VIPAC-9XX

Intel 6th/7th Core i Socket Type Expandable with Fan PANEL PC

User Manual

Release Date	Revision
Oct.2019	V1.5

Aplex Technology, Inc.
15F-1, No.186, Jian Yi Road, Zhonghe District, New Taipei City 235, Taiwan
Tel: 886-2-82262881 Fax: 886-2-82262883 URL: http://www.aplextec.com/zh/home.php

Revision History

Reversion	Date	Description
1.0	2017/10/25	Official Version
1.1	2018/01/25	● Modify PCIe information. ● Renew product images.
1.2	2018/06/01	● Modify Core I 7 motherboard/BIOS chapter
1.3	2018/06/08	● SW1-6
1.4	2019/01/02	● Modify front bezel information
1.5	2019/10/25	● Revise product images, dimensions and mechanical information

Warning!_____

This equipment will generate, use and 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 its 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.

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.

Caution

There is risk of explosion if the battery is replaced with an incorrect way.
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.

Table of Contents

Figures

Chapter 1 Getting Started

1.1 Features

- 15”, 15.6”, 17”, 21.5” TFT LCD panel PC
- Intel 6th/7th Core i7/i5/i3 Socket type Processor
- Modular concept with fan design
- Support Project capacitive/ Resistive/ AR glass touch
- Front bezel IP66 design
- 2 x Expansion slot and 2 x 2.5 SATA HDD space
- Support WIFI, Bluetooth and Speaker
- Support panel mount
- Support DC 9~36V power input; and AC input can be option

1.2 Specifications

	VIPAC-915 P/R/G(H)	VIPAC-916 P/R/G(H)	VIPAC-917 P/R/G(H)	VIPAC-921 P/R/G(H)
System				
Processor	Socket H4,6th/7th Gen. Intel Core Processor 6th i7-6700TE (Quad/3.4GHz) 6th i5-6500TE (Quad/3.3GHz) 6th i3-6100TE (Dual/2.4GHz) 6th Pentium G4400TE (Dual/2.4GHz) 6th Celeron G3900TE (Dual/2.3GHz) 7th i7-7700T (Quad/2.9GHz) 7th i7-7500T (Quad/2.7GHz) 7th i7-7101TE (Quad/3.4GHz) 7th Celeron G3930TE (Dual/2.7GHz)			
System Chipset	Intel 100 Series Chipset (H170 Default)			
System Memory	2 x 260-pin SO-DIMM up to 32GB DDR4 2133MHz SDRAM			
Outside I/O				
Front I/O Ports	4 x USB 3.0 type A 2 x RJ-45 GbE LAN 1 x RS-232/422/485 DB-9, COM1(default RS-232) 1 x RS-232 DB-9, COM2 1 x RS-422/485 DB-9, COM3(default RS-485) 1 x Line-out/1 x Mic-in			

	1 x VGA by DB-15 1 x HDMI with cover 1 x System LED indication at front 2 x LED indicators for HDD/system 1 x Power switch on/off 1 x 3-pin terminal block for DC power input 1 x 2-pin power switch			
Option Function	4 x USB 2.0 type A 2 x DB-9 COM port 1 x 8-bit GPIO(3 in/out/VCC/GND) 2 x 2W Speaker			
Storage				
Storage	2 x 2.5” SATA HDD space (easy accessible design) Support RAID 0, 1, 5			
Watchdog timer				
Watchdog timer	System reset, programmable via software from 1 to 255 seconds			
Expansion				
Expansion Slots	1 x Mini-PCIe slot full size (PCIe/USB/SATA, SATA by default) 1 x Mini-PCIe slot half size (PCIe/USB, PCIe by default) 1 x SIM slot for option 1 x PCIe x 1 and 1 x PCIe x 16 slot 1 x WIFI/Bluetooth/LTE and antenna at rear side for option			
LCD				
Display type	15” color TFT LCD	15.6” color TFT LCD	17” color TFT LCD	21.5” color TFT LCD
Max. Resolution	1024 x 768	1366 x 768 1920 x 1080	1280 x 1024	1920 x 1080
Max. Color	16.7M	16.7M	16.7M	16.7M
Luminance (cd/m^2)	420	300	350	250
Contrast Ratio	800:1	500:1	1000:1	3000:1
Viewing Angle (H)/(V)	160/160 (160/140)	160/160	170/170	178/178
Backlight Lifetime	50,000 hrs	50,000 hrs	50,000 hrs	30,000 hrs
LCD (High brightness)				
Display type	15” color TFT LCD	15.6” color TFT LCD	17” color TFT LCD	21.5” color TFT LCD
Max. Resolution	1024 x 768	1366 x 768	1280 x 1024	1920 x 1080
Max. Color	262K/16.2M	16.7M	16.7M	16.7M
Luminance (cd/m^2)	1000	1000	1000	1000
Contrast Ratio	800:1	500:1	1000:1	3000:1

Viewing Angle (H)/(V)	160/150	160/160	170/160	178/178
Backlight Lifetime	30,000 hrs	50,000 hrs	50,000 hrs	50,000 hrs
Touch				
Type	Project Capacitive Resistive Glass			
Interface	USB			
Light Transmission	Over 90% for PCT Over 80% for RT			
Power				
Power Input	DC 9~36V			
Power Consumption	MAX: 88.4W	MAX: 78.6W	MAX: 102.2W	MAX: 94.7W
Mechanical				
Front bezel	Aluminum die-casting front bezel			
Rear bezel	Steel metal chassis			
Dimension	410 x 310 x 90 mm	412 x 277x 90 mm	439 x 348 x 90 mm	557 x 362 x 90 mm
Net Weight	6.5 Kg	6.5 kg	7 kg	8.5 kg
Mounting type	Panel mount			
Environmental				
Operating Temperature	0~50 °C			
Storage Temperature	-30~70 °C			
Storage Temperature	10%~95%@ 40°C, non-condensing			
Certificate	CE / FCC Class A			
Operating System Support				
OS Support	Windows 7 Pro for Embedded, Windows Embedded Standard 7, Windows Embedded 8.1 Industry Pro, Windows Embedded 8 Standard, Window 10 IoT 2016			

1.3 Dimensions

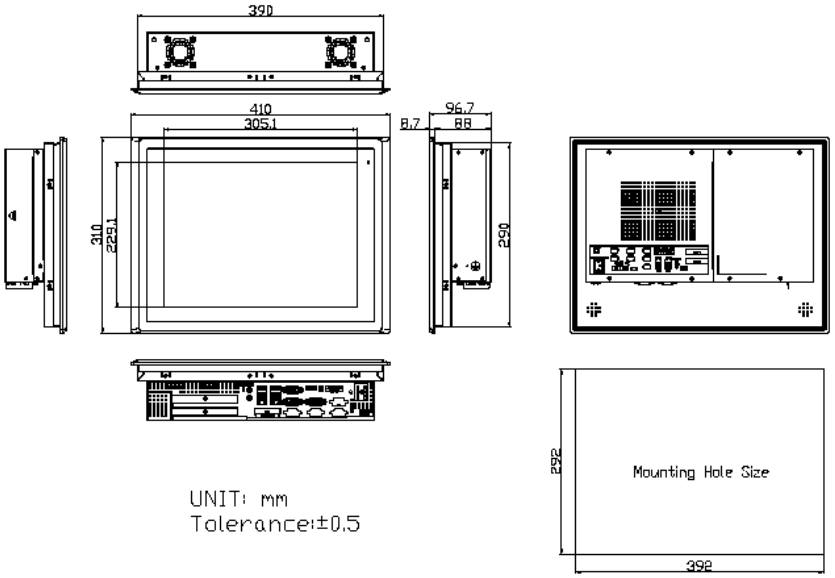


Figure 1.1: Dimensions of VIPAC-915

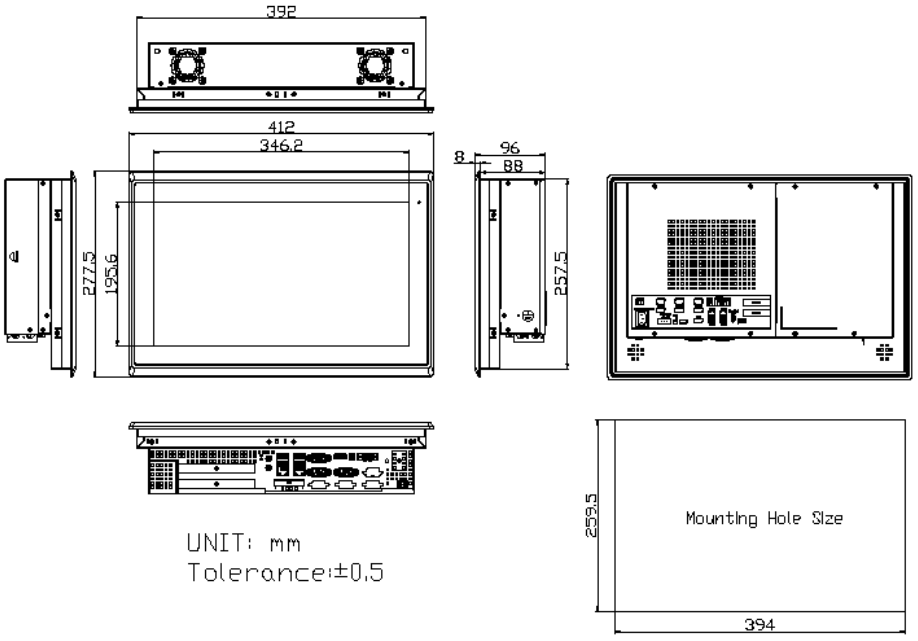


Figure 1.2: Dimensions of VIPAC-916

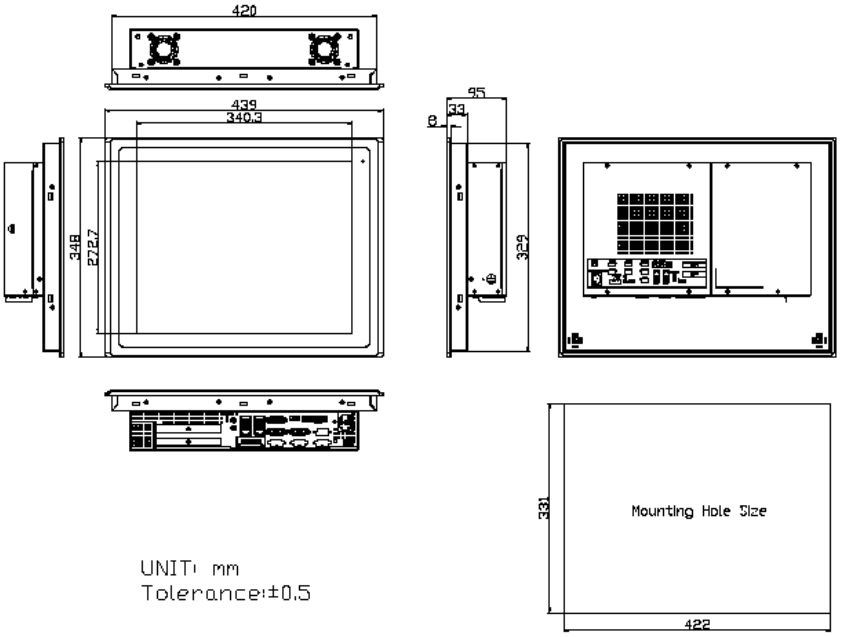


Figure 1.3: Dimensions of VIPAC-917

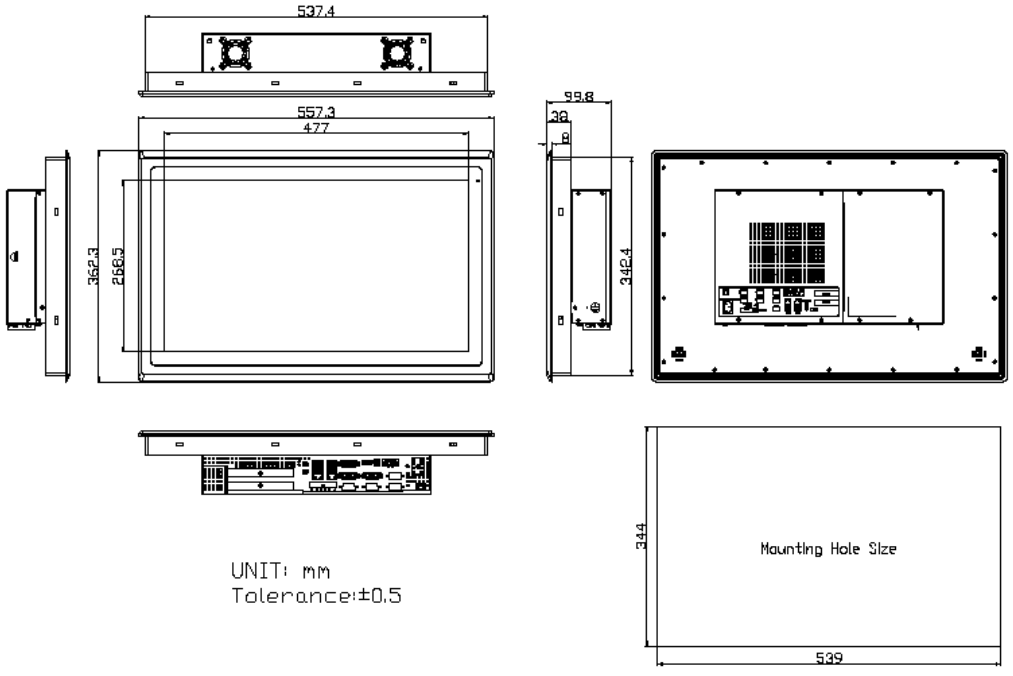


Figure 1.4: Dimensions of VIPAC-921

1.4 Brief Description of VIPAC-9XX Series

The VIPAC-9XX comes with full metal chassis, while front bezel adopts IP66 Aluminum die-casting design. These systems are powered by socket H4 6th/7th Gen. Intel Core processor and supports 2 x SO-DIMM DDR4L up to 32G memory. And it's equipped with 2 x speakers at the side to meet the ability for critical utilizations. Besides they feature abundant I/O ports such as 4 x USB 3.0, 1 x VGA, 2 x LAN, 1 x line out, 1 x mic-in, 3 x COM ports, and so on; and 2x expansion slots which offer the expandability to integrate versatile applications. Provide projected capacitive, resistive touch screen and anti-reflection glass screen, wide range DC 9~36V power input, AT/ATX model and panel mount. These systems are rich I/O alternative to get preparation for intelligent automation panel PC.

