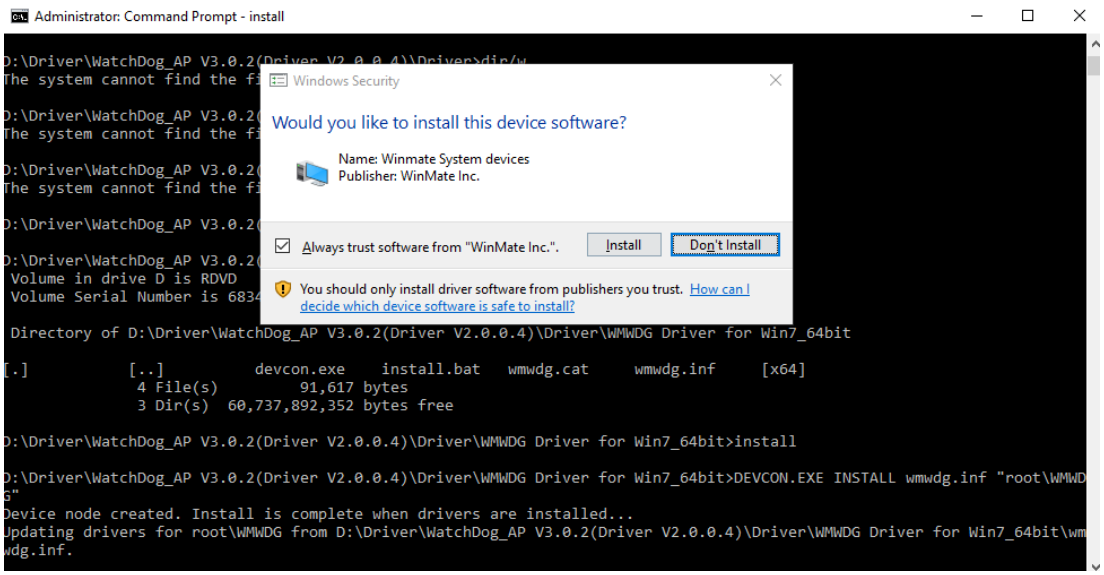
For more details about Winmate Watchdog, please download Watchdog Guide from Winmate Downloads Center.

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

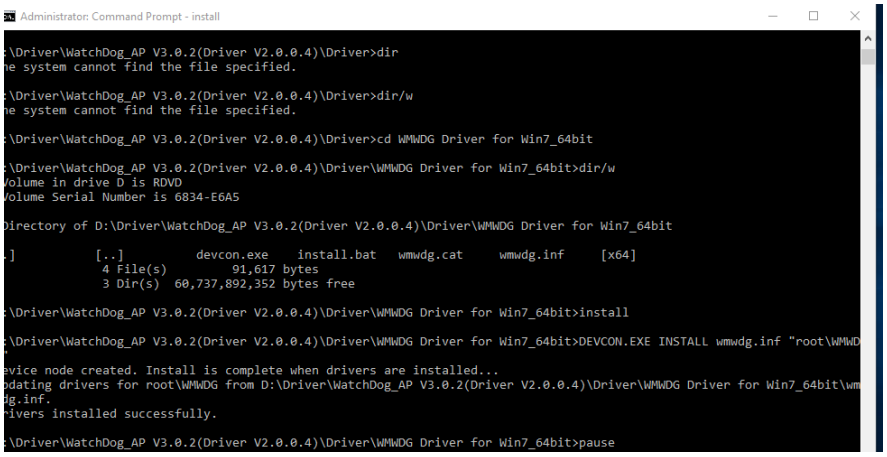
1. Type “cmd” in the run box then the cmd.exe will appear in programs.
2. Right click on the cmd.exe and click on “Run as administrator” to start.



