AEx-2410

Stainless steel BOX PC for Hazardous Locations

ATEX/IECEX/CID2/CIID2/CIII/UKCA Certified BOX PC

User Manual

Release Date	Revision
Mar. 2022	V1.7

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Revision History

Reversion	Date	Description
0.1	2017/11/24	For Preliminary Release
1.0	2018/01/02	Official version
1.1	2018/03/27	Modify power pin defined
1.2	2018/05/16	Modify power pin description
1.3	2018/06/22	Add Warning
1.4	2021/06/24	Add IECEX/ATEX Standards in P5
1.5	2021/12/03	Add Pin define information in 1.2 chart
1.6	2022/01/20	Modify ATEX Zone2/Zone22 Standards and Notice, Certification information
1.7	2022/03/11/	Add UKCA LOGO and Standards

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.

If you need to connect or reconnect M12 cables, please make sure turning off the power before all the replacement procedures and must in normal environment, Recommend use ATEx certificated IO cables.

Disclaimer

This information in this document is subject to change without notice. In no event shall Aplex Technology Inc. be liable for damages of any kind, whether incidental or consequential, arising from either the use or misuse of information in this document or in any related materials.

ATEX Instruction Guide

SAFETY INSTRUCTIONS

Read these instructions carefully, and look at the equipment to become familiar with the device before trying to install, operate, or maintain it. The following special messages may appear throughout this documentation or on the equipment to warn of potential hazards or to call attention to information that clarifies or simplifies a procedure.

This is the safety alert symbol. It is used to alert you to potential personal injury hazards. Obey all safety messages that follow this symbol to avoid possible injury or death.

PLEASE NOTE

Electrical equipment should be installed, operated, serviced, and maintained only by qualified personnel. No responsibility is assumed by Digital Electronics Corporation for any consequences arising out of the use of this material. A qualified person is one who has skills and knowledge related to the construction and operation of electrical equipment and its installation, and has received safety training to recognize and avoid the hazards involved.

SCOPE

This present document applies when AEx-2410 bears  marking. They are supplied only with DC 9~36 V. This documentation has to be kept and always refer to those instructions for installation, operation, maintenance or evolution of your system.

Permitted zones of application

Refer to the section titled "Markings" to get information about the permitted zones of protection and the types of protection.

- AEx-2410 is installed in zones 2 hazardous areas must be certified and bear the  UK CA marking.
- Ensure with the marking that the terminals are compatible with the conditions permitted for the hazardous area at the site where it is being used.

Notice

1. Under certain extreme circumstances, the label may generate an ignition-capable level of electrostatic charge. Therefore the equipment shall not be installed in a location where the external conditions are conducive to the build-up of electrostatic charge on the label. In addition, the label shall only be cleaned with a damp cloth.

2. Warning – in locations where high external humidity and internal temperature variations (e.g. frequent on-off cycles) may cause condensation inside the equipment, the interior should be periodically inspected.

3. When the device is mounted in a hazardous area, connection and disconnection of external connectors while live is only permitted if the potentially explosive atmosphere is shown to be absent.

4. The "9-36" Vdc rated supply shall be protected such that transients are limited to a maximum of 119 V; no such protection is required for the signal lines.

5. Equipotential bonding facilities on the outside of enclosure are assessed as providing effective connection of a conductor with a cross-sectional area of at least 4 mm2, 10AWG, 600V wire

6. The equipment is suitable for use in class I, division 2, groups A, B, C, D, Class II, Division2, Group F,G, T135℃, Class III OR non-hazardous locations only.

7. Warning- Do not use USB while the circuit is live unless the area is known to be non-hazardous.

8. Electrostatic charging hazard - Clean only with a damp cloth.

Markings

Markings applied to the AEx-2410 Graphic Operator Interface, are as follows:

AEx-2410
Ex ec IIC T4 Gc **CID2, CIID2, CIII, IP66** **Ex tc IIIC T135°C Dc** **Power Input Voltage: DC 9~36V** WARNING: Read instruction manual before installation and use.

Below designated standards were certified with conform the relevant regulations:

New standards		
 II 3GD	Ex ec ic IIC T4 Gc Ex tc IIIC T135°C Dc	
IECEx	ATEX	UKCA
IEC 60079-0:2017	EN 60079-0:2018	BS 60079-0:2018
IEC 60079-11:2011	EN 60079-11:2012	BS 60079-11:2012
IEC 60079-7:2015 +AMD1:2017	EN 60079-7:2015/A1:2018	BS 60079-7:2015/A1:2018
IEC 60079-31:2013	EN 60079-31:2014	BS 60079-31:2014

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- WLAN for Option
- Full IP66 grade with M12 waterproof connector
- DC 9~36V wide range power input
- Support VESA and Wall mounting
- 316 Stainless steel design

1.2 Specifications

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<tr><td>Memory</td><td colspan="2">Onboard 4GB DDR3L (8GB for option)</td></tr>
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<tr><th></th><th>Pin Define</th></tr>
<tr><td>1</td><td>VCC</td></tr>
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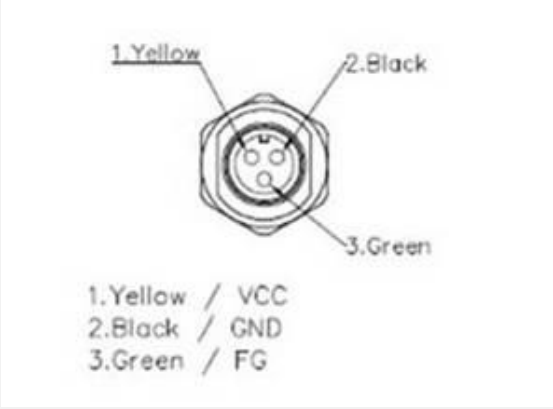
</td><td> 
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<tr><td colspan="3">Optional IO Port (Must be replacement for standard I/O)</td></tr>
<tr><td>USB</td><td colspan="2">1 x M12 for 2 x USB2.0 with metal waterproof CAP
1 x M12 for 1 x USB3.0 with metal waterproof CAP</td></tr>
<tr><td>Serial/Parallel</td><td colspan="2">1 x M12 for 1x RS-232 with metal waterproof CAP</td></tr>
<tr><td colspan="3">Storage Space</td></tr>
<tr><td>Storage</td><td colspan="2">1 x 2.5” SATA HDD or SSD space
1 x Internal SD Card slot on board</td></tr>
</table>

Expansion	
Expansion	1 x Mini PCIe full size slot (For option WLAN/BT module)
Power	
Power Input	DC 9~36V
Power Consumption	MAX: 15.9W
Mechanical	
Construction	316 Stainless Steel Chassis
Mounting	VESA Mount 100 x100 Wall Mount
Dimension (mm)	334 x 195 x 38.5mm
Net Weight (Kg)	4 kg
Environmental	
Operating temperature	-20~60°C
Storage temperature	-30~70°C
Storage humidity	10 to 90% @ 40°C, non- condensing
Altitude limit for application	Under 2000m
Overvoltage category	CAT II
Pollution degree	2
Certification	CE / FCC Class A IECEx Certification: Ex ec ic IIC T4 Gc Ex tc IIIC T135°C Dc ATEX Certification: Ⓔx II 3 GD Certification: Class I, Division2, Group A,B,C,D,T4 Class II, Division2, Group F,G, T135℃ Class III ANSI/ISA 12.12.01-2013 CSA Std.C22.2 No213-1987 CSAE 22UKEX 1073X
Operating System Support	
OS Support	Windows 7 Embedded Standard Windows Embedded Standard 7 Windows Embedded 8.1 Pro Windows Embedded 8.1 Industry Pro

	Windows 10 IOT Enterprise LTSB 2016

1.3 Dimensions

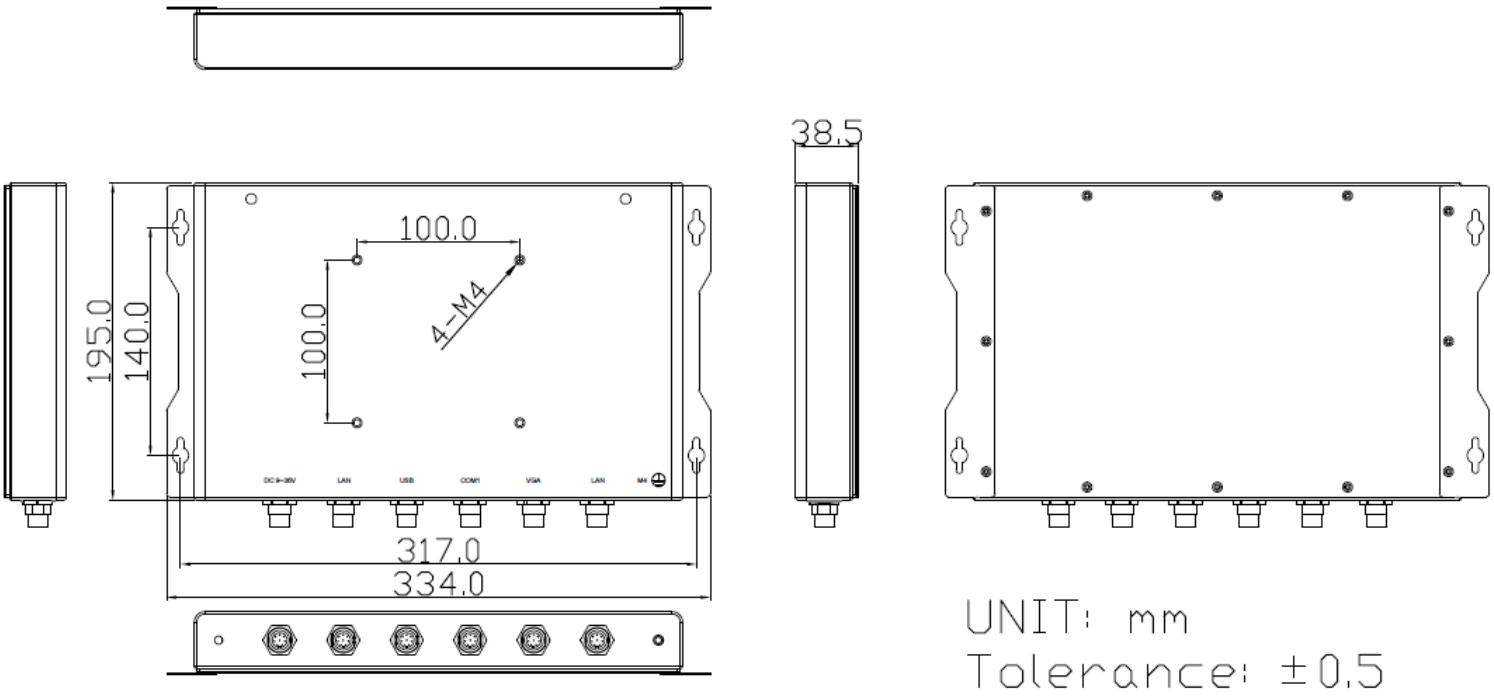


Figure 1.1: Dimensions of AEx-2410

1.4 Brief Description of AEx-2410

The AEx-2410 is a fanless design high-efficiency BOX PC for Hazardous Locations, powered by Intel Celeron N2930 1.83GHz processor and supports 1 x Onboard DDR3L up to 8G memory. It comes with 1x USB2.0 (support 2x USB2.0 function), 2x LAN, 1x COM and 1x VGA for standard I/O port, but also can be replaced by USB2.0/3.0 or RS-232; also designed by full IP66 waterproof connector. It supports 1 x 2.5” SATA2 HDD space and DC 9~36V wide-ranging power input. The model has 1 x Mini-PCIe full size slot for expansion. There are some specified limits for WIFI module such as the output power of transmitter which has to be less than 33dBm, and operating channel frequency band must be between 9KHZ to 60GHZ. The model is plating stainless steel chassis and full IP66 grade design. The AEx-2410 works very well along with any of our display series and it absolutely can provide an easy way to perform control and field maintenance.

Figure 1.2: Overview of AEx-2410

1.5 VESA mounting and Wall mounting

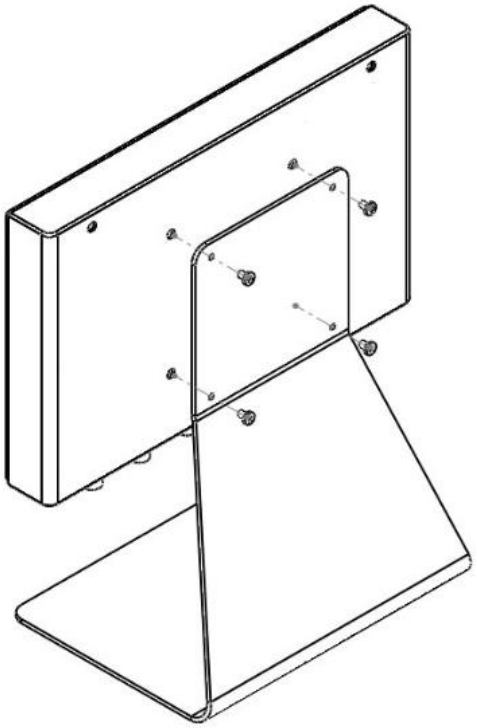


Figure 1.3: VESA mount of AEx-2410

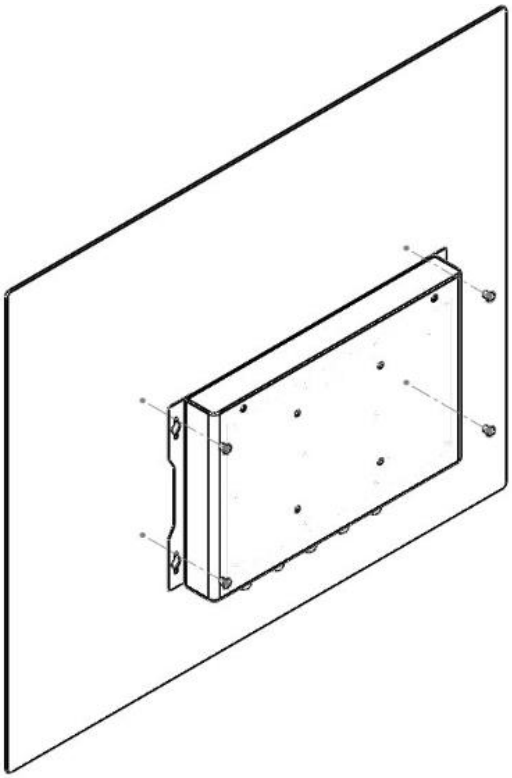


Figure 1.4: Wall mount of AEx-2410

Chapter 2 Hardware

2.1 Motherboard Introduction

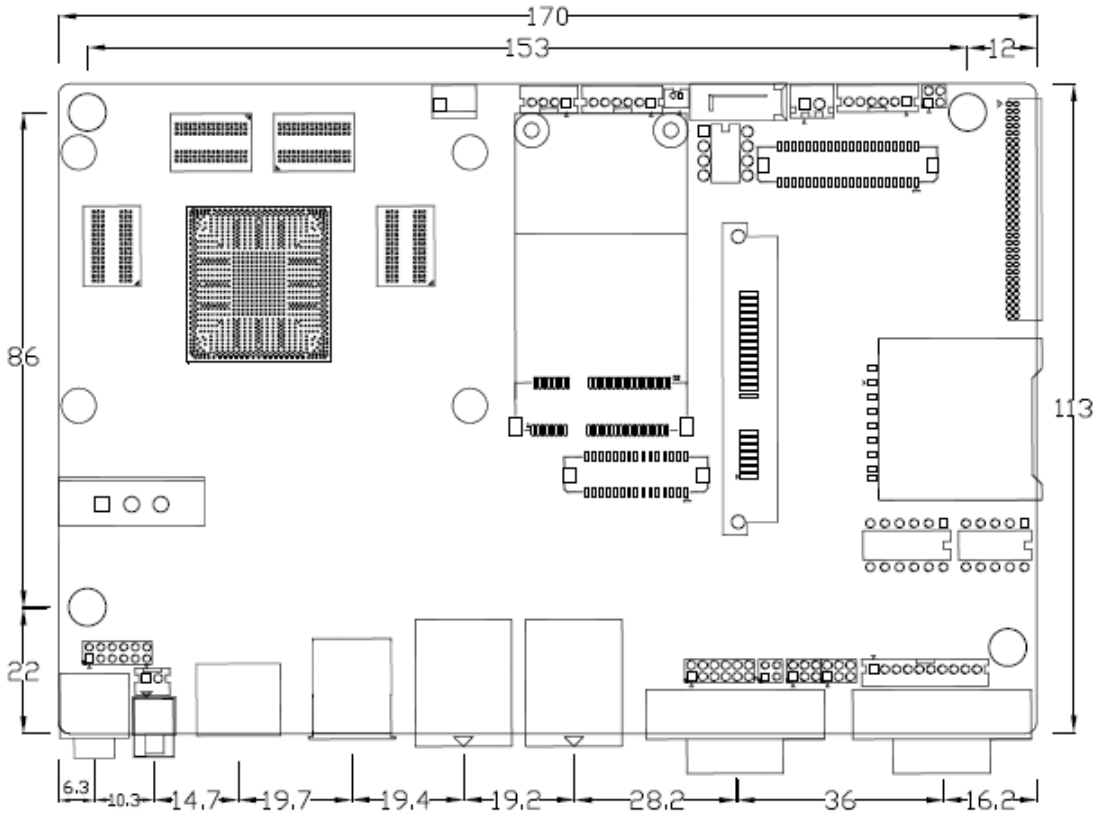
SBC-7111 is a 4" industrial motherboard developed on the basis of Intel Bay trail-I/M Processors, which provides abundant peripheral interfaces to meet the needs of different customers. Also, it features dual GbE ports, 4-COM ports and one Mini PCIE configuration, one VGA port, one HDMI port, one LVDS 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

