VIKING-9XXB Series

12.1”/19”/24” Intel 8th Core i3/i5 Marine Panel PC

User Manual

Release Date	Revision
Jan 2024	V1.0

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Revision History

Reversion	Date	Description
1.0	2024/01/05	Official Version

Warning!_____

This equipment generates, uses and can radiate radio frequency energy and if not installed and used in accordance with the instructions manual, it may cause interference to radio communications. It has been tested and found to comply with the limits for a Class A computing device pursuant to FCC Rules, which are designed to provide reasonable protection against such interference when operated in a commercial environment. Operation of this equipment in a residential area is likely to cause interference in which case the user at his own expense will be required to take whatever measures may be required to correct the interference.

Electric Shock Hazard – Do not operate the machine with its back cover removed. There are dangerous high voltages inside.

Caution

Risk of explosion if the battery is replaced with an incorrect type.
Batteries should be recycled where possible. Disposal of used batteries must be in accordance with local environmental regulations.

Packing List

Accessories (as ticked) included in this package are:
☐ Adaptor ☐ Driver & manual CD disc ☐ Other._____(please specify)

Safety Precautions

Follow the messages below to prevent your systems from damage:

- Avoid your system from static electricity on all occasions.
- Prevent electric shock. Don‘t touch any components of this card when the card is power-on. Always disconnect power when the system is not in use.
- Disconnect power when you change any hardware devices. For instance, when you connect a jumper or install any cards, a surge of power may damage the electronic components or the whole system.

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1.1 Features

- Intel® Core 8th Gen i3/i5 Processor
- 12.1”/19”/24” TFT LCD
- Aluminum Enclosure (with Anti-Corrosion Coating)
- True Flat Bezel Design
- IP66 Front Panel
- 1 x 260pin SO-DIMM, up to 32GB DDR4 2400MHz
- 24V DC Power Input, isolated
- Meet CE/FCC/ IEC 60945

1.2 Specifications

	VIKING-912BP/R(H)	VIKINGTAM-919BP/R(H)	VIKING-924BP(H)
System			
CPU	Intel 8th Gen. Core i5-8365UE Processor(4C/8T, up to 1.60 GHz, 15W TDP) Intel 8th Gen. Core i3-8145UE Processor(2C/4T, up to 2.20 GHz, 15W TDP)		
Chipset	SoC		
Memory	1 x 260-pin SO-DIMM up to 32GB DDR4 2400MHz		
LVDS	18bit/24bit LVDS support		
Outside IO Port – Front I/O			
LED	1 x Power System LED (with Power Button ON/OFF)		
Buzzer	1		
Dimming Control	0.1%~100%		
OSD Keypad	5-Keys OSD Capacitive Touch at front		
Outside IO Port—Rear I/O			
USB	4 x USB3.0 type A		
Serial/Parallel	1 x RS-232 (COM1, 5 pin terminal block) 1 x RS-232/422/485 selectable (default RS-485) (COM2, 5pin terminal block, mode select by BIOS setup.)		
Display Port	1 x DP		
Audio	1 x Line-out, phone jack		
LAN	2 x GbE RJ-45		
Power	1 x 2Pin terminal block connector (for remote power switch) 1 x 3pin terminal block connector		

ESD	1 x ESD Ground		
Storage Space			
Storage	Default 1 x M.2 M-Key support 2242 SSD (2280 for option, can't use TB-528 at the same time) 1 x 2.5" HDD space (Option)		
Expansion			
Expansion Slot	1 x Full-size mPCIe slot onboard 1 x TB-528 expansion connector (CN3, for 19"/24") (option TB-528C2I for 2 x RS-422/485 isolation)		
Display – Standard LCD			
Display Type	12.1" TFT LCD	19" TFT LCD	24" TFT LCD
Max. Resolution	1024 x 768	1280 x 1024	1920 x 1080
Max. Color	16.7M	16.7M	16.7M
Luminance (cd/m^2)	500	350	300
Contrast Ratio	1000:1	1000:1	3000:1
Viewing Angle(H/V)	178/178	170/160	178/178
Backlight Lifetime	30,000hrs	50,000hrs	50,000hrs
Option	Optical bonding		
Display – High Brightness LCD (option)			
Display Type	12.1" TFT LCD	19" TFT LCD	24" TFT LCD
Max. Resolution	1024 x 768	1280 x 1024	1920 x 1080
Max. Color	16.7M	16.7M	16.7M
Luminance (cd/m^2)	1000	1000	1000
Contrast Ratio	3000:1	1000:1	5000:1
Viewing Angle(H/V)	176/176	170/160	178/178
Backlight Lifetime	70,000hrs	50,000hrs	50,000hrs
Option	Optical bonding		
Touch Screen			
Type	Projected capacitive touch screen		
Interface	USB		
Light Transmission	Projected capacitive touch screen: over 90%		
Power			
Power Input	DC 24V/ 1 x 3pin terminal block connector by TB-323 (option AC 90~264V in)		
Power Consumption	MAX: 50.88W-912BH	MAX: 52.85W-919BH	MAX: 69.94W-924BH
Mechanical			

Construction	Black/Aluminum bezel and Aluminum housing (Anti-corrosion coating)		
Mounting	Panel Mount/VESA mount		
IP Rating	IP66/IP69K		
Dimension (mm)	307 x 246 x 73.5	439 x 396 x 76.3	609 x 400 x 76.3
Net Weight	4.07 Kg	7.15 Kg	8.88 Kg
Environmental			
Operating temperature	0~50°C (-20~60°C for option)		
Storage temperature	-30~70°C		
Storage humidity	10 to 90% @ 40°C, non- condensing		
Certification	Meet CE / FCC Class B / IEC 60945		
IP Rating	Front Panel IP66 Design for Panel Mount		
Operating System Support	Windows 10 IoT ENT LTSC, Windows 11/Ubuntu 20.04		

1.3 Dimensions

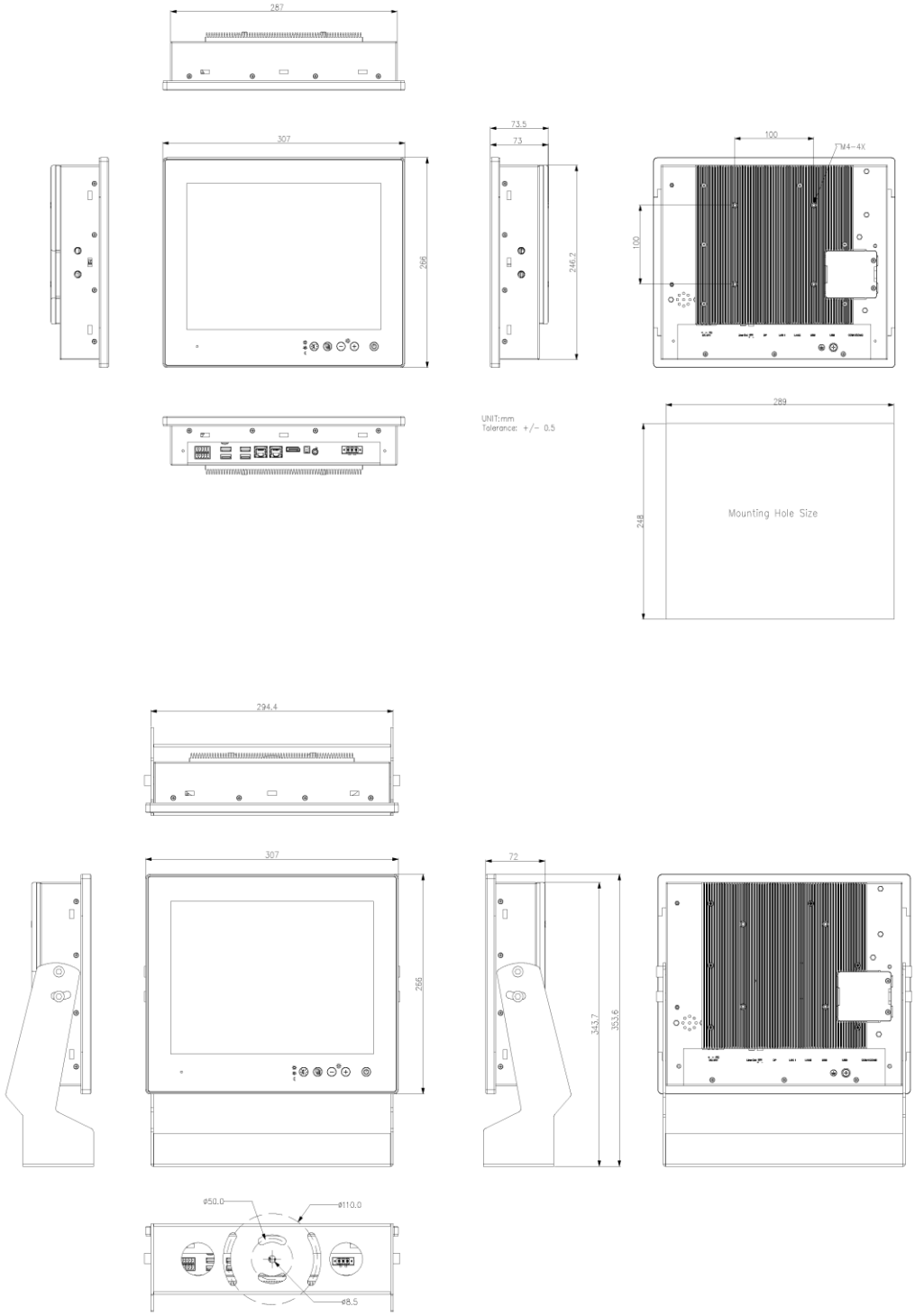


Figure 1.1: Dimensions of VIKING-912BP(H)

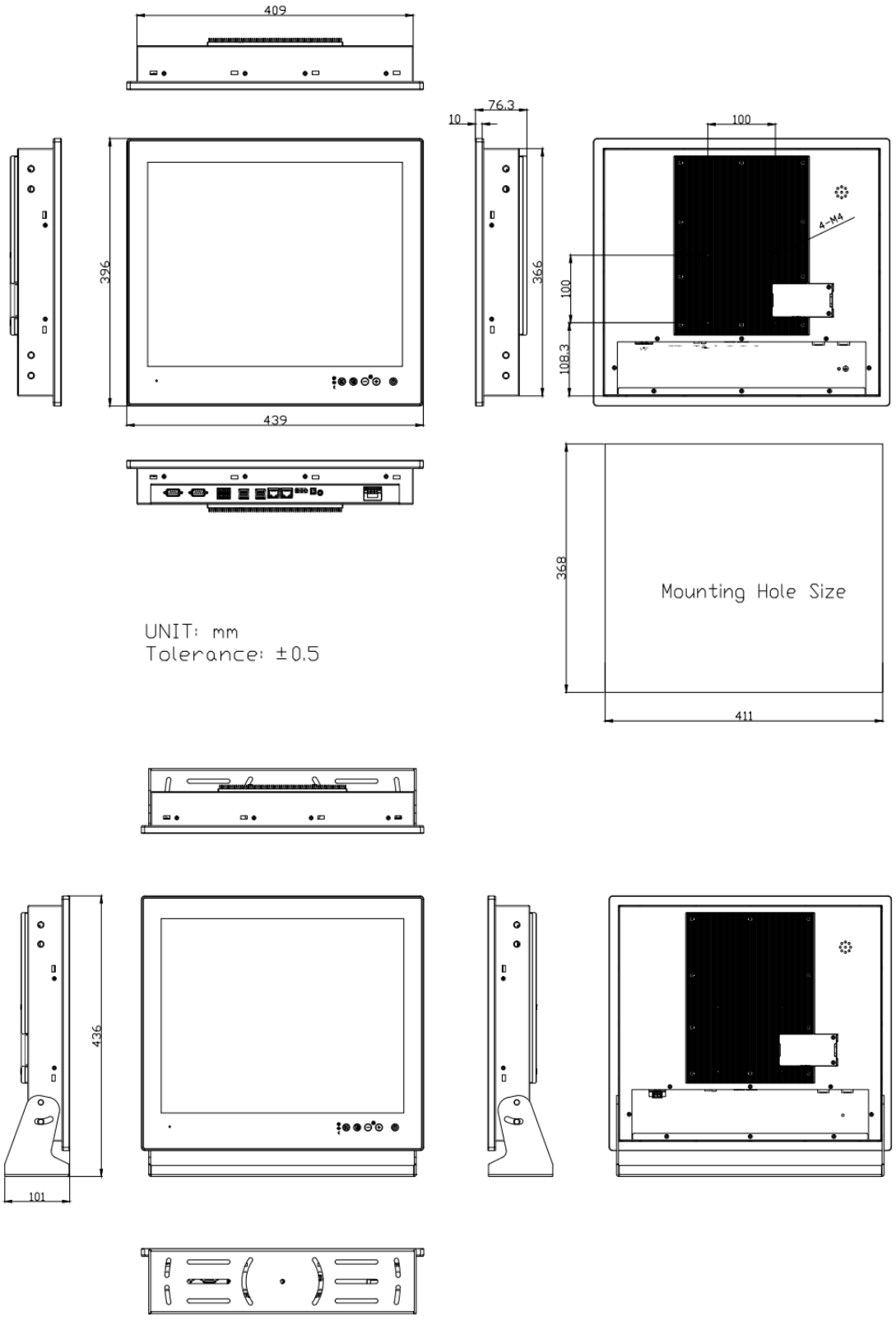


Figure 1.2: Dimensions of VIKING-919BP(H)