Figure 1.5: Front View of VIPAC-915/917

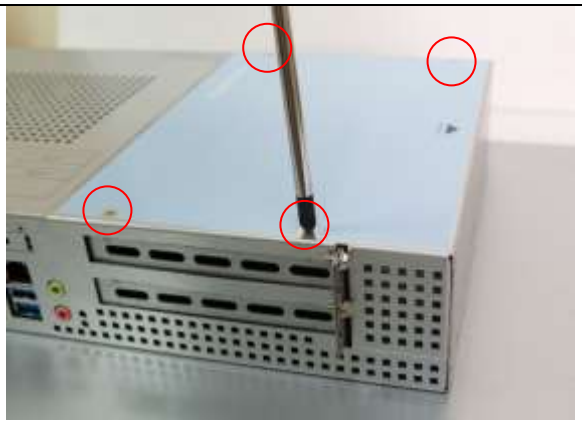
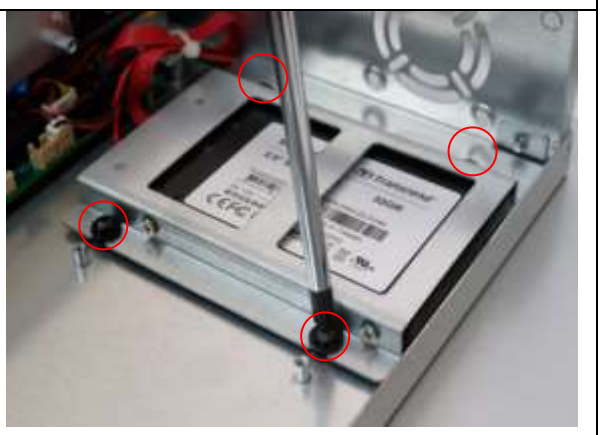
Figure 1.6: Front View of VIPAC-916/921

Figure 1.7: Rear View of VIPAC-915/916

Figure 1.8: Rear View of VIPAC-917

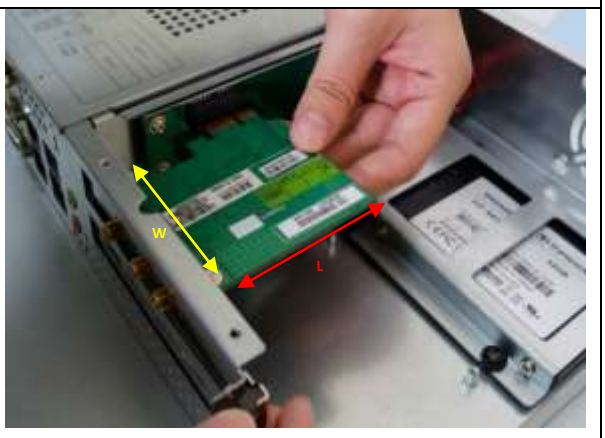
Figure 1.9: Rear View of VIPAC-921

1.5 Installation of HDD

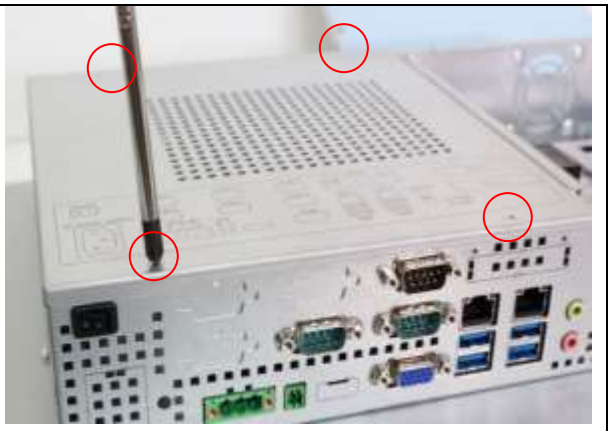
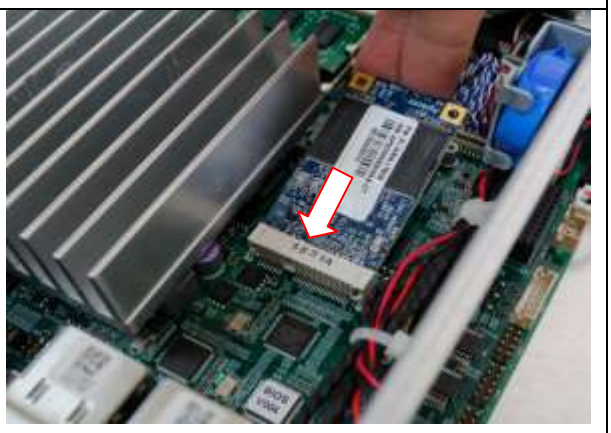
Step 1 There are 4 screws to deal with when enclosing or removing the chassis. Gently remove 4 screws.	
Step 2 Remove the chassis.	
Step 3 There are 4 screws around HDD bay, you can remove screws of HDD.	

Step 4 You can remove HDD by unscrewing 4 screws in the HDD bracket, and pull out the HDD.	

1.6 Installation of PCIe card

Step 1 There are 2 PCIe slot on the bottom side. Gently remove 2 screws on side.	
Step 2 Remove the bracket on the bottom.	
Step 3 You can insert PCIe card to expansion model function. **(PCIe Card maximum size can support 135mm(W) x 185mm(L) x 20.32mm(1 slot))**	

1.7 Installation of mSATA SSD

Step 1 There are 4 screws to deal with when enclosing or removing the chassis. Gently remove 4 screws.	
Step 2 Remove the chassis.	
Step 3 You can insert mSATA SSD card to expansion storage.	
Step 4 You can use 2 screws to fasten SSD card to motherboard.	

Chapter 2 Motherboard

2.1 Motherboard Specifications

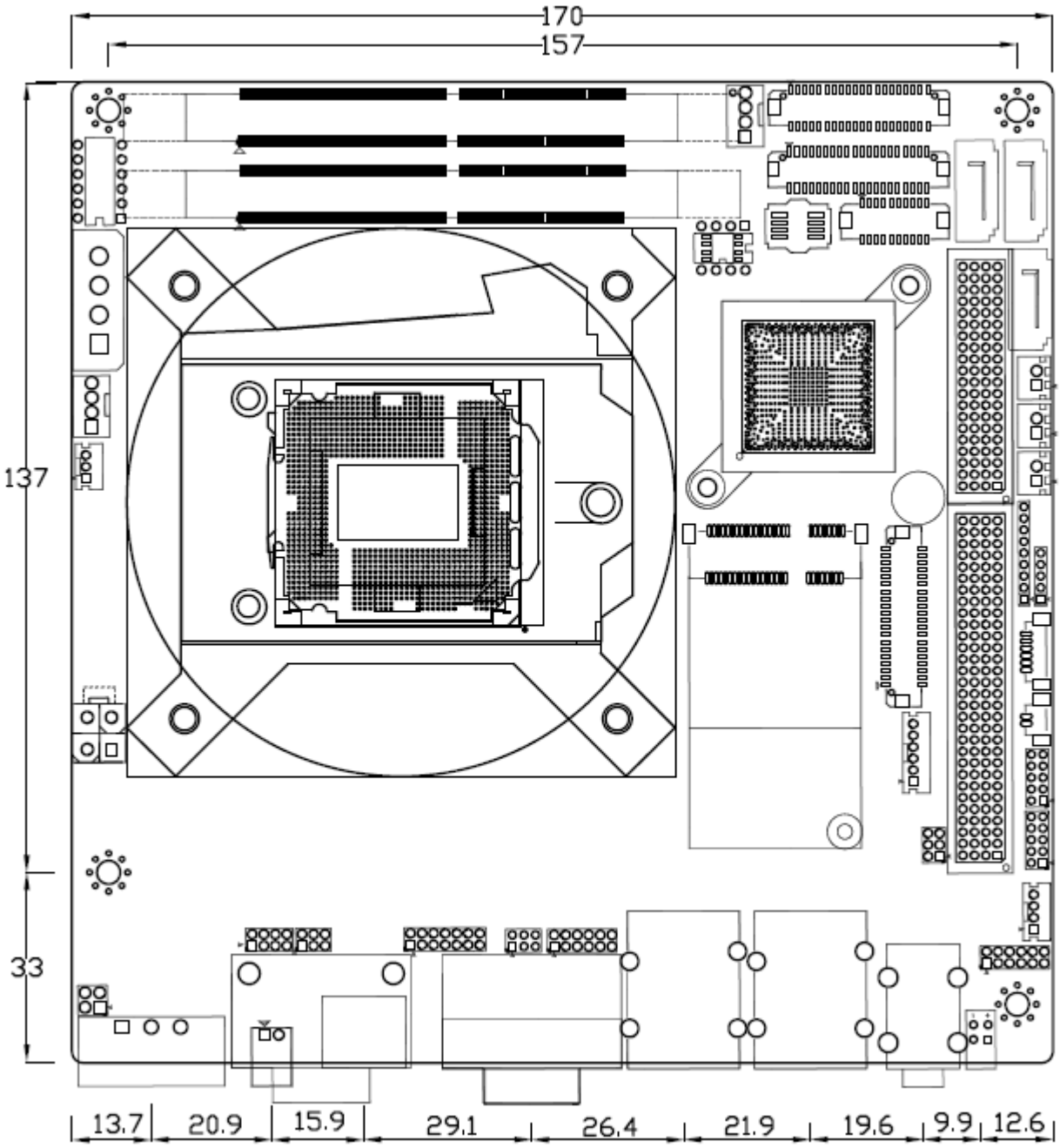
ASB-M8171 is a mini-ITX industrial motherboard developed on the basis of Intel H170,which provides abundant peripheral interfaces to meet the needs of different customers. Also,it features two GbE ports, 6-COM ports and one Mini PCIE configuration. To satisfy the special needs of high-end customers, ADOtec designed 120Pin PCIe x16 and 80Pin PCIe x4 expansion interface. The product is widely used in various sectors of industrial control.

Specifications	
Board Size	170mm x 170mm
CPU Socket	LGA1151 Socket
CPU Support	installing the 6th Generation intel Core i3/i5/i7 6xxxTE Processors (up to 35W). - *Intel Core I3-6100TE 2.70GHz 35W* - *Intel Core I5-6500TE 2.30 GHz (up to 3.30 GHz) 35W* - *Intel Core I7-6700TE 2.40 GHz (up to 3.40 GHz) 35W*
Chipset	Intel H170
Memory Support	2x SO-DIMM (260pins), up to 32GB DDR4 1866/2133MHz FSB
Graphics	Intel HD Graphics 530（I3-6100TE/I5-6500TE/I7-6700TE）
Display Mode	1x DVI-I interface (Pin header) 1x HDMI interface 1x 18/24bit 2CH LVDS interface 1x VGA interface (DB15 or 2x6 Pin header)
Support Resolution	Up to 4096 x 2304 for HDMI Up to 2560 x 1600 for DVI-I Up to 1920 x 1200 for LVDS Up to 1920 x 1200 for VGA
Three Display	HDMI + DVI-I + LVDS HDMI + DVI-I + VGA1/CRT1（option) HDMI + LVDS + VGA1/CRT1（option) DVI-I + LVDS + VGA1/CRT1（option)
Super I/O	Nuvoton NCT6106D
BIOS	AMI/UEFI BIOS
Storage	3x SATA3.0 Connector (SATA1/SATA2/SATA3) 1x MSATA Connector (M-SATA or mini PCIE, option)
Ethernet	2x PCIe GbE LAN by Intel I211AT

USB	4x USB 3.0/2.0 stack ports for external (USB3.0：USB3-1/USB3-2/USB3-3/USB3-4) (USB2.0：USB2-1/USB2-2/USB2-3/USB2-4) 3x USB 2.0 Pin header for MIO1 (USB9/USB12/USB13) 4x USB 2.0 Pin header for MIO2 (USB7/USB8/USB10/USB11) 1x USB 2.0 internal for M-PCIE1 (USB14)
Serial	1x RS232/422/485 port, DB9 connector for external (COM1) Pin9 w/5V/12V/Ring select 1x RS232 port, DB9 connector for external (COM2) Pin9 w/5V/12V/Ring select 1x RS422/485 select header for internal MIO1 (COM3) 1x RS232 select header for internal MIO1 (COM4) 1x RS232 header for internal (COM5) 1x RS232 header for internal (COM6), pin 9 w/5V/12V/Ring select
Digital I/O	8-bit digital I/O by Pin header (MIO2) 4-bit digital Input 4-bit digital Output
Battery	Support CR2477 Li battery by 2-pin header (1000mAh)
Audio	Support Audio via Realtek ALC269Q-VB HD audio codec Support Line-out, Line-in,MIC-in by JACK (AUDIO1) Line in/Line out/Mic by 2 x 6 Pin header (F_AUDIO1) Support a stereo Class-D Speaker Amplifier with 2 watt per channel output power, by 1x4-pin header (SPK1)
Keyboard /Mouse	PS2 K/B and Mouse by 1x6Pin Wafer connector 1x PS/2 keyboard 1x PS/2 mouse
Expansion	1x PCI-express x4 extend by 4x20 pin socket (PCIE_4X1) 1x PCI-express x16 extend by 4x30 pin socket (PCIE_16X1) 1x mini-PCI-express slot (M-PCIE1) 1x CRT 2x5 Pin Header (VGA1)
Power Management	1x 3-pin power input connector (Wide range DC+9V~36V) DC5V/12V output by 1x4 pin Connectors
Switches and LED Indicators	Power on/off switch by MIO1 and MIO2 Power LED status by MIO1 and MIO2 HDD LED status by MIO2 Reset switch by MIO2
External I/O port	2x COM Ports (COM1/COM2) 4x USB 3.0 Ports (stack) 2x RJ45 GbE LAN Ports 1x HDMI interface 1x CRT interface 1x Audio Ports (Mic in,Line in,Line out)

Keyboard /Mouse	PS2 K/B and Mouse by MIO2 1x PS/2 keyboard 1x PS/2 mouse
SIM	1x SIM Card Holder,1x 6Pin Wafer by SIM1
LPT	1x LPT Port by DF13-20P (LPT1)
Temperature	Operating: -20℃ to 70℃ Storage: -40℃ to 85℃
Humidity	10% - 90%, non-condensing, operating
Power Consumption	12V/3.8A(Intel i3-6100TE 2.30 GHz Processor with 16GB DDR4/SSD)
EMI/EMS	Meet CE/FCC class A

2.2 Motherboard Layout



(units :mm)