Specifications	
Board Size	170mm x 113mm
CPU Support	Intel Atom E3845 / 1.91GHz (4cores, 10W, onboard) Intel Celeron N2930 / 1.83 up to 2.16GHz (4cores, option)
Chipset	SoC
Memory Support	Onboard 2GB DDR3L SDRAM (N2930, option) Onboard 4GB DDR3L SDRAM (E3845/N2930, option) Onboard 8GB DDR3L SDRAM (N2930, option)
Graphics	Intel® HD Graphics 313/854MHz (N2930) Intel® HD Graphics 542/792MHz (E3845)
Display Mode	1 x HDMI Port 1 x LVDS (18/24-bit dual LVDS) 1 x CRT Port
Support Resolution	Up to 1920 x 1200 for HDMI Up to 1920 x 1200 for LVDS (PS8625) Up to 1920 x 1200 for CRT
Dual Display	HDMI + LVDS HDMI + CRT LVDS + CRT
Super I/O	ITE IT8518E Fintek F81216AD

BIOS	AMI/UEFI
Storage	1 x SATAII Connector (7Pin, option) 1 x SATAII Connector (7Pin + 15Pin) 1 x SD Slot (USB2 to SD)
Ethernet	2 x PCIe Gbe LAN by Intel 82574L
USB	USB 3.0 Hub(USB5534): 2 x USB 3.0/USB 2.0 (type A)stack ports (E2_USB5/E2_USB6) 1 x USB 2.0 for Touch controller (E2_USB7) 1 x USB 2.0 Pin header for CN1 (E2_USB8) USB 2.0 Hub(USB2514) 1 x USB 2.0 Pin header for CN2 (E-USB9) 2 x USB 2.0 Pin header for CN3 (E-USB10/E-USB11) 1 x USB 2.0 for MPCIE1 (E-USB12)
Serial	1 x RS232/RS422/RS485 port, DB9 connector for external (COM1) Pin 9 w/5V/12V/Ring select 1 x RS232 port, DB9 connector for external (COM2) Pin 9 w/5V/12V/Ring select 2 x UART for CN3 (COM3,COM4) 2 x RS422/485 header for CN2 (IT8518E/COM5/COM6)
Digital I/O	8-bit digital I/O by Pin header (CN2) 4-bit digital Input 4-bit digital Output 4-bit digital I/O by Pin header (CN3) 2-bit digital Input 2-bit digital Output
Battery	Support CR2477 Li battery by 2-pin header (BAT1/CMOS)
Audio	Support Audio via Realtek ALC662-VD HD audio codec Support Line-in, Line-out, MIC by 2x6-pin header
Keyboard /Mouse	1 x PS2 keyboard/mouse by box pin header (CN3)
Expansion Bus	1 x mini-PCI-express slot 1 x PCI-express (CN3)
Touch Ctrl	1 x Touch ctrl header for TCH1 (PM6000 for USB4 or COM6)
Power Management	Wide Range DC6V~36V input 1 x 3-pin power input connector (DC_IN1/DC6~36V)

	1 x 4-pin power input connector (DC_IN2/DC12V)
Switches and LED Indicators	1 x Power on/off switch (BT1/BT2/P_SW/CN2/Cn3) 1 x Reset (CN2) 1 x Power LED status (CN1) 1 x HDD LED status (CN2) 1 x Buzzer
External I/O port	2 x COM Ports (COM1/COM2) 2 x USB 3.0/2.0 Ports (stack) 2 x RJ45 GbE LAN Ports 1 x HDMI Port 1 x Stack audio Jack (Line out) 1 x Power on/off switch (BT1)
Temperature	Operating: -20°C to 70°C Storage: -40°C to 85°C
Humidity	10% - 90%, non-condensing, operating
Power Consumption	12V /0.80A (Intel Atom E3845 processor with 4GB DDR3L DRAM) 12V /0.60A (Intel Atom E3815 processor with 2GB DDR3L DRAM) 12V /0.70A (Intel Celeron N2930 processor with 4GB DDR3L DRAM)
EMI/EMS	Meet CE/FCC class A



(units :mm)

Figure 2.1: Motherboard Dimensions

2.3 Jumpers and Connectors Location

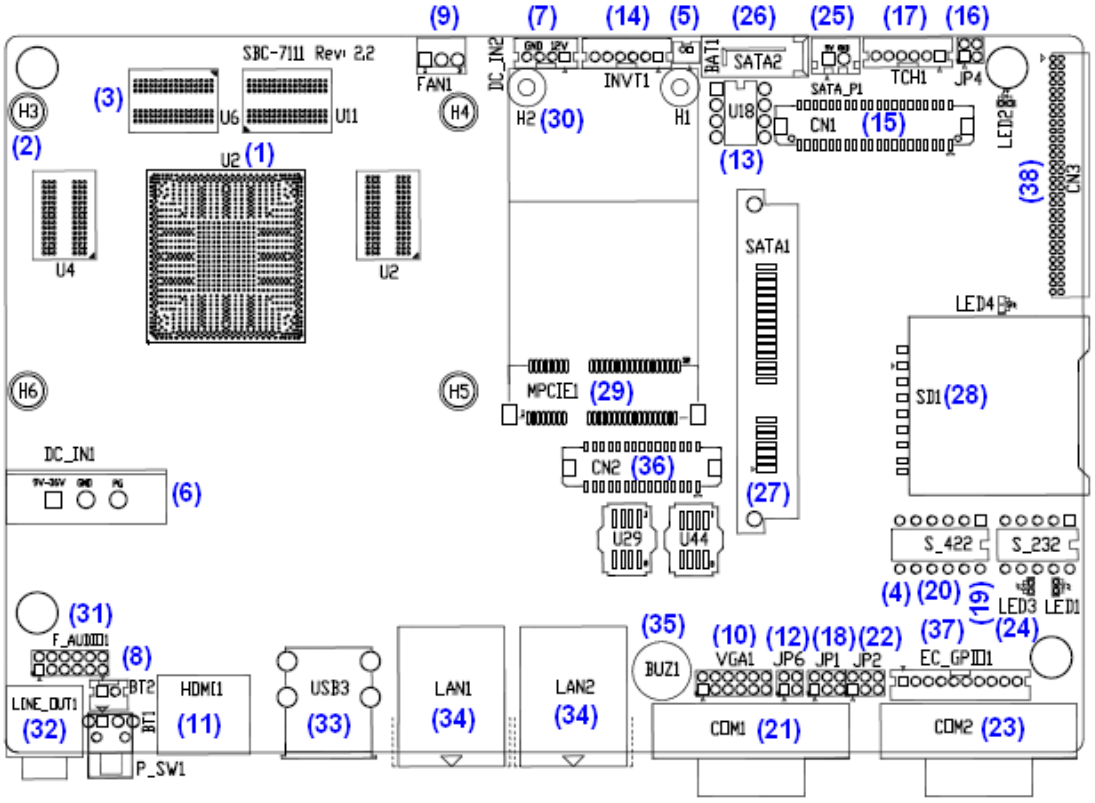


Figure 2.2: Jumpers and Connectors Location- Board Top

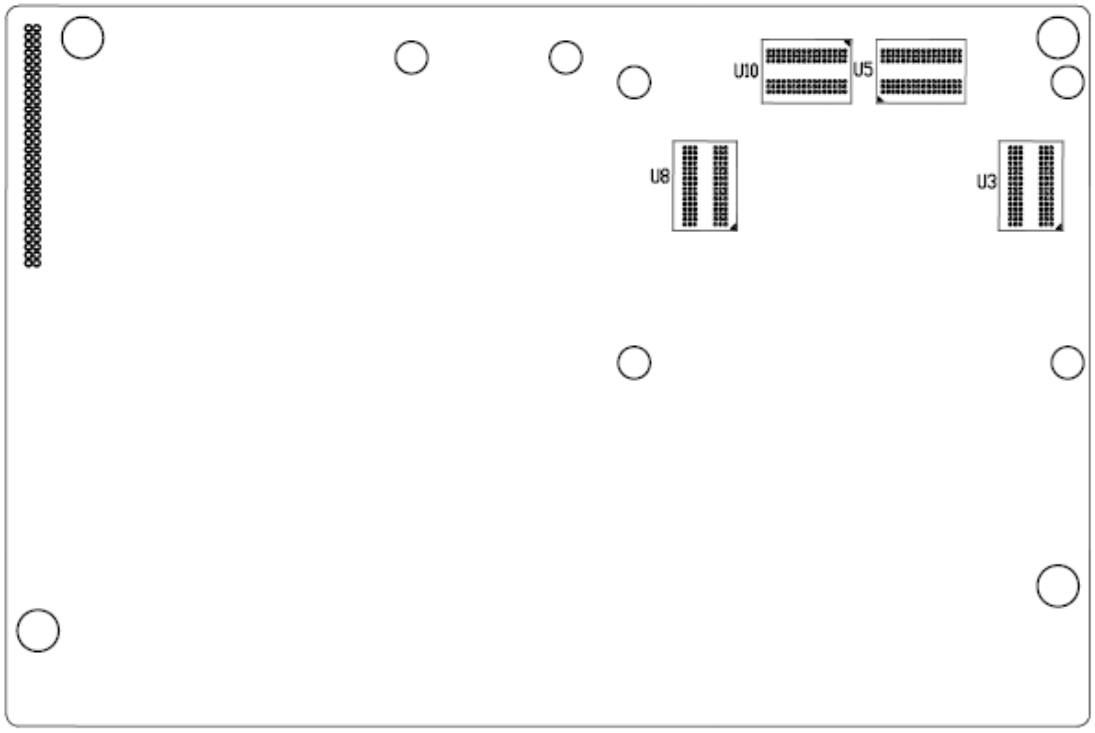


Figure 2.3: Jumpers and Connectors Location- Board Bottom

2.4 Jumpers Setting and Connectors

1. **U2:**

   (FCBGA1170), onboard Intel Bay trail-I/M Processors.

Model	Processor				
	Number	PBF	Cores/Threads	TDP	Remarks
SBC-7111-N2930-4G	N2930	1.83 up to 2.16GHz	4 / 4	4.5/7.5W	
SBC-7111-N2930-4G-SW					
SBC-7111-N2930P-4G					
SBC-7111-N2930-2G					
SBC-7111-N2930P-CN3V-2G					
SBC-7111-N2930-8G					
SBC-7111-E3845-4G	E3845	1.91GHz	4 / 4	10W	option

2. **H3/H4/H5/H6 (option):**

   U2 Heat Sink Screw holes, four screw holes for Intel Bay trail-I/M Processors Heat Sink assemble.

3. **U3/U4/U5/U6:**

   (FBGA96), Onboard DDR3L Memory.

Model	Memory
SBC-7111-N2930-4G	4GB
SBC-7111-N2930-4G-SW	4GB (option)
SBC-7111-N2930P-4G	4GB (option)
SBC-7111-E3845-4G	4GB (option)
SBC-7111-N2930-2G	2GB (option)
SBC-7111-N2930P-CN3V-2G	2GB (option)
SBC-7111-N2930-8G	8GB (option)

4. **S-422 (PIN6):**

   (Switch), ATX Power and Auto Power on jumper setting**.**

S-422(Switch)	Mode
Pin6 (Off)	Manual Power on
Pin6 (On)	**Auto Power on (Default)**

5. **BAT1:**

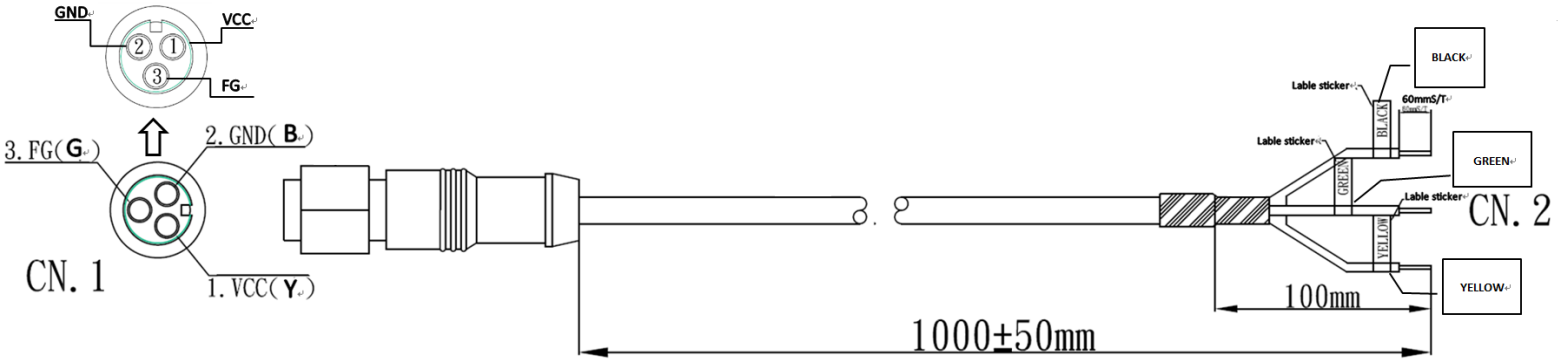
   (1.25mm Pitch 1x2 Wafer Pin Header) 3.0V Li battery is embedded to provide power for CMOS.

Pin#	Signal Name
1	VBAT
2	Ground

6. DC_IN1:

(5.08mm Pitch 1x3 Pin Connector), DC9~36V System power input connector.

Pin#	PIN OUT		
CN. 1	Wire Color	Power Input	CN. 2
1	Yellow	DC+6V~36V	Tail peeling 60mm
2	Black	Ground	Tail peeling 60mm
3	Green	FG	Tail peeling 60mm



Model	DC_IN1
SBC-7111-N2930-4G	180°Connector
SBC-7111-N2930-4G-SW	180°Connector
SBC-7111-N2930-2G	180°Connector
SBC-7111-N2930-8G	180°Connector
SBC-7111-E3845-4G	180°Connector
SBC-7111-N2930P-4G	45°Connector
SBC-7111-N2930P-CN3V-2G	45°Connector

7. DC_IN2 (option):

(2.0mm Pitch 1x4 wafer Pin Header) DC12V System power input connector.