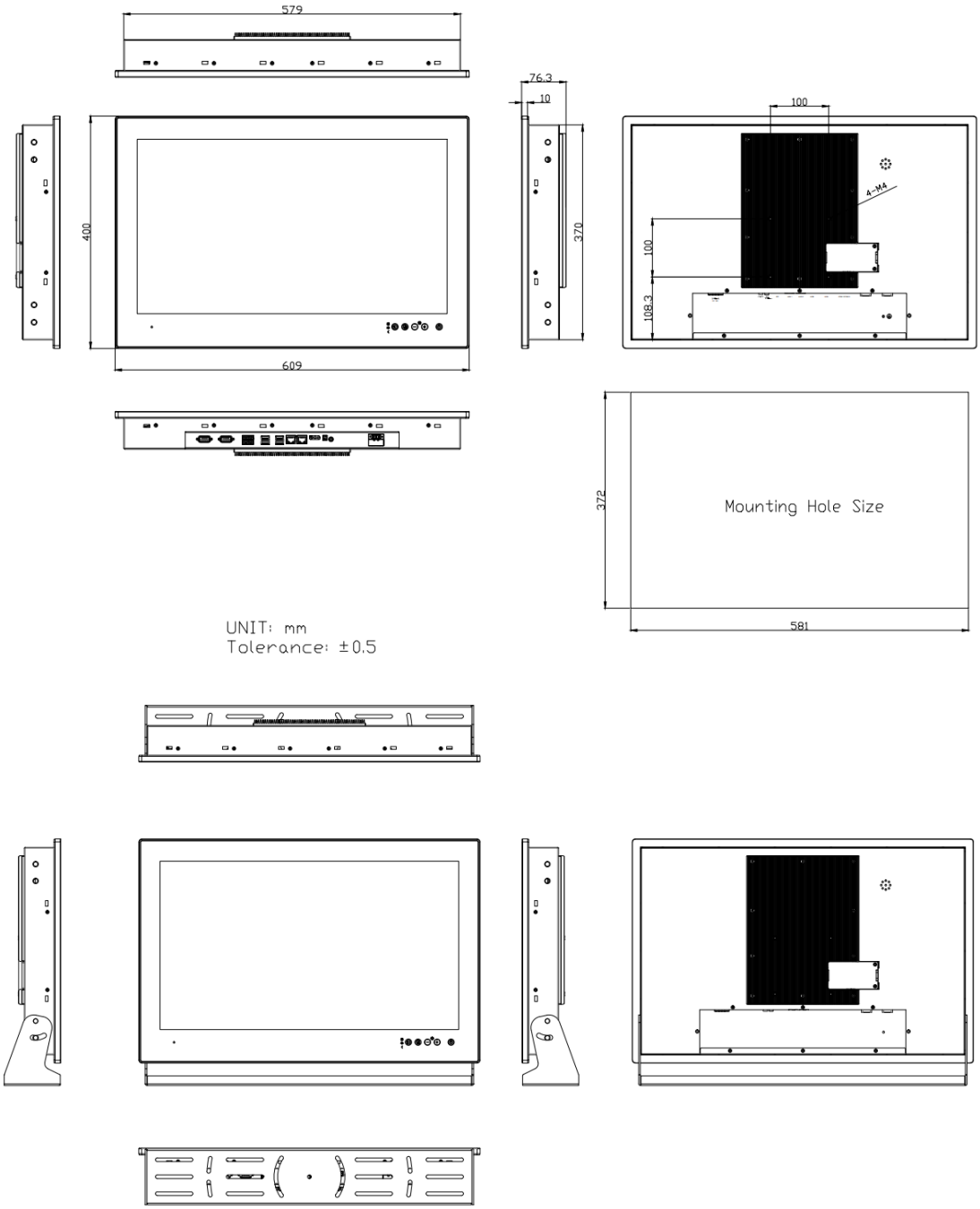


Figure 1.3: Dimensions of VIKING-924BP(H)

1.4 Brief Description of VIKING-9XXB Series

There are 12.1”, 19” and 24” new generation adopt Black/Aluminum bezel and Aluminum housing panel PC in VIKING-9XXB series, which comes with 100% dust and waterproof guarantee, and the all-in-one fanless design. It is powered by 8th Gen. Intel Core i3-8145UE/i5-8365UE processor, 1 x 260-pin SO-DIMM up to 32GB DDR4 2400MHz memory, 1 x 2.5” HDD space and 1 x M.2 M-Key 2242 space for storage. VIKING-9XXB series is DC24V power input and IP66/IP69K rated with M12 connectors. Furthermore, the models support resistive touch and projected capacitive touch for option, and can be high brightness LCD and optical bonding designed for option. It supports touch on/off button on the side edge for hygienic cleaning and ergonomic versatile mounting: Yoke mounting and space-saving VESA mounting.

Figure 1.4: Front View VIKING-912B

Figure 1.5: Rear View of VIKING-912B

Figure 1.6: Front View VIKING-919B

Figure 1.7: Rear View of VIKING-919B

Figure 1.8: Front View VIKING-924B

Figure 1.9: Rear View of VIKING-924B

1.5 Panel Mount and VESA Mount

The VIKING-9XXB Series model can be Panel mounted and VESA mounted as shown in Picture below.

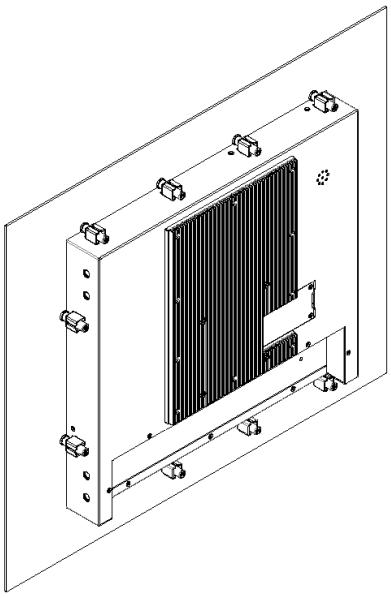


Figure 1.9: Panel mount of VIKING-9XXB Series

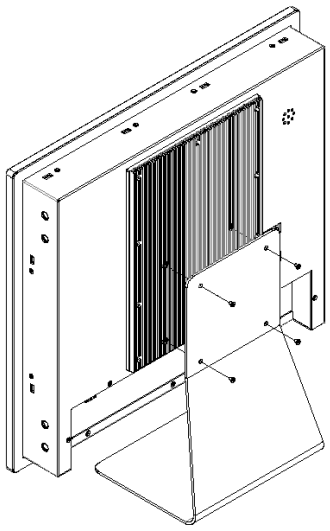


Figure 1.10: VESA mount of VIKING-9XXB Series

Chapter 2 Hardware

2.1 Motherboard Introduction

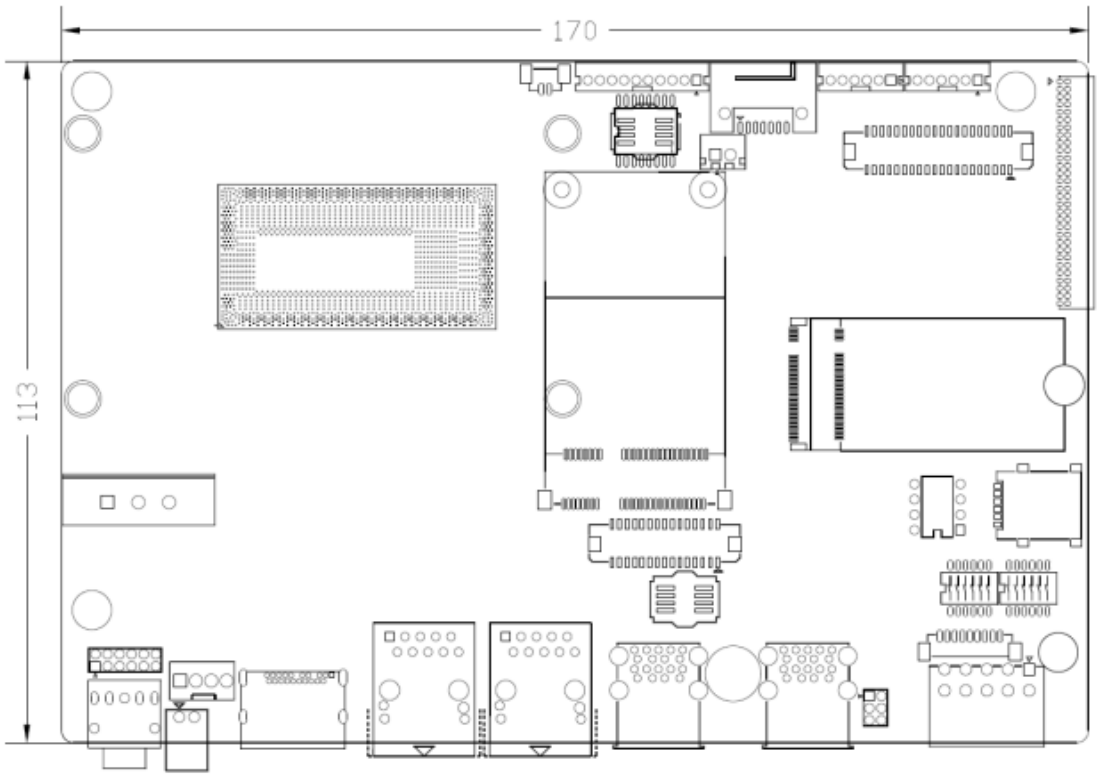
SBC-7124 is a 4” industrial motherboard developed on the basis of Intel Whiskey Lake-U Processor, which provides abundant peripheral interfaces to meet the needs of different customers. Also, it features dual GbE ports, 6xCOM ports and one M.2 M-Key configuration, one DP Port and one LVDS interface. To satisfy the special needs of high-end customers, CN1 and CN2 and CN3 richer extension functions, the product is widely used in various sectors of industrial control.

2.2 Specifications & Dimensions

Specifications	
Board Size	170mm x 113mm
CPU Support	Intel® Core™ i3-8145UE (2.20GHz, up to 3.90GHz) Intel® Core™ i5-8365UE (1.60GHz, up to 4.10GHz) (option)
Chipset	SOC
Memory Support	1 x SO-DIMM (260 pins), up to 32GB DDR4 2400MHz FSB (i3-8145UE/i5-8365UE)
Graphics	Intel® UHD Graphics 620 (i3-8145UE/i5-8365UE)
Display Mode	1 x LVDS (18/24-bit dual LVDS) 1 x DP Port
Support Resolution	Up to 4096 x 2304 for DP1 Up to 1920 x 1200 for LVDS (PS8625)
Dual Display	LVDS + DP1
Super I/O	Nuvoton NCT6106D
BIOS	AMI/UEFI
Storage	1 x SATAIII Connector (7Pin) 1 x M.2 M-Key (PCIex4/SATAIII Auto Detect), Support 2242 NVME SSD
USB	4 x USB 3.2 Gen1 (Type A) Stack Ports (USB3_1/USB3_2) (USB3.2:USB3-1/USB3-2/USB3_3/USB3_4, USB2.0:USB1/2/3/4) 2 x USB 2.0 Pin header for CN3 (USB5/USB6)

	1 x USB 2.0 Pin header for CN1 (USB7) 1 x USB 2.0 Pin header for CN2 (USB8) 1 x USB 2.0 for M-PCIE1 (USB9) 1 x USB 2.0 for PM6000 (USB10)
Serial	1 x PH3y.50mm, 2*5Pin Connectors for external (COM1_1) 1 x RS232 port, Pin1 w/5V/12~14VRTS select (COM1_1-1) 1 x RS232/RS422/RS485 port (COM1_1-2) 2 x UART for CN3 (COM3, COM4) 2 x RS422/485 header for CN2 (COM5/COM6)
Digital I/O	8-bit digital I/O (CN2) 4-bit digital Input 4-bit digital Output 4-bit digital I/O (CN3) 2-bit digital Input 2-bit digital Output
Battery	Support CR2477 Li Battery by 2-pin header
Smart Battery	1 x Smart Battery Support 3 Serial Li battery by 10-pin header (BAT2)
Audio	Support Audio via Realtek ALC888S-VD2 audio codec Support Line-out by JACK (LINE_OUT1) Support Line-in, Line-out, MIC by 2x6-pin header (F_AUDIO1)
Expansion Bus	1 x mini-PCI-express slot for M-PCIE1 1 x PCI-express for CN3
Touch Ctrl	1 x Touch ctrl header for TCH1 (USB10)
Power Management	Wide Range DC+9V~36V 1 x 3-pin power input connector
Switches and LED Indicators	1 x Power on/off switch (BT1/CN2/CN3) 1 x Reset (CN2) 1 x HDD LED status (CN2) 1 x Power LED status (CN1) 1 x Buzzer
External I/O port	1 x COM Ports (COM1_1-1/COM1_1-2) 4 x USB 3.2 Gen 1 Ports (stack) 2 x RJ45 GbE LAN Ports

	1 x DP Port 1 x Audio Jack (Line out)
TPM	Infineon's Trusted Platform Module (TPM 2.0) ***Note: Only support Windows 10 IOT***
Temperature	Operating: -20℃ to 70℃ Storage: -40℃ to 85℃
Humidity	10% - 90% relatively, non-condensing, operating
Power Consumption	24V/1.6A (Intel i3-8145UE Processor with 16GB DDR4/HDD) 24V/2.0A (Intel i5-8365UE Processor with 16GB DDR4/HDD)
EMI/EMS	Meet CE/FCC class A



(Unit: mm)