Figure 2.1: Motherboard ASB-M8171 Layout

2.3 Jumpers and Connectors Location

Board Top

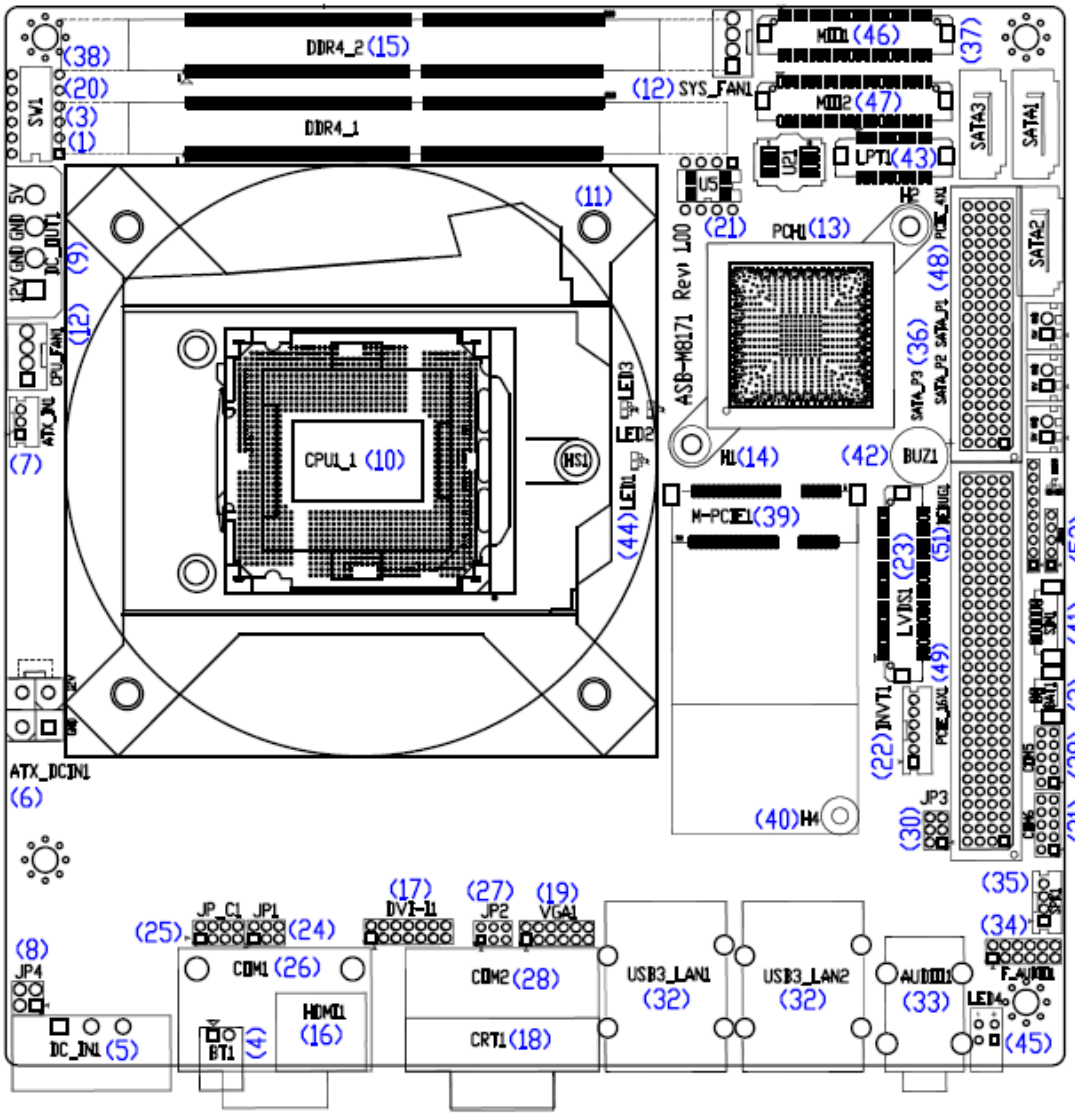


Figure 2.2: Motherboard top draw of ASB-M8171

Board Bottom

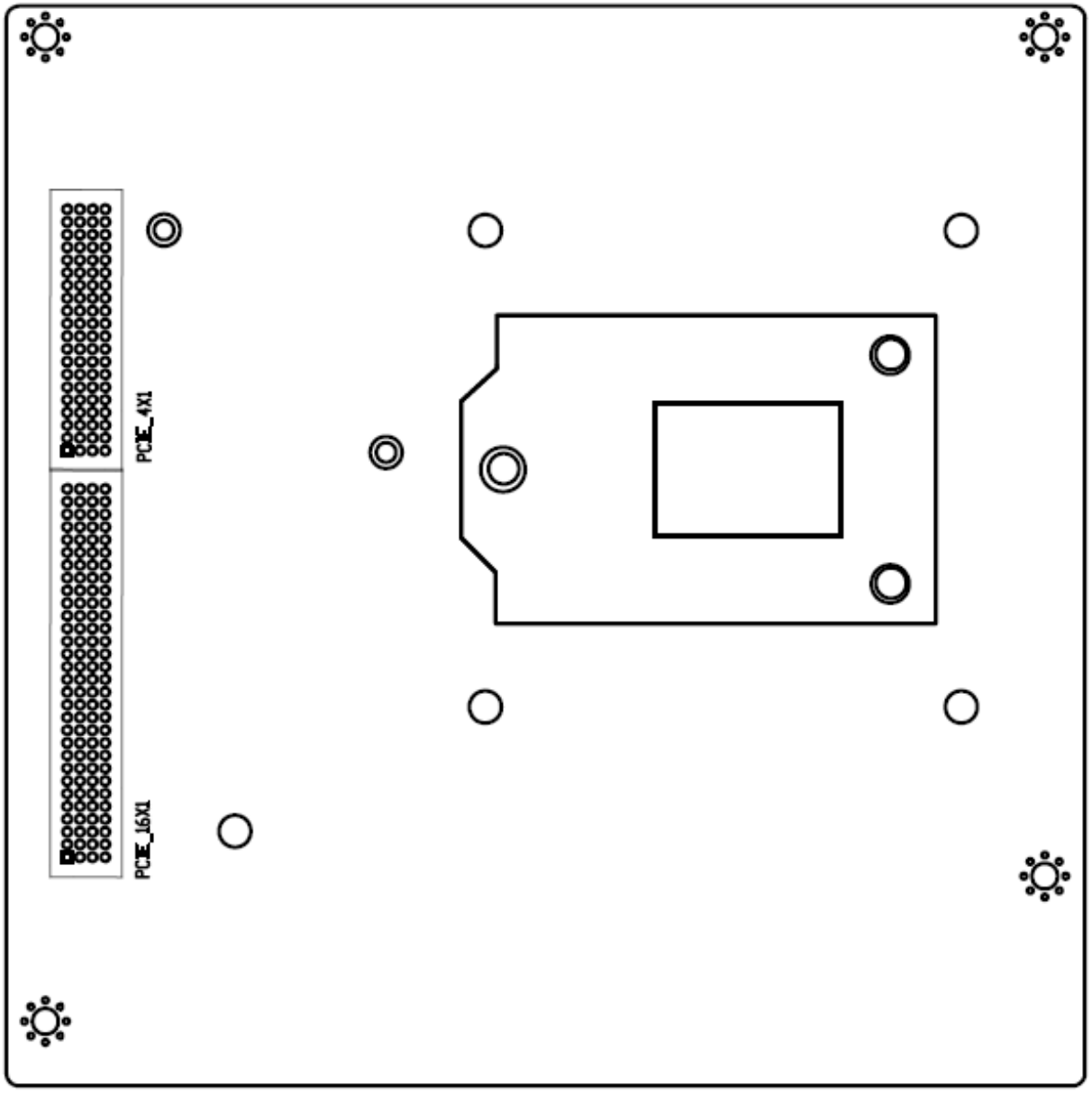


Figure 2.3: Motherboard bottom draw of ASB-M8171

2.4 Jumpers Setting and Connectors

1. SW1-2:

CMOS clear switch, CMOS clear operation will permanently reset old BIOS settings to factory defaults.

SW1	CMOS
Pin2 OFF	NORMAL (Default)
Pin2 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 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.

2. BAT1 :

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

Pin#	Signal Name
Pin1	Ground
Pin2	VCC_RTC

3. SW1-1:

Switch, DC Power input setting,Power on/off button and Auto Power on switch setting**.**

SW1	Function（DC input /DC_IN1）
Pin1 ON	**Auto Power on (Default)**
Pin1 OFF	Power on/Off button (option)

4. BT1:

(2.0mm Pitch 1x2 Wafer Pin Header),**Power on/off**, 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.

5. DC_IN1:

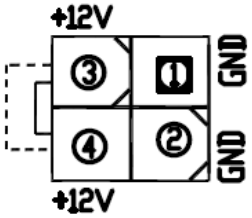
(5.08mm Pitch 1x3 Pin Connector),DC9V ~ DC36V System power input connector。

Pin#	Power Input（DC_IN1）
Pin1	DC+9V~36V
Pin2	Ground
Pin3	PG

DC_IN1(Power Input)	JP4
DC+9V~36V	**NC (Default)**
DC12V only（*）	Option (BOM cost down)

6. ATX_DCIN1 (option):

(5.50mm Pitch 2x2 Pin Connector),DC12V System power output connector。



Pin#	Power output
Pin1	Ground
Pin2	Ground
Pin3	DC+12V
Pin4	DC+12V

Note:

DC+12V Output current of the connector must not be above 1A.

7. ATX_IN1 (ATX Power,option):

(2.0mm Pitch 1X3 wafer Pin Header),connect PSON and 5VSB and Ground signal,support ATX Power model.

Pin#	Signal Name
Pin1	ATX PSON
Pin2	ATX Ground
Pin3	ATX 5VSB

ATX Power input setting	
SW1	ATX Power input

	（ATX_IN1+ ATX_DCIN1）
Pin1 ON	ATX Power Mode
Pin1 OFF	-
Pin5 ON	Auto Power on（ATX Power）
Pin5 OFF	Power on/off button (ATX Power)

Power input select			
Power input	DC_IN1	ATX_DCIN1	ATX_IN1
DC Power input	●	X	X
ATX Power input	X	●	●

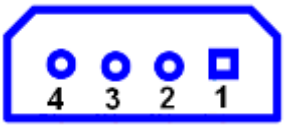
8. JP4 (option):

(2.0mm Pitch 2x2 Pin Pin Header), DC12V System only power **input** jumper setting.

【*please contact technical support】

9. DC_OUT:

(2x2 Pin Connector),DC+12V and DC+5V System power **output** connector.



Pin#	Power output
Pin1	DC+12V（DC12V_S0）
Pin2	Ground
Pin3	Ground
Pin4	DC+5V(DC5V_S0)

Note:

DC+5V Output current of the connector must not be above 0.5A.

DC+12V Output current of the connector must not be above 1A.

10. CPU1_1:

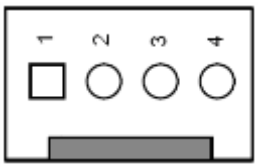
(LGA1151 Socket), installing the 6th Generation intel Core i3/i5/i7CPU Socket.

11. HS1.4/HS1.5/HS1.6/HS1.7(CPU SCREW HOLES):

CPU FAN SCREW HOLES, Four screw holes for fixed CPU Cooler assemble.

12. CPU_FAN1/SYS_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	CPU_FAN1	SYS_FAN1
1	Ground	●	●
2	VCC	●	●
3	CPU_FANTACH	●	●
4	CPU_FANPWM	●	●

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

13. PCH1:

(BGA,Package Size:23x24mm),Intel H170 Chipset.

Model	PCH1（Chipset）
ASB-M8171HT	Intel H170
ASB-M8171HT-TPM	Intel H170
ASB-M8171HB	Intel H170
ASB-M8171HB-TPM	Intel H170

14. H1/H2 (option):

PCH1 HeatSink Screw holes.

15. DDR4_1/DDR4_2:

(SO-DIMM 260Pin socket), DDR4 memory socket, the socket is located at the top of the board and supports 260Pin 1.2V DDR4 1866/2133MHz FSB SO-DIMM memory module up to 32GB.

16. HDMI1:

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

17 DVI-I1:

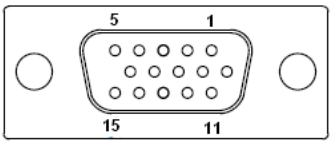
(DVI-I 2.0mm Pitch 2X7 Pin Header), Digital Visual Interface-Integrated connector.

Signal Name	Pin#	Pin#	Signal Name
DVI3_D2+	1	2	DVI3_D2-
DVI3_D1+	3	4	DVI3_D1-
DVI3_D0+	5	6	DVI3_D0-
DVI3_CLK+	7	8	DVI3_CLK-

DVI3_DDCCLK	9	10	DVI3_DDCDATA
Ground	11	12	Ground
5V_DVI	13	14	DVI3_HPDET

18. CRT1:

(CRT Connector DB15),Video Graphic Array Port, provide high-quality video output. **they can not work at the same time for CRT1 and VGA1.**



19. VGA1(option):

(CRT 2.0mm Pitch 2X6 Pin Header), Video Graphic Array Port, Provide 2x6Pin cable to VGA Port.The IT6515FN is a high-performance single-chip DisplayPort to VGA converter. **they can not work at the same time for CRT1 and VGA1.**

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

20. SW1-3/SW1-4:

(Switch),18bit or 24bit LVDS setting.

SW1	Function
Pin3 on	Single Channel LVDS
Pin3 off	Dual Channel LVDS
Pin4 on	24bit LVDS
Pin4 off	18bit LVDS

21. U5(option):

AT24C02-DIP8,The EEPROM IC（U5）is the set of LVDS resolution. If you need other resolution settings, please upgrade U5 data.

Model	LVDS resolution
ASB-M8171HT ASB-M8171HB	1280*1024 (Default)
	800*480（option）
	800*600（option）
	1024*768（option）
	1920*1080（option）
	……

22. INVT1(option):

(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

23. LVDS1:

(1.25mm Pitch 2x20 Connector,DF13-40P),For 18⁄24-bit LVDS output connector,Fully supported by Parad PS8625(DDI1 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.

Signal Name	Pin#	Pin#	Signal Name
VDD5	2	1	VDD5
Ground	4	3	Ground
VDD3	6	5	VDD3
LB_D0_N	8	7	LA_D0_N
LB_D0_P	10	9	LA_D0_P
Ground	12	11	Ground
LB_D1_N	14	13	LA_D1_N
LA_D1_P	16	15	LA_D1_P
Ground	18	17	Ground
LB_D2_N	20	19	LA_D2_N
LB_D2_P	22	21	LA_D2_P
Ground	24	23	Ground
LB_CLK_N	26	25	LA_CLK_N
LB_CLK_P	28	27	LA_CLK_P
Ground	30	29	Ground
LVDS_DDC_DATA	32	31	LVDS_DDC_CLK
Ground	34	33	Ground
LB_D3_N	36	35	LA_D3_N
LB_D3_P	38	37	LA_D3_P
NC	40	39	NC

24. 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.

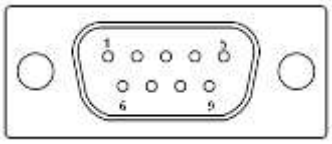
JP1 Pin#	Function
Close 1-2	**COM1 Pin9 RI (Ring Indicator) (default)**
Close 3-4	COM1 Pin9 = +5V (option)
Close 5-6	COM1 Pin9 = +12V (option)

25. JP_C1(Reserve**):**

(2.0mm Pitch 2x4 Pin Header), Reserve.

26. COM1:

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



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)**

RS422 (option):	
Pin#	Signal Name
1	422TX-
2	422TX+
3	422RX+
4	422RX-
5	Ground
6	NC
7	NC
8	NC
9	NC

RS485 (option):	
Pin#	Signal Name
1	485-
2	485+
3	NC
4	NC
5	Ground
6	NC
7	NC
8	NC
9	NC

BIOS/Serial Port 1 Configuration/F75111 COM1 Config: **[RS-232 Mode]** [RS-485 Mode] [RS-422 Mode]

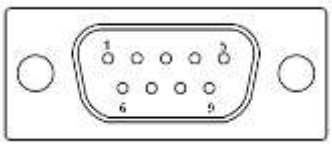
27. JP2:

(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 Pin9 RI (Ring Indicator) (default)**
Close 3-4	COM2 Pin9=+5V (option)
Close 5-6	COM2 Pin9=+12V (option)

28. COM2:

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



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	**JP2 select Setting (RI/5V/12V)**

29. COM5:

(2.0mm Pitch 2X5 Pin Header),COM5 Port, standard RS232 ports are provided. They can be used directly via COM cable connection.

Signal Name	Pin#	Pin#	Signal Name
DCD	1	2	RXD
TXD	3	4	DTR
Ground	5	6	DSR
RTS	7	8	CTS
RI	9	10	NC

30. JP3:

(2.0mm Pitch 2x3 Pin Header),COM6 jumper setting, pin 1~6 are used to select signal out of pin 9 of COM6 port.

JP3 Pin#	Function
Close 1-2	**COM6 Pin9 RI (Ring Indicator) (default)**
Close 3-4	COM6 Pin9=+5V (option)
Close 5-6	COM6 Pin9=+12V (option)

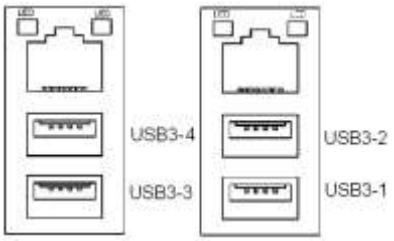
31. COM6:

(2.0mm Pitch 2X5 Pin Header),COM6 Port, standard RS232 ports are provided. They can be used directly via COM cable connection.

Signal Name	Pin#	Pin#	Signal Name
DCD	1	2	RXD
TXD	3	4	DTR
Ground	5	6	DSR
RTS	7	8	CTS
JP3 select Setting (RI/5V/12V)	9	10	NC

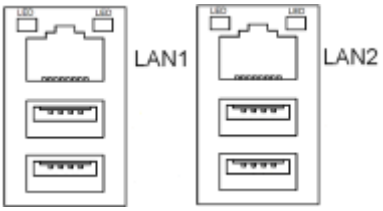
32. USB3_LAN1/USB3_LAN2:

USB3-1/USB3-2/USB3-3/USB3-4：(Double stack USB typeA),Rear USB connector, it provides up to 4 USB3.0 ports,USB 3.0 allows data transfers up to 5.0Gb/s ,support USB2.0 and full-speed and low-speed signaling.



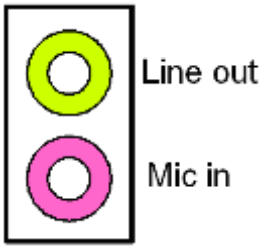
Each USB Type A Receptacle (2 Ports) Current limited value is 2.0A. If the external USB device current exceeds 2.0A, please separate connectors into different Receptacle.

LAN1/LAN2: (RJ45 Connector), Rear LAN port, Two standard 10/100/1000M RJ-45 Ethernet ports are provided. Used Intel I211AT chipset.



33. AUDIO1:

(Diameter 3.5mm Two stack Jack), High Definition Audio port, An onboard Realtek ALC269Q-VB codec is used to provide high quality audio I/O ports.



34. F_AUDIO1:

(2.0mm Pitch 2x6 Pin Header), Front Audio, An onboard Realtek ALC269Q-VB 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
HPOUT-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

35 SPK1：

(2.0mm Pitch 1x4 Wafer Pin Header),support a stereo Class-D Speaker Amplifier with 2 watt per channel output power

Pin#	Signal Name
1	SPK_OUTL_P
2	SPK_OUTL_N
3	SPK_OUTR_N
4	SPK_OUTR_P

36. SATA_P1/SATA_P2/ SATA_P3:

(2.5mm Pitch 1x2 Wafer Pin Header), Two onboard 5V output connectors are reserved to provide power for SATA devices.

Pin#	Signal Name
1	+DC5V_S0
2	Ground

Note:

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

37. SATA1/SATA2/SATA3:

(SATA 7P), SATA Connectors,Three SATA connectors are provided,SATA1 and SATA2 and SATA3 transfer speed up to 6.0Gb/s.

RAID controller supporting: RAID0/RAID1/RAID5.

38. SW1-6:

(Switch),SATA or PCIE setting.

SW1	M-PCIE1（52Pin）
Pin6 on	PCIE7 Signal
Pin6 off	SATA4 Signal

39. M-PCIE1:

(Socket 52Pin),mini PCIe socket, it is located at the top, it supports mini PCIe devices with USB2.0 and SIM and SMBUS and PCIe signal. MPCIe card size is 30 x 50.95mm.