Pin#	Signal Name
1	VCC_BAT (DC+12V input)
2	VCC_BAT (DC+12V input)
3	Ground
4	Ground

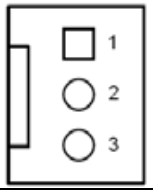
8. BT1/BT2/P_SW (option):

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

Model	BT1	BT2	P_SW1
SBC-7111-N2930-4G	●	●	○
SBC-7111-N2930P-4G	●	●	○
SBC-7111-N2930-2G	●	●	○
SBC-7111-N2930-8G	●	●	○
SBC-7111-E3845-4G	●	●	○
SBC-7111-N2930P-CN3V-2G	○	●	○
SBC-7111-N2930-4G-SW	○	●	●

9. FAN1(option):

(2.54mm Pitch 1x3 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	Rotation detection

Note:

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

Model	FAN1
SBC-7111-N2930-4G	○
SBC-7111-N2930-4G-SW	○
SBC-7111-N2930P-4G	○
SBC-7111-N2930P-CN3V-2G	○
SBC-7111-E3845-4G	○
SBC-7111-N2930-2G	○
SBC-7111-N2930-8G	○

10. VGA1:

(CRT 2.0mm Pitch 2x6 Pin Header), Video Graphic Array Port, Provide 2x6Pin cable to VGA Port.

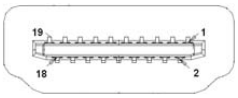
Signal Name	Pin#	Pin#	Signal Name
CRT_RED	1	2	Ground
CRT_GREEN	3	4	Ground
CRT_BLUE	5	6	VGA_EN
CRT_H_SYNC	7	8	CRT_DDCDATA
CRT_V_SYNC	9	10	CRT_DDCCLK
Ground	11	12	Ground

○

VGA hot plug setting:	
VGA1 (Pin Header)	Function
Pin4-Pin6 (Close)	VGA Simulation Disabled
Pin4-Pin6 (Open)	VGA Simulation Enabled
Use the 2.0mm jumper cap to close pin4 and pin6	

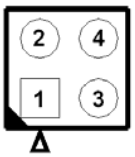
11. HDMI1:

(HDMI 19P Connector), High Definition Multimedia Interface connector.



12. JP6:

(2.0mm Pitch 2x2 Pin Header), LVDS jumper setting.



JP6	Function (CN1)
Pin1-Pin2 (Close)	Single channel LVDS
Pin1-Pin2 (Open)	**Dual channel LVDS (Default)**
Pin3-Pin4 (Close)	**8/24 bit (Default)**
Pin3-Pin4 (Open)	6/18 bit

13. U18:

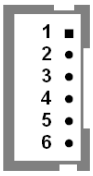
AT24C02-DIP8,The EEPROM IC（U18）is the set of LVDS resolution. If you need other resolution settings, please upgrade U18 data.

Model	LVDS resolution
SBC-7111-N2930-4G	1280*1024 (Default)
SBC-7111-N2930-4G-SW	800*480 (option)

SBC-7111-N2930P-4G	800*600 (option)
SBC-7111-N2930P-CN3V-2G	1024*768 (option)
	1920*1080 (option)
SBC-7111-N2930-2G SBC-7111-N2930-8G SBC-7111-E3845-4G	------

14. INVT1:

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



Pin#	Signal Name
1	+DC12V
2	+DC12V
3	Ground
4	Ground
5	BKLT_EN_OUT
6	BKLT_CTRL

15. CN1:

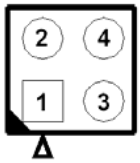
(1.25mm Pitch 2x20 Connector, DF13-40P), for 18/24-bit LVDS output connector, fully supported by Parad PS8625(DP to LVDS), the interface features dual channel 24-bit output. Low Voltage Differential Signaling, A high speed, low power data transmission standard used for display connections to LCD panels.

Function	Signal Name	Pin#	Pin#	Signal Name	Function
LVDS	12V_S0	2	1	12V_S0	LVDS
	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	
	Ground	34	33	Ground	E2-USB8
D2-USB8	E2-USB8_P	36	35	E2-USB8_N	
	5V_S5_USB	38	37	5V_S5_USB	
Power LED	PWR_LED+	40	39	Ground	Power LED

16. JP4 *(Reserve)*:

(2.0mm Pitch 2x2 Pin Header).



JP4	Function
Close 3-4 (default)	-
Open 1-2 (default)	-
Close 3-4 (option)	Hardware Enabled

17. TCH1:

(2.0mm Pitch 1x6 wafer Pin Header), internal Touch controller connector.

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

Touch Interface Setting	EC(U44) Data
TCH1(PM6000)	Option A
CN1(E2-USB8)	Option B

18. JP1:

(2.0mm Pitch 2x3 Pin Header), COM1 jumper setting, pin 1~6 are used to select signal out of pin 9 of COM1 port.

JP1 Pin#	Function
Close 1-2	**COM1 RI (Ring Indicator) (default)**
Close 3-4	COM1 Pin9: DC+5V (option)
Close 5-6	COM1 Pin9: DC+12V (option)

19. S_232:

(Switch), COM1 jumper setting, it provides selectable RS232 or RS422 or RS485 serial signal output.

Function	S_232 Pin# (switch)
RS232 (Default)	**ON: Pin1, Pin2, Pin3, Pin4, Pin5**
RS422 (option)	OFF: Pin1, Pin2, Pin3, Pin4, Pin5
RS485 (option)	OFF: Pin1, Pin2, Pin3, Pin4, Pin5

20. S_422:

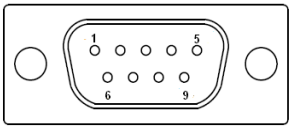
(Switch), COM1 setting, it provides selectable RS232 or RS422 or RS485 serial signal output.

Function	S_422 Pin# (switch)
RS232 (Default)	**OFF: Pin1, Pin2, Pin3, Pin4, Pin5**
RS422 (option)	ON: Pin1, Pin2, Pin3, Pin4, Pin5
RS485 (option)	ON: Pin1, Pin2, Pin3, Pin4, Pin5

S-422 (switch)	Mode
Pin6 (Off)	ATX Power
Pin6 (On)	**Auto Power on (Default)**

21. COM1:

(Type DB9M), Rear serial port, standard DB9 Male serial port is provided to make a direct connection to serial devices. COM1 port is controlled by pins No.1~6 of JP1, select output Signal RI or 5V or 12V, for details, please refer to description of JP1 and S_232 and S_422 setting.



RS232 (Default)	
Pin#	Signal Name
1	DCD# (Data Carrier Detect)
2	RXD (Received Data)

3	TXD (Transmit Data)
4	DTR (Data Terminal Ready)
5	Ground
6	DSR (Data Set Ready)
7	RTS (Request To Send)
8	CTS (Clear To Send)
9	**JP1 select Setting (RI/5V/12V)**
BIOS Setup: Advanced/F81216SEC Super IO Configuration/Serial Port 1 Configuration 【RS-232】	

RS422 (option)	
Pin#	Signal Name
1	422_RX+
2	422_RX-
3	422_TX-
4	422_TX+
5	Ground
6	NC
7	NC
8	NC
9	NC
BIOS Setup: Advanced/F81216SEC Super IO Configuration/Serial Port 1 Configuration 【RS-422】	

RS485 (option)	
Pin#	Signal Name
1	NC
2	NC
3	485-
4	485+
5	Ground
6	NC
7	NC
8	NC
9	NC
BIOS Setup: Advanced/F81216SEC Super IO Configuration/Serial Port 1 Configuration 【RS-485】	

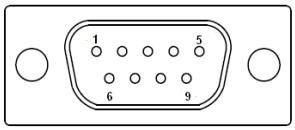
22. JP2:

(2.0mm Pitch 2x3 Pin Header), COM2 jumper setting, pin 1~6 are used to select signal out of pin 9 of COM2 port.

JP2 Pin#	Function
Close 1-2	**COM2 RI (Ring Indicator) (default)**
Close 3-4	COM2 Pin9: DC+5V (option)
Close 5-6	COM2 Pin9: DC+12V (option)

23. COM2:

(Type DB9M),Rear serial port, standard DB9 Male serial port is provided to make a direct connection to serial devices.



Pin#	Signal Name
1	DCD# (Data Carrier Detect)
2	RXD (Received Data)
3	TXD (Transmit Data)
4	DTR (Data Terminal Ready)
5	Ground
6	DSR (Data Set Ready)
7	RTS (Request To Send)
8	CTS (Clear To Send)
9	**JP2 select Setting (RI/5V/12V)**

24. LED1, LED2, LED3, LED4 (option) :

LED1: LED STATUS. Green LED for Motherboard Power Good status.

LED2: LED STATUS. Green LED for Touch Power Status.

LED3: LED STATUS. Green LED for EC Power status.

LED4: LED STATUS. Green LED for Motherboard Power Good status.

25. SATA_P(option):

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

Pin#	Signal Name
1	+DC5V
2	Ground

Note:

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

Model	SATA_P (Wafer)
SBC-7111-N2930-4G	○
SBC-7111-N2930-4G-SW	○
SBC-7111-N2930P-4G	○
SBC-7111-N2930P-CN3V-2G	○
SBC-7111-E3845-4G	○
SBC-7111-N2930-2G	○
SBC-7111-N2930-8G	○

26. SATA2(option):

(SATA 7Pin), SATA Connectors, one SATA connector are provided, with transfer speed up to 3.0Gb/s.

Model	SATA2 (Connectors)
SBC-7111-N2930-4G	○
SBC-7111-N2930-4G-SW	○
SBC-7111-N2930P-4G	○
SBC-7111-N2930P-CN3V-2G	○
SBC-7111-E3845-4G	○
SBC-7111-N2930-2G	○
SBC-7111-N2930-8G	○

27. SATA1:

(SATA 7Pin+15Pin), SATA Connectors, one SATA connector are provided, with transfer speed up to 3.0Gb/s.

28. SD1:

(SD card slot), Secure Digital Memory Card socket.

29. MPCIE1:

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

30. H1/H2:

MPCIE1 SCREW HOLES, H1and H2 for mini PCIE card (30mmx50.95mm) assemble.

31. F_AUDIO1:

(2.0mm Pitch 2X6 Pin Header), Front Audio, An onboard Realtek ALC662-VD 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	1	2	GND_AUD
LINE-OUT-L	3	4	LINE-OUT-R
FRONT_JD	5	6	LINE1_JD
LINE_IN-L	7	8	LINE-IN-R
MIC-IN-L	9	10	MIC-IN-R
GND-AUD	11	12	MIC1_JD

32. LINE_OUT1:

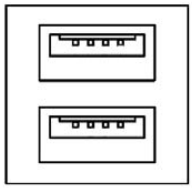
(Diameter 3.5mm Jack), HD Audio port, an onboard Realtek ALC662-VD codec is used to provide high quality audio I/O ports. Line Out can be connected to a headphone or amplifier.

Line out

Model	LINE_OUT1
SBC-7111-N2930-4G	●
SBC-7111-N2930P-4G	●
SBC-7111-N2930-2G	●
SBC-7111-N2930-8G	●
SBC-7111-E3845-4G	●
SBC-7111-N2930P-CN3V-2G	○
SBC-7111-N2930-4G-SW	●

33. USB3:

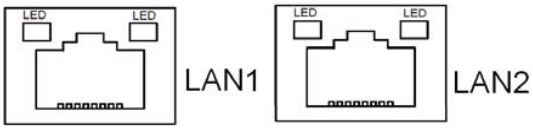
USB0/USB3: (Double stack USB type A), Rear USB connector, it provides up to two USB3.0 ports, one USB2.0 port, supports USB full-speed and low-speed signaling.



Each USB Type A Receptacle (2 Ports) Current limited value is 2.0A.
If the external USB device current exceeds 2.0A, please separate connectors into different Receptacle.

34. LAN1/LAN2:

LAN1/LAN2: (RJ45 Connector), Rear LAN port, Two standard 10/100/1000M RJ-45 Ethernet ports are provided. Used intel 82574L chipset, LINK LED (green) and ACTIVE LED (yellow) respectively located at the left-hand and right-hand side of the Ethernet port indicate the activity and transmission state of LAN.



Model	RJ45(LAN1)	RJ45(LAN2)
SBC-7111-N2930-4G	●	●
SBC-7111-N2930P-4G	●	●
SBC-7111-N2930-2G	●	●
SBC-7111-N2930-8G	●	●
SBC-7111-E3845-4G	●	●
SBC-7111-N2930P-CN3V-2G	●	○
SBC-7111-N2930-4G-SW	●	●

35. BUZ1:

Onboard buzzer.

36. CN2:

(DF13-30P Connector) For expand output connector, It provides eight GPIO, one RS422 or RS485, one USB2.0, one Power on/off, one Reset.

Function	Signal Name	Pin#	Pin#	Signal Name	Function
5V	5V_S5	2	1	5V_S5	5V
SOC_GPIO10	GPIO_IN2	4	3	GPIO_IN1	SOC_SPIO09
SOC_GPIO26	GPIO_IN4	6	5	GPIO_IN3	SOC_GPIO17
SOC_GPIO05	GPIO_OUT2	8	7	GPIO_OUT1	SOC_GPIO04
SOC_GPIO08	GPIO_OUT4	10	9	GPIO_OUT3	SOC_GPIO06
	Ground	12	11	Ground	

485 or 422	485+_422TX5+	14	13	485-_422TX5-	485 or 422
RS422(COM5)	422_RX5+	16	15	422_RX5-	RS422(COM5)
485 or 422	485+_422TX6+	18	17	485-_422TX6-	485 or 422
RS422(COM6)	422_RX6+	20	19	422_RX6-	RS422(COM6)
5V	5V_S0	22	21	HDD_LED+	HDD LED
USB2.0	5V_USB09	24	23	5V_USB09	USB2.0
	E_USB9_P	26	25	E_USB9_N	
	Ground	28	27	FP_RST-	RESET
Power auto on	PWRBTN_ON	30	29	Ground	
COM5/COM6 BIOS Setup： Advanced/IT8518Super IO Configuration/Serial Port 1 Configuration【RS-485】 Advanced/IT8518Super IO Configuration/Serial Port 1 Configuration【RS-422】 Advanced/IT8518Super IO Configuration/Serial Port 2 Configuration【RS-485】 Advanced/IT8518Super IO Configuration/Serial Port 2 Configuration【RS-422】					

37. EC_GPIO1(option):

(2.0mm Pitch 1X10 Pin Header)For expand connector, it provides eight GPIO.

Pin#	Signal Name
1	Ground
2	GPA0_ONOFF
3	GPA1_SPK-
4	GPE6_BKLT-
5	GPE0_BKLT+
6	SPKGPC3_SPK+
7	BKL_CTRL_PWR
8	ADC6_BKLT_CTRL
9	ADC7_L_SENSE
10	3.3V

Function	EC_GPIO1
Backlight Automatic dimming	o
Backlight manual dimming	o

38. CN3:

(1.27mm Pitch 2X30 Female Header), for expand output connector, it provides four GPIO, two USB 2.0,one PS/2 mouse, one PS/2 keyboard, two uart, one PCIex1, one SMbus. connected to the TB-528 riser Card.