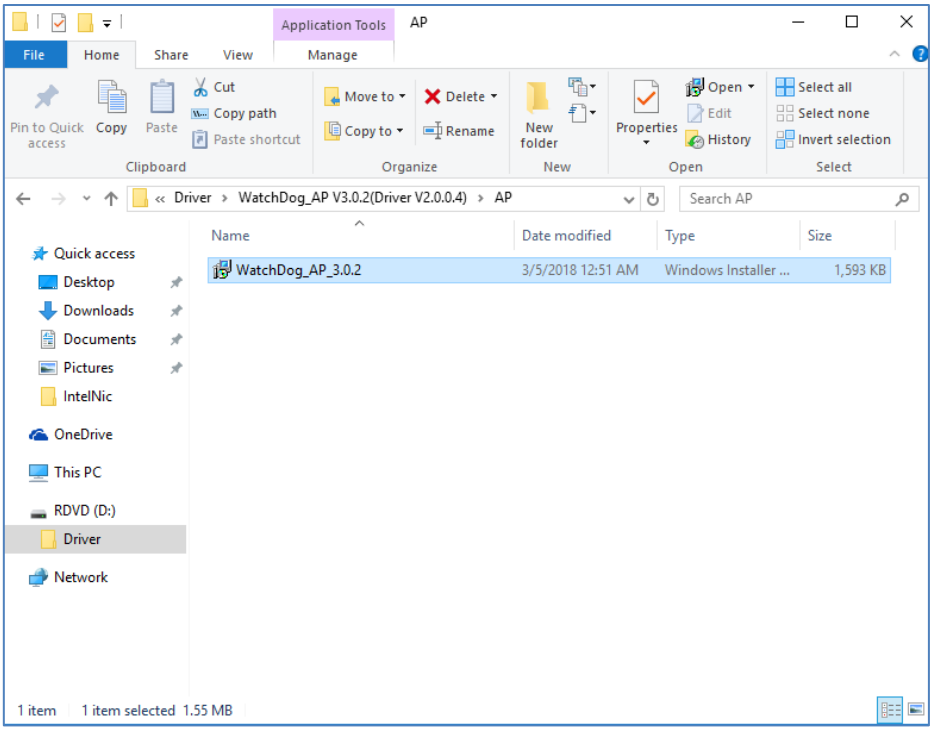
3. Open the Driver CD (included in the package) and select Watchdog driver.
4. When Windows Security dialog appear, select **install** to continue the installation.