Function	Support	Remarks
Mini PCie (PCIe 7)	●	(SW1-6：off)
Mini SATA	o	Option (SW1-6：on)
LPC bus	●	
SMbus	●	
SIM	●	
USB2.0（USB14）	●	

40. H4:

M-PCIE1 SCREW HOLES, H4 for M-PCIE1 card (30mmx50.95mm) assemble.

41. SIM1:

(2.0mm Pitch 1x6 Pin Wafer Header), Support SIM Card devices.

Pin#	Signal Name
1	SIM_VCC
2	Ground
3	SIM_RST
4	NC
5	SIM_CLK
6	SIM_IO

42. BUZZER1:

Onboard buzzer.

43. LPT1 :

(DF13-20P Connector),For expand output connector,a standard 20 pin parallel port is provided to connect parallel peripherals as required.

Signal Name	Pin#		Signal Name
Ground	2	1	Ground
LPT_AFD-	4	3	LPT_STB-
LPT_ERR-	6	5	LPT_D0
LPT_INIT-	8	7	LPT_D1
LPT_SLIN-	10	9	LPT_D2
LPT_D4	12	11	LPT_D3
LPT_D6	14	13	LPT_D5
LPT_ACK-	16	15	LPT_D7
LPT_PE	18	17	LPT_BUSY
+5V_S0	20	19	LPT_SLCT

44. LED1/LED2/LED3/LED5:

LED1 STATUS. Green LED for Motherboard Power status.

LED2 STATUS. Green LED for Motherboard Standby Power Good status.

LED3 STATUS. Green LED for CPU Power status.

LED5 STATUS. Green LED for Debug status.

45. LED4:

LED STATUS. Green LED for Motherboard Standby Power Good status, Yellow LED for HDD status.

46. MIO1:

(DF13-40P Connector),For expand output connector, It provides one RS232 port,one RS422 or RS485 ports, three USB ports, one power led, one power button, via a dedicated cable connected to **TB-523 MIO1.**

Function	Signal Name	Pin#		Signal Name	Function
COM3 (RS422 or RS485)	485+ 422TX+	2	1	422_RX+	COM3 (RS422)
	485- 422TX-	4	3	422_RX-	
WLAN LED	3P3V_S0	6	5	Ground	
	WLAN_LED-	8	7	NC	
	5V_S5	10	9	5V_S5	
COM4 (RS232)	RXD4	12	11	DCD4-	COM4 (RS232)
	DTR4-	14	13	TXD4	
	DSR4-	16	15	Ground	
	CTS4-	18	17	RTS4-	
	5V_S5	20	19	RI4-	
USB2.0 (USB13)	5V_USB1011	22	21	5V_S5	
	USB13_N	24	23	USB12_N	USB2.0 (USB12)
	USB13_P	26	25	USB12_P	
	Ground	28	27	Ground	
	Ground	30	29	Ground	
Power LED	Power LED+	32	31	5V_USB1011	USB2.0 (USB9)
	Power LED-	34	33	USB9_N	
Power Button	MIO_PSON-	36	35	USB9_P	
	Ground	38	37	Ground	
Power Auto on	AUTO_PSON-	40	39	NC	

BIOS Setup：
Advanced/ NCT6106D Super IO Configuration/Serial Port 3 Configuration:

[RS-485 Mode]

[RS-422 Mode]

47. MIO2:

(DF13-40P Connector),Front panel connector.

Function	Signal Name	Pin#		Signal Name	Function
Power LED+	PWR_LED	2	1	HDD_LED-	HDD LED+
Power Button	Ground	4	3	USB0708_OC-	
	MIO_PSON	6	5	USB0910_OC-	
RESET	Ground	8	7	FP_RESET-	RESET
BUZZER	BUZZER-	10	9	BUZZER+	BUZZER
75111/GPIO_23	GPIO_OUT1	12	11	GPIO_IN1	75111/GPIO_27
75111/GPIO_22	GPIO_OUT2	14	13	GPIO_IN2	75111/GPIO_26
75111/GPIO_21	GPIO_OUT3	16	15	GPIO_IN3	75111/GPIO_25
75111/GPIO_20	GPIO_OUT4	18	17	GPIO_IN4	75111/GPIO_24
	5V_S5_USB	20	19	Ground	

PS/2 MOUSE	PS2_MSDATA	22	21	PS2_KBDATA	PS/2 KB
	PS2_MSCLK	24	23	PS2_KBCLK	
USB2.0 (USB10)	5V_S5_USB	26	25	5V_S5_USB	USB2.0 (USB08)
	USB10_N	28	27	USB8_N	
	USB10_P	30	29	USB8_P	
	Ground	32	31	Ground	
USB2.0 (USB11)	5V_S5_USB	34	33	5V_S5_USB	USB2.0 (USB07)
	USB11_N	36	35	USB7_N	
	USB11_P	38	37	USB7_P	
	Ground	40	39	Ground	

Pin1-Ground: **HDD LED**, They are used to connect hard disk activity LED. The LED blinks when the hard disk is reading or writing data.

Pin2-Ground: **POWER LED**, They are used to connect power LED. When the system is powered on or under S0/S1 state, the LED is normally on, when the system is under S4/S5 state, the LED is off.

Pin4- Pin5: **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.

Pin9- Pin10: **BUZZER**, They are used to connect an external buzzer.

Pin25~Pin40: **USB7/USB8/USB210/USB11**,Front USB connector,it provides four USB2.0 ports via a dedicated USB cable.

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.

Note:

When connecting LEDs and buzzer and USB, pay special attention to the signal polarity. Make sure that the connector pins have a one-to-one correspondence with chassis wiring, or it may cause boot up failure.

48. PCIE_4X1 (option)**:**

(4x20 Pin connector), Riser Card expansion connector. Can expand support one PCIeX4 or four PCIeX1 Signal.

ASB-M8171HT：PCIE_4X1 connector is located at the top.

ASB-M8171HB：PCIE_4X1 connector is located at the Bottom.

MODEL	PC1E_4X1
ASB-M8171HT	Top
ASB-M8171HT-TPM	Top

ASB-M8171HB	Bottom
ASB-M8171HB-TPM	Bottom

Riser Card	Function	ASB-M8171HB	ASB-M8171HT
TB-526E11	Pcie 1x slot *1	●	X
TB-526E12	Pcie 1x slot *2	●	X
TB-526P1	PCI slot *1	●	X
TB-526P2	PCI slot *2	●	X
TB-526P1E11	PCI slot *1, Pcie 1x slot *1	●	X
TB-525E11	Pcie 1x slot *1	X	●
TB-525E12	Pcie 1x slot *2	X	●
TB-525P1	PCI slot *1	X	●
TB-560E12	Pcie 1x slot *2	X	●
TB-560AP1E11	PCI slot *1, Pcie 1x slot *1	X	●
TB-560P1E11	PCI slot *1, Pcie 1x slot *1	X	●
TB-560P2	PCI slot *2	X	●
Note: Please correctly assemble the riser card, otherwise it will burn out the motherboard! If you do not know how to assemble, please contact technical support!			

49. PCIE_16X1 (option)**:**

(4x30 Pin), Riser Card expansion connector. Can expand support one PCIeX16 or two PCIeX8 Signal.

ASB-M8171HT：PCIE_16X connector is located at the top.

ASB-M8171HB：PCIE_16X connector is located at the Bottom.

MODEL	PC1E_16X1 connector
ASB-M8171HT	Top
ASB-M8171HT-TPM	Top
ASB-M8171HB	Bottom
ASB-M8171HB-TPM	Bottom

Riser Card	Function	ASB-M8171HT	ASB-M8171HB
TB-525P1E161	PCI slot *1, Pcie 16x slot *1	●	X
TB-560E11E161	Pcie 1x slot *1 Pcie 16x slot *1	●	X

TB-526E161	Pcie 16x slot *1	X	●
TB-526P1E161	PCI slot *1, Pcie 16x slot *1	X	●
TB-526P2E161	PCI slot *2, Pcie 16x slot *1	X	●
TB-526P1E82	PCI slot *1, Pcie 8x slot *2	X	●
Note: Please correctly assemble the riser card, otherwise it will burn out the motherboard! If you do not know how to assemble, please contact technical support!			

50. TPM_U1(option)**:**

TPM_U1	SLB 9665 TT2.0
MODEL	TPM Function
ASB-M8171HT	X
ASB-M8171HT-TPM	●
ASB-M8171HB	X
ASB-M8171HB-TPM	●

51. DEBUG(option)**:**

(2.0mm Pitch 1x9 Pin Header), it supports SPI signal.

Pin#	Signal Name
1	LPC_FRAME-
2	LPC_AD3
3	LPC_AD2
4	LPC_AD1
5	LPC_AD0
6	Ground
7	PLT_RST_BUF1-
8	CLK_24M_DEBUG
9	3P3V_S0

52. JTAG1(Reserve)**:**

Chapter 3 BIOS Setup

3.1 Operations after POST Screen

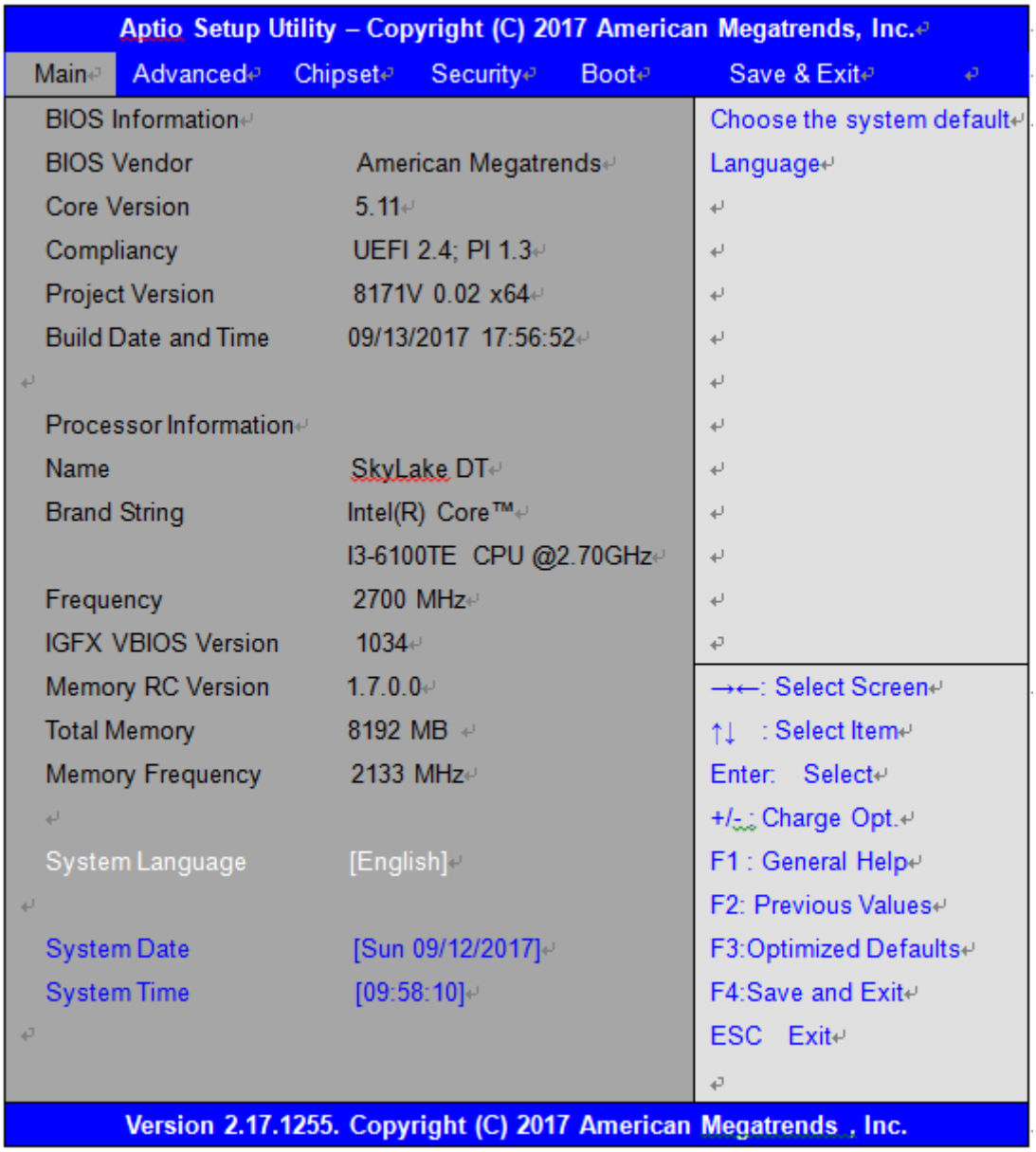
After CMOS discharge or BIOS flashing operation,.Press [Delete] key to enter CMOS Setup.

After optimizing and exiting CMOS Setup

3.2 BIOS SETUP UTILITY

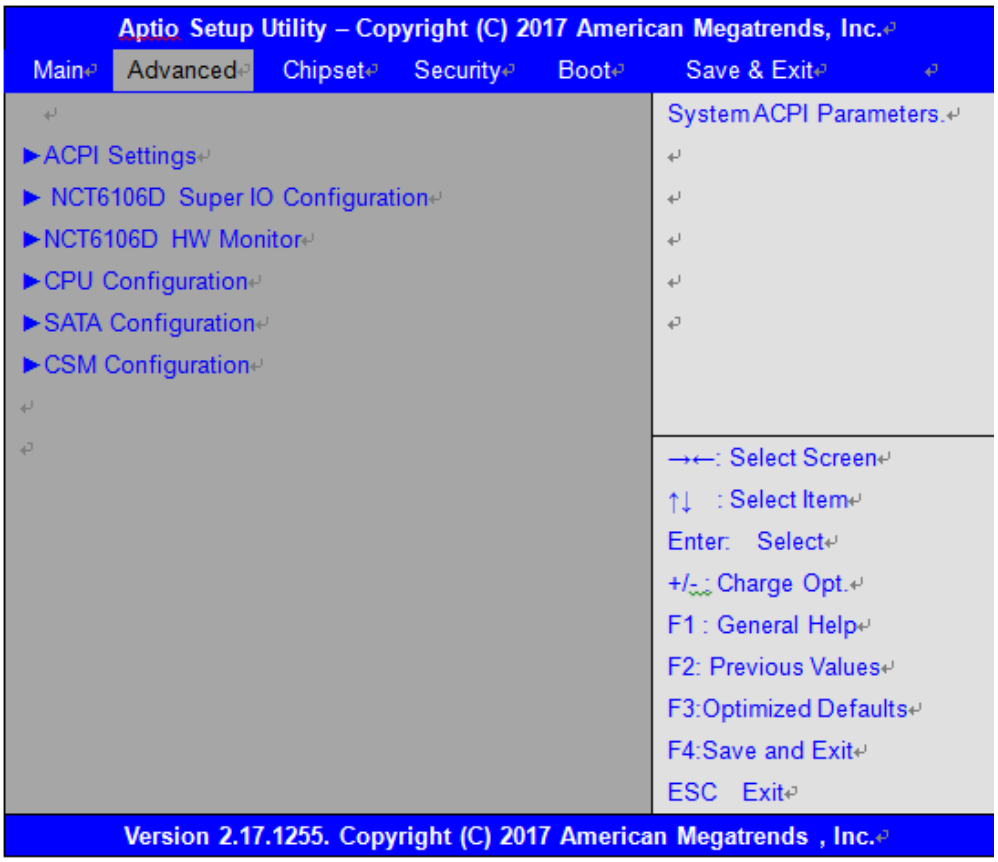
Press [Delete] key to enter BIOS Setup utility during POST, and then a main menu containing system summary information will appear.