Function	Signal Name	Pin#	Pin#	Signal Name	Function
	5V_S5_USB	1	2	5V_S5_USB	
	5V_S5_USB	3	4	5V_S5_USB	
	USB1011_OC	5	6	PSON_ATX-	
Exp-USB10	E-USB10_N	7	8	E-USB10_P	Exp-USB10
Exp-USB11	E-USB11_N	9	10	E-USB11_P	Exp-USB11
	Ground	11	12	Ground	
PS/2 MS	PS2_MSCLK	13	14	PS2_MSDATA	PS/2 MS
PS/2 KB	PS2_KBCLK	15	16	PS2_KBDATA	PS/2 KB
COM4 (UART)	COM4_RI	17	18	COM4_DCD-	COM4 (UART)
	COM4_TXD	19	20	COM4_RXD	
	COM4_DTR	21	22	RICOM4_RTS-	
	COM4_DSR	23	24	COM_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	DSRCOM3_RTS-	
	COM3_DSR	33	34	DTRCOM3_CTS-	
GPIO23	SOC_GPIO23	35	36	ICH_GPIO22	GPIO12
GPIO25	SOC_GPIO25	37	38	ICH_GPIO24	GPIO24
	Ground	39	40	Ground	
PCIE	PCIE_TX0_DN	41	42	PCIE_TX0_DP	PCIE
	PCIE_RX0_DN	43	44	PCIE_RX0_DP	
	Ground	45	46	Ground	
	PCIE_REFCLK0_DN	47	48	PCIE_REFCLK0_DP	
	PCIE0_WAKE_N	49	50	PLTRST_3P3_N	
SMBUS	SMB_CLK_S0	51	52	SMB_DATA_S0	SMBUS
PCIE	PCIE_CLKREQ0_N	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

Model	CN3(connector)
SBC-7111-N2930-4G	90°Connector
SBC-7111-N2930-4G-SW	90°Connector
SBC-7111-N2930-2G	90°Connector

SBC-7111-N2930-8G	90°Connector
SBC-7111-E3845-4G	90°Connector
SBC-7111-N2930P-4G	90°Connector
SBC-7111-N2930P-CN3V-2G	1805°Connector

Chapter 3 BIOS Setup

3.1 Operations after POST Screen

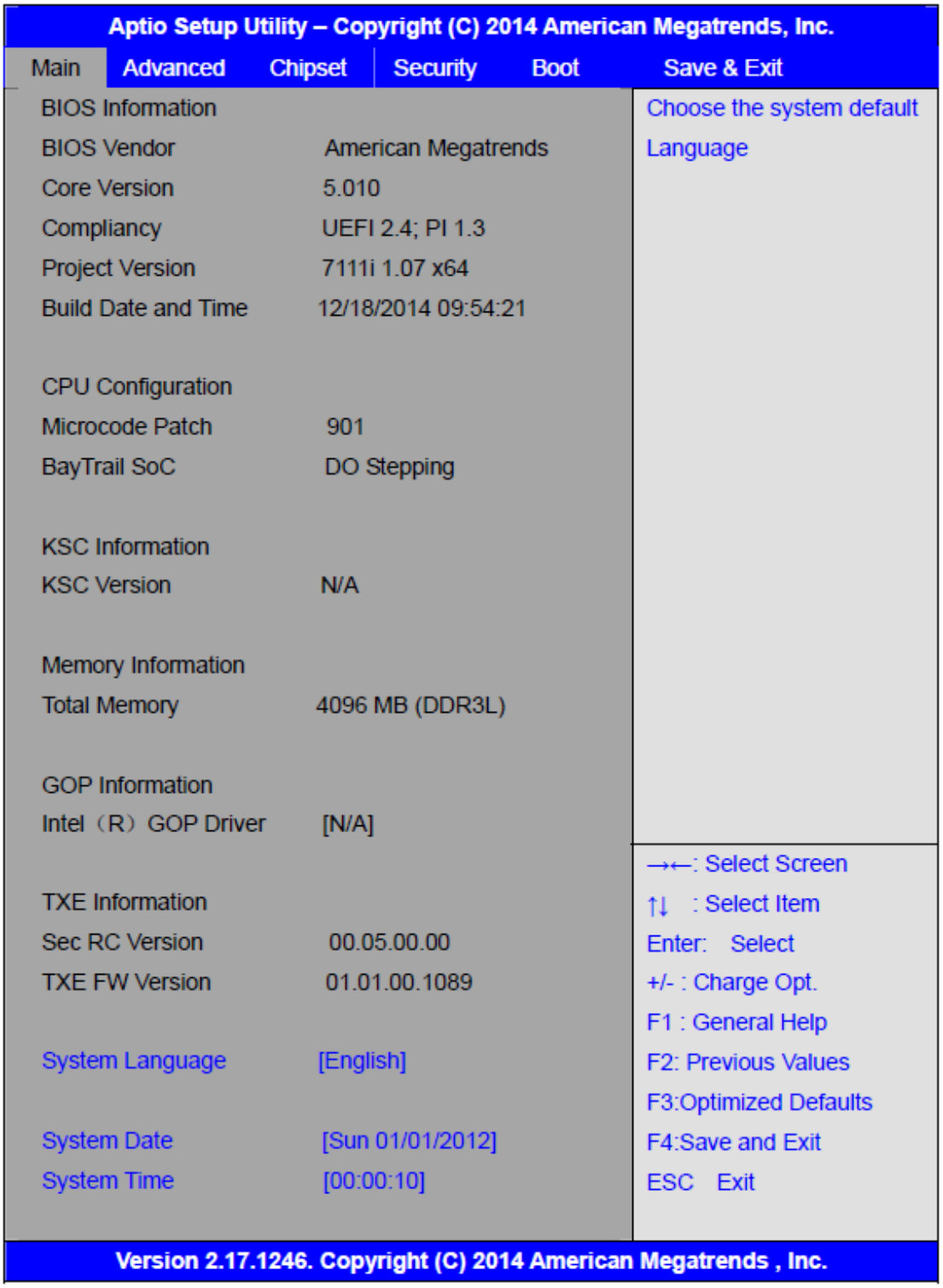
After CMOS discharge or BIOS flashing operation, press [Delete] key to enter CMOS Setup.

After optimizing and exiting CMOS Setup, the POST screen displayed for the first time is as follows and includes basic information on BIOS, CPU, memory, and storage devices.

3.2 BIOS Setup Utility

Press [Delete] key to enter BIOS Setup utility during POST, and then a main menu containing system summary information will appear.

3.3 Main Settings



System Time:

Set the system time, the time format is:

Hour : 0 to 23

Minute : 0 to 59

Second : 0 to 59

System Date:

Set the system date, the date format is:

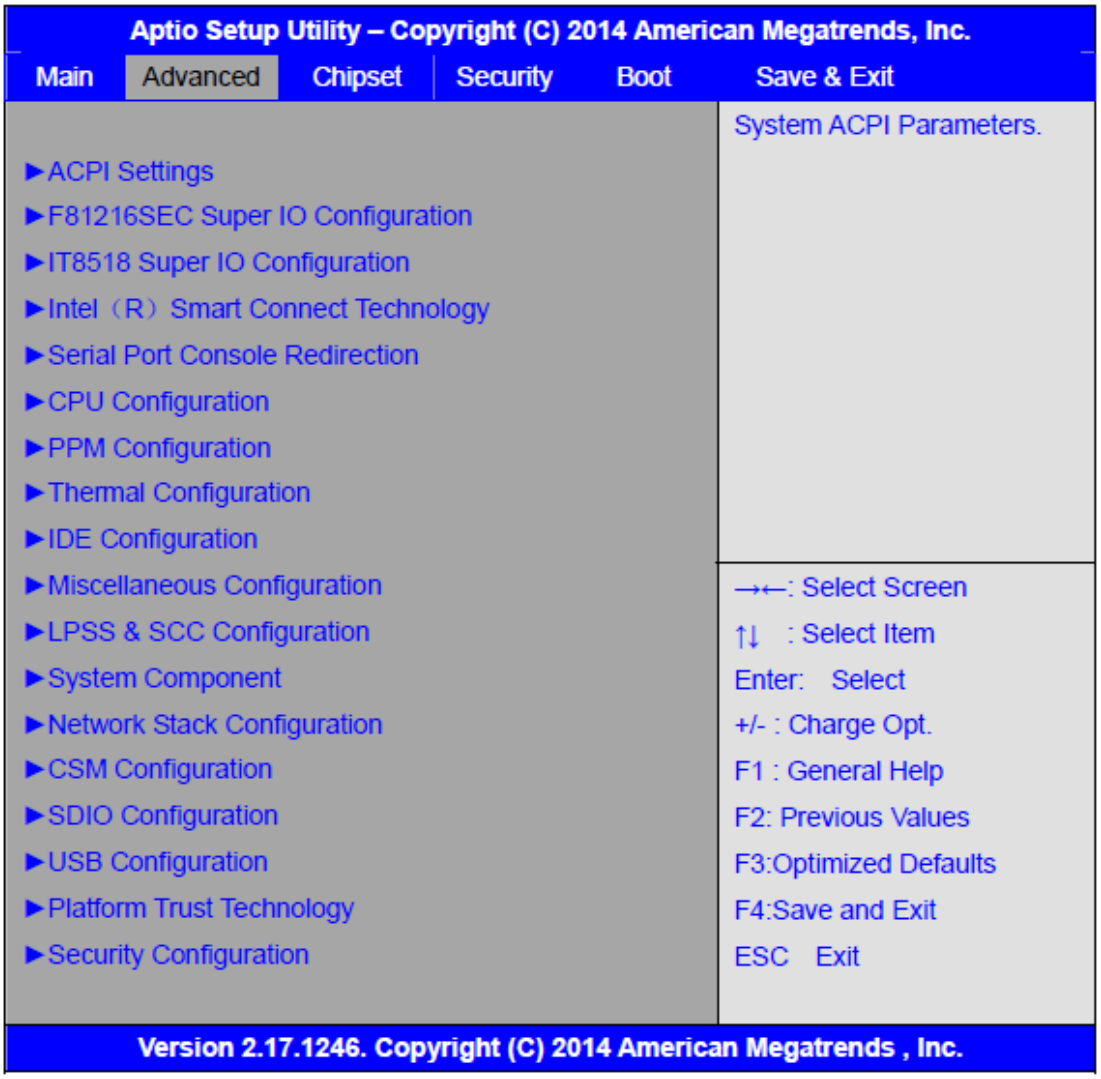
Day: Note that the 'Day' automatically changes when you set the date.

Month: 01 to 12

Date: 01 to 31

Year: 1998 to 2099

3.4 Advanced Settings



3.4.1 ACPI Settings

Enable ACPI Auto Conf:

[Disabled]

[Enabled]

Enable Hibernation:

[Enabled]

[Disabled]

ACPI Sleep State:

[S3 (Suspend to RAM)]

[Suspend Disabled]

Lock Legacy Resources:

[Disabled]

[Enabled]

3.4.2 F81216SEC Super IO Configuration

Super IO chip F81216SEC

Serial Port 1 Configuration

UART1 Mode Selection：

[RS-232]

[RS-485]

[RS-422]

Serial Port 2 Configuration

Change Settings [Auto]

Serial Port 3 Configuration

Change Settings [Auto]

Serial Port 4 Configuration

Change Settings [Auto]

3.4.3 IT8518 Super IO Configuration

Super IO chip IT8518/IT8519

Serial Port 1 Configuration

Backlight PWM Controller（COM5）：

[RS-485]

[RS-422]

Serial Port 2 Configuration (COM6)

Change Settings [Auto]

3.4.4 Intel（R）Smart Connect Technology

ISCT Support

[Disabled]

[Enabled]

3.4.5 Serial Port Console Redirection

COM0

Console Redirection

[Disabled]

[Enabled]

Console Redirection Settings

Legacy Console Redirection

Legacy Console Redirection settings

Serial Port for Out-of-Band Management/

Windows Emergency Management Services (EMS)

Console Redirection

[Disabled]

[Enabled]

Console Redirection Settings

3.4.6 CPU Configuration

Socket 0 CPU Information

Intel(R) Atom(TM) CPU E3845 @ 1.91GHz

CPU Signature	30679
Microcode Patch	901
Max CPU Speed	1910 MHz
Mix CPU Speed	500 MHz
Processor Cores	4
Intel HT Technology	Not Supported
Intel HT-X Technology	Supported
L1 Data Cache	24KB x 4
L1 Code Cache	32KB x 4
L2 Cache	1024KB x 2
L2 Cache	Not Present

CPU Thermal configuration

CPU Speed	1918 MHz
64-bit	Supported

Hyper-Threading:

[Enabled]

[Disabled]

Limit CPUID Maximum:

[Disabled]

[Enabled]

Execute Disable Bit:

[Enabled]

[Disabled]

Intel Virtualization Technology:

[Enabled]

[Disabled]

Power Technology

[Energy Efficient]

[Disabled]

[Custom]

3.4.7 PPM Configuration

CPU C State Report

[Enabled]

[Disabled]

Max CPU C-state

[C7]

[C6]

[C1]

SOix

[Disabled]

[Enabled]

3.4.8 Thermal Configuration Parameters

3.4.9 IDE Configuration

Serial-ATA(SATA)

[Enabled]

[Disabled]

SATA Test Mode

[Disabled]

[Enabled]

SATA Speed Support

[Gen2]

[Gen1]

SATA ODD Port

[No ODD]

[Porto ODD]

[Port1 ODD]

[Disabled]

SATA Mode

[AHCI Mode]

[IDE Mode]

Serial-ATA Port 0

[Enabled]

[Disabled]

SATA Port0 Hotplug

[Disabled]

[Enabled]

Serial-ATA Port 1

[Enabled]

[Disabled]

SATA Port1 Hotplug

[Disabled]

[Enabled]

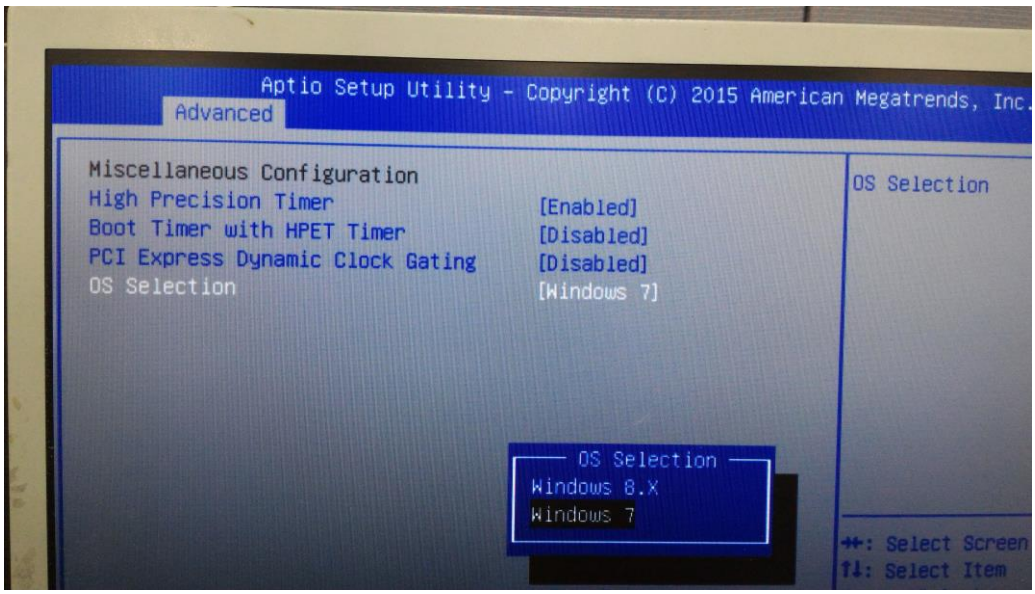
SATA Port0

Not Present

SATA Port1

Not Present

3.4.10 Miscellaneous Configuration



High Precision Timer

[Enabled]

[Disabled]

Boot Timer with HPET Timer

[Disabled]

[Enabled]

PCI Express Dynamic Clock Gating

[Disabled]

[Enabled]

OS Selection

Use the **OS Selection** option to select an operating system for the system.

Note:

Users must go to this item to select the OS mode before installing corresponding OS driver, otherwise problems will occur when installing the driver.