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

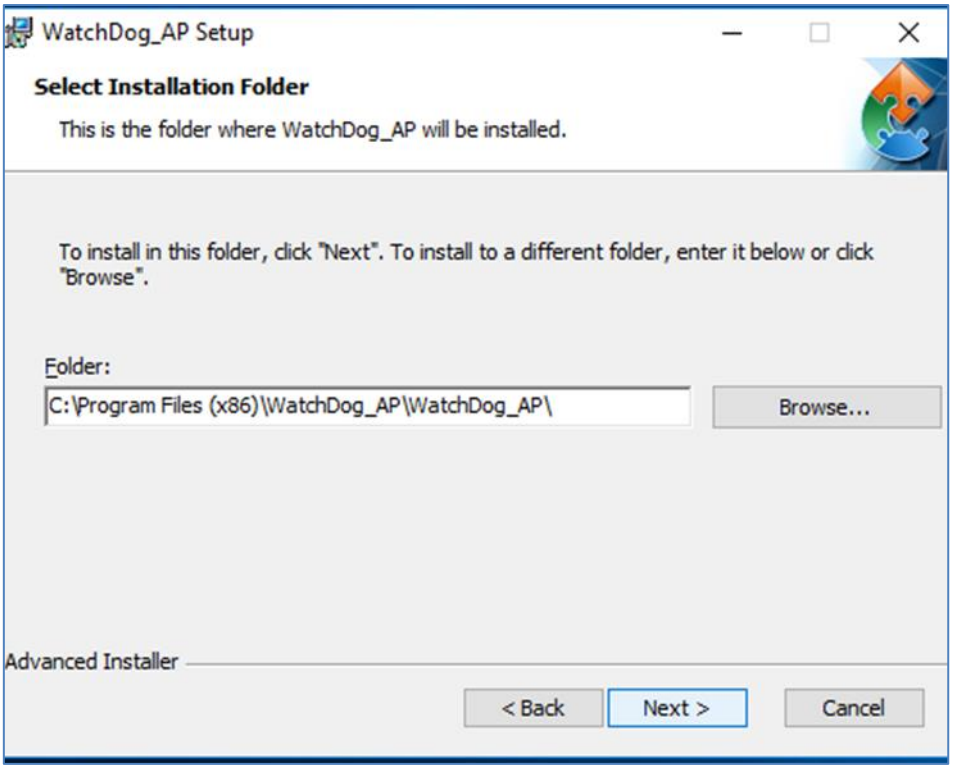


6. Open the Driver CD (included in the package) and select **Watchdog AP**.

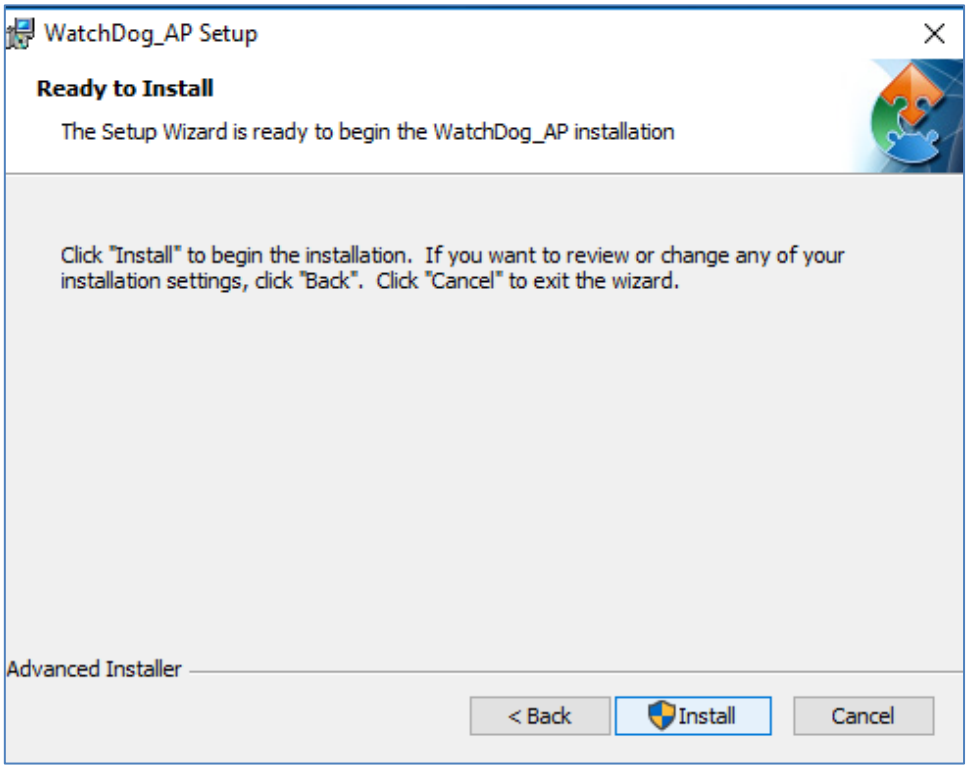


7. Select **Next**.

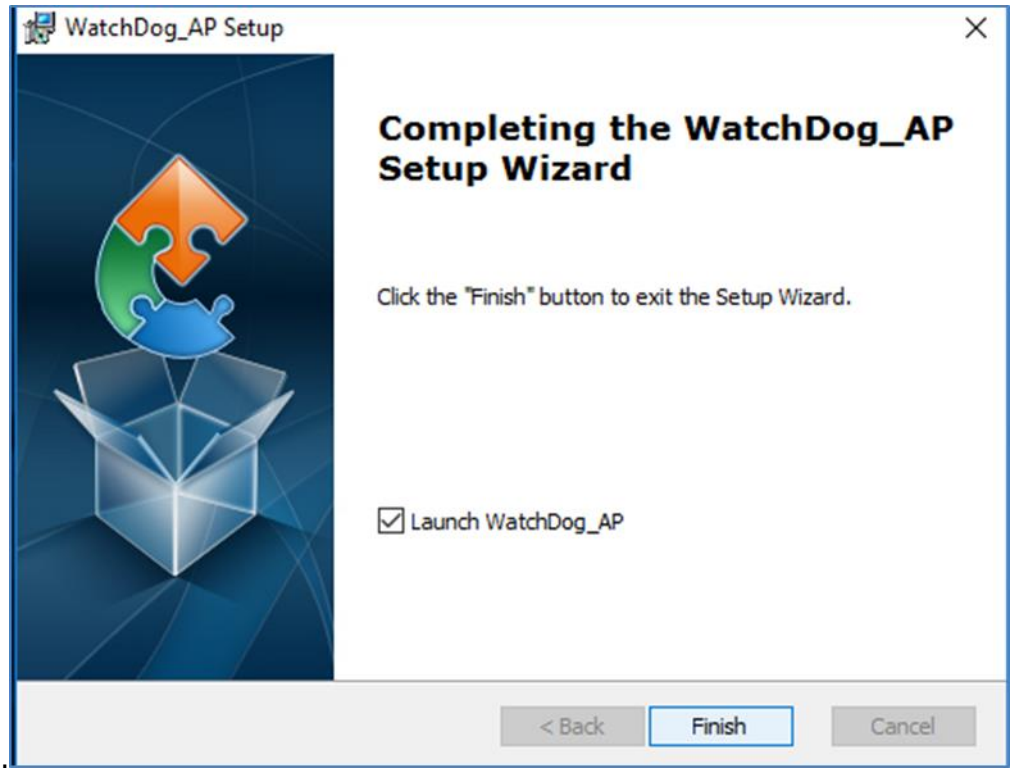
8. The installed storage location is displayed, select **Next** to continue.