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 Configuration:

[Disabled]
[Enabled]

Enable Hibernation:

[Enabled]
[Disabled]

ACPI Sleep State:

[S3 (Suspend to RAM)]
[Suspend Disabled]

Lock Legacy Resources:

[Disabled]
[Enabled]

S3 Video Repost:

[Disabled]
[Enabled]

ACPI Low Power S0 Idle:

[Disabled]
[Enabled]

3.4.2 NCT6106D Super IO Configuration

Super IO Chip NCT6106D

Serial Port 1 Configuration

Serial port

[Enabled]
[Disabled]

Device Settings IO=3F8h； IRQ=4；

Change Settings

[Auto]

F75111 COM1 Config

[RS-232 Mode]
[RS-485 Mode]
[RS-422 Mode]

Serial Port 2 Configuration

Serial port

[Enabled]
[Disabled]

Device Settings IO=2F8h； IRQ=3；

Change Settings [Auto]

Serial Port 3 Configuration

Serial port

[Enabled]
[Disabled]

Device Settings IO=3E8h； IRQ=7；

Change Settings [Auto]

F75111 COM3 Config

[RS-485 Mode]
[RS-422 Mode]

Serial Port 4 Configuration

Serial port

[Enabled]
[Disabled]

Device Settings IO=2E8h； IRQ=7；

Change Settings [Auto]

Serial Port 5 Configuration

Serial port

[Enabled]
[Disabled]

Device Settings IO=2F0h； IRQ=7；

Change Settings [Auto]

Serial Port 6 Configuration
Serial port

[Enabled]
[Disabled]

Device Settings IO=2E0h； IRQ=7；
Change Settings [Auto]

Power Failure

[Power OFF]
[Power ON]
[Last state]

Parallel Port Configuration
Parallel port

[Enabled]
[Disabled]

Device Settings IO=378h； IRQ=5；
Change Settings [Auto]
Device Mode [STD Printer Mode]

3.4.3 NCT6106D HW Monitor

Pc Health Status
CPU Temperature ：+32 C
CPU Fan Speed ：1970 RPM
VCORE ：+1.112 V
12V ：+11.960V
5V ：+5.120V
1.5V ：+1.536V

3.4.4 CPU Configuration

Intel(R) Core(TM) i3-6100TE CPU @ 2.70GHz

CPU Signature	506E3
Microcode Patch	49
Max CPU Speed	2700 MHz
Mix CPU Speed	800 MHz
CPU Speed	2700 MHz
Processor Cores	2
Hyper Threading Technology	Supported
Intel VT-X Technology	Supported
Intel SMX Technology	Not Supported
64-bit	Supported
EIST Technology	Supported
CPU C3 state	Supported
CPU C6 state	Supported
CPU C7 state	Supported
CPU C8 state	Supported

CPU C9 state	Not Supported
CPU C10 state	Not Supported
L1 Date Cache	32KB x 2
L1 Code Cache	32KB x 2
L2 Cache	256 KB x 2
L3 Cache	4 MB
L4 Cache	Not Present
Hyber-threading	[Enabled]
Active Processor Cores	[All]
Overclocking lock	[Disabled]
Intel Virtualization Technology	[Enabled]
Hardware Prefetcher	[Enabled]
Adjacent Cache Line Prefetch	[Enabled]
CPU AES	[Enabled]
Boot performance mode	[Max Non-Turbo Performance]
Intel(R) Speed Shift Technology	[Enabled]
Intel(R) SpeedStep(tm)	[Enabled]
Power Limit 1 Override	[Disabled]
Power Limit 2 Override	[Enabled]
Power Limit 2	0
1-Core Ratio Limit Override	0
2-Core Ratio Limit Override	0
Platform PL1 Enable	[Disabled]
Platform PL2 Enable	[Disabled]
CPU C states	[Enabled]
Enhanced C-states	[Enabled]
C-State Auto Demotion	[C1 and C3]
C-State Un-demotion	[C1 and C3]
Package C state demotion	[Enabled]
Package C state undemotion	[Enabled]
CState Pre-Wake	[Enabled]
Package C State limit	[AUTO]
CFG lock	[Enabled]
►Power Limit 3 Settings	
Power Limit 3 Override	[Disabled]
►Power Limit 4 Settings	
Power Limit 4 Override	[Disabled]
►CPU Thermal Configuration	
CPU DTS	[Disabled]
TCC Activation Offset	0
ACPI 3.0 T-States	[Disabled]
Debug Interface	[Disabled]
Debug Interface Lock	[Enabled]
SW Guard Extensions(SGX)	[Software Controlled]
Select Owner EPOCH input type	[No Change in Owner EPOCHs]
PRMRR Size	[AUTO]

3.4.5 SATA Configuration

SATA Controller（S）

[Enabled]
[Disabled]

SATA Mode Selection

[AHCI]
[RAID]

SATA Test Mode

[Disabled]
[Enabled]

►Software Feature Mask Configuration

RAID0	[Enabled]
RAID1	[Enabled]
RAID10	[Enabled]
RAID5	[Enabled]
Intel Rapid Recovery Technology	[Enabled]
OROM UI and BANNER	[Enabled]
HDD Unlock	[Enabled]
LED Locate	[Enabled]
IRRT Only on Esata	[Enabled]
Smart Response Technology	[Enabled]
OROM UI Normal Delay	[2 Seconds]
RST Force Form	[Disabled]
Aggressive LPM Support	[Enabled]
Serial ATA Port 0	Empty
Software Preserve	Unknown
Port 0	[Enabled]
Hot Plug	[Disabled]
External SATA	[Disabled]
Spin Up Device	[Disabled]
SATA Device Type	[Hard Disk Drive]
Topology	[Unknown]
Device Sleep	[Disabled]
SATA DEVSLEP Idle Timeout Config	[Disabled]
Serial ATA Port 1	Empty
Software Preserve	Unknown
Port 1	[Enabled]
Hot Plug	[Disabled]
External SATA	[Disabled]
Spin Up Device	[Disabled]
SATA Device Type	[Hard Disk Drive]
Topology	[Unknown]
Device Sleep	[Disabled]
SATA DEVSLEP Idle Timeout Config	[Disabled]

Serial ATA Port 2	Empty
Software Preserve	Unknown
Port 2	[Enabled]
Hot Plug	[Disabled]
External SATA	[Disabled]
Spin Up Device	[Disabled]
SATA Device Type	[Hard Disk Drive]
Topology	[Unknown]
Device Sleep	[Disabled]
SATA DEVSLEP Idle Timeout Config	[Disabled]
Serial ATA Port 3	Empty
Software Preserve	Unknown
Port 3	[Enabled]
Hot Plug	[Disabled]
External SATA	[Disabled]
Spin Up Device	[Disabled]
SATA Device Type	[Hard Disk Drive]
Topology	[Unknown]
Device Sleep	[Disabled]
SATA DEVSLEP Idle Timeout Config	[Disabled]

Serial ATA Port 4	Empty
Software Preserve	Unknown
Port 4	[Enabled]
Hot Plug	[Disabled]
External SATA	[Disabled]
Spin Up Device	[Disabled]
SATA Device Type	[Hard Disk Drive]
Topology	[Unknown]
Device Sleep	[Disabled]
SATA DEVSLEP Idle Timeout Config	[Disabled]

Serial ATA Port 5	Empty
Software Preserve	Unknown
Port 5	[Enabled]
Hot Plug	[Disabled]
External SATA	[Disabled]
Spin Up Device	[Disabled]
SATA Device Type	[Hard Disk Drive]
Topology	[Unknown]
Device Sleep	[Disabled]
SATA DEVSLEP Idle Timeout Config	[Disabled]

3.4.6 PPM Configuration

Compatibility Support Module Configuration

CSM Support	[Enabled]

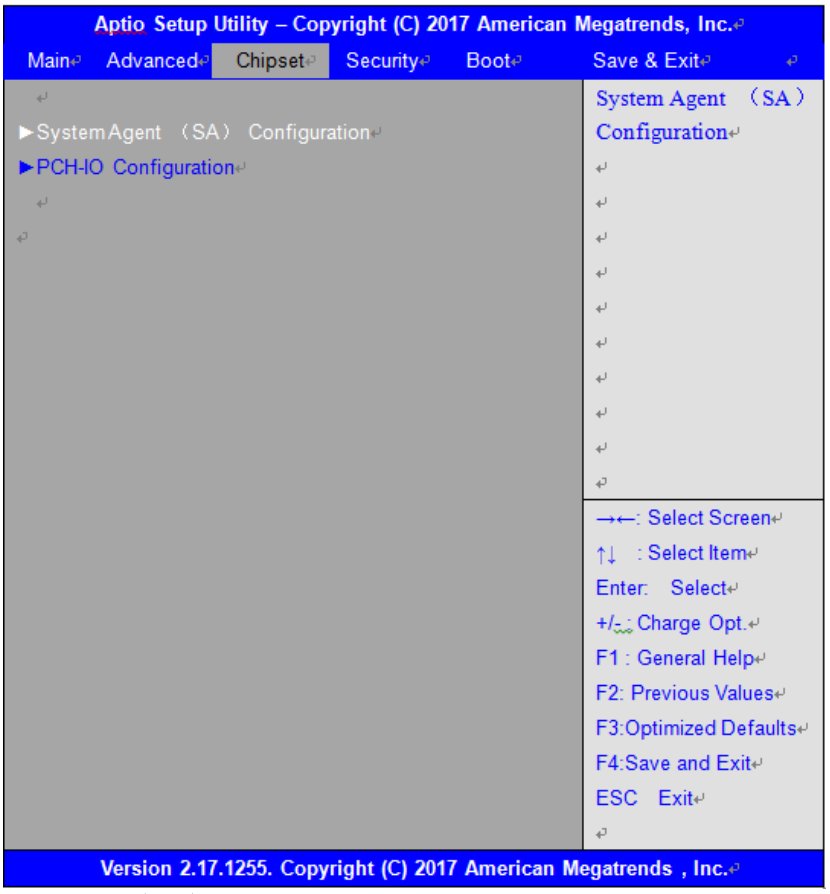
CSM16 Module Version 07.79

GateA20 Active	[Upon Request]
Option ROM Messages	[Force BIOS]
INT19 Trap Response	[Immediate]
Boot option filter	[UEFI and Legacy]

Ooption ROM execution

Network	[Do not launch]
Storage	[UEFI]
Video	[Legacy]
Other PCI devices	[Legacy]

3.5 Chipset Settings



3.5.1 System Agent （SA） Configuration

System Agent Bridge Name	Skylake
SA PCIe Code Version	1.7.0.0
VT-d	Supported

►Graphics Configuration

IGFX VBIOS Version	1034
Graphics Turbo IMON Current	31

Skip Scaning of External Gfx Card [Disabled]

Primary Display	[Auto]
Primary PEG	[Auto]
Primary PCIE	[Auto]
Internal Graphics	[Auto]
GTT Size	[8MB]
Aperture Size	[256MB]
DVMT Pre-Allocated	[32M]
DVMT Total Gfx Mem	[256MB]
Gfx Low Power Mode	[Enabled]
VDD Enabled	[Enabled]
PM Support	[Enabled]
PAVP Enable	[Enabled]
Cd Clock Frequency	[675MHz]

►LCD Control

Primary IGFX Boot Display	[VBIOS Default]
LCD Panel Type	[VBIOS Default]
Panel Scaling	[Auto]
Backlight Control	[PWM Normal]
BIA	[Auto]
Spread Spectrum clock Chip	[Off]
Active CRT	[CRT]
Panel Color Depth	[24 Bit]

►Memory Information

Memory RC Version	1.7.0.0
Memory Frequency	2133 MHz
Total Memory	8192MB
VDD	1200
DIMM#0	8192MB
DIMM#1	Not Present
DIMM#2	Not Present
DIMM#3	Not Present
Memory Timings(tCL-tRCD-tRP-tRAS)	
15-36	
MRC ULT Safe Config	[Disabled]
Maximum Memory Frequency	[Auto]
HOB Buffer Size	[Auto]
ECC Support	[Enabled]
Max TOLUD	[Dynamic]
SA GV	[Enabled]
SA GV Low Freq	[1333]
Energy Performance Gain	[Disabled]
EPG DIMM Idd3N	26
EPG DIMM Idd3P	11
Retrain on Fast Fail	[Enabled]
Enable RH Prevention	[Enabled]

Row Hammer Solution	[Hardware RHP]
RH Activation Probability	[1/2^11]
Exit On Failure(MRC)	[Enabled]
MC Lock	[Enabled]
Probeless Trace	[Disabled]
Enabled/Disable IED(Intel Enhanced Debug)	[Disabled]
Ch Hash Support	[Enabled]
Ch Hash Mask	12488
Ch Hash Interleaved Bit	[BIT8]
VC1 Read Metering	[Enabled]
VC1 RdMeter Time Window	800
VC1 RdMeter Threshold	280
Strong Weak Leaker	7
Memory Scrambler	[Enabled]
Channel A DIMM Control	[Enable both DIMMs]
Channel B DIMM Control	[Enable both DIMMs]
Force Single Rank	[Disabled]
Memory Remap	[Enabled]
Time Measure	[Disabled]
Lpddr Mem WL Set	[Set B]
EV Loader	[Disabled]
EV Loader Delay	[Enabled]
Fast Boot	[Enabled]
DLL Weak Lock Support	[Enabled]

►Memory Thermal Configuration

►Memory Power and Thermal Throttling

DDR PowerDown and idle counter	[BIOS]
For LPDDR Only:DDR PowerDown and Idle counter	[BIOS]
REFRESH_2X_MODE	[Disabled]
LPDDR Thermal Sensor	[Enabled]
SelfRefresh Enable	[Enabled]
SelfRefresh IdleTimer	512
Throttler CKEMin Defeature	[Disabled]
Throttler CKEMin Timer	48
Pwr Down Idle Timer	0

►Dram Power Meter

Use user provided power weights, Scale factor,and channel power Floor values	[Disabled]
Energy Scale Factor	4
Idle Energy Ch0Dimm0	10
PowerDown Energy Ch0Dimm0	6
Activate Energy Ch0Dimm0	172
Read Energy Ch0Dimm0	212

Write Energy Ch0Dimm0	221
Idle Energy Ch0Dimm0	10
PowerDown Energy Ch0Dimm1	6
Activate Energy Ch0Dimm1	172
Read Energy Ch0Dimm1	212
Write Energy Ch0Dimm1	221
Idle Energy Ch1Dimm0	10
PowerDown Energy Ch1Dimm0	6
Activate Energy Ch1Dimm0	172
Read Energy Ch1Dimm0	212
Write Energy Ch1Dimm0	221
Idle Energy Ch1Dimm1	10
PowerDown Energy Ch1Dimm1	6
Activate Energy Ch1Dimm1	172
Read Energy Ch1Dimm1	212
Write Energy Ch1Dimm1	221

►Memory Thermal Reporting

Lock Thermal Management Registers	[Enabled]
Memory Thermal Reporting	
Extern Therm Status	[Disabled]
Closed Loop Therm Manage	[Disabled]
Open Loop Therm Manage	[Disabled]
Thermal Threshold Settings	
Warm Threshold Ch0 Dimm0	255
Warm Threshold Ch0 Dimm1	255
Hot Threshold Ch0 Dimm0	255
Hot Threshold Ch0 Dimm1	255
Warm Threshold Ch1 Dimm0	255
Warm Threshold Ch1 Dimm1	255
Hot Threshold Ch1 Dimm0	255
Hot Threshold Ch1 Dimm1	255
Thermal Throttle Budget Settings	
Warm Budget Ch0 Dimm0	255
Warm Budget Ch0 Dimm1	255
Hot Budget Ch0 Dimm0	255
Hot Budget Ch0 Dimm1	255
Warm Budget Ch1 Dimm0	255
Warm Budget Ch1 Dimm1	255

Hot Budget Ch1 Dimm0	255
Hot Budget Ch1 Dimm1	255

►Memory RAPL

Rapl Power Floor Ch0	0
Rapl Power Floor Ch1	0
RAPL PL Lock	[Disabled]
RAPL PL 1 enable	[Disabled]
RAPL PL 1 Power	0
RAPL PL 1 WindowX	0
RAPL PL 1 WindowY	0
RAPL PL 2 enable	[Disabled]
RAPL PL 2 Power	222
RAPL PL 2 WindowX	1
RAPL PL 2 WindowY	10
Memory Thermal Management	[Disabled]

►Memory Training Algorithms

Early Command Training	[Disabled]
SenseAmp Offset Training	[Enabled]
Early ReadMPR Timing Centering 2D	[Enabled]
Read MPR Training	[Enabled]
Receive Enable Training	[Enabled]
Jedec Write Leveling	[Enabled]
Early Write Time Centering 2D	[Enabled]
Early Read Time Centering 2D	[Enabled]
Write Timing Centering 1D	[Enabled]
Write Voltage Centering 1D	[Enabled]
Read Timing Centering 1D	[Enabled]
Dimm ODT Training*	[Enabled]
Max RTT_WR	[ODT Off]
DIMM RON Training*	[Enabled]
Write Drive Strength/Equaliztion 2D*	[Disabled]
Write Slew Rate Training*	[Enabled]
Read ODT Training*	[Enabled]
Read Equalization Training*	[Enabled]
Read Amplifier Training*	[Enabled]
Write Timing Centering 2D	[Enabled]
Read Timing Centering 2D	[Enabled]
Command Voltage Centering	[Enabled]
Write Voltage Centering 2D	[Enabled]
Read Voltage Centering 2D	[Enabled]
Late Command Training	[Enabled]
Round Trip Latency	[Enabled]
Turn Around Timing Training	[Enabled]