3.4.11 LPSS & SCC Configuration

LPSS & SCC Configuration	[ACPI Mode]
SCC Configuration	
SCC eMMC Support	[eMMC AUTO MODE]
SCC eMMC 4.5 DDR50 Support	[Enabled]
SCC eMMC 4.5 HS200 Support	[Disabled]
eMMC Secure Erase	[Disabled]
SCC SDIO Support	[Enabled]
SCC SD Card Support	[Enabled]
SDR25 Support for SDCard	[Disabled]
SDR50 Support for SDCard	[Enabled]
MIPI HSI Support	[Disabled]
LPSS Configuration	
LPSS DMA #1 Support	[Enabled]
LPSS DMA #2 Support	[Enabled]
LPSS I2C #1 Support	[Enabled]
LPSS I2C #2 Support	[Enabled]
LPSS I2C #3 Support	[Enabled]
LPSS I2C #4 Support	[Enabled]

LPSS I2C #5 Support	[Enabled]
LPSS I2C #6 Support	[Enabled]
LPSS I2C #7 Support	[Enabled]
NFC	[Disabled]
Touch Pad	[Disabled]
I2C touch Device Address	
LPSS HSUART #1 Support	[Disabled]
LPSS HSUART #2 Support	[Disabled]
LPSS PWM #1 Support	[Enabled]
LPSS PWM #2 Support	[Enabled]
LPSS SPI Support	[Enabled]

3.4.12 System Component

3.4.13 Network Stack Configuration

Network Stack	[Disabled]

3.4.14 CSM Configuration

CSM Support	[Enabled]
CSM16 Module Version	07.76
GateA20 Active	[Upon Request]
	[Always]
Option ROM Messages	[Force BIOS]
	[Keep Current]
Boot option filter	[UEFI and Legacy]
	[Legacy only]
	[UEFI only]
Network	
	[UEFI]
	[Do not launch]
	[Legacy]
Storage	
	[UEFI]
	[Do not launch]
	[Legacy]
Video	
	[Legacy]
	[UEFI]

[Do not launch]

Other PCI devices

[UEFI]

[Do not launch]

[Legacy]

3.4.15 SDIO Configuration

3.4.16 USB Configuration

USB Configuration

USB Module Version 8.11.02

USB Devices:

1 keyboard, 1 Mouse，2 Hubs

Legacy USB Support:

[Enabled]

[Disabled]

XHCI Hand-off:

[Enabled]

[Disabled]

EHCI Hand-off:

[Disabled]

[Enabled]

USB Mass Storage Driver Support

[Enabled]

[Disabled]

USB hardware delays and time-outs：

USB transfer time-out:

[20 sec]

[10 sec]

[5 sec]

[1 sec]

Device reset time-out:

[20 sec]

[10 sec]

[30 sec]

[40 sec]

Device power-up delay

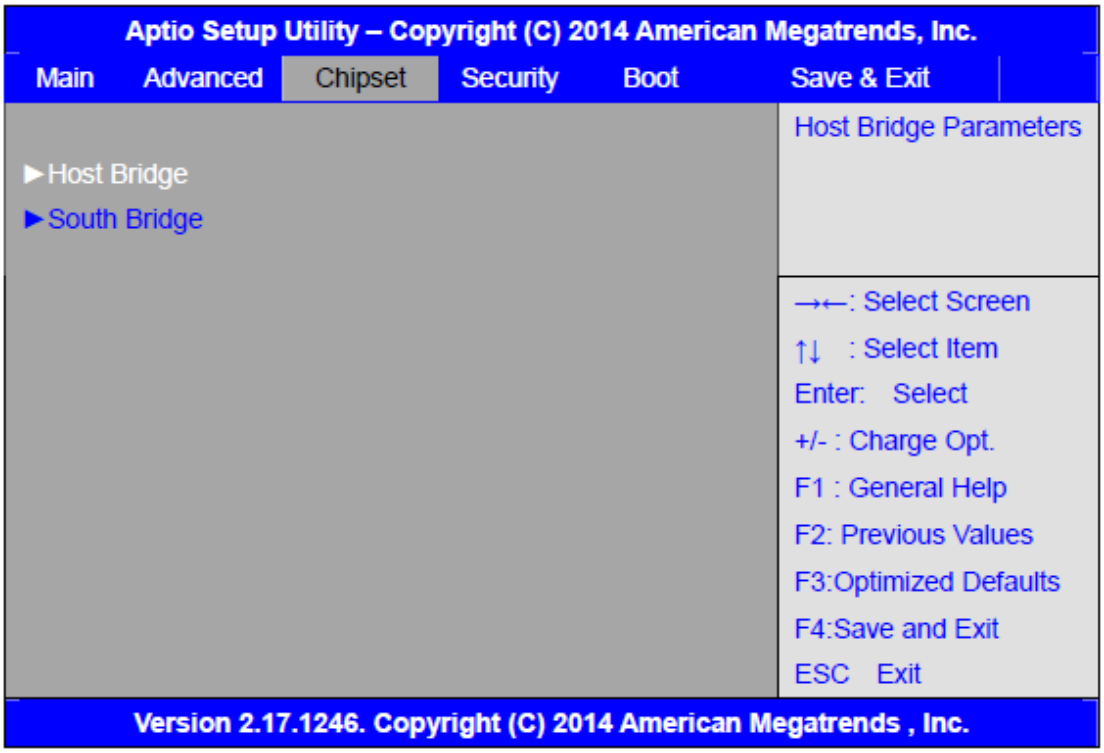
[Auto]

[Manual]

3.4.17 Platform Trust Technology

3.4.18 Security Configuration

3.5 Chipset Settings



3.5.1 Host Bridge

►Intel IGD Configuration

►IGD – LCD Control

Force Lid Status	[On]
	[Off]
BIA	[Auto]
ALS Support	[Disabled]
IGD Flat Panel	[Auto]
Pannel Scaling	[Auto]

►Memory Frequency and Timing

►Graphics Power Management Control

Memory Information	
Total Memory	4096 MB(DDR3L)
Memory Slot0	4096 MB(DDR3L)
DIMM#1	Not Present

Max TOLUD	
	[Dynamic]
	[2GB]
	[2.25GB]
	[2.5GB]
	[2.75GB]
	[3GB]

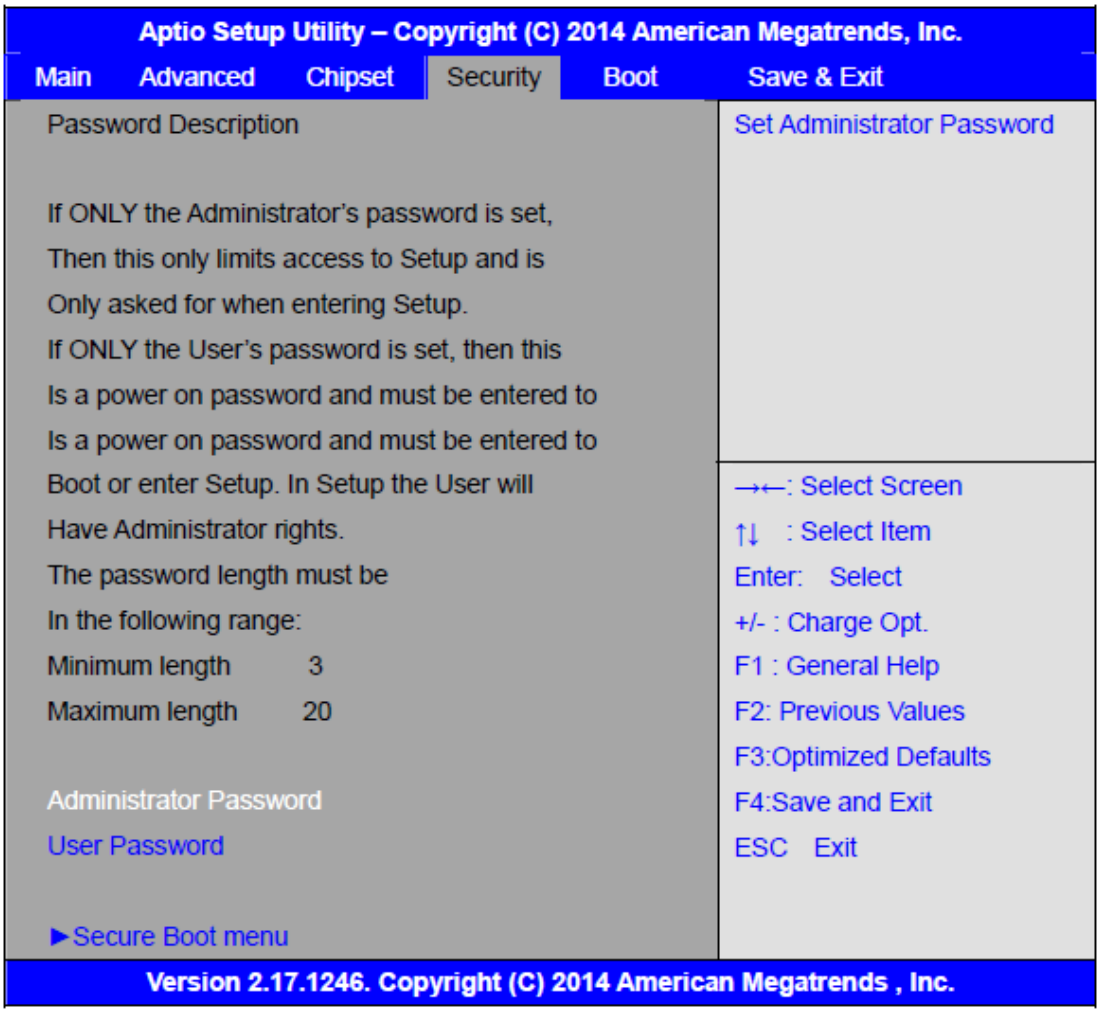
3.5.2 South Bridge

►Azalia HD Audio

►USB Configuration

USB OTG Support	[Disabled]
USB VBUS	[On]
XHCI Mode	[Smart Auto]
USB2 Link Power Management	[Enabled]
USB 2.0(EHCI) Support	[Enabled]
USB EHCI debug	[Disabled]
USB Per Port Control	[Enabled]
USB Port 0	[Enabled]
USB Port 1	[Enabled]
USB Port 2	[Enabled]
USB Port 3	[Enabled]

3.6 Security Settings



3.6.1 Administrator Password

3.6.2 User Password

Type the password with up to 20 characters and then press ⮜Enter⮞ key. This will clear all previously typed CMOS passwords. You will be requested to confirm the password. Type the password again and press ⮜Enter⮞ key. You may press ⮜Esc⮞ key to abandon password entry operation.

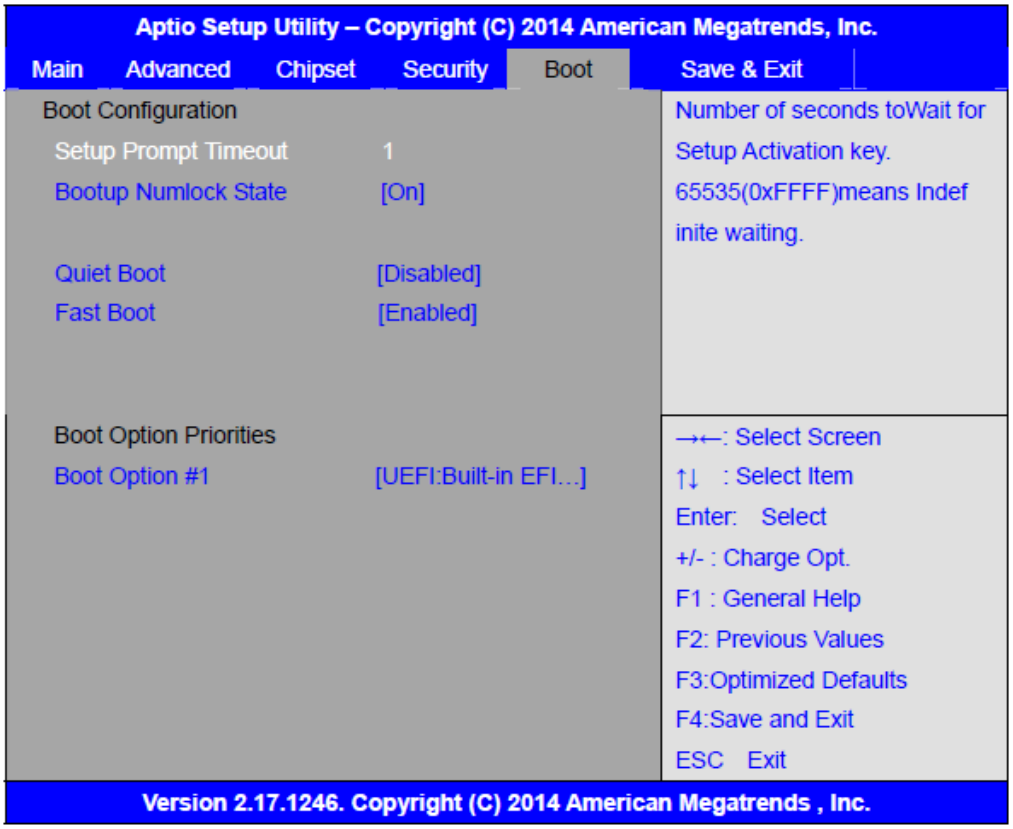
To clear the password, just press ⮜Enter⮞ key when password input window pops up. A confirmation message will be shown on the screen as to whether the password

will be disabled. You will have direct access to BIOS setup without typing any password after system reboot once the password is disabled.

Once the password feature is used, you will be requested to type the password each time you enter BIOS setup. This will prevent unauthorized persons from changing your system configurations.

Also, the feature is capable of requesting users to enter the password prior to system boot to control unauthorized access to your computer. Users may enable the feature in Security Option of Advanced BIOS Features. If Security Option is set to System, you will be requested to enter the password before system boot and when entering BIOS setup; if Security Option is set to Setup, you will be requested for password for entering BIOS setup.

3.7 Boot Settings



Setup Prompt Timeout [1]

Bootup Numlock State

[On]

[off]

Quiet Boot

[Disabled]

[Enabled]

Fast Boot

[Disabled]

[Enabled]

Boot Option Priorities

Boot Option #1

Sets the system boot order

Hard Drive BBS Priorities [SATA PM:*** …]

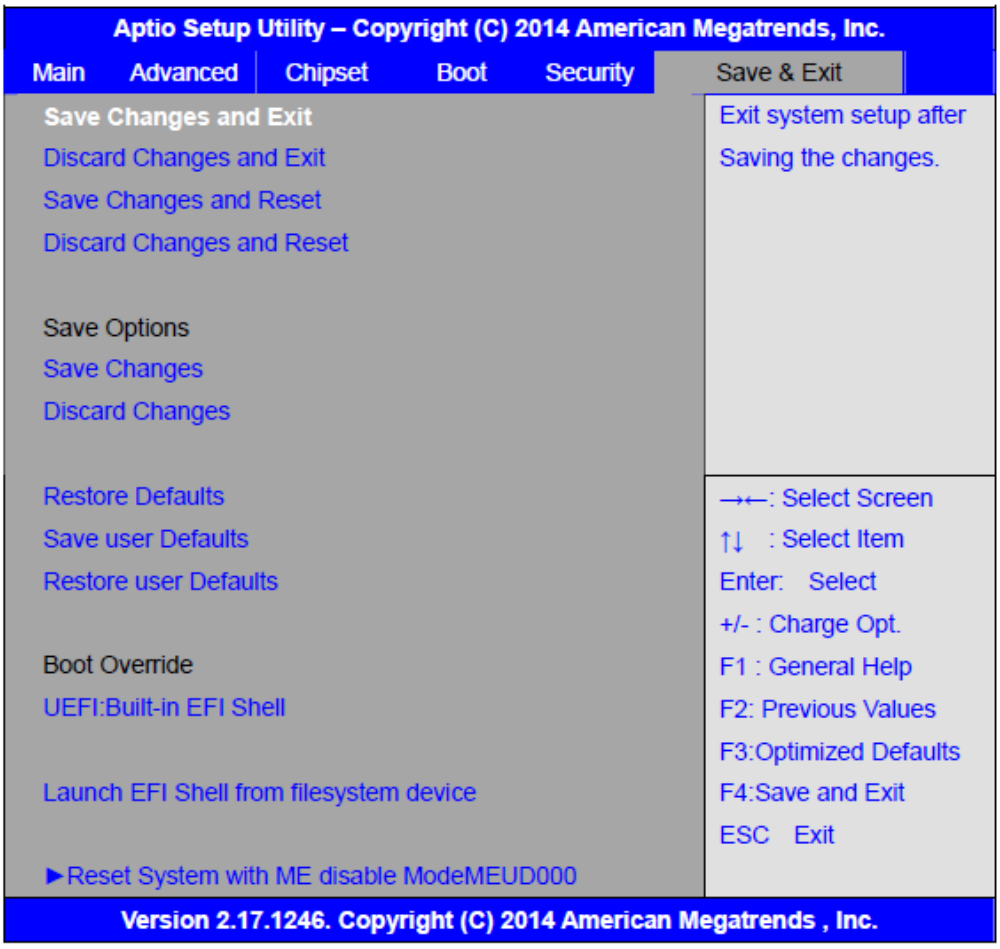
Boot Option #1

SATA PM:***…

******

Disabled

3.8 Save & Exit Settings



Save Changes and Exit

Save & Exit Setup save Configuration and exit ?

[Yes]

[No]

Discard Changes and Ext

Exit Without Saving Quit without saving?

[Yes]

[No]

Save Changes and Reset

Save & reset Save Configuration and reset?

[Yes]

[No]

Discard Changes and Reset

Reset Without Saving Reset without saving?

[Yes]

[No]

Save Changes

Save Setup Values Save configuration?