Figure 2.1: Motherboard Dimensions

2.3 Jumpers and Connectors Location

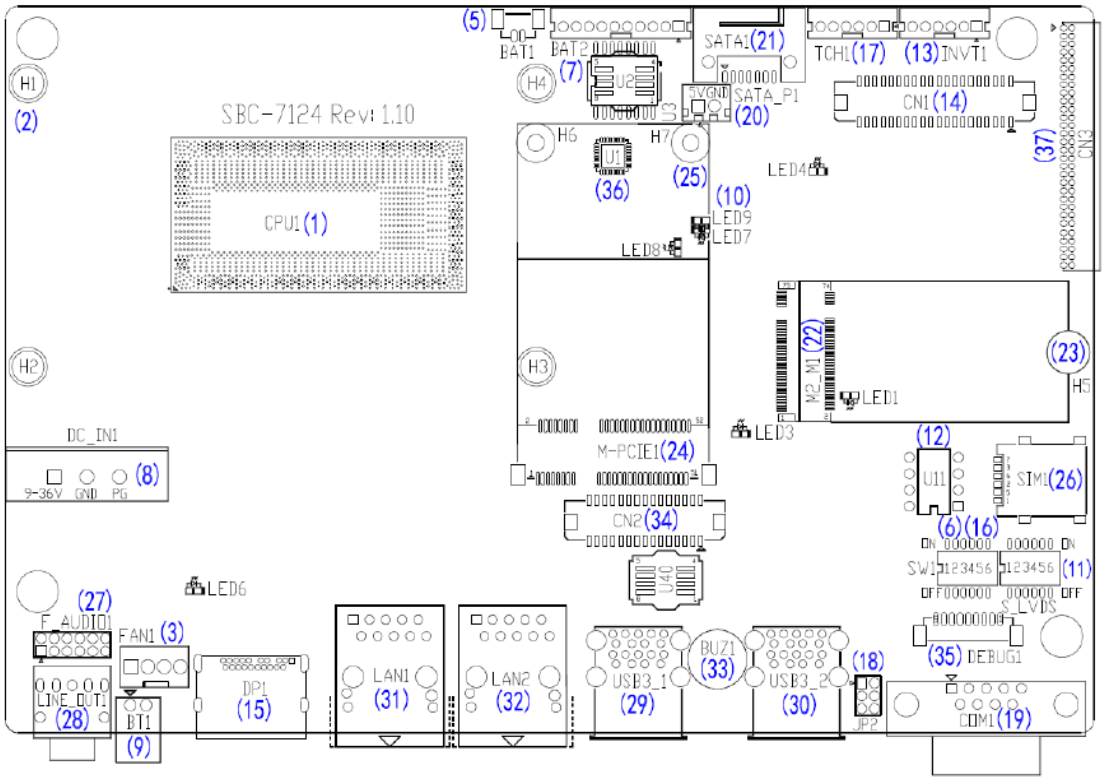


Figure 2.2: Jumpers and Connectors Location- Board Top

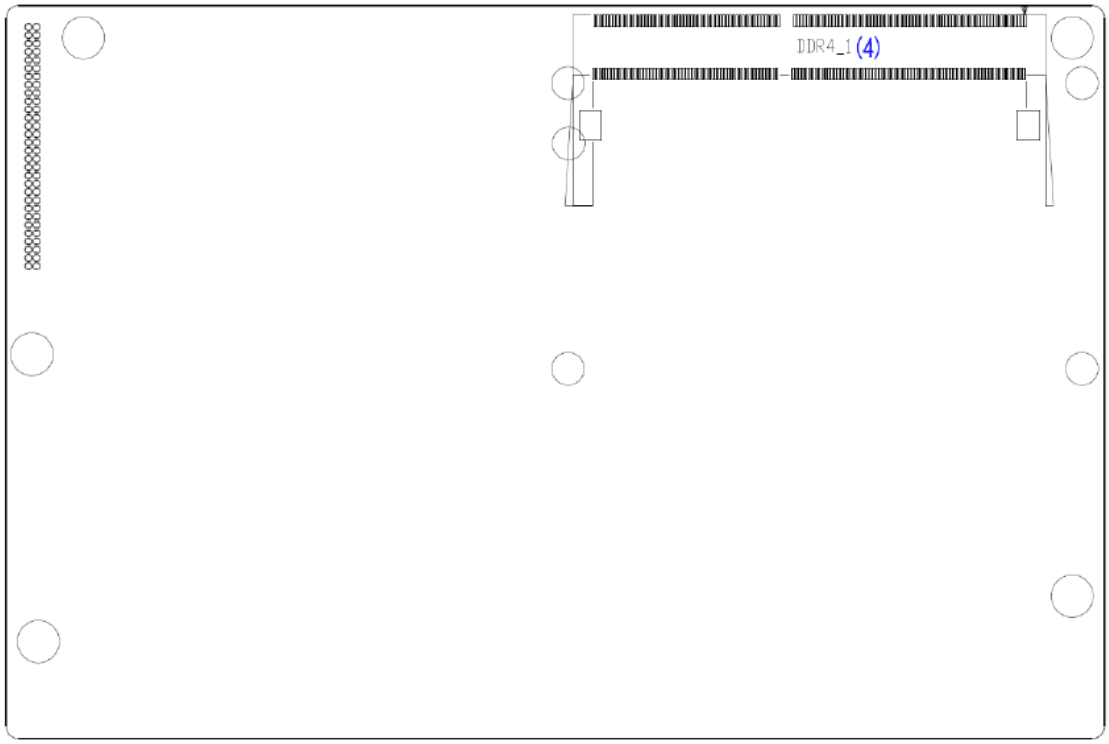


Figure 2.3: Jumpers and Connectors Location- Board Bottom

2.4 Jumpers Setting and Connectors

1. CPU1:

(FCBGA1528), onboard Intel Whiskey Lake-UE Processors.

Model	Processor						
	Number	PBF	Cores/ Threads	TDP	Embedded	Intel VPro	Remarks
SBC-7124-I3-8145UE	I3-8145UE	2.20 up to 3.90GHz	2/4	12.5W 25W	●	-	
SBC-7124-I5-8365UE	I5-8365UE	1.60 up to 4.10GHz	4/8	12.5W 25W	●	●	option
SBC-7124-I7-8665UE	I7-8665UE	1.70 up to 4.40GHz	4/8	12.5W 25W	●	●	option

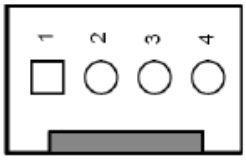
2. H1/H2/H3/H4 (option):

CPU1 Heat Sink Screw holes, four screw holes for Intel Whiskey Lake-UE Processors.

Heat Sink assembles.

3. FAN1:

(2.54mm Pitch 1x4 Pin Header), FAN connector, cooling fans can be connected directly for use. You may set the rotation condition of cooling fan in menu of BIOS CMOS Setup.



Pin#	Signal Name
1	Ground
2	VCC
3	SYS_FANTACH
4	SYS_FANPWM

Note:

Output power of cooling fan must be limited under 5W.

4. DDR4_1:

(SO-DIMM 260Pin slot), DDR4 memory socket, the slot is located at the socket of the board and supports 260Pin 1.2V DDR4 2400MHz FSB SO-DIMM memory module up to 32GB.

Model	DDR4 Memory Types (FSB)
SBC-7124-I3-8145UE	2400MHz
SBC-7124-I5-8365UE	2400MHz

5. BAT1:

(1.25mm Pitch 1x2 Wafer Pin Header, SMD) 3.0V Li battery is embedded to provide power for CMOS. CMOS clear operation will permanently reset old BIOS settings to factory defults.

Pin#	Signal Name
Pin1	Ground
Pin2	VBAT

6. SW1 (PIN1, PIN2, PIN3, PIN6):

SW1-6(Switch), ATX Power and Auto Power on jumper setting.

SW1 (Switch)	Mode
Pin6 (Off)	ATX Power
Pin6 (On)	**Auto Power on (Default)**

SW1-1(Switch), POE or DCIN input setting.

SW1 (Switch)	DC_IN1	BAT2 (PoE)
Pin1 (Off, Default)	●	-
Pin1 (On)	-	●

SW1-2, SW1-3 (Switch), CMOS clear switch, CMOS clear operation will permanently reset old BIOS setting to factory defaults.

SW1	CMOS
Pin2 (Off)	NORMAL (Default)
Pin2 (On)	Clear CMOS
Pin3 (Off)	NORMAL (Default)
Pin3 (On)	Clear CMOS


Procedures of CMOS clear:

a) Turn off the system and unplug the power cord from the power outlet.
b) To clear the CMOS settings, use the switch to Pin2 on for about 3 seconds then move the switch Pin2 and Pin3 off.

c) Power on the system again.
d) When entering the POST screen, press the <DEL> key to enter CMOS Setup Utility to load optimal defaults.
e) After the above operations, save changes and exit BIOS Setup.

7. BAT2:

(2.0mm Pitch 1x10 Wafer Pin Header), Smart battery Interface

Pin#	Signal Name
Pin1	VCC_BAT1
Pin2	VCC_BAT1
Pin3	VCC_BAT1
Pin4	SMB_DAT_SW
Pin5	SMB_CLK_SW
Pin6	BAT1_TEMP
Pin7	Ground
Pin8	Ground
Pin9	Ground
Pin10	NC

Function	Specifications
Nominal voltage (3S1P)	11.1~12.6V
Charge voltage	12.6V
Charge current	0.5C

8. DC_IN1:

(5.08mm Pitch 1x3 Pin Connector), DC9V~36V Sustem power input connector.

Pin#	Power Input
Pin1	DC_IN+ (DC+9V~36V)
Pin2	DC_IN- (Ground)
Pin3	FG

Model	DC_IN1
SBC-7124-I3-8145UE	180^{o} Connector
SBC-7124-I5-8365UE	180^{o} Connector
SBC-7124-I7-8665UE	180^{o} Connector

Connector	Power input
DC_IN1 (Default)	DC_IN1

BAT2 (option)	BAT2
DC_IN1 + BAT2 (option)	DC_IN1

9. BT1:

Power on/off button, it is used to connect power switch button. The two pins are disconnected uncer normal condition. You may short them temporarily to realize system startup & shutdown or awaken the system from sleep state.

10. LED1/LED2/LED3/LED4/LED5/LED6/LED7/LED8/LED9:

LED1: LED STATUS. Green LED for M2_M1 Power status.

LED2: LED STATUS. Green LED for PM6000 Power status.

LED3: LED STATUS. Green LED for 3P3V_ALLS_EC Power status.

LED4: LED STATUS. Green LED for PM_S5_OK status.

LED5: LED STATUS. Green LED for PM_PCH_PWROK status.

LED6: LED STATUS. Green LED for H_CATERR status.

LED7: LED STATUS. Green LED for charge Power Good status.

LED8: LED STATUS. Green LED for charge Power Good status.

LED9: LED STATUS. Green LED for charge Complete status.

11. S_LVDS:

(Switch), LVDS jumper setting.

S_LVDS (Switch)	Function (DN1)
Pin1 (ON)	3.3V Level
Pin1 (OFF)	5V Level
Pin2 (ON)	Single channel LVDS
Pin2 (OFF)	Dual channel LVDS
Pin3 (ON)	8/24 bit
Pin3 (OFF)	6/18 bit
Pin4 (ON)	DC Mode
Pin4 (OFF)	PWM Mode
Pin5 (ON)	Enable PS8625
Pin5 (OFF)	Disable PS8625

12. U11:

AT24C02-DIP8, The EEPROM IC(U11) is the set of LVDS resolution. If you need other resolution settings, please upgrade U11 data.

Model	LVDS resolution
SBC-7124-I3-8145UE	1280*1024 (Default)

SBC-7124-I5-8365UE SBC-7124-I7-8665UE	800*480 (option)
	800*600 (option)
	1024*768 (option)
	1920*1080 (option)
	……

13. INVT1:

(2.0mm Pitch 1x6 wafer Pin Header), Backlight control connector for LVDS.

Pin#	Signal Name
1	+DC12V_LVDS
2	+DC12V_LVDS
3	Ground
4	Ground
5	BKLT_EN_OUT
6	BKLT_PWM_OUT

14. CN1:

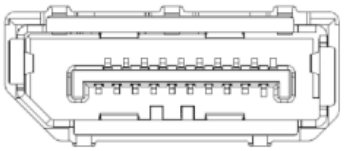
(1.25mm Pitch 2x20 Connectorm DF13-40P), for 18/24-bit LVDS output connector, fully supported by Parad PS8625 (DP to LVDS), the interface features dual channel 24-bit output. Low Voltage Differential Signalling, a high speed, low power data transmission standard used for display connections to LCD panels.

Function	Signal Name	Pin#		Signal Name	Function
LVDS Signal	12V_LVDS	2	1	12V_LVDS	LVDS Signal
	BKLT_EN_OUT	4	3	BKLT_CTRL	
	Ground	6	5	Ground	
	LVDS_VDD5	8	7	LVDS_VDD5	
	LVDS_VDD3	10	9	LVDS_VDD3	
	Ground	12	11	Ground	
	LA_D0_P	14	13	LA_D0_N	
	LA_D1_P	16	15	LA_D1_N	

	LA_D2_P	18	17	LA_D2_N	
	LA_D3_P	20	19	LA_D3_N	
	LA_CLKP	22	21	LA_CLKN	
	LB_D0_P	24	23	LB_D0_N	
	LB_D1_P	26	25	LB_D1_N	
	LB_D2_P	28	27	LB_D2_N	
	LB_D3_P	30	29	LB_D3_N	
	LB_CLKP	32	31	LB_CLKN	
USB7 (option)	Ground	34	33	Ground	
	USB7_P	36	35	USB7_N	
	5V_S5_USB	38	37	5V_S5	
Power LED	PWR_LED+	40	39	Ground	

15. DP1:

(DP Connector), Display Port Interface connector.