Rank Margin Tool	[Disabled]
Memory Test	[Disabled]
DIMM SPD Alias Test	[Enabled]
Receive Enable Centering 1D	[Enabled]
Retrain Margin Check	[Enabled]
Command Power Training	[Disabled]

3.5.2 PCH-IO Configuration

Intel PCH RC Version	1.7.0.0
Intel PCH SKU Name	PCH-H Desktop H170 SKU
Intel PCH Rev ID	31/D1

►PCI Express Configuration

PCI Express Clock Gating	[Enabled]
DMI Link ASPM Control	[Enabled]
Port8xh Decode	[Disabled]
Peer Memory Write Enable	[Disabled]
Compliance Test Mode	[Disabled]
PCIe-USB Glitch W/A	[Disabled]
PCIe Function swap	[Enabled]

►PCI Express Gen3 Eq Lanes

Override SW EQ settings	[Disabled]

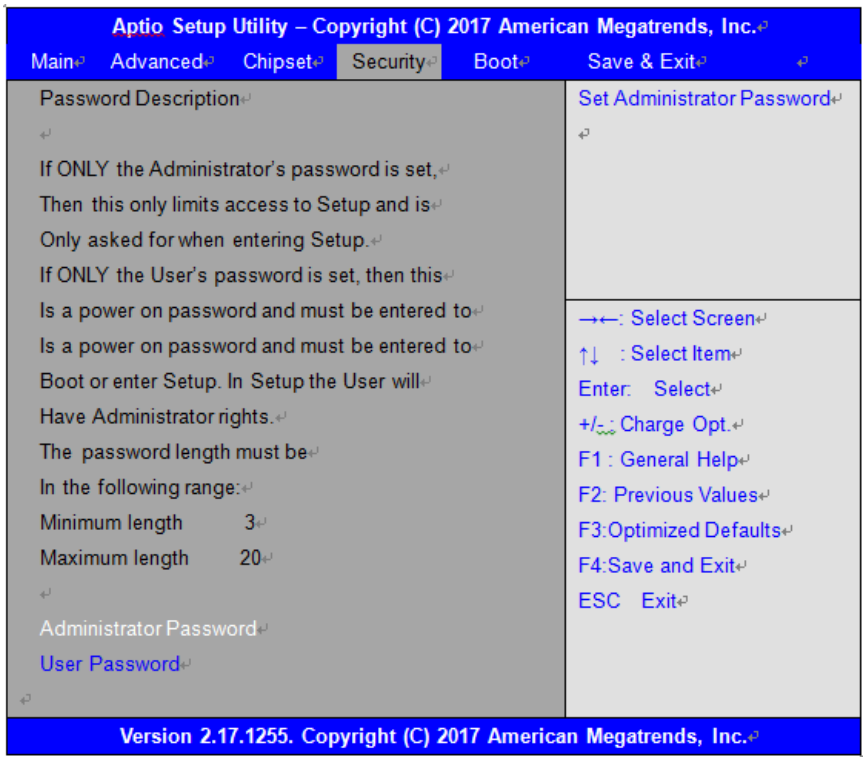
►PCI Express Root Port 1
►PCI Express Root Port 2
►PCI Express Root Port 3
►PCI Express Root Port 4
►PCI Express Root Port 5
►PCI Express Root Port 6
►PCI Express Root Port 7
►PCI Express Root Port 8
►PCI Express Root Port 9
►PCI Express Root Port 10
►PCI Express Root Port 11
►PCI Express Root Port 12
►PCI Express Root Port 13
►PCI Express Root Port 14
►PCI Express Root Port 15
►PCI Express Root Port 16
►PCI Express Root Port 17
►PCI Express Root Port 18
►PCI Express Root Port 19
►PCI Express Root Port 20

►USB Configuration

USB Precondition	[Disabled]

XHCI Disable Compliance Mode	[FALSE]
xDCI Support	[Disabled]
USB Port Disable Override	[Disabled]
WiFi Control	[Enabled]
State After G3	[S5 State]
DC PWM Config	[PWM]
F75111 GPIO20	[Output]
F75111 GPIO20 Output setting	[Low]
F75111 GPIO21	[Output]
F75111 GPIO21 Output setting	[Low]
F75111 GPIO22	[Output]
F75111 GPIO22 Output setting	[Low]
F75111 GPIO23	[Output]
F75111 GPIO23 Output setting	[Low]
F75111 GPIO24	[Output]
F75111 GPIO24 Output setting	[Low]
F75111 GPIO25	[Output]
F75111 GPIO25 Output setting	[Low]
F75111 GPIO26	[Output]
F75111 GPIO26 Output setting	[Low]
F75111 GPIO27	[Output]
F75111 GPIO27 Output setting	[Low]

3.6 Security Settings



3.6.1 Administrator Password

3.6.2 User Password

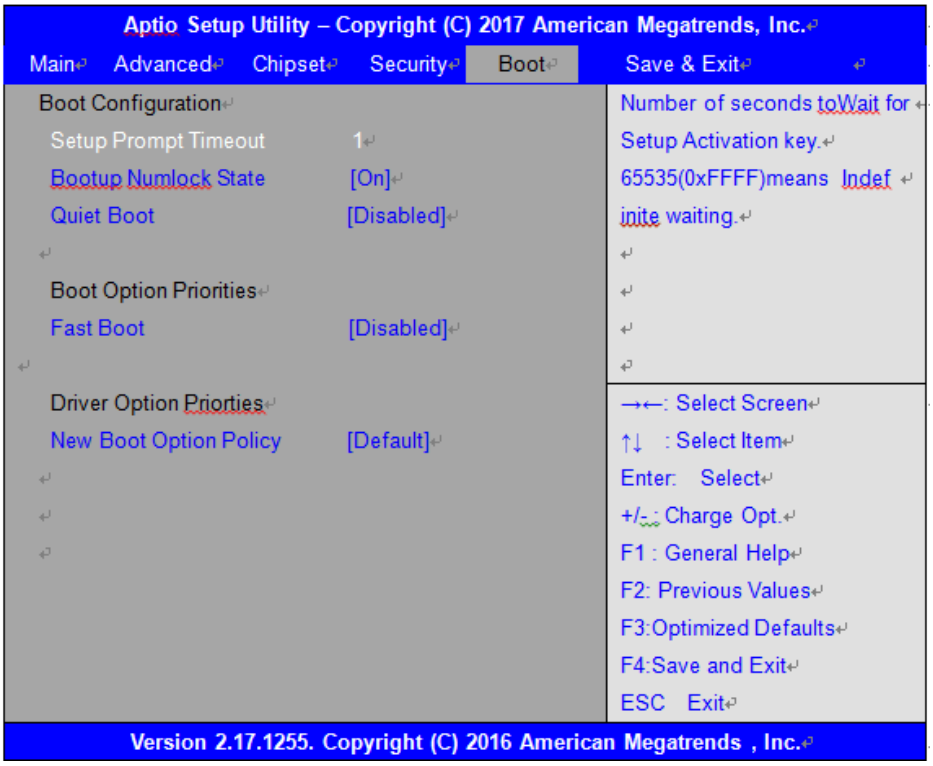
Type the password with up to 20 characters and then press ⮜Enter⮞ key. This will clear all previously typed CMOS passwords. You will be requested to confirm the password. Type the password again and press ⮜Enter⮞ key. You may press ⮜Esc⮞ key to abandon password entry operation.

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]

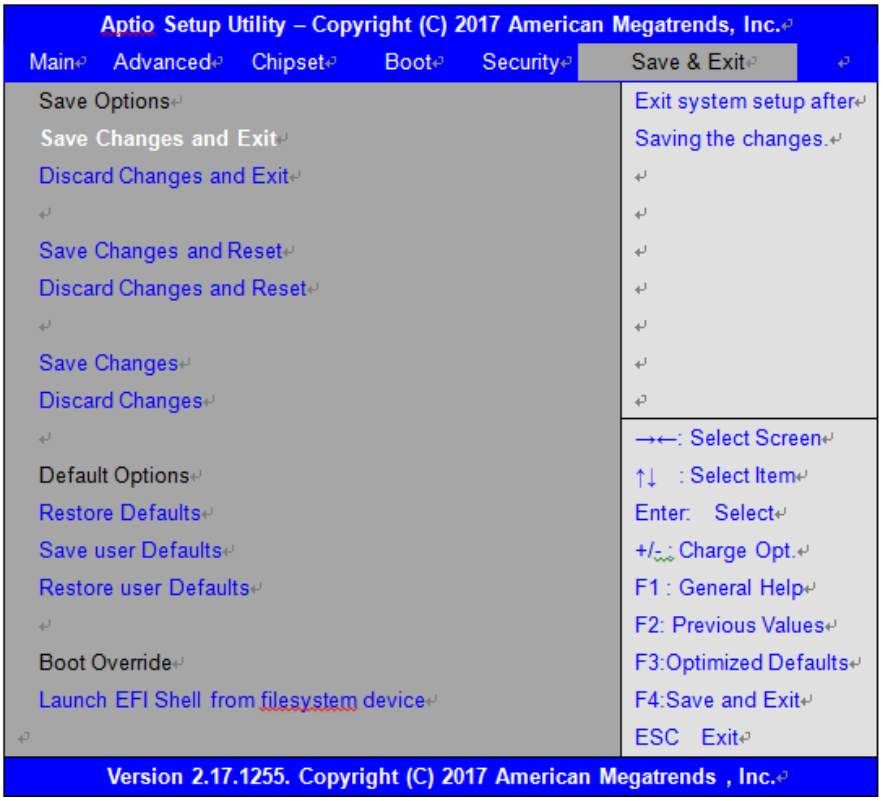
Boot Option Priorities

Fast Boot

[Disabled]
[Enabled]

New Boot Option Policy [Default]
[Place First]
[Place Last]

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

Reset the system after Saving The changes?

[Yes]

[No]

Discard Changes and Reset

Reset system setup without Saving any changes?

[Yes]

[No]

Save Changes

Save Setup done so far to any of the setup options?

[Yes]

[No]

Discard Changes

Discard Changes done so far to any of the setup options?

[Yes]

[No]

Restore Defaults

Restore/Load Defaults values for all the setup options?

[Yes]

[No]

Save as user Defaults

Save the changes done so far as User Defaults?

[Yes]

[No]

Restore user Defaults

Restore the User Defaults to all the setup options?

[Yes]

[No]

Boot Override

Launch EFI Shell from file system device

WARNING Not Found

[ok]

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, Audio driver, IME driver, and touch driver** Installation instructions are given below.

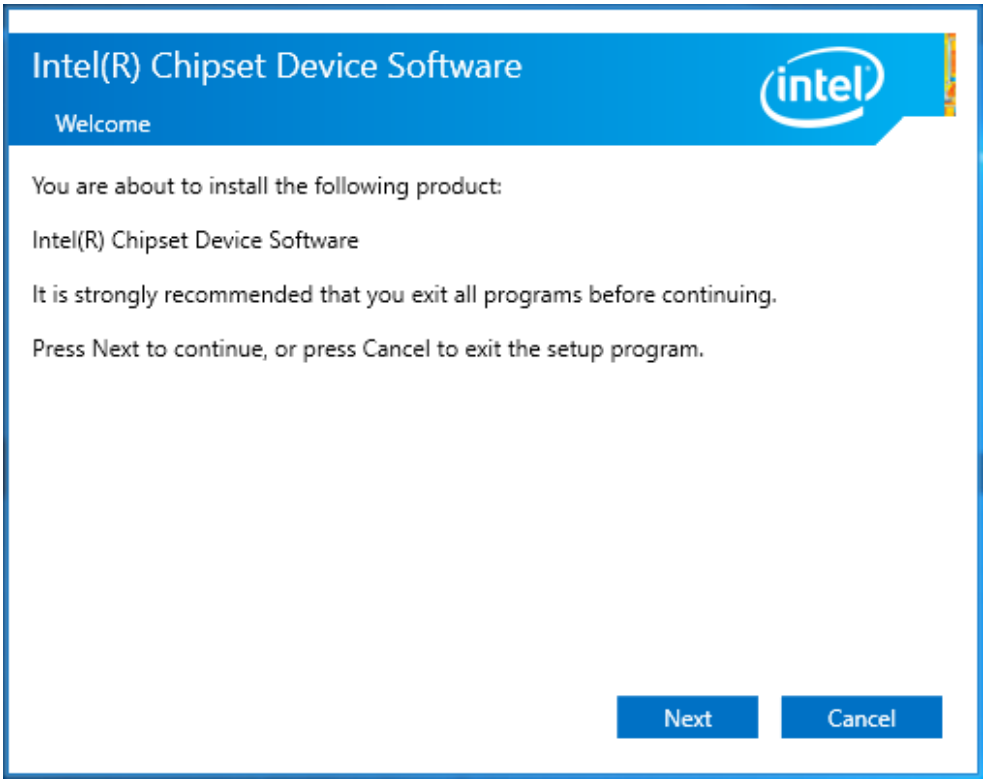
Important Note:
After installing your Windows operating system, you must install first the Intel Chipset Software Installation Utility before proceeding with the installation of drivers.

4.1 Intel H170 Chipset Driver

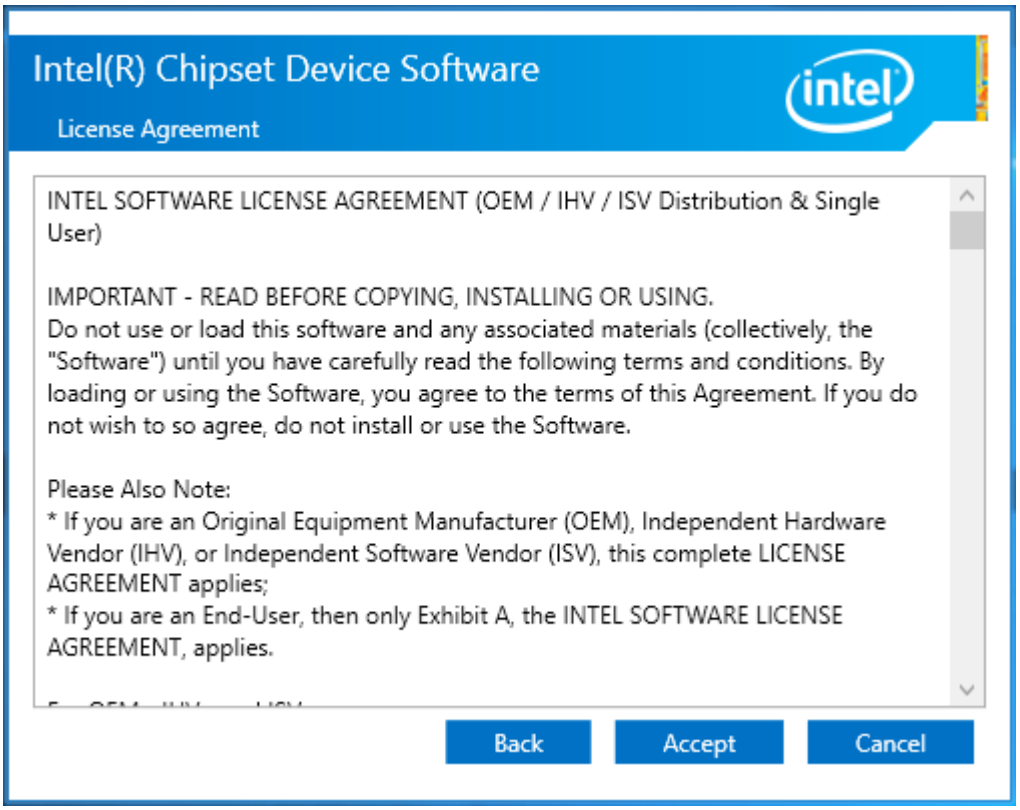
To install the Intel chipset driver, please follow the steps below.