[Yes]

[No]

Discard Changes

Load Previous Values Load Previous Values?

[Yes]

[No]

Restore Defaults

Load Optimized Defaults Load optimized Defaults?

[Yes]

[No]

Save user Defaults

Save Values as User Defaults Save configuration?

[Yes]

[No]

Restore user Defaults

Restore User Defaults Restore User Defaults?

[Yes]

[No]

Launch EFI Shell from filesystem device

WARNING Not Found

[ok]

Reset System with ME disable ModeMEUD000

ME will runs into the temporary disable mode, Ignore if ME Ignition FWMEUD001.

Chapter 4 Installation of Drivers

This chapter describes the installation procedures for software and drivers under the windows 8.1/10. The software and drivers are included with the motherboard. The contents include **Intel chipset driver, VGA driver, Audio driver, Com, and TXE driver Installation instructions are given below.**

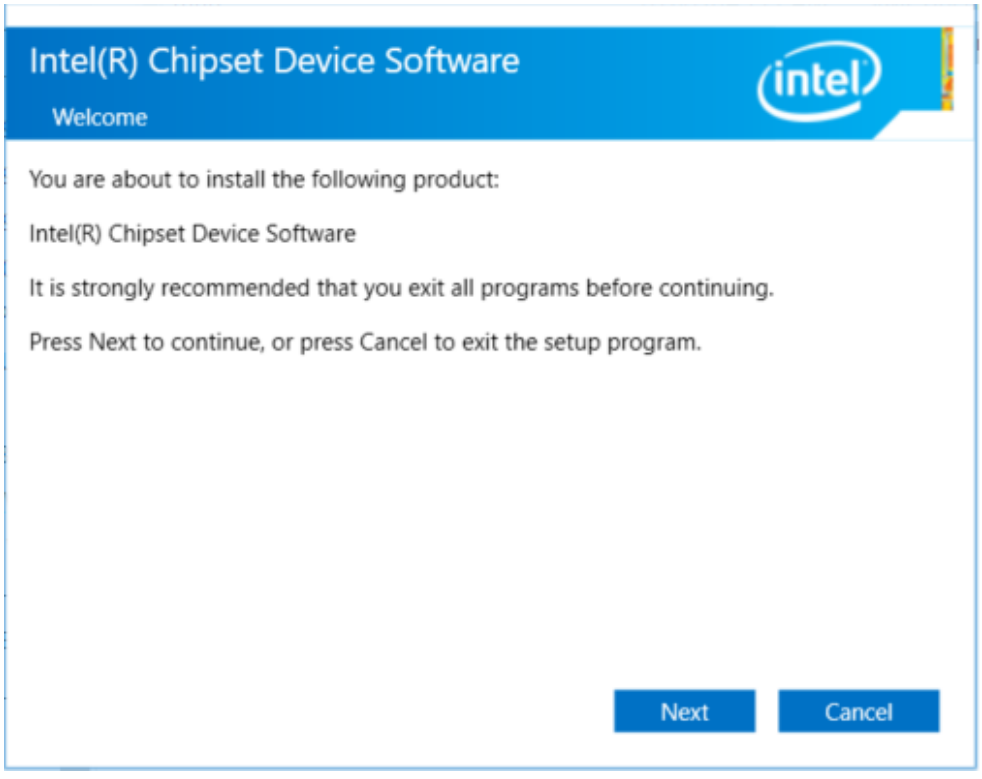
> **Important Note:**
> After installing your Windows operating system, you must install first the Intel Chipset Software Installation Utility before proceeding with the installation of drivers.

4.1 Intel® Atom™ SoC Chipset

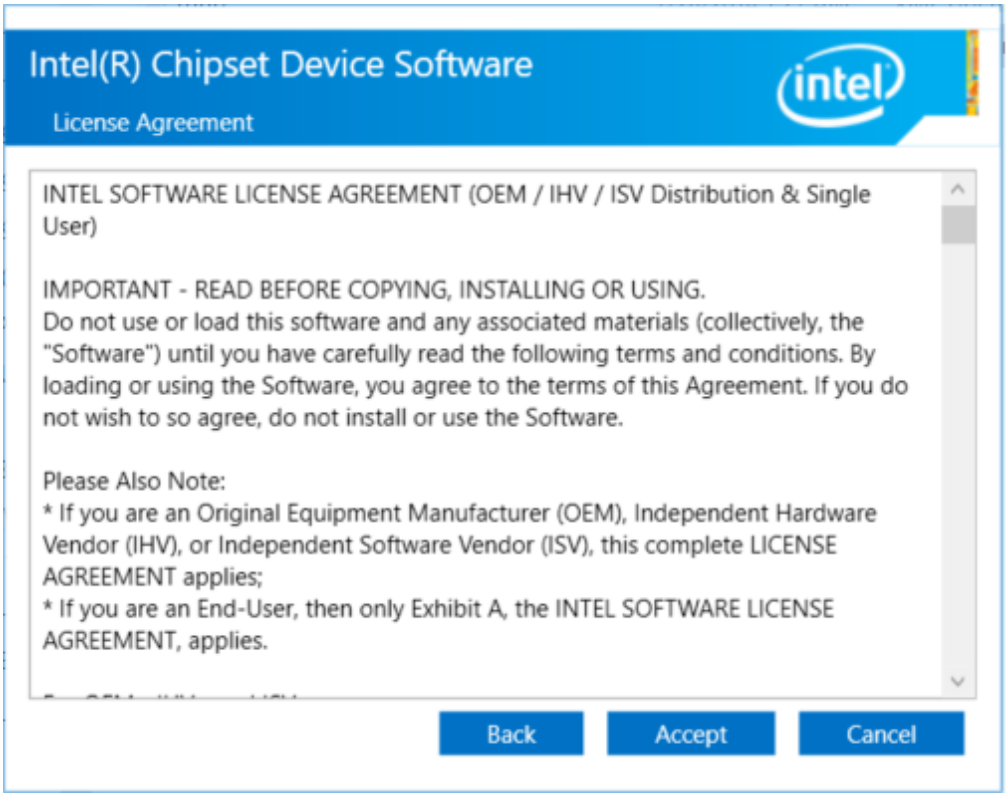
To install the Intel chipset driver, please follow the steps below.

Step 1. Select **Intel® Atom™ SoC Chipset** from the list

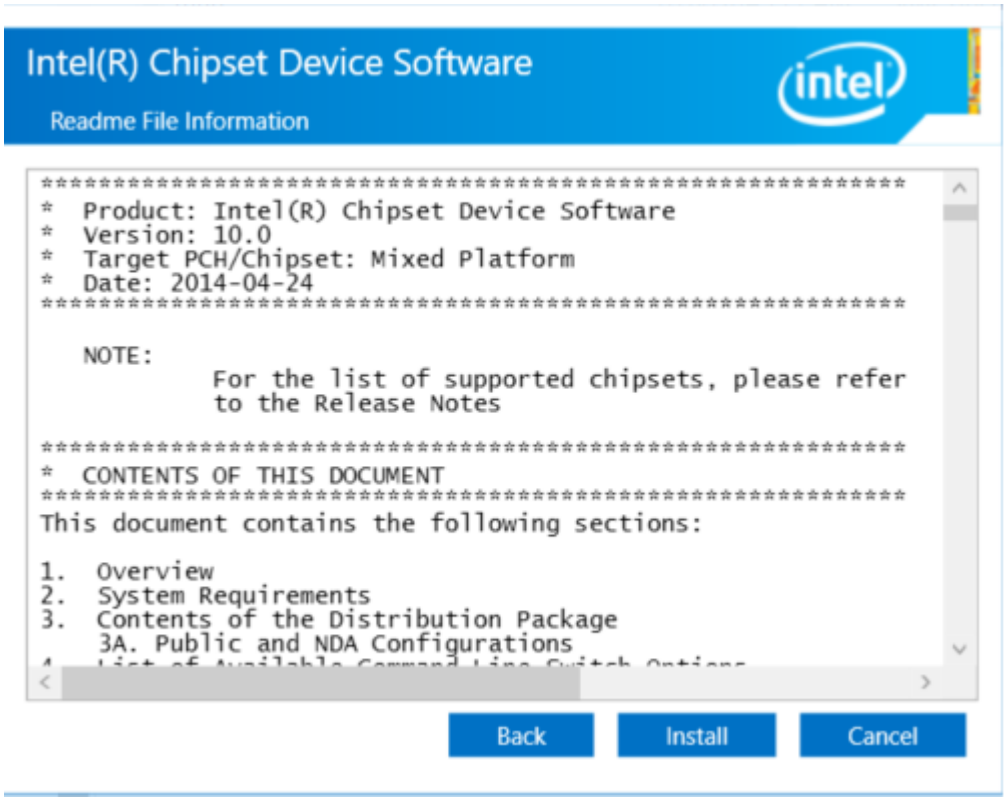
Step 2. Here is welcome page. Please make sure you save and exit all programs before install**.** Click **Next.**



Step 3. Read the license agreement. Click **Accept** to accept all of the terms of the license agreement.



Step 4. Click **Install** to begin the installation.



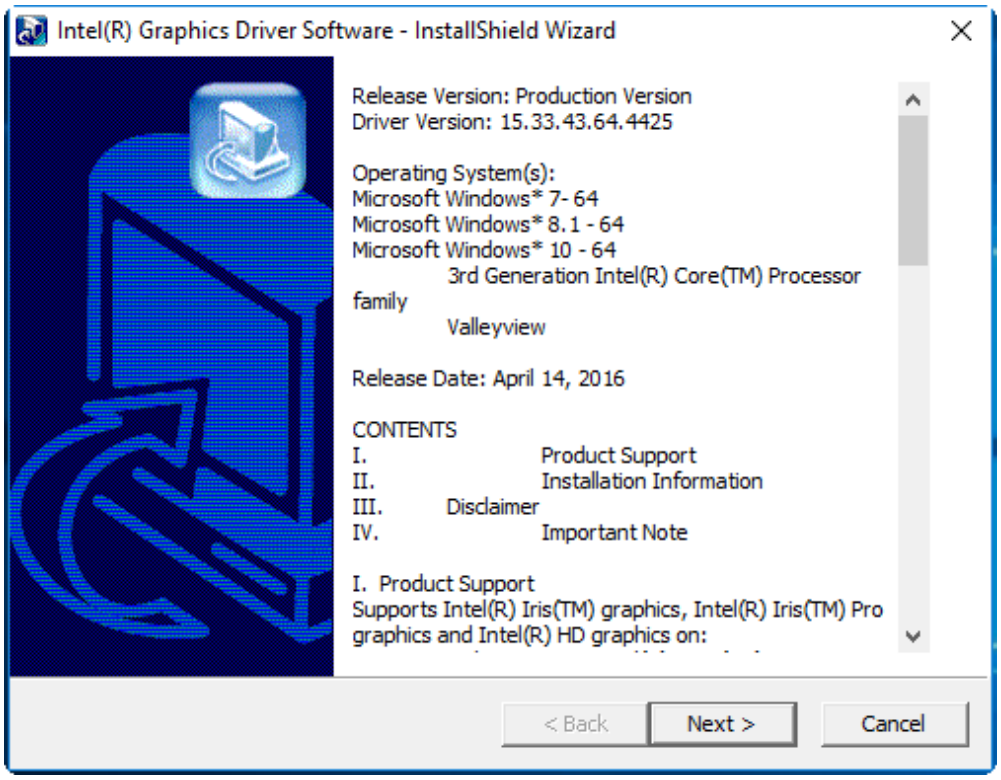
Step 5. Click **Finish** to exit the wizard.

4.2 Intel® VGA Chipset

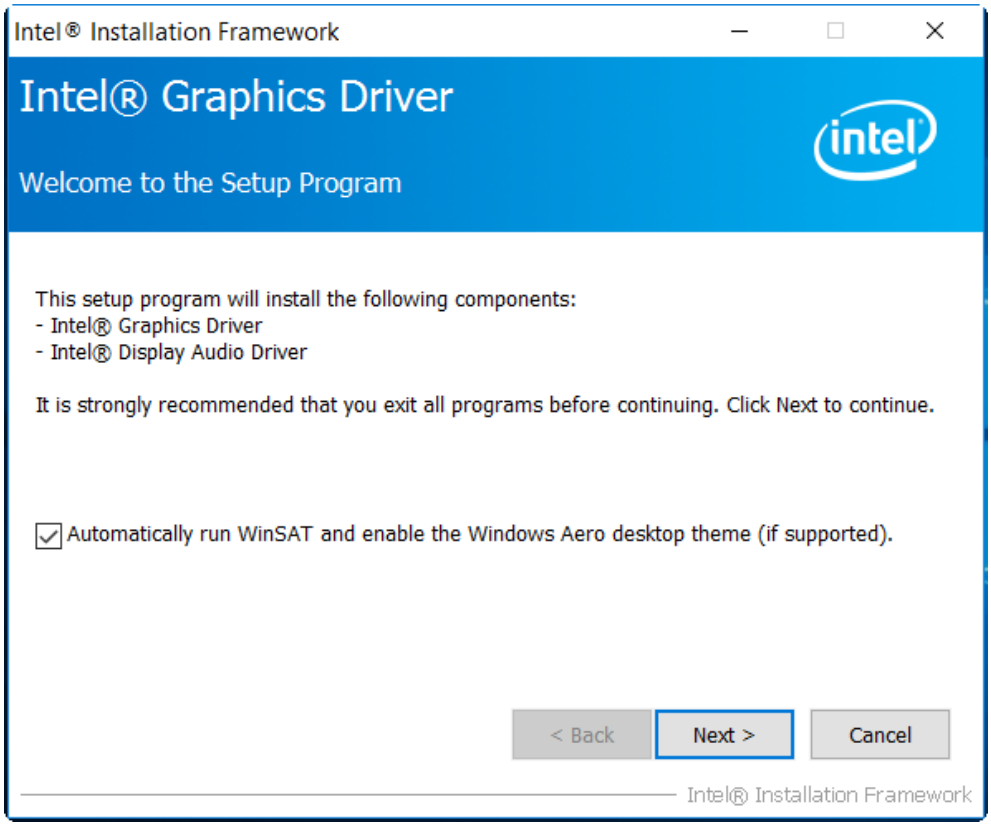
To install the Intel® VGA Chipset, please follow the steps below.