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



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

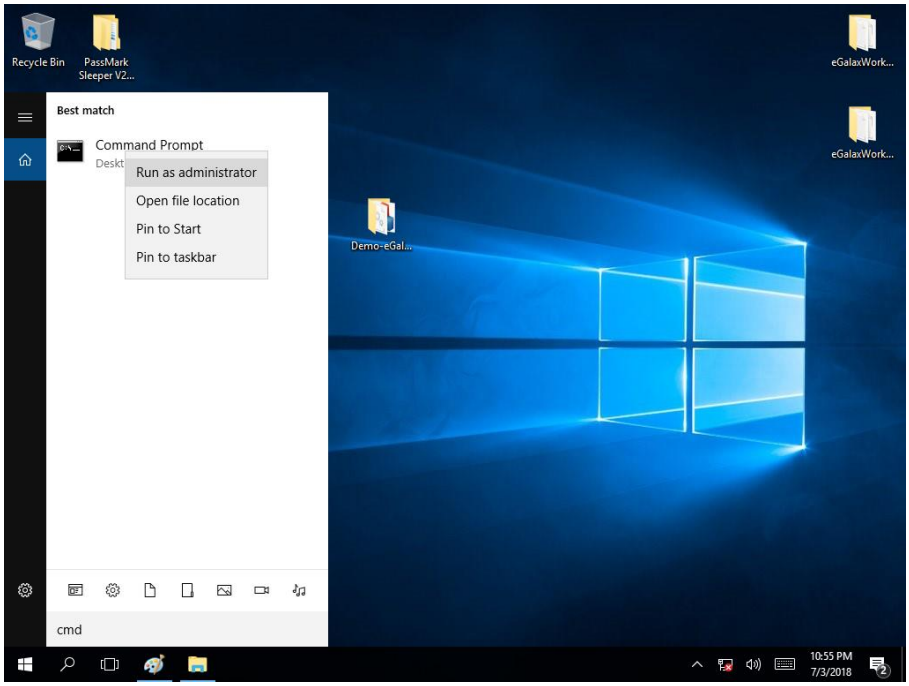


4.7 Digital IO Driver Installation

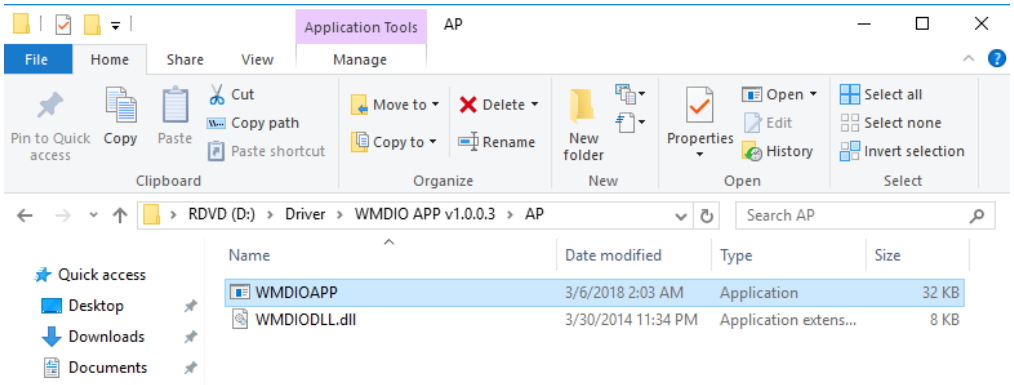
For more details about Winmate Watchdog, please download Digital IO Guide from Winmate Downloads Center.

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 includes the directory for 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.

5.1 Drivers

The list of drivers available for IK32 Motherboard:

Item	Driver
1	Chipset Driver
2	Graphics Driver
3	Audio Driver
4	Ethernet Driver
5	Intel® Management Engine Software
6	Watchdog Driver
7	Digital IO Driver

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

5.2 Software Development Kit (SDK)

The list of SDK available for IK32 Motherboard

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 Winmate Sales team.

5.3 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 the PCI/ PCIe card and CFast 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.

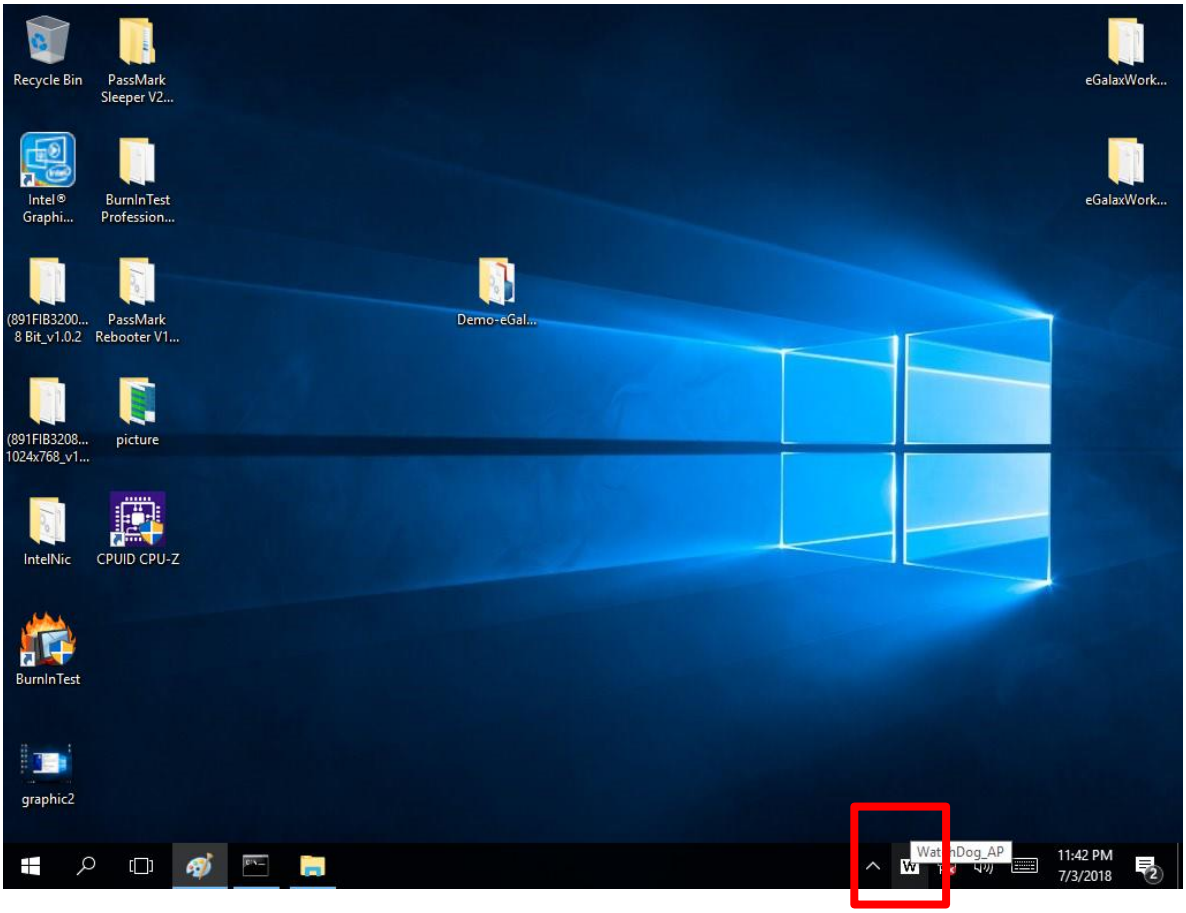
5. Wait the recovery process to complete. During the recovery process, a command prompt will show up to indicate the percent of recovery process complete. After complete the recovery process, the system will be turned off automatically. Please restart your system manually to complete the OS initialize process.

5.4 How to Enable Watchdog

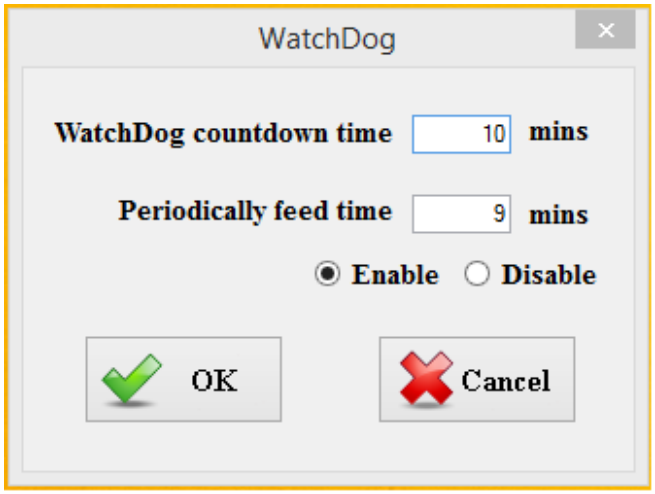
To enable Watchdog, you need to download Winmate Watchdog utility. Find more information on Watchdog in “Watchdog Guide” that you can download from Winmate Download Center or File Share. Refer to the User Manual for more details.

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. Click 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*

Note

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