Step 1. Select 4.1 **Intel H170 Chipset** from the list

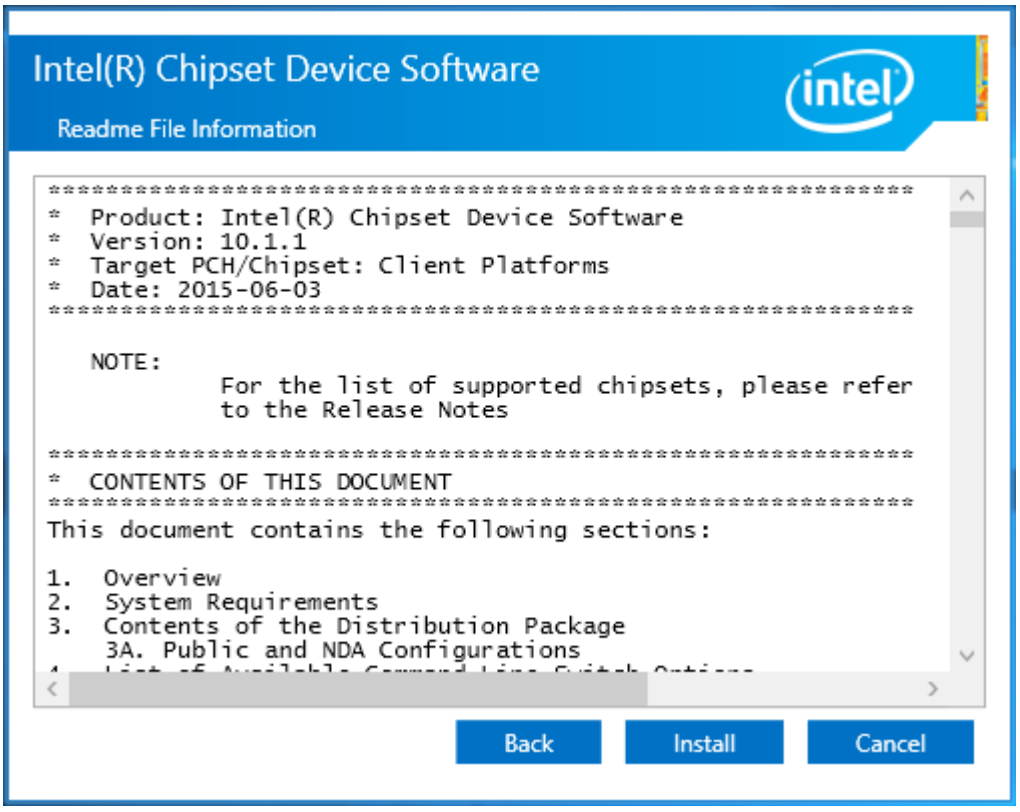
Step 2. Click **Next** to setup program.



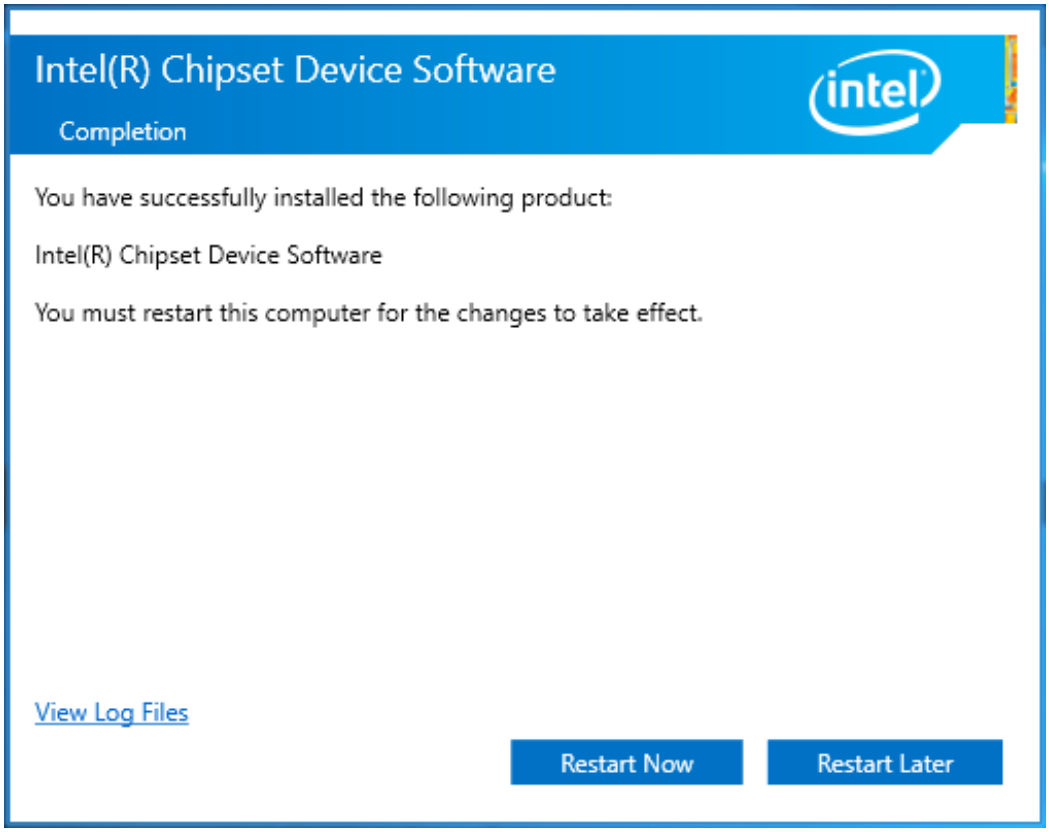
Step 3. Read the license agreement. Click **Accept** to accept all of the terms of the license agreement.



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



Step 5. Click **Restart Now** to complete the setup process. You must restart the computer which has been installed for the changes to take effects.

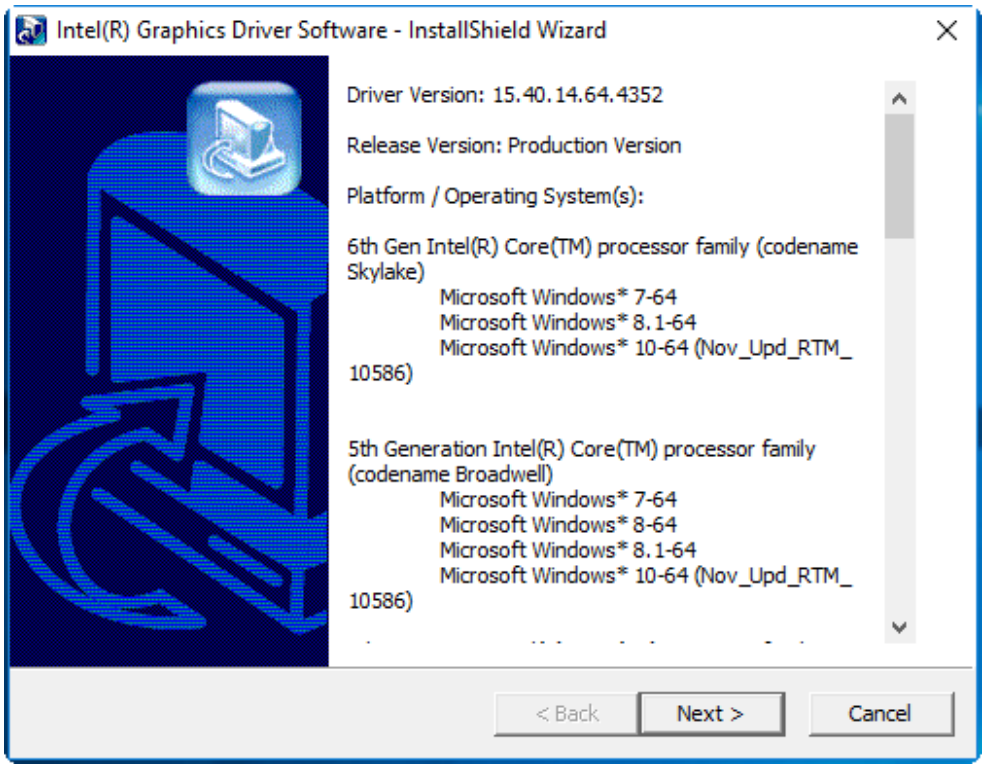


4.2 Intel(R) HD Graphics 530 Chipset Driver

To install the HD Graphics 530 Chipset drivers, follow the steps below to proceed with the installation.

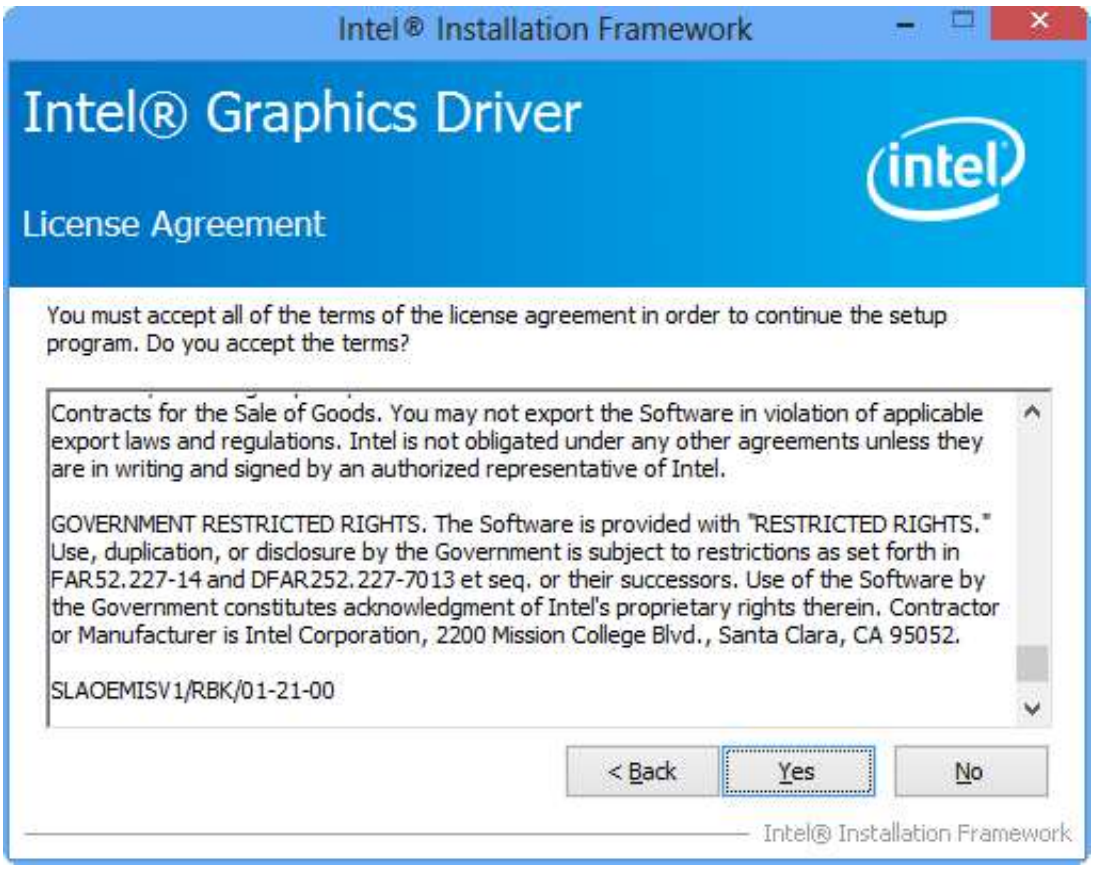
Step 1.Select **Intel(R) HD Graphics 530 Chipset** from the list.

Step 2. Click **Next** to setup program**.**

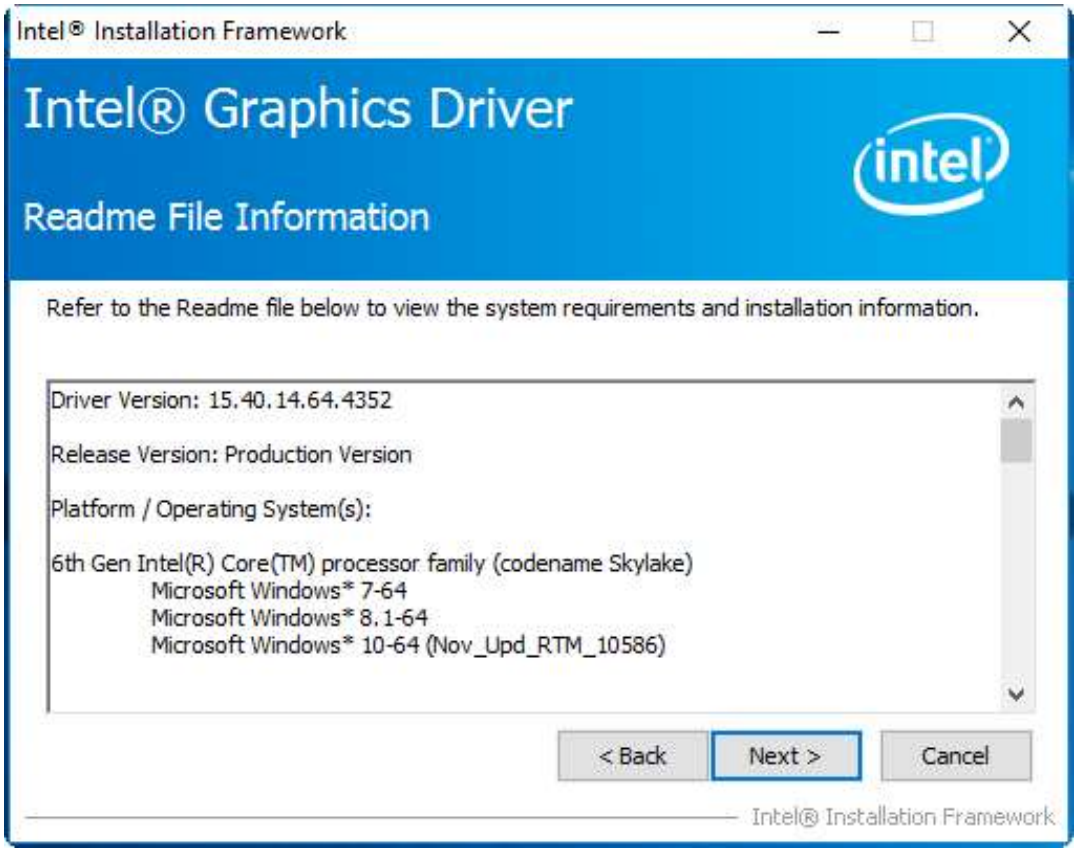


Step 3. Click **Next** to setup program**.**

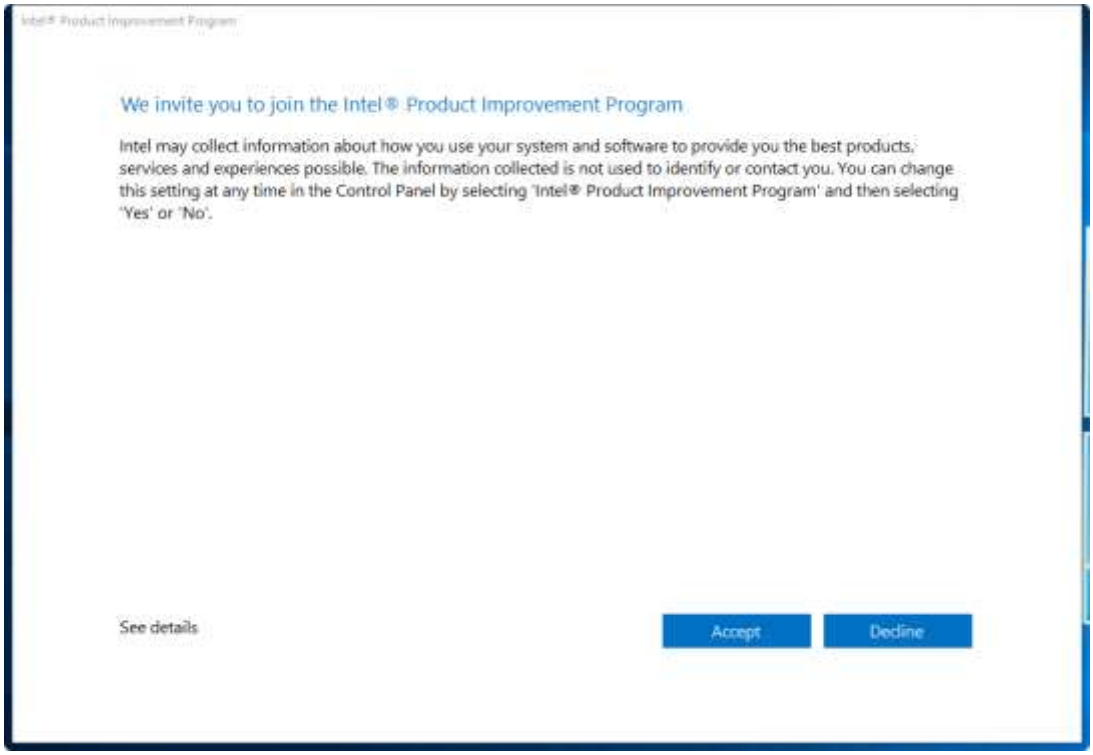
Step 4. Click **Yes** for agree the license in Intel Agreement.



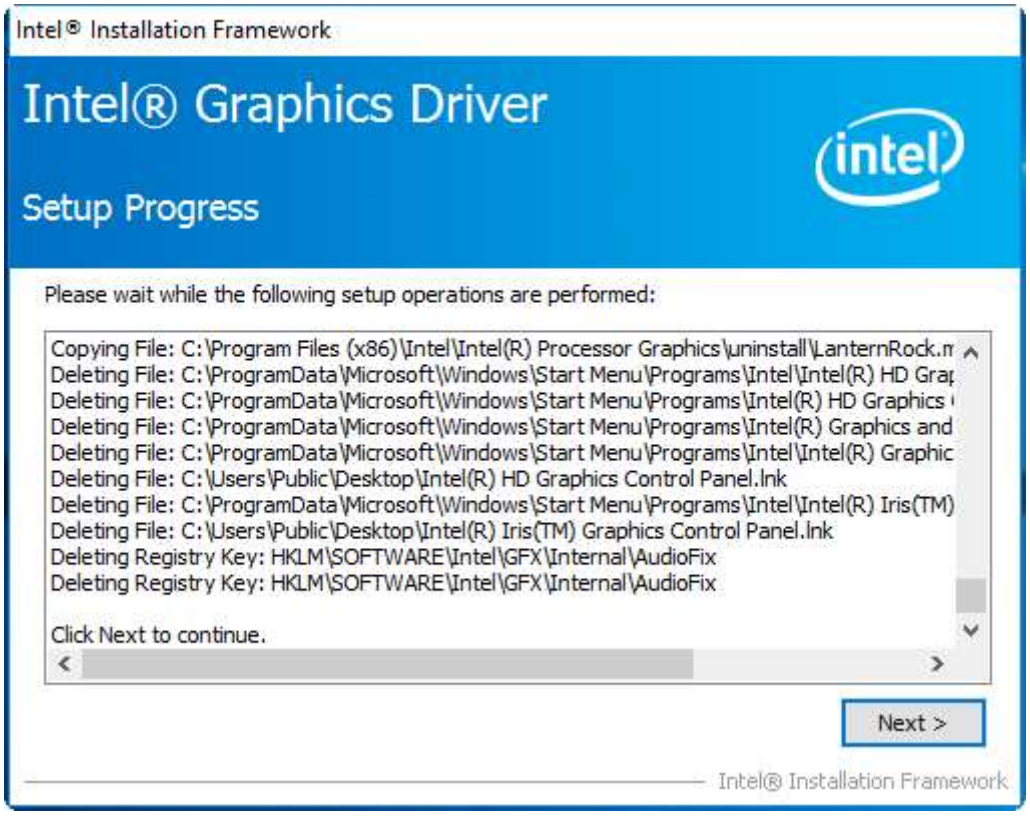
Step 5. Click **Next** to continue.



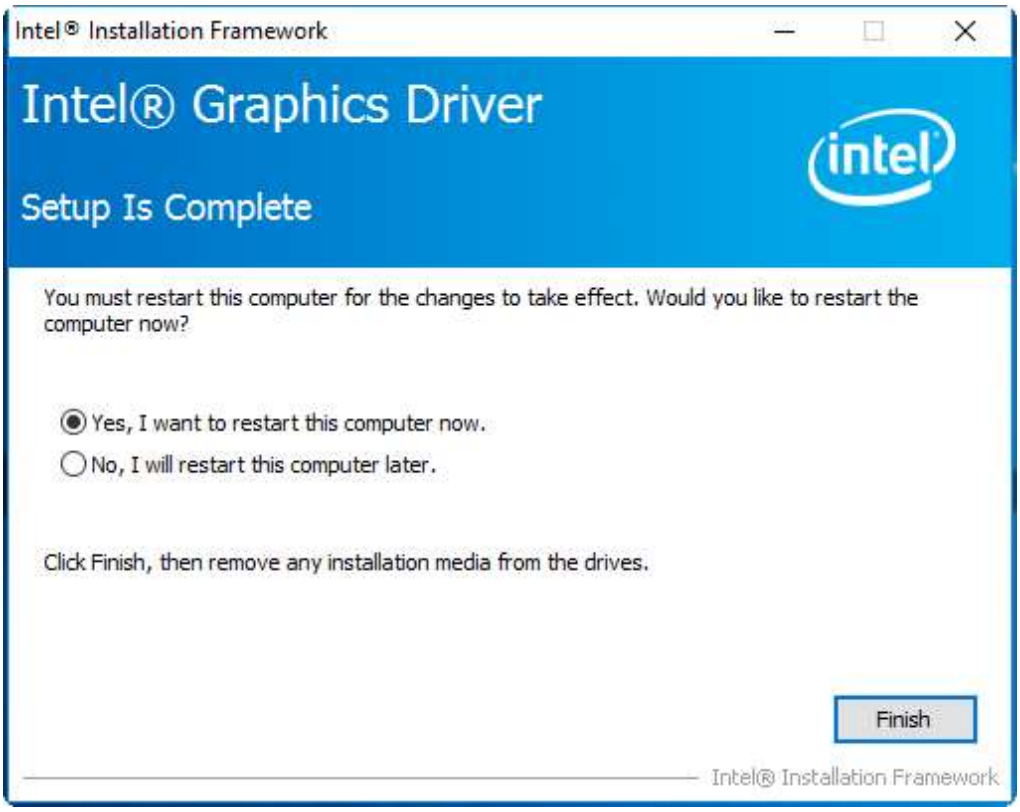
Step 6. You can choose **Accept** or **Decline** for join the intel® product improvement program. The Intel Company may collect information about how you use your system and software.



Step7. Click **Next** to continue.



Step8. Select **Yes, I want to restart this computer now.** Then click **Finish** to complete the installation.

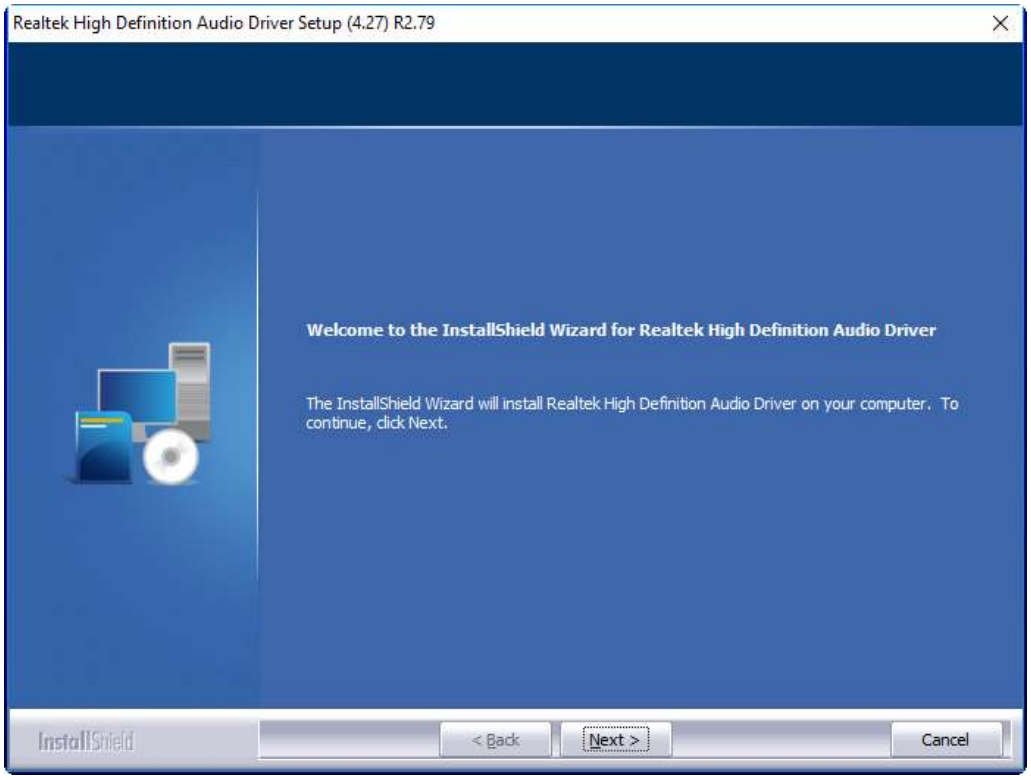


4.3 Realtek ALC269 HD Audio Driver

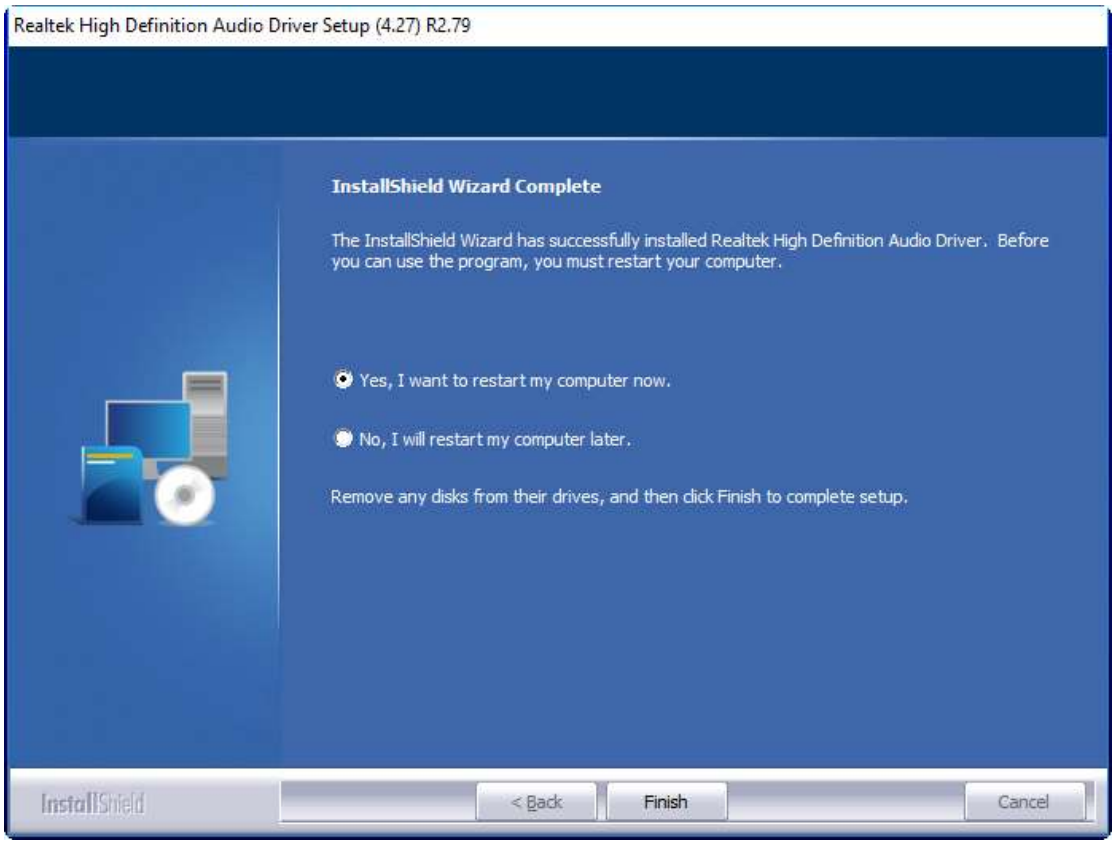
To install the Realtek ALC269 HD Audio Driver, please follow the steps below.

Step 1. Select **Realtek ALC269 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.

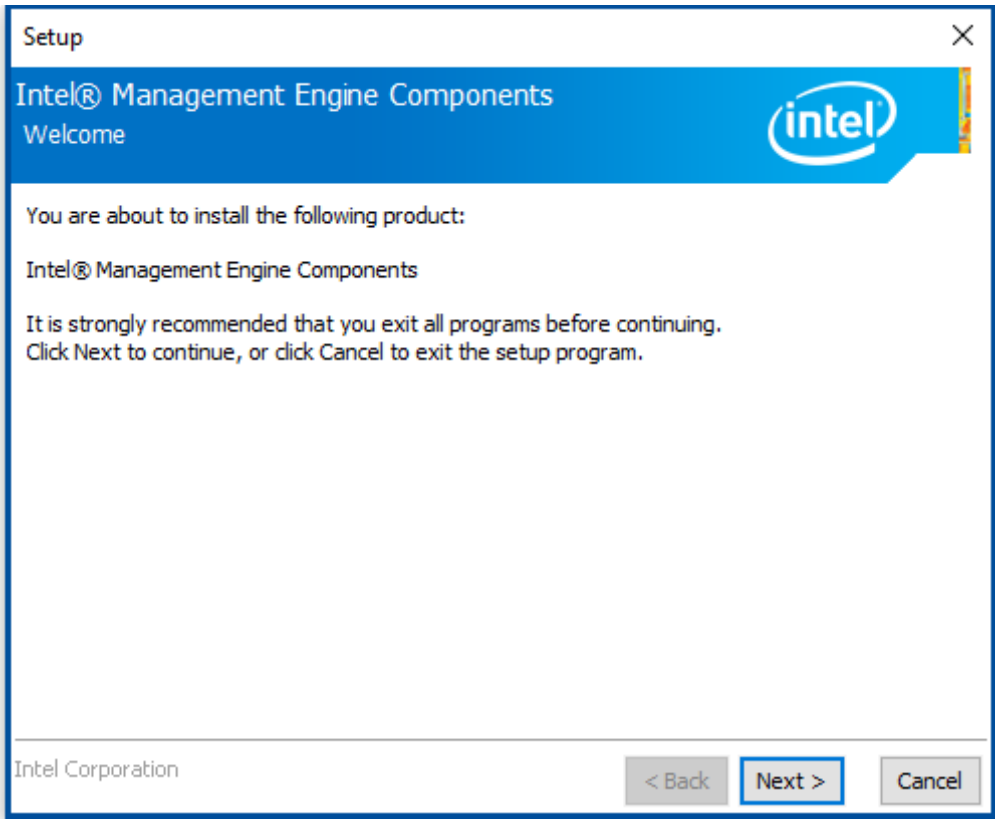


4.4 Intel Management Engine Interface

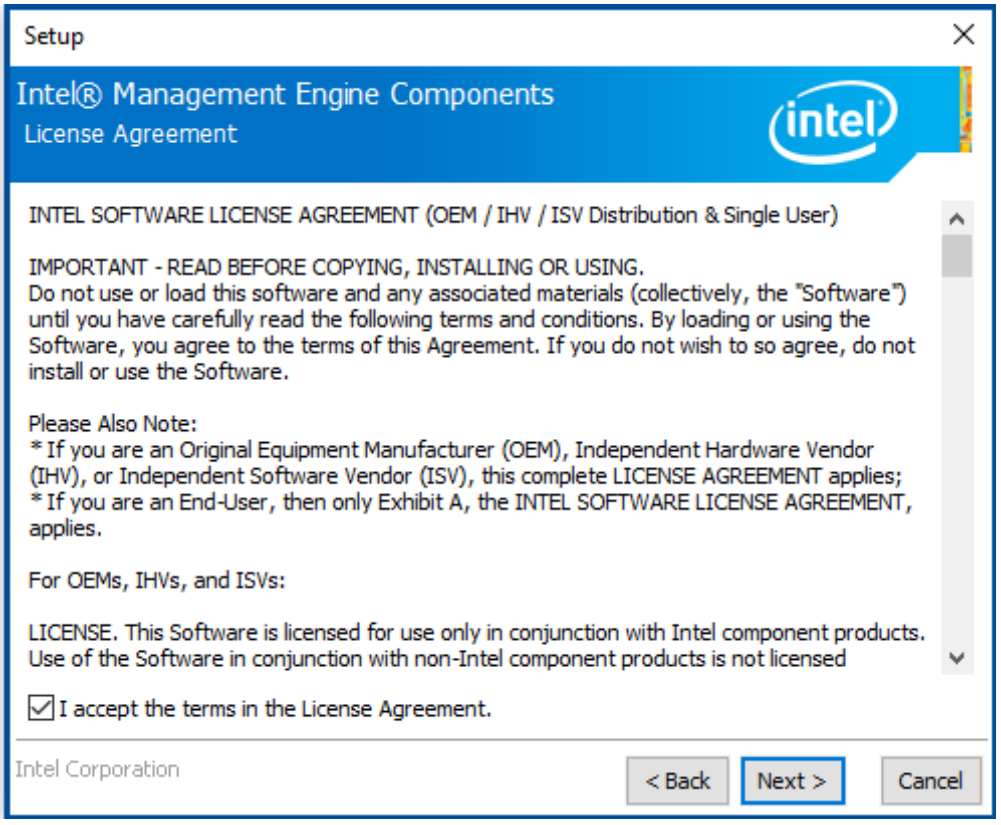