Step 1. Select **Intel® VGA Chipset** from the list**.**

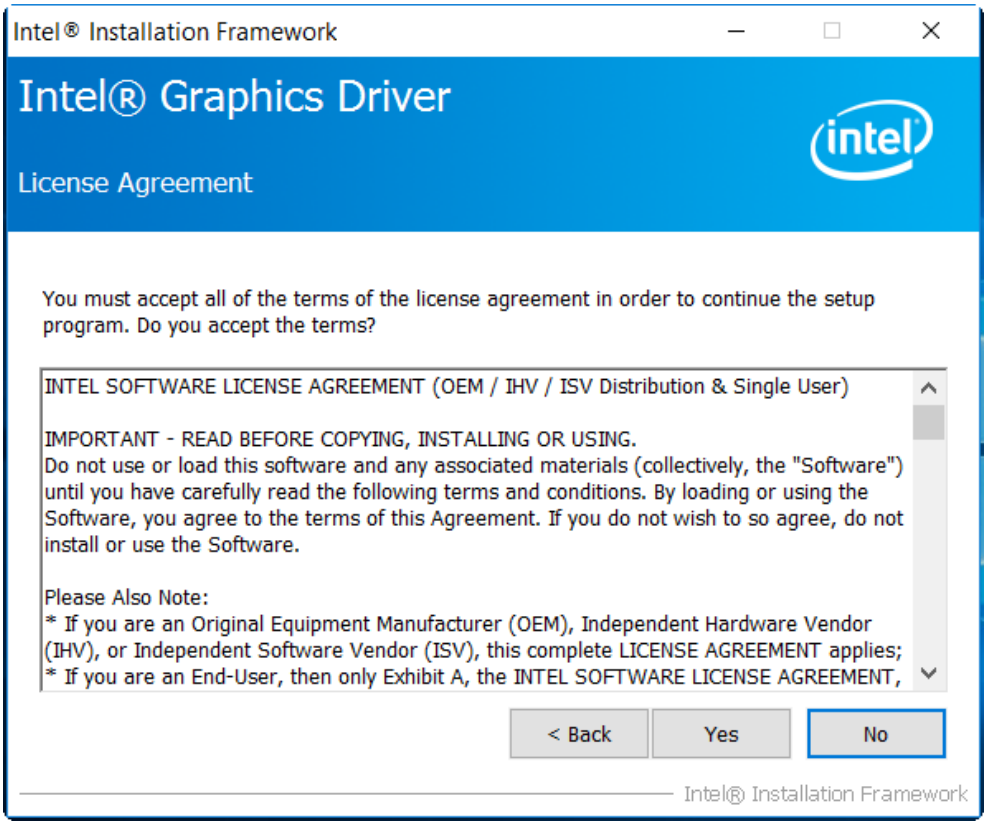
Step 2. . Click **Next.**



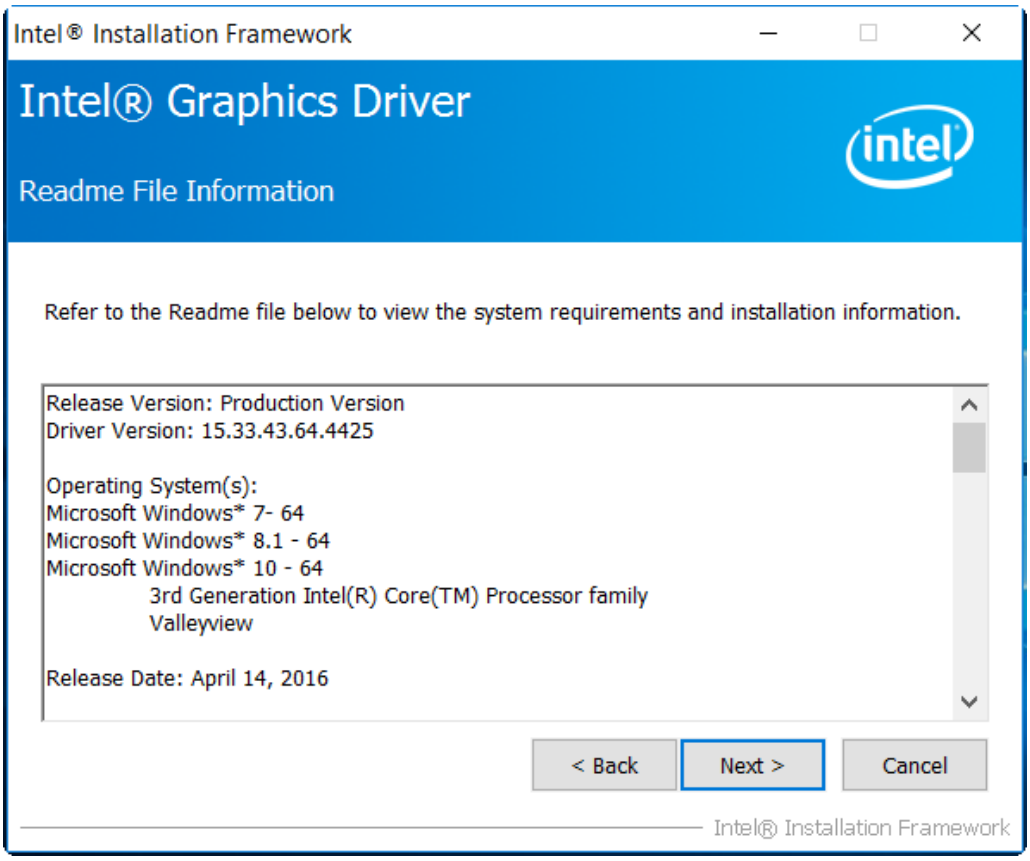
Step 3. Choose **automatically run** function and Click **Next** to setup program.



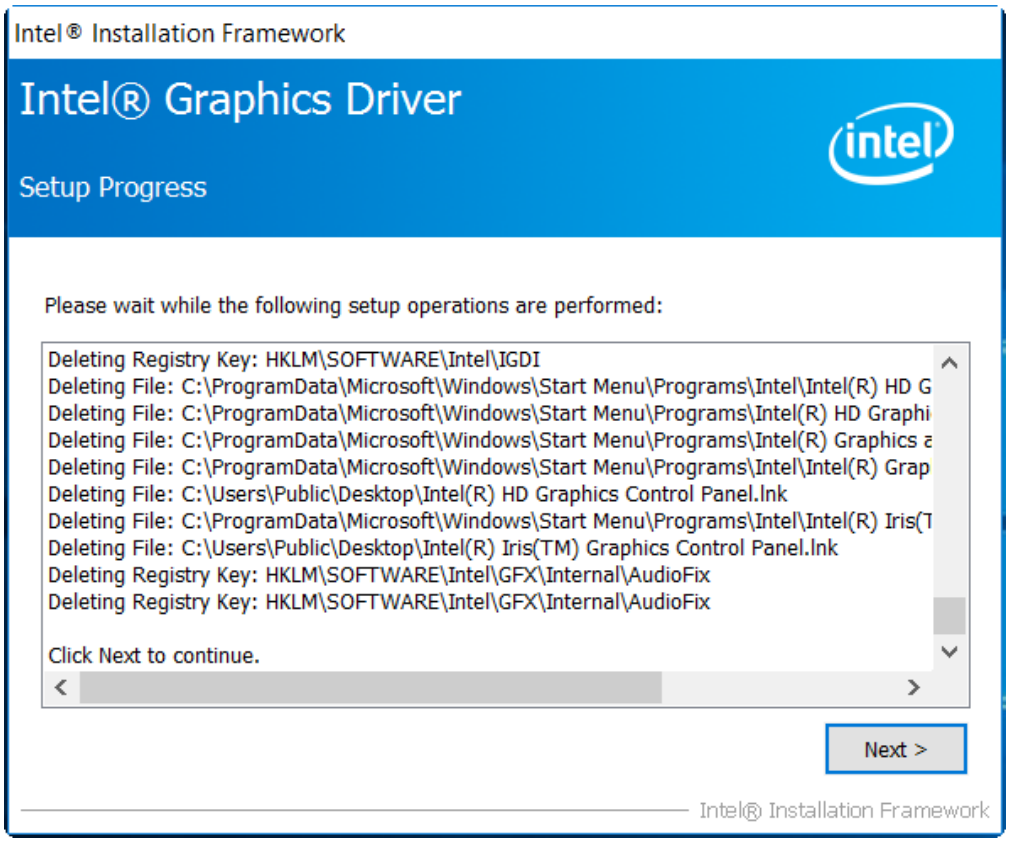
Step 4. Read the license agreement. Click **Yes** to accept all of the terms of the license agreement.



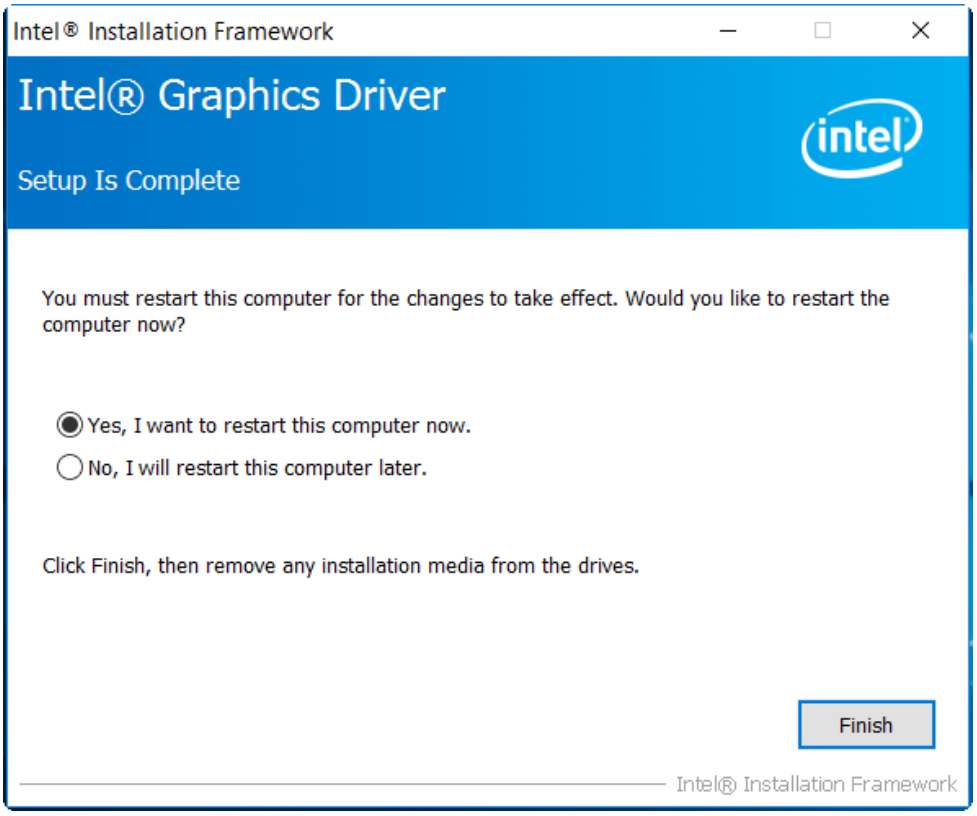
Step 5. Click **Next** to continue.



Step 6. Click **Next** to continue.



Step 7. Select **Yes, I want to restart this computer now**. Click **Finish**, then remove any installation media from the drives.

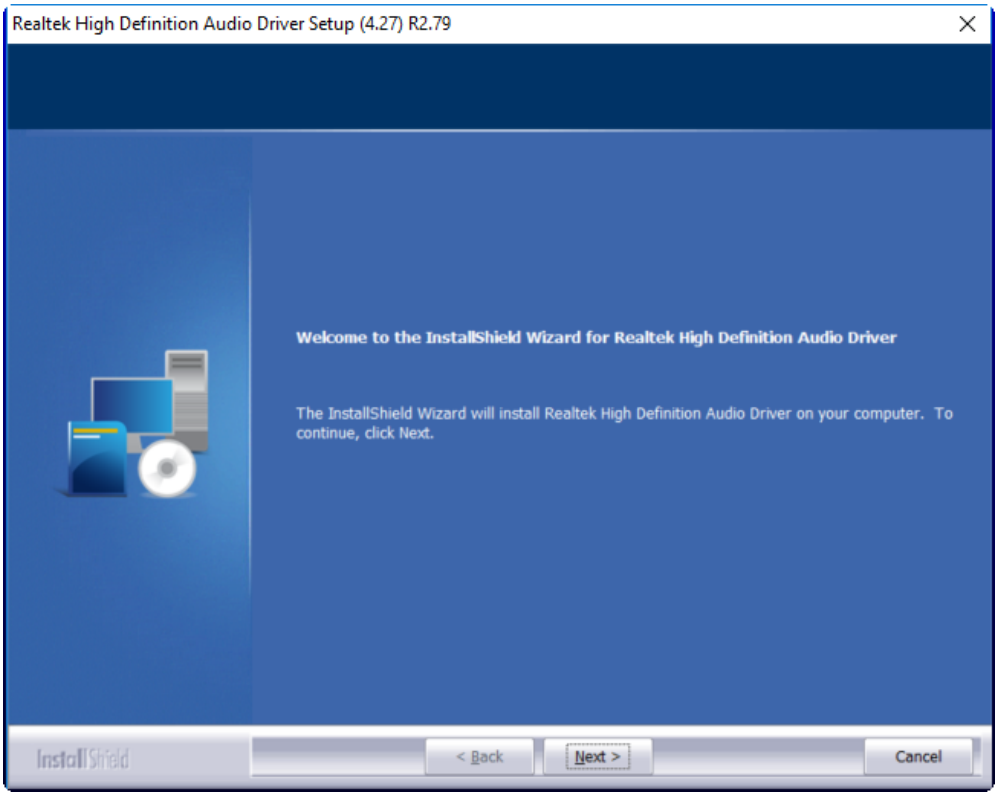


4.3 Realtek ALC662 HD Audio Driver Installation

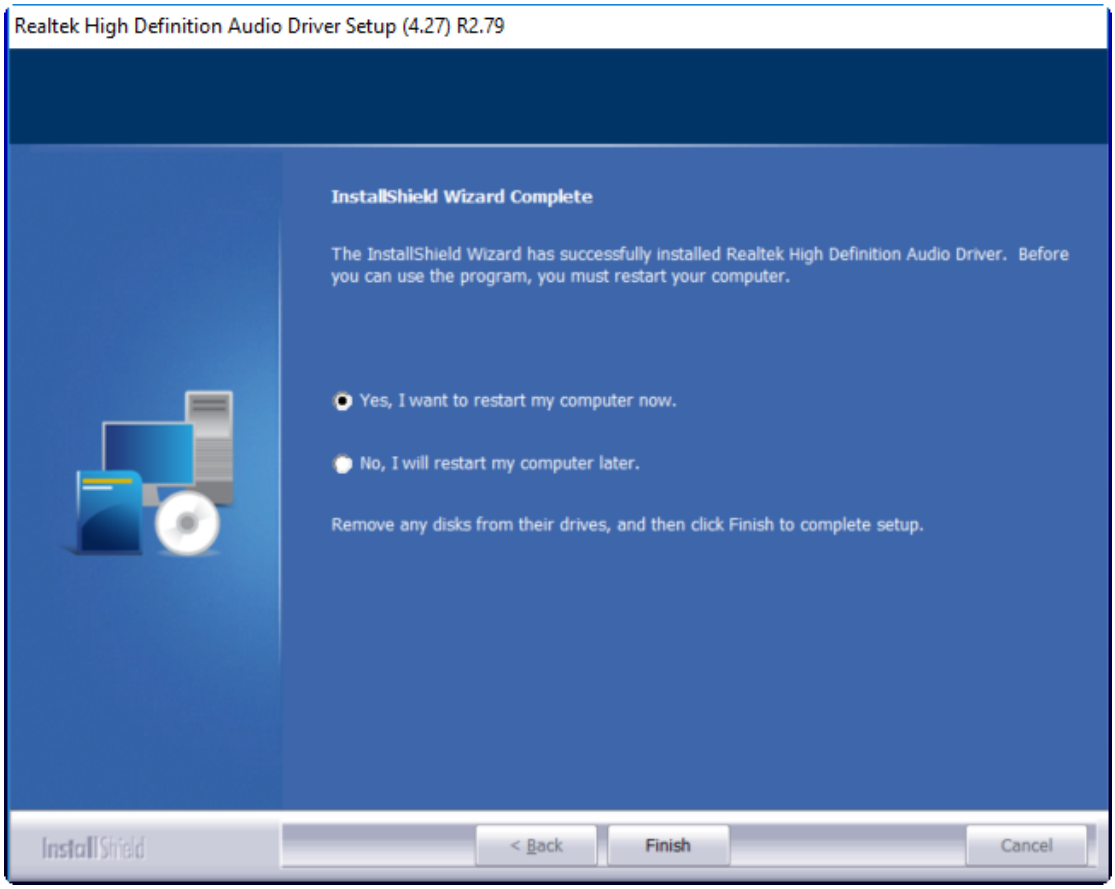
To install the Realtek ALC662 HD Audio Driver, please follow the steps below.

Step 1. Select **Realtek AL662 HD Audio Driver** from the list

Step 2. Click **Next** to continue.



Step 3. Click **Yes, I want to restart my computer now**. Click **Finish** to complete the installation.