16. SW1 (Pin5):

SW1-5 (Switch), Touch jumper setting.

SW1(Switch)	Touch (TCH1)
SW1-5 OFF (Default)	Enable
SW1-5 ON (option)	Disable

17. TCH1:

(2.0mm Pitch 2x3 Pin Header), COM1 jumper setting, pin1~6 is used to select signal out of pin 1 of COM1 port.

Pin#	Signal Name
1	SENSE
2	X+
3	X-
4	Y+
5	Y-
6	GND_EARCH

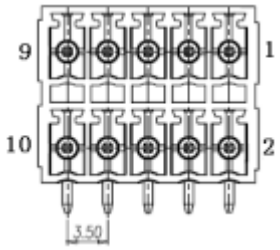
18. JP2:

(2.0mm Pitch 2x3 Pin Header), COM1 jumper setting, pin1~6 is used to select signal out of pin 1 of COM1 port.

JP1 Pin#	Function
Close 1-2	**COM1 Pin1 RTS (Default)**
Close 3-4	COM1 Pin1: DC+5V (option)
Close 5-6	COM1 Pin1: DC+12V~14V (option)

19. COM1:

(3.50mm, 2x5pin connector), Rear serial port, Phoenix connector serial port is provided to make a direct connection to serial devices. COM1 port is controlled by pins No.1~6 of JP2, select output Signal RTS or 5V or 12V~14V, for details, please refer to description of JP2 setting.



Pin#	COM1(RS232)	COM2(RS232)	COM2(RS422)	COM2(RS485)
1	-	-	-	-
2	Ground	Ground	Ground	Ground
3	-	RXD2	422_TX-	485+
4	CTS1-	-	-	-
5	-	DCD2-	422_TX+	485-
6	TXD1	-	-	-
7	-	DTR2-	422_RX-	
8	RXD1	-	-	-
9	-	RXD2	422_TX+	-
10	RTS-/5V/(12~14V)	5V/(12~14V)	5V/(12~14V)	5V/(12~14V)

COM1 BIOS Setup:
Advanced/NCT6106D Super IO Configuration/Serial Port 1 Configuration:【RS-232】
COM2 BIOS Setup:
Advanced/NCT6106D Super IO Configuration/Serial Port 2 Configuration:【RS-232】
Advanced/NCT6106D Super IO Configuration/Serial Port 2 Configuration:【RS-422】
Advanced/NCT6106D Super IO Configuration/Serial Port 2 Configuration:【RS-485】

Caution:

Please Pay attention to pin1 pin definition. The power output might damage your device if is connected to the RTS port.

20. SATA_P1:

(2.5mm Pitch 1x2 box Pin Header), one onboard 5V output connector is reserved to provide power for SATA devices.

Pin#	Signal Name
1	5V_S0 (+DC5V output)
2	Ground

Note:

Output current of the connector must not be above 1A.

21. SATA1:

(SATA 7Pin), SATA Connectors, one SATA connector is proveded, with transfer speed up to 6.0Gb/s.

22. M2_M1:

(NGFF M.2 Socket), NGFF(M.2) M-Key, is located at the top, it supports M.2 M-Key devices with four PCIe or SATA signal, support 2242 size card.

23. H5:

M2_M1 SCREW HOLES, H5 for M2_M1 card assemble.

24. M-PCIE1:

(Socket 52Pin), mini PCIe socket, is located at the top, it supports mini PCIe devices with USB2.0 and SIM and SMBUS signal. MPCIe card size is 30x50.95mm.

Function	Support	Remarks
Mini PCIe (PCIe 13)	●	
SMbus	●	
SIM	●	
USB2.0 (USB9)	●	

25. H7:

M-PCIE1 SCREW HOLES, H7 for mini PCIE card (30mmx50.95mm) assemble.

26. SIM1:

(NANO-SIM Socket), Support nano SIM Card devices.

27. F_AUDIO1:

(2.0mm Pitch 2x6 Pin Header), front audio, an onboard Realtek ALC888C-VD2 codec is used to provide high-quality audio I/O ports. Line Out can be connected to a headphone or amplifier. Line in is used for the connection of external audio source via a Line in cable. MIC is the port for microphone input audio.

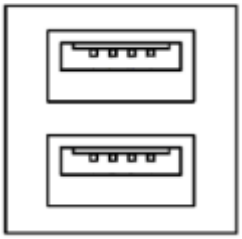
Signal Name	Pin#	Pin#	Signal Name
+5V_F_AUDIO	1	2	GND_AUD
LINE-OUT-L	3	4	LINE-OUT-R
FRONT_JD	5	6	LINE_IN_JD
LINE-IN-L	7	8	LINE-IN-R
MIC-IN-L	9	10	MIC-IN-R
GND_AUD	11	12	MIC1_JD

28. LINE_OUT1:

(Diameter 3.5mm Jack), HD Audio Port, an onboard Realtek ALC888S-VD2 codec is used to provide high quality audio I/O ports. Line out can be connected to a headphone or amplifier.

29. USB3_1:

USB3-1/USB3-2: (Double stack USB type A), rear USB connector, provodes up to two USB3.2 Gen1 ports, High-speed USB2.0 allows data transfer up to 480 Mb/s, USB3.2 Gen1 allows data transfer up to 5.0Gb/s, support USB full-speed and low-speed signaling.

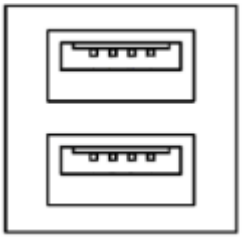


Each USB Type A Receptacle (2 Ports) Current limited value is 2.0A.

If the external USB device current exceeds 1.5A, please separate connectors into different Receptacle.

30. USB3_2:

USB3-3/USB3-4: (Double stack USB type A), rear USB connector, provides up to two USB3.2 Gen1 ports, High-speed USB 2.0 allows data transfer up to 480 Mb/s, USB 3.2 Gen1 allows data transfer up to 5.0Gb/s, support USB full-speed and low-speed signaling.



Each USB Type A Receptacle (2 Ports) Current limited value is 2.0A.

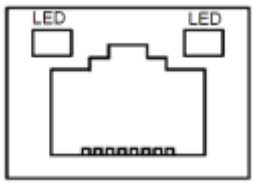
If the external USB device current exceeds 1.5A, please separate connectors into different Receptacle.

31. LAN1:

(RJ45 Connector), Rear LAN port, two standard 10/100/1000M RJ-45 Ethernet ports are provided. Intel I219-LM chipset is used, LINK LED (green) and ACTIVE LED (green or orange) respectively located at the left-hand and right-hand side of the Ethernet port indicate the activity and transmission state iof LAN.

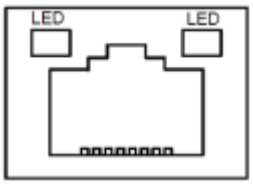
Corporate LAN product with support for Intel® AMT2 technology.

Model	Intel® AMT2 technology
SBC-7124-I3-8145UE	-
SBC-7124-I5-8365UE	●
SBC-7124-I7-8665UE	●



32. LAN2:

(RJ45 Connector), Rear LAN port, two standard 10/100/1000M RJ-45 Ethernet ports are provided. Intel I210AT chipset is used, LINK LED (green) and ACTIVE LED (green or orange) respectively located at the left-hand and right-hand side of the Ethernet port indicate the activity and transmission state iof LAN.



33. BUZ1:

Onboard buzzer

34. CN2:

(DF 13-30P Connector), for expand output connector, it provides eight GPIO, two RS-422 or RS-485, one USB2.0, one Power on/off, one Reset.

Function	Signal Name	Pin#		Signal Name	Function
5V	5V_S5	2	1	5V_S5	5V
SIO_GP31	GPIO_IN2	4	3	GPIO_IN1	SIO_GP30
SIO_GP33	GPIO_IN4	6	5	GPIO_IN3	SIO_GP32
SIO_GP35	GPIO_OUT2	8	7	GPIO_OUT1	SIO_CP34
SIO_CP27	GPIO_OUT4	10	9	GPIO_OUT3	SIO_GP36
	Ground	12	11	Ground	
485 or 422 (COM5)	485+_422TX5+	14	13	485-_422TX5-	485 or 422 (COM5)
	422_RX5+	16	15	422_RX5-	
485 or 422 (COM6)	485+_422TX6+	18	17	485-_422TX6-	485 or 422 (COM6)
	422_RX6+	20	19	422_RX6-	
5V	5V_S0	22	21	HDD_LED+	HDD LED
USB2.0	5V_S5	24	23	5V_S5	USB2.0
	USB8_P	26	25	USB8_N	
Power auto on	Ground	28	27	FP_RST-	RESET
	PWRBTN_ON	30	29	Ground	

COM5 BIOS Setup:
Advanced/NCT6106D Super IO Configuration/Serial Port 5 Configuration:【RS-422】
Advanced/NCT6106D Super IO Configuration/Serial Port 5 Configuration:【RS-485】
COM6 BIOS Setup:
Advanced/NCT6106D Super IO Configuration/Serial Port 6 Configuration:【RS-422】
Advanced/NCT6106D Super IO Configuration/Serial Port 6 Configuration:【RS-485】

35. DEBUG1 (option):

(1.25mm Pitch 1x9 Wafer Pin Header, SMD), Debug Port

Pin#	Signal Name
Pin1	3P3V_S0
Pin2	CLK_24M_SIO
Pin3	PLT_RST_BUF1-
Pin4	Ground
Pin5	LPC_AD0
Pin6	LPC_AD1
Pin7	APC_AD2
Pin8	APC_AD3
Pin9	LPC_FRAME-

36. U1(option):

Infineon's Trusted Platform Module (TPM2.0) SLM9670AQ is a fully standard compliant TPM based on the latest Trusted Computing Group (TCG) specification 2.0.

Note: only support Windows 10 IOT.

Model	U1 (TPM2.0)
SBC-7124-I3-8145UE	●
SBC-7124-I5-8365UE	●
SBC-7124-I7-8665UE	●

37. CN3:

(1.27mm Pitch 2x30 Female Header), for expand output connector, it provides four GPIO, two USB2.0, oneSPI, two UART, one PCIex1, one SMbus, connexts to the TB-528 card series.

Function	Signal Name	Pin#		Signal Name	Function
	5V_S5_USB	1	2	5V_S5_USB	
	5V_S5_USB	3	4	5V_S5_USB	
	USB0506_OC	5	6	PS_ON_ALL-	
USB5	USB5_N	7	8	USB5_P	USB5
USB6	USB6_N	9	10	USB6_P	USB6
	Ground	11	12	Ground	
SPI	PCH_SPI1_CLK	13	14	SPI1_MISO_PCH	SPI
	PCH_SPI1_CS0-	15	16	PCH_SPI1_MOSI	
COM4 (UART)	COM4_RI	17	18	COM4_DCD-	COM4 (UART)
	COM4_TXD	19	20	COM4_RXD	

	COM4_DTR	21	22	COM4_RTS-	
	COM4_DSR	23	24	COM4_CTS-	
	Ground	25	26	Ground	
COM3 (UART)	COM3_RI	27	28	COM3_DCD-	COM3 (UART)
	COM3_TXD	29	30	COM3_RXD	
	COM3_DTR	31	32	COM3_RTS-	
	COM3_DSR	33	34	COM3_CTS-	
	SIO_GP45	35	36	SIO_GP44	
	SIO_GP47	37	38	SIO_GP46	
	Ground	39	40	Ground	
PCIE14	PCIE14_TX_N0	41	42	PCIE14_TX_P0	PCIE14
	PCIE14_RX_N0	43	44	PCIE14_RX_P0	
	Ground	45	46	Ground	
	CLK_100M_PE4_N	47	48	CLK_100M_PE4_P	
	PCIE_WAKE_N	49	50	PLT_RST_BUF2-	
SMBUS	SMB_CLK_S0	51	52	SMB_DATA_S0	SMBUS
PCIE	CLKREQ_PE4	53	54	Ground	
	3P3V_S5	55	56	PWRBTN_ON-	Power Auto on
	3P3V_S5	57	58	3P3V_S5	
12V	12V_S0	59	60	12V_S0	12V

Chapter 3 OSD

3.1 Keypad Control

Item	Description
	Press to turn on the power the system. Press 2 seconds to turn off the power the system. • Green : working state
	Increase LCD brightness • Green is always on
	Decrease LCD brightness • Green is always on
	Programmable (No function, Reserve) • LED is always off
	Swap Brightness mode (Day / Dust / Night mode) • Green is always on

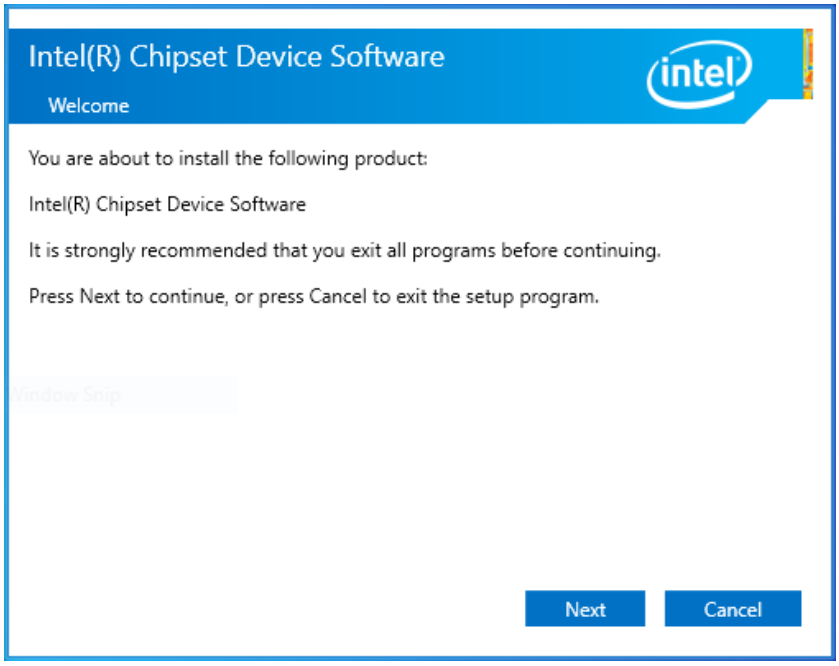
Item	Description
	Lights up when brightness adjusted to Day mode (70% Brightness)
	Lights up when brightness adjusted to Dust mode (50% Brightness)
	Lights up when brightness adjusted to Night mode (30% Brightness)

Chapter 4 Installation of Drivers

4.1 Intel® 8th Generation Core Chipset

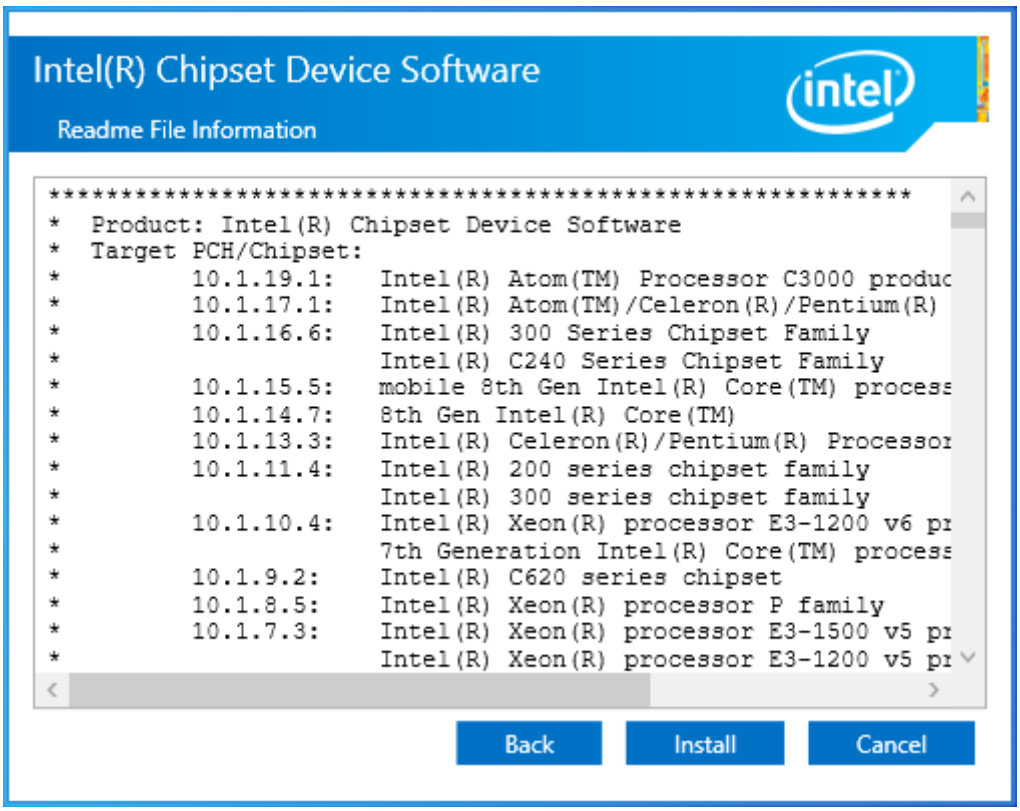
To install the Intel® 8th Generation Core Chipset, please follow the steps below.

Step 1. Here is welcome page. Please make sure you save and exit all programs before install**.** Click **Next.**



Step2. Read the license agreement. Click **Accept** to accept all of the terms of the license agreement.

Step3. Click **Install** to begin the installation.

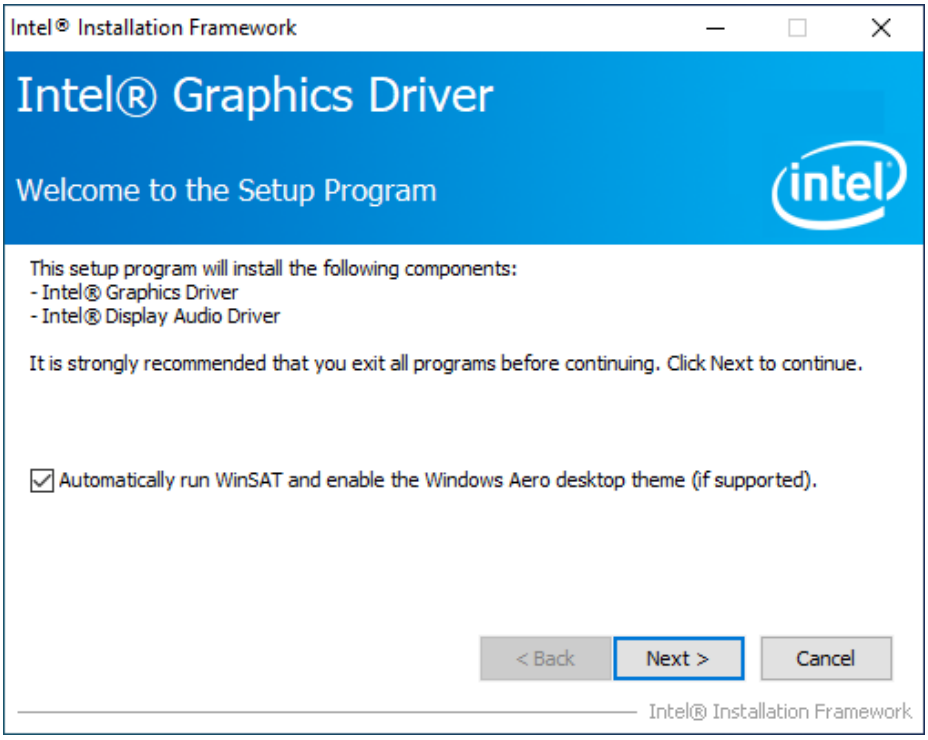


Step4. Select **Restart Now** to reboot your computer for the changes to take effect.

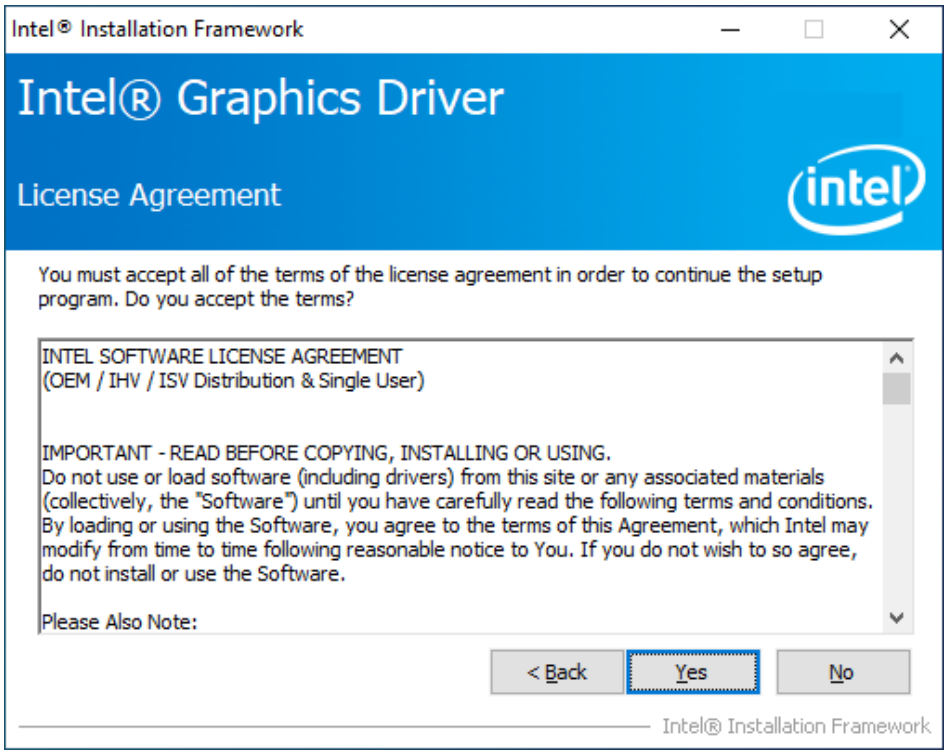
4.2 Intel® VGA Chipset

To install the Intel® VGA Chipset, please follow the steps below.

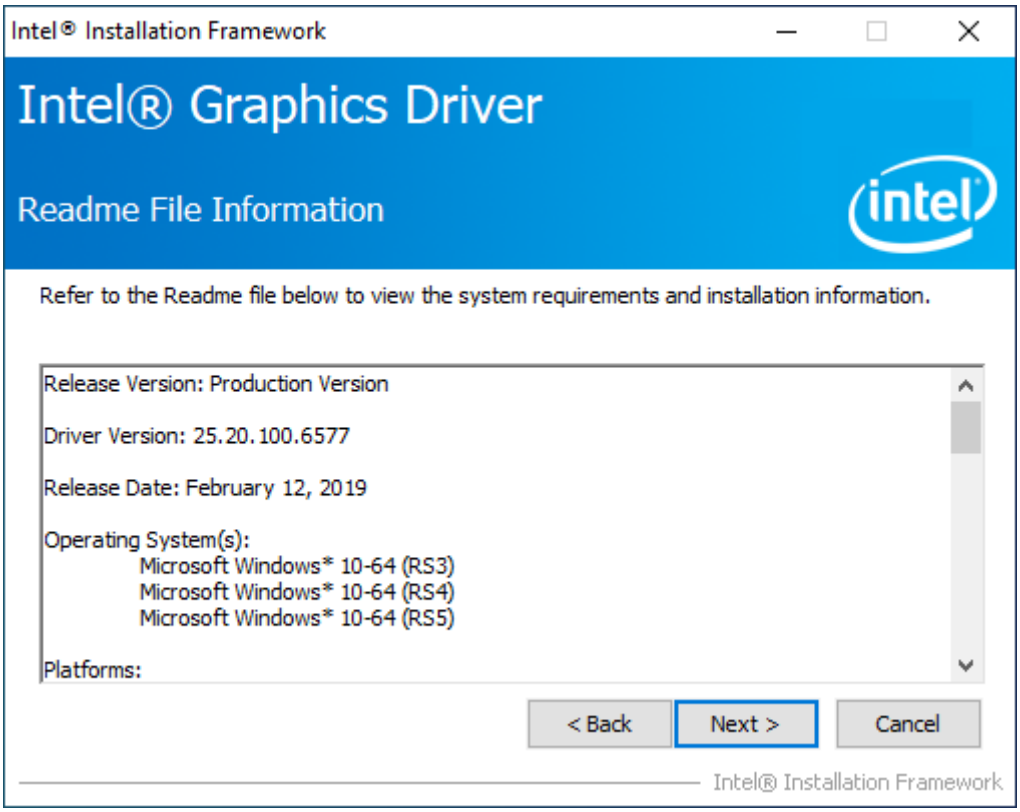
Step1. Click **Next.**



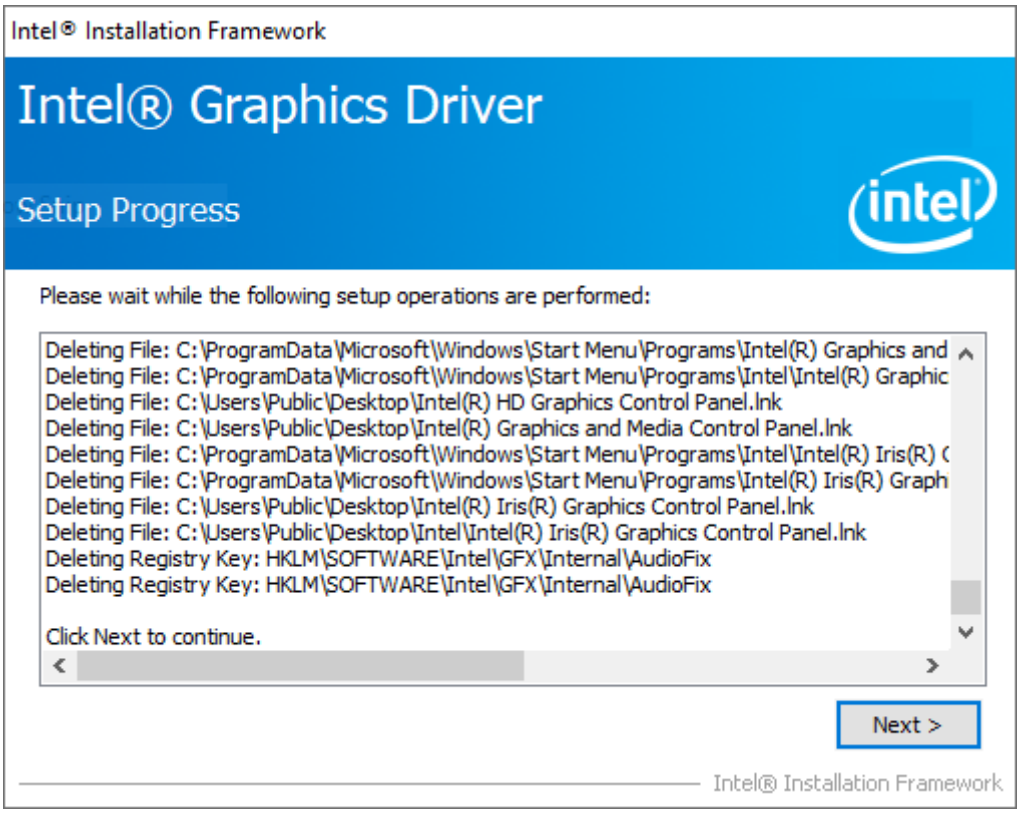
Step2. Read the license agreement. Click **Yes** to accept all of the terms of the license agreement.



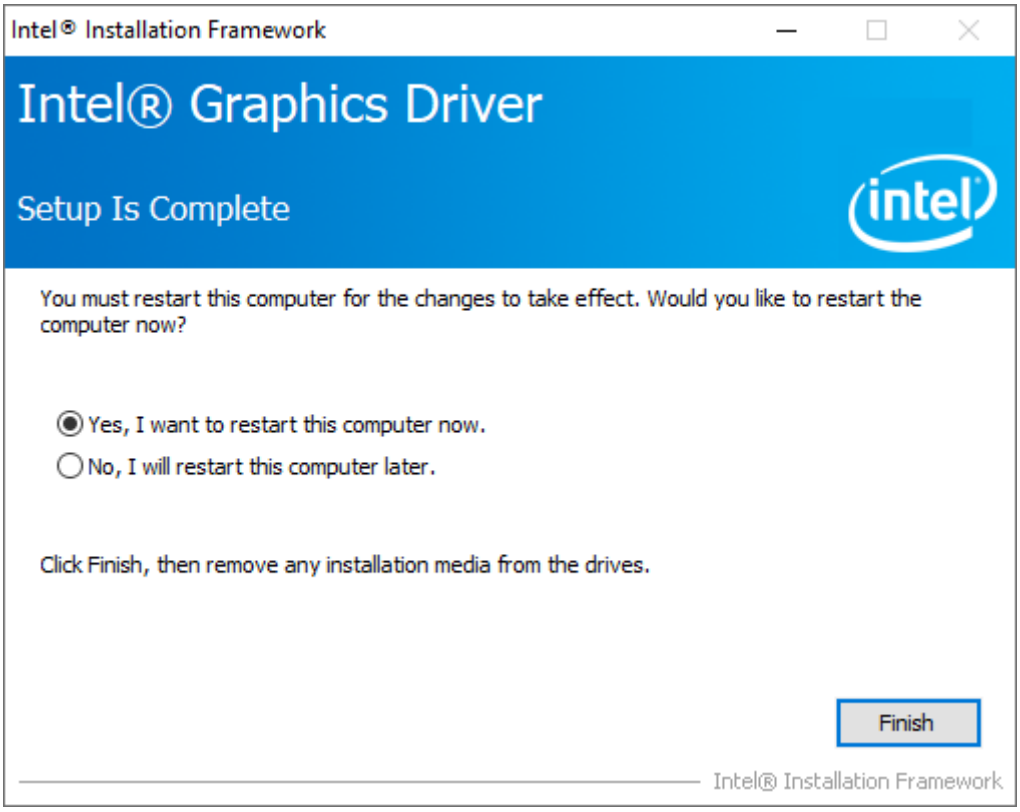
Step3. Click **Next** to continue.



Step4. Click **Next** to continue the program.



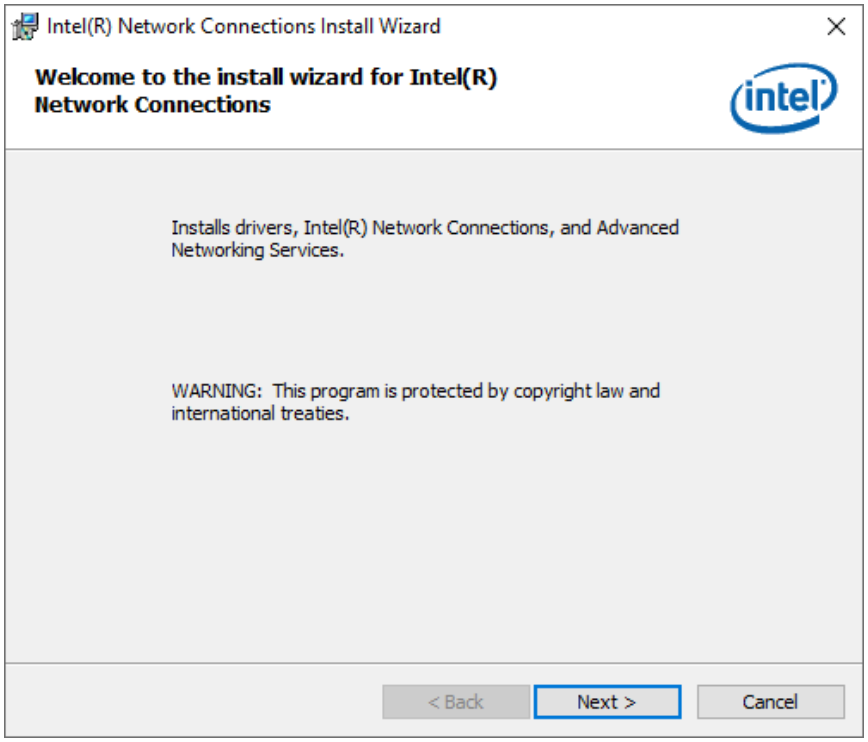
Step5. Select **Yes, I want to restart this computer now**. Click **Finish** to complete installation.



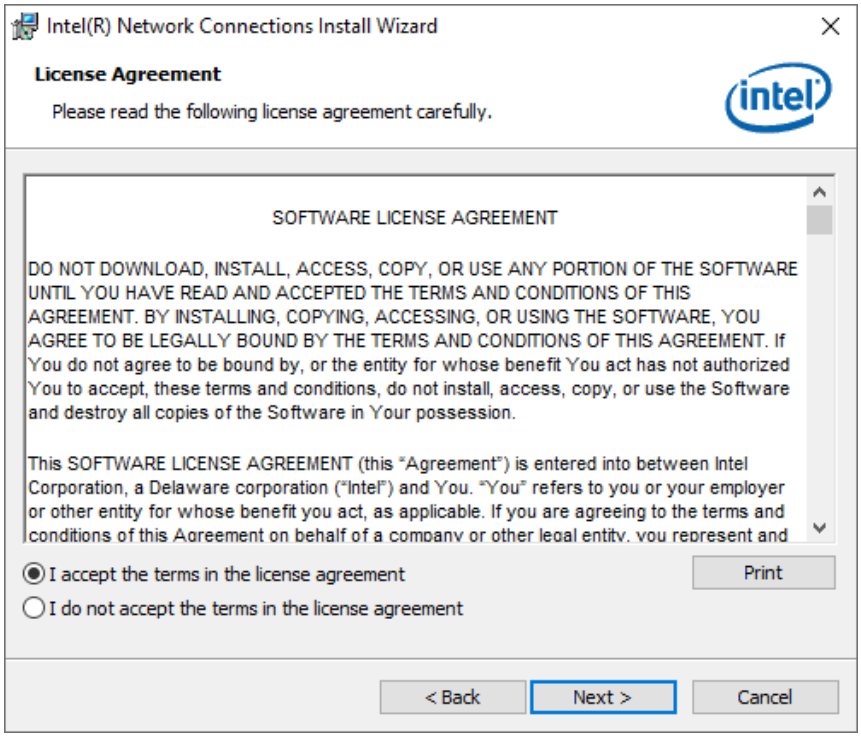
4.3 Intel® LAN Driver

To install the Intel® LAN Driver, please follow the steps below.

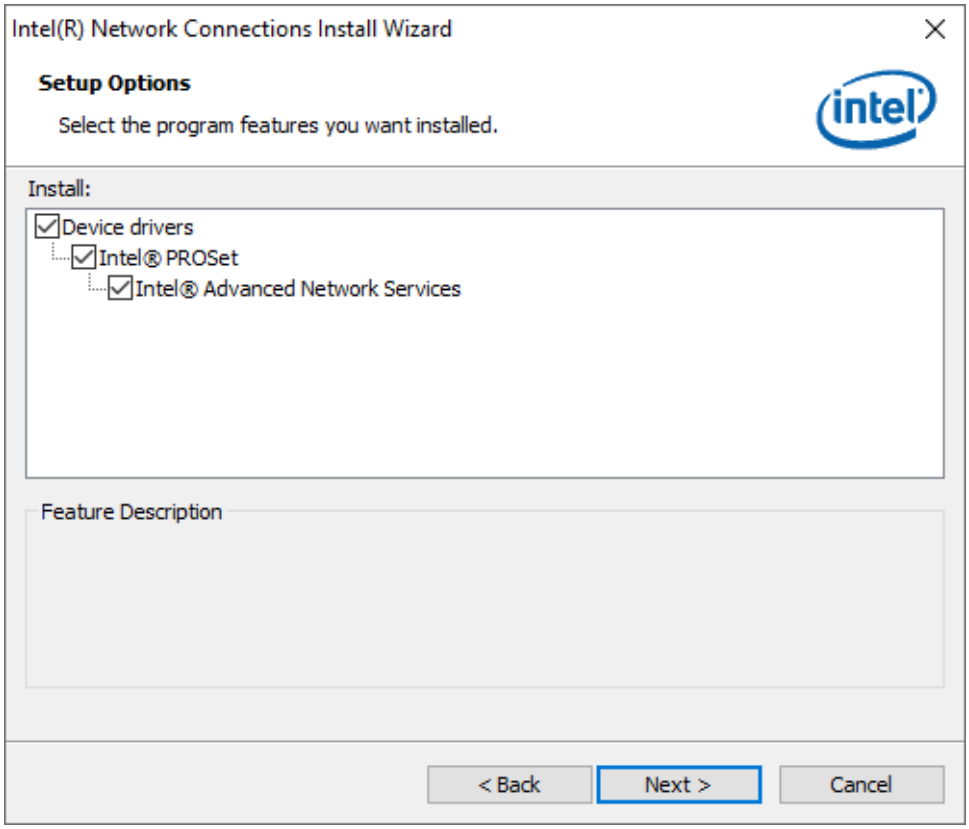
Step1. Click **Next** to continue.



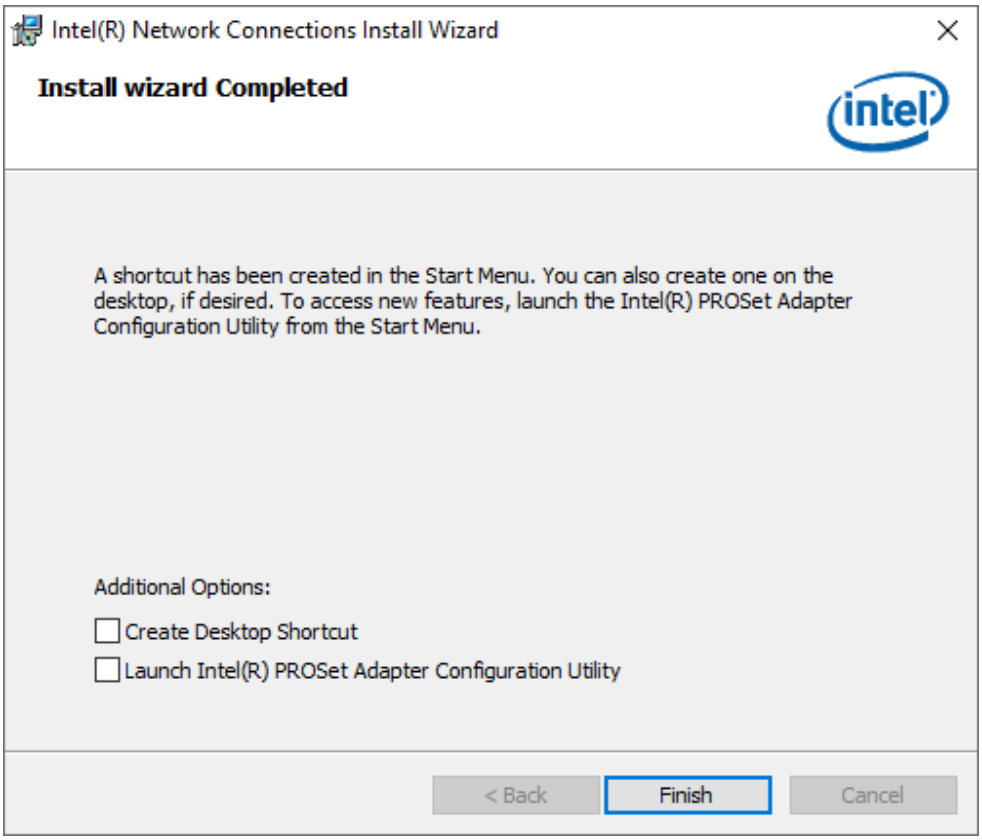
Step2. Read the license agreement. Click **Yes** to accept all the terms of the license agreement.



Step3. Click **Next** to continue.



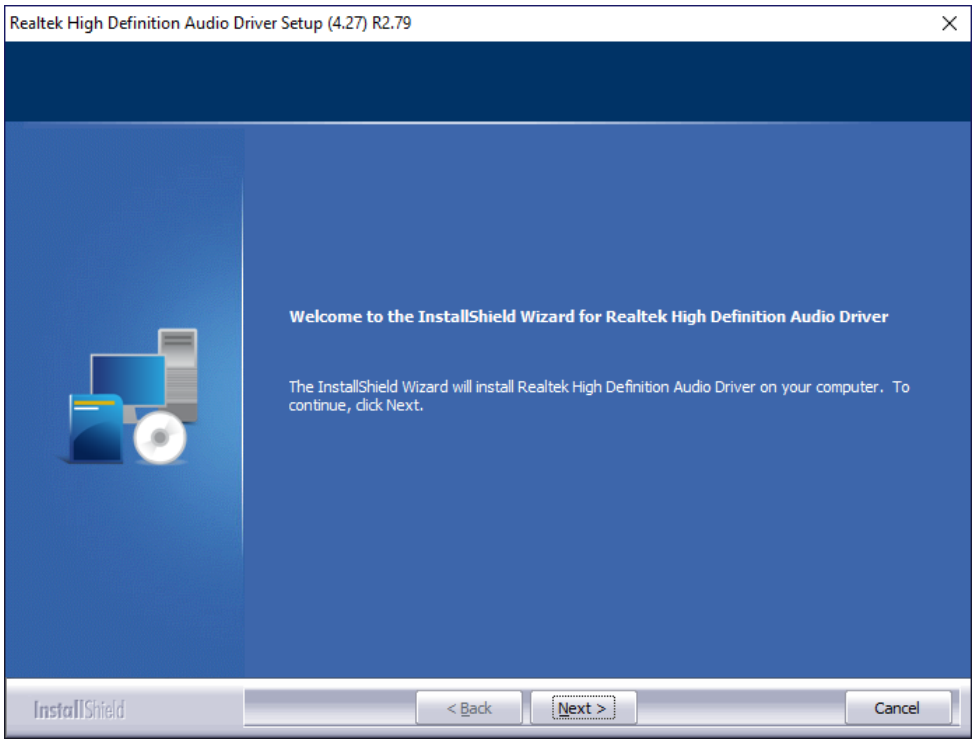
Step4. Click **Finish** to complete the installation.



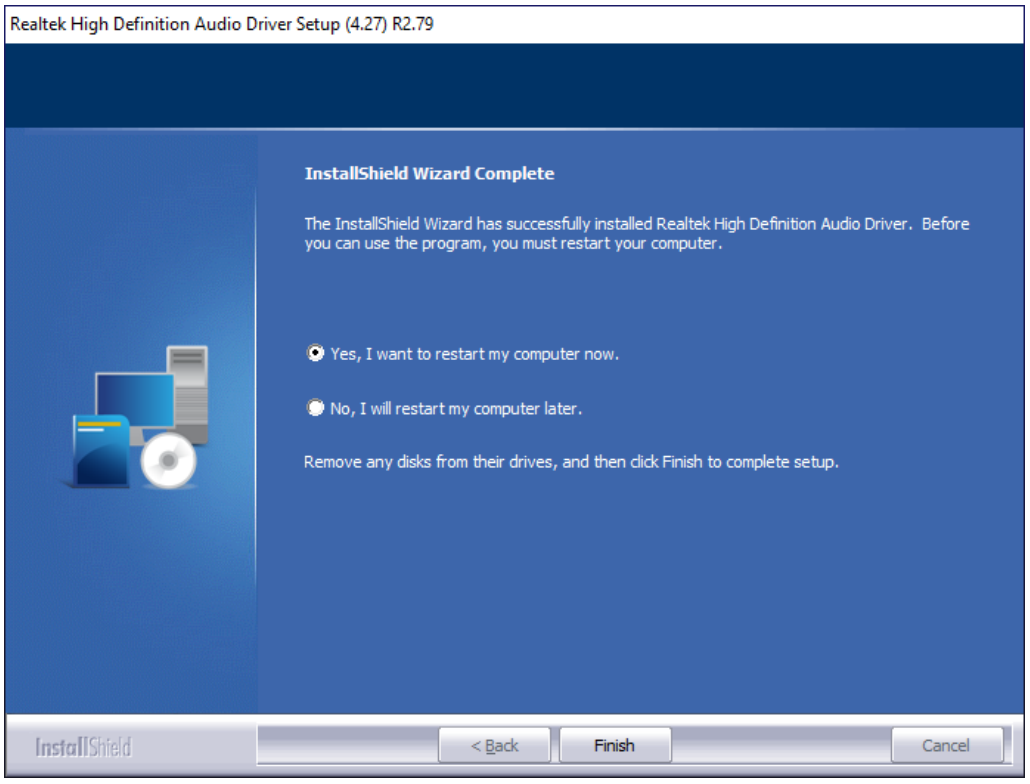
4.4 Realtek Audio Driver

To install the Realtek Audio Driver, please follow the steps below.

Step1. Select setup language you need. Click **Next** to continue.



Step3. Click **Finish** to complete the installation.

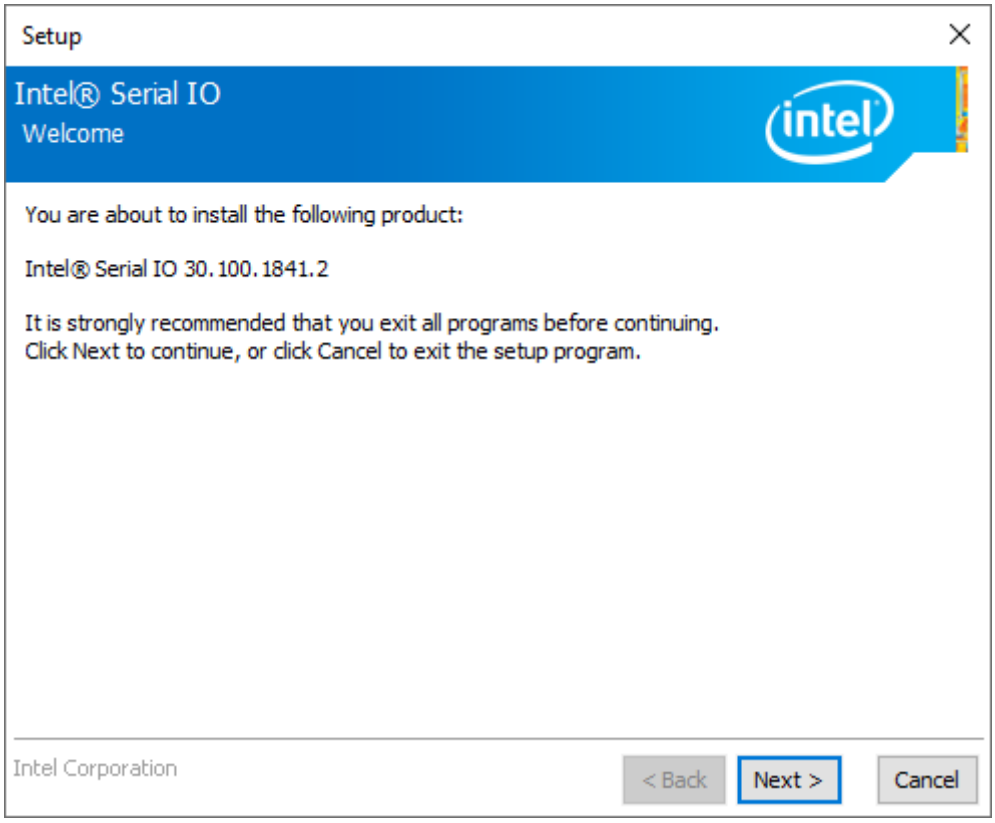


4.5 Intel Serial IO Driver

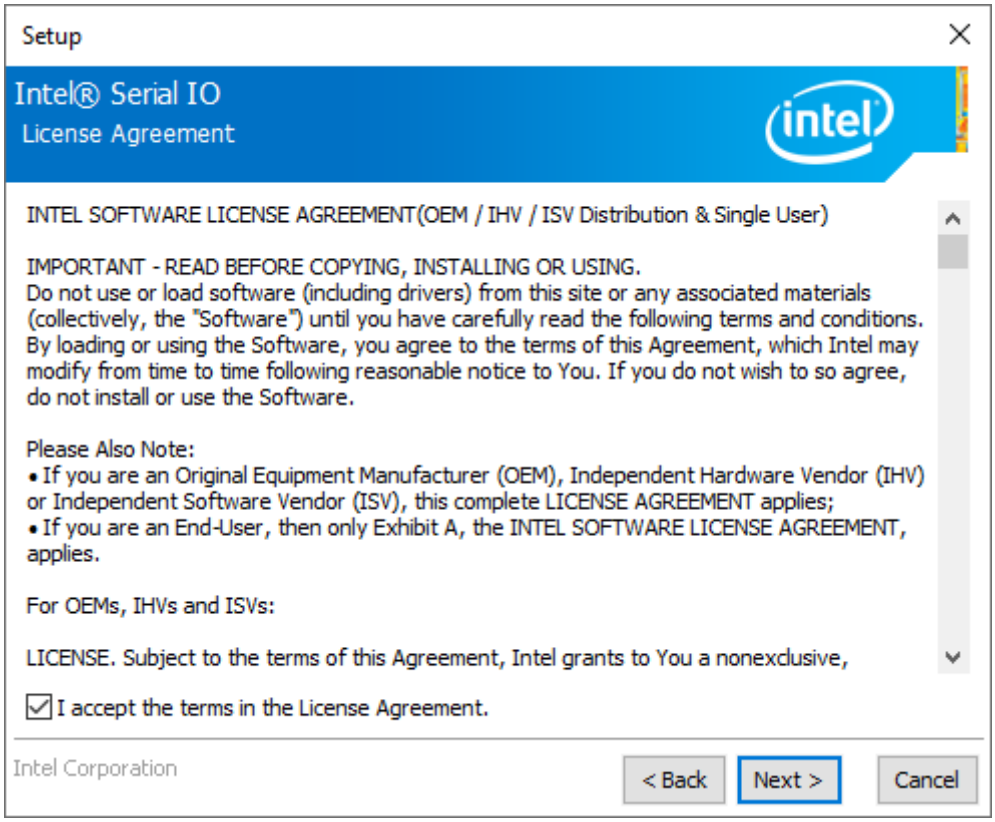
To install the Intel Serial IO Driver, please follow the steps below.

Step1. Select **Intel Serial IO Driver** from the list

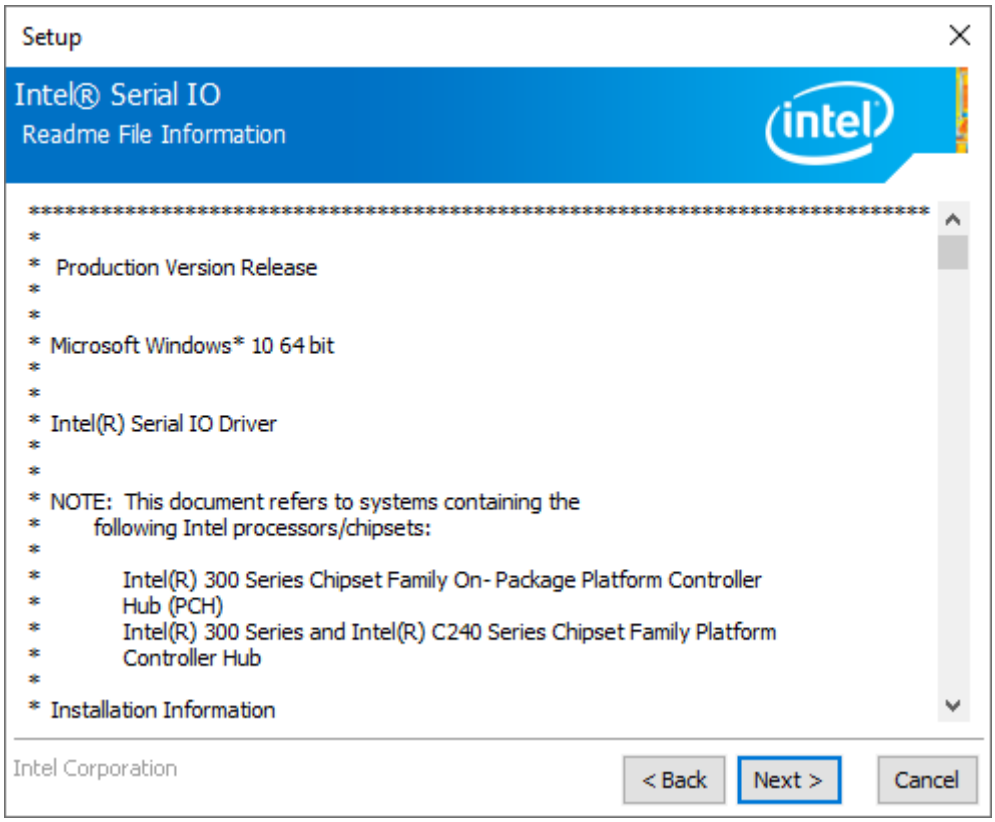
Step2. Click **Next** to continue.



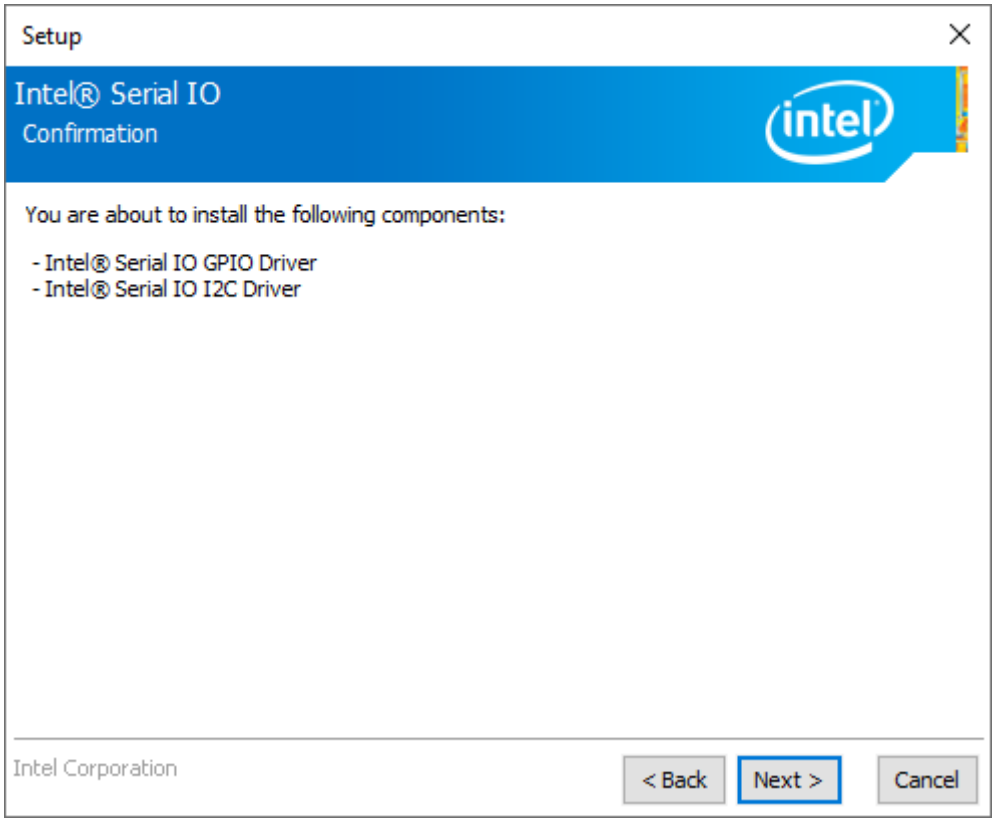
Step3. Read the license agreement. Choose **Accept** and click **Next** to accept all of the terms of the license agreement.



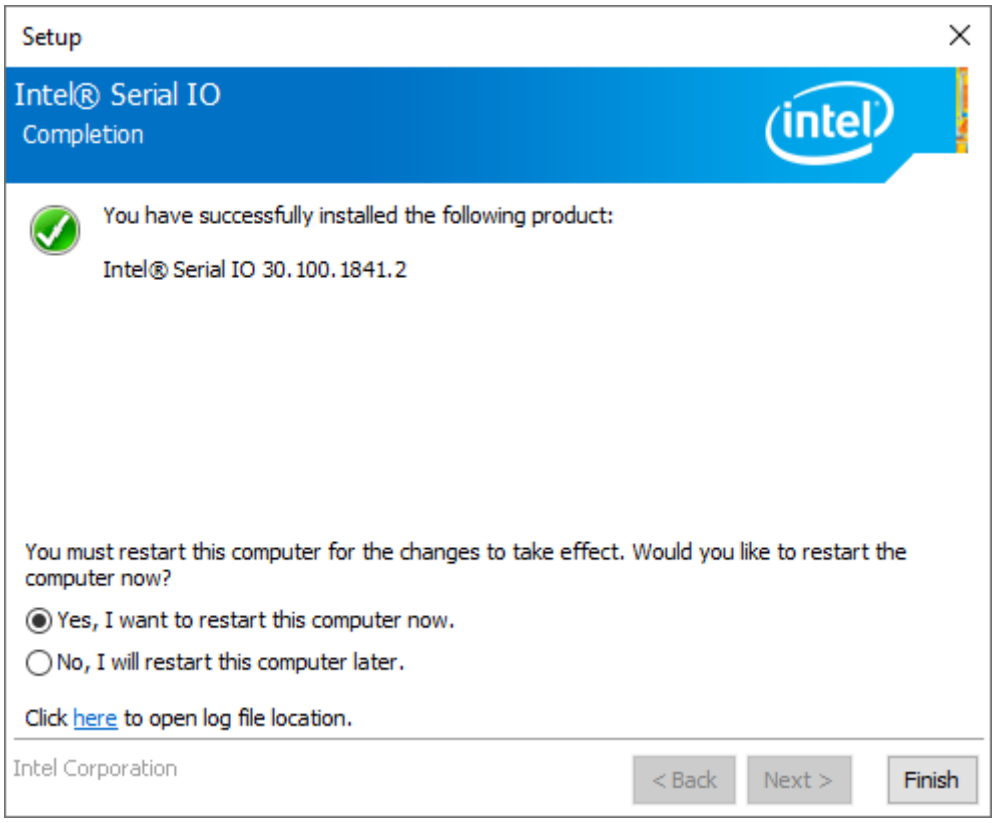
Step4. Click **Next** to continue.



Step5. Click **Install** to continue the installing.



Step6. Click **Finish** to complete the installation and **restart** computer immediately.

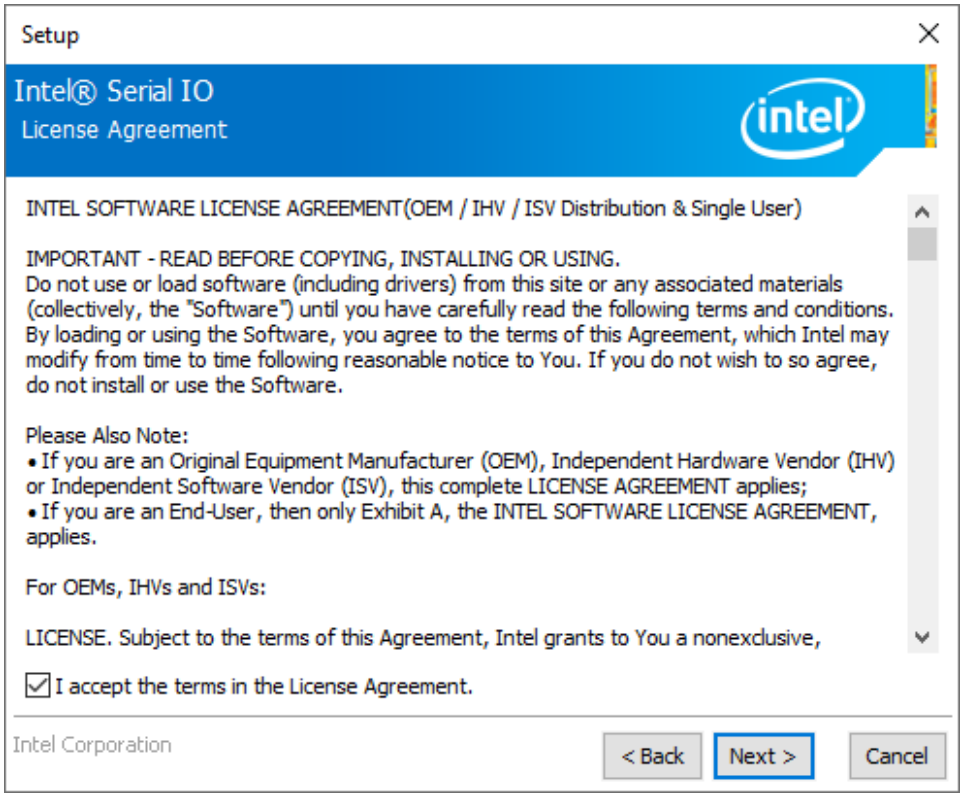


4.6 Resistive Touch Driver

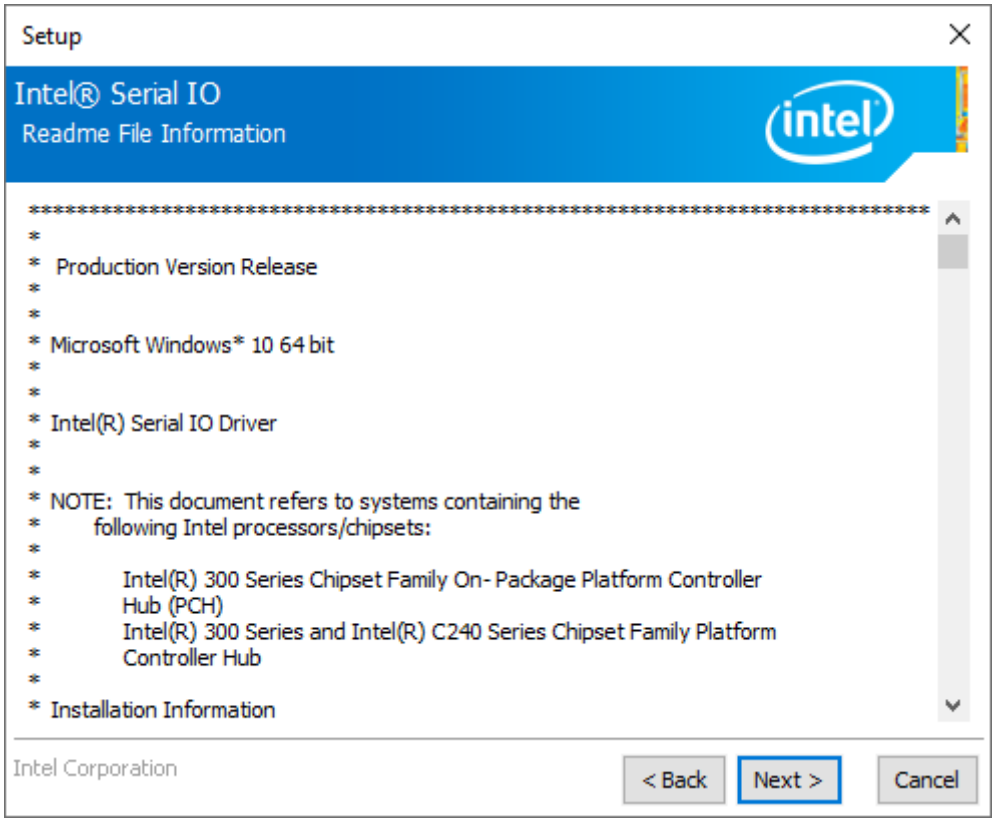
To install the **Resistive Touch Driver**, please follow the steps below.

Step1. Select **Resistive Touch Driver** from the list

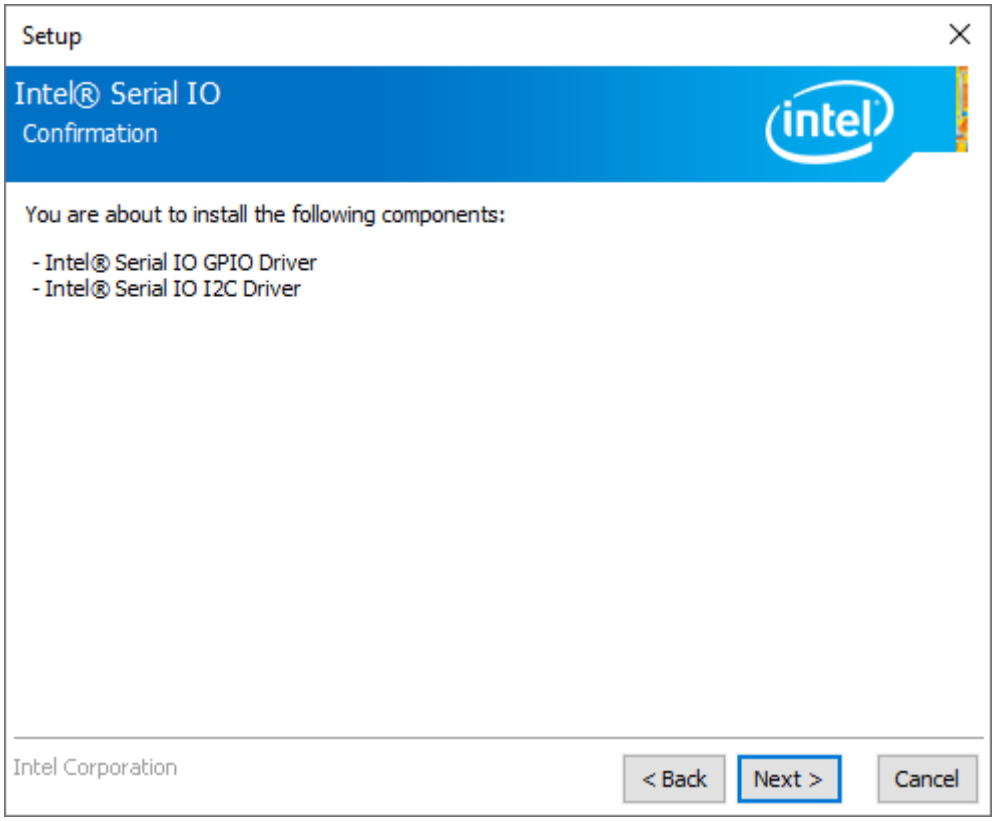
Step2. Read the license agreement. Choose **Accept** and click **Next** to accept all of the terms of the license agreement.



Step3. Click **Next** to continue.



Step4. Click **Next** to continue.



Step5. Click **Finish** to complete the installation and **restart** computer immediately.