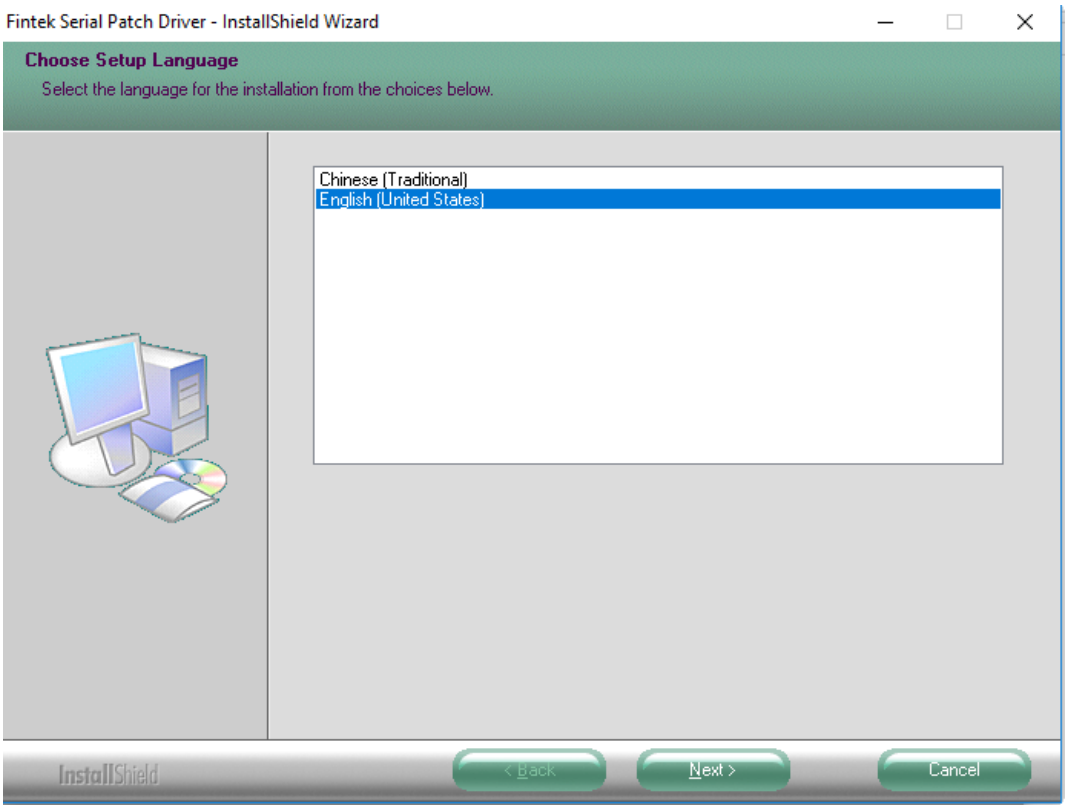


4.4 Com Driver

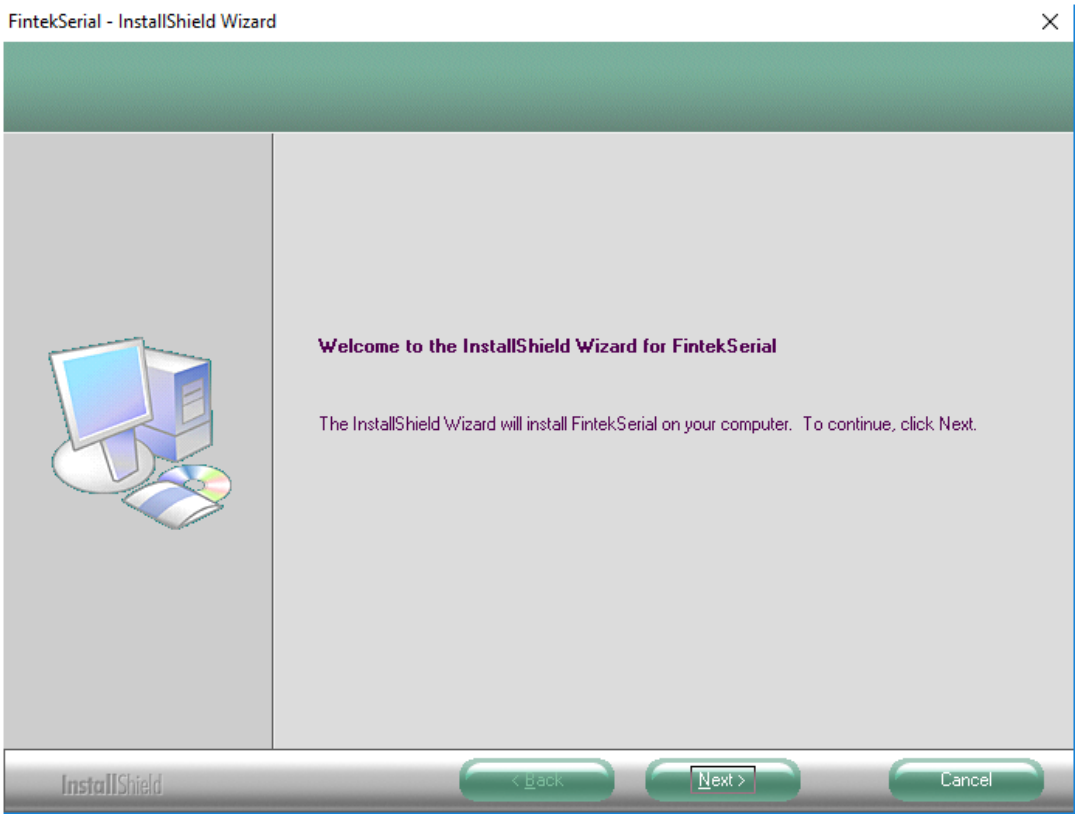
To install the Com Driver, please follow the steps below.

Step 1. Select **Com Driver** from the list

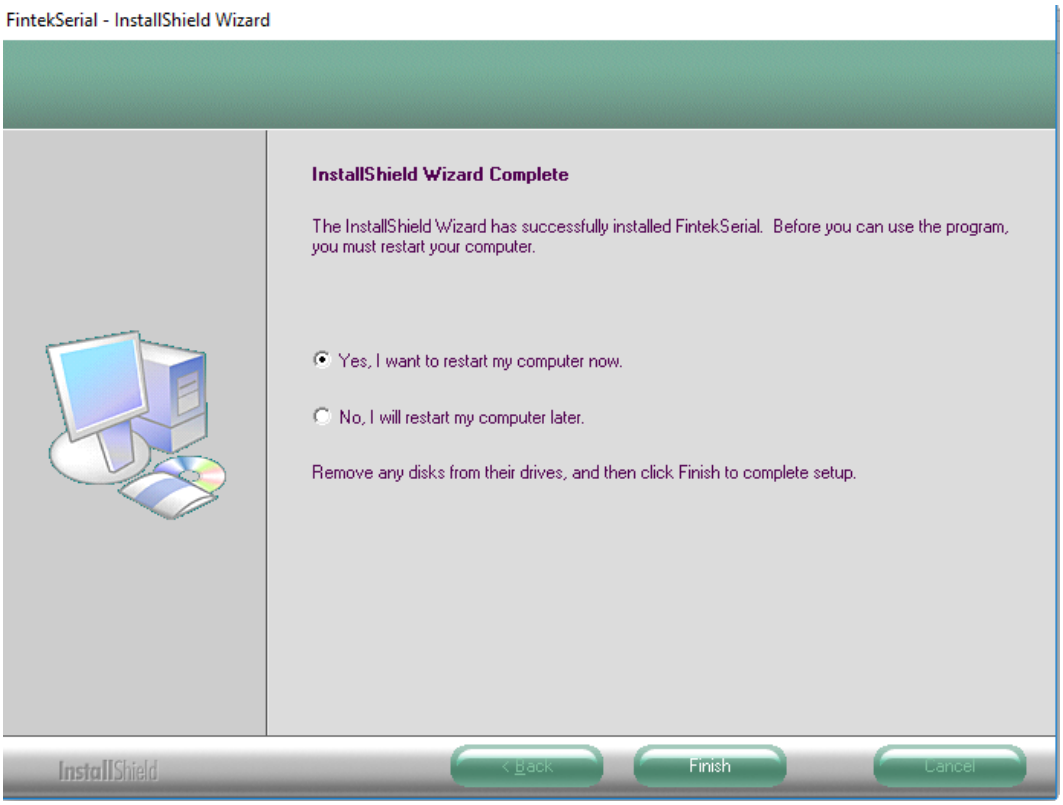
Step 2. Select setup language you need. Click **Next** to continue.



Step 3. Click **Next** to begin the installation.



Step 4. Choose **Yes, I want to restart my computer now**. Click **Finish** to complete the installation.

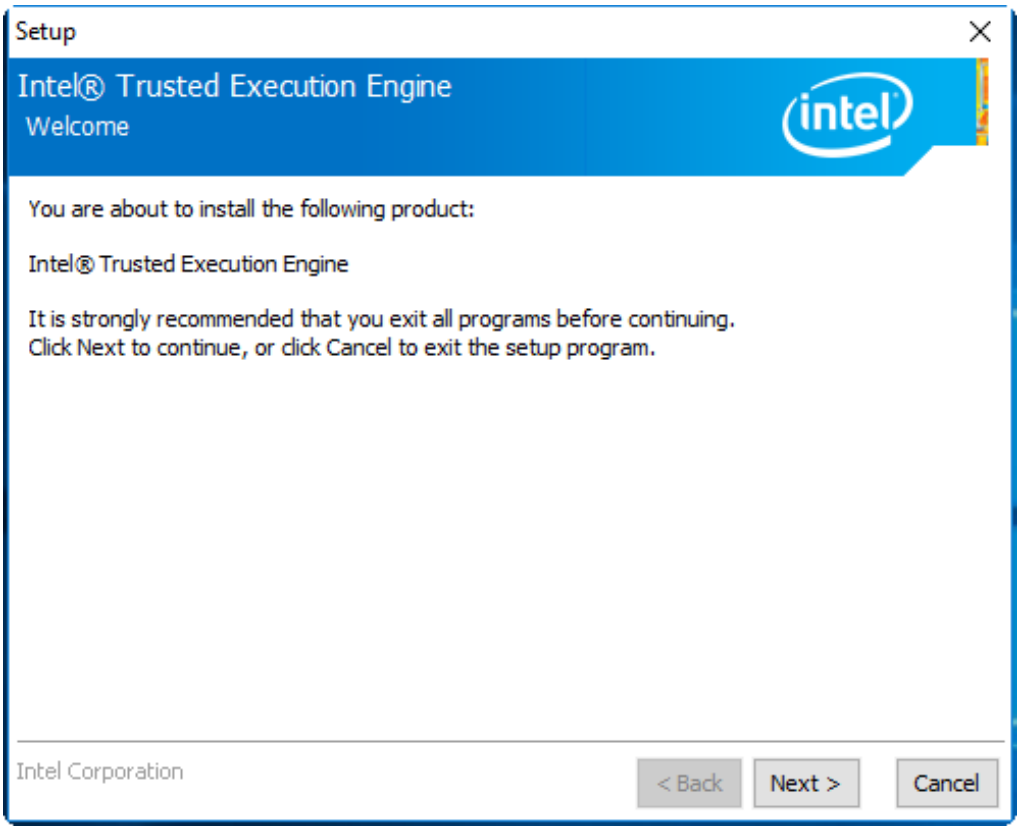


4.5 Intel_TXE(Win) Driver

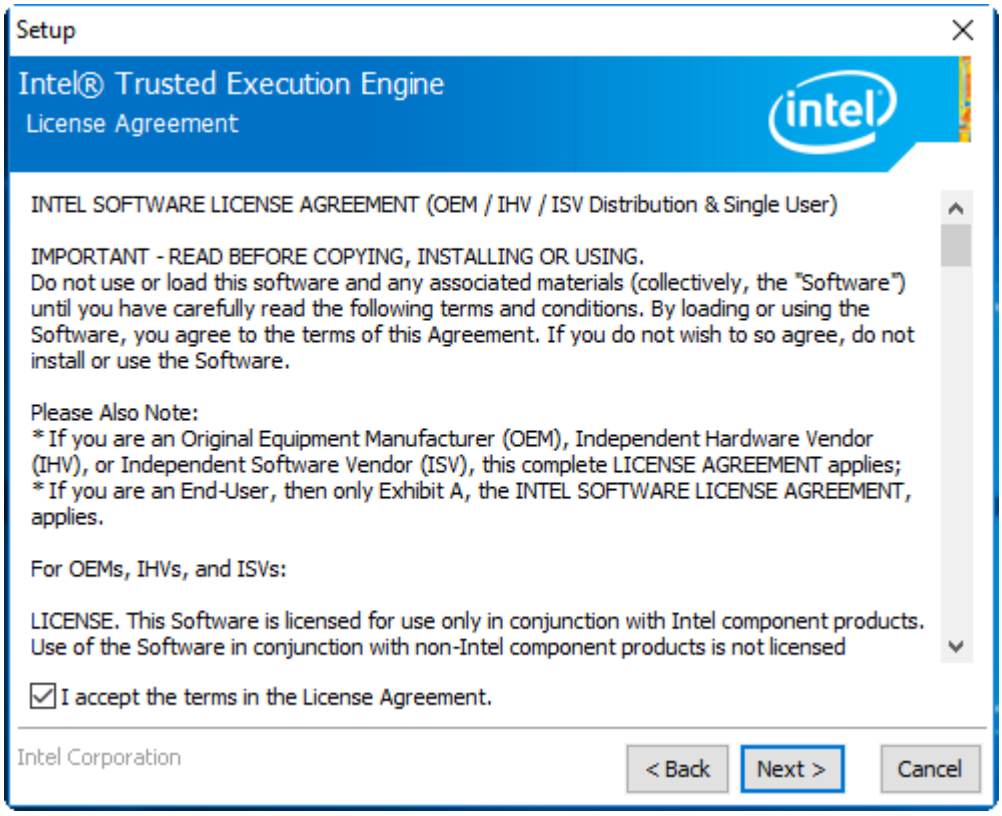
To install the Intel_TXE(Win) Driver, please follow the steps below.

Step 1. Select **Intel_TXE(Win) Driver** from the list

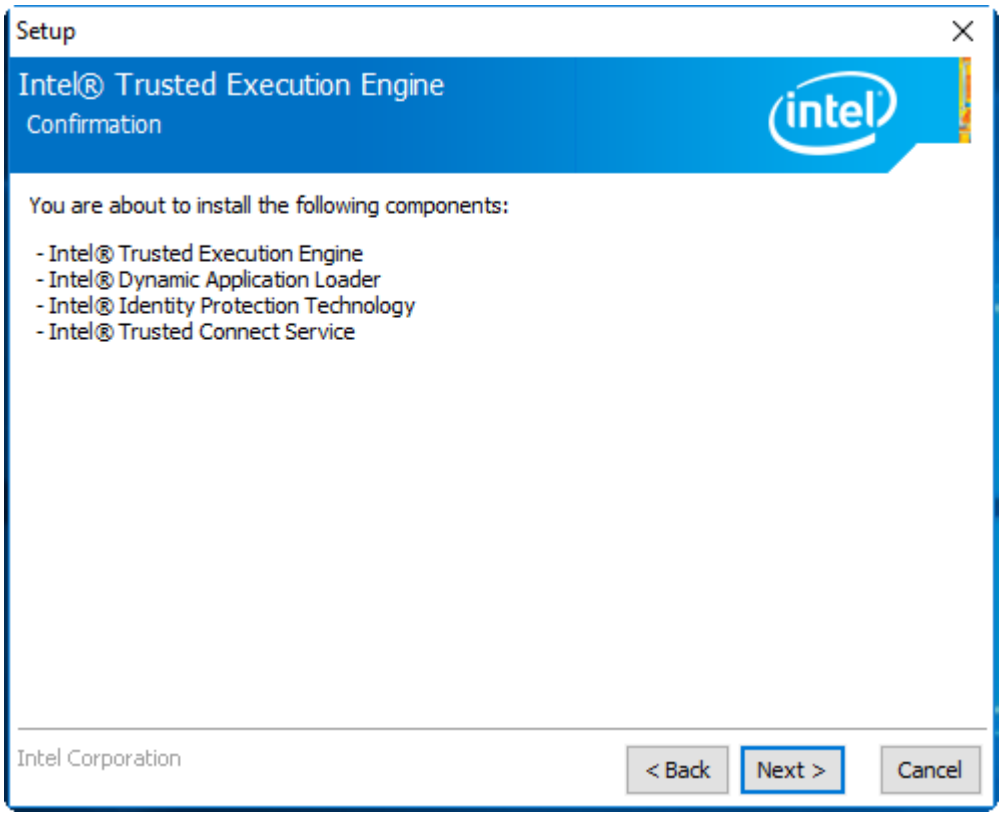
Step 2. Click **Next** to continue.



Step 3. Read the license agreement. Choose **Accept** and click **Next** to accept all of the terms of the license agreement.



Step 4. Click **Next** to continue.



Step 5. Click **Finish** to complete the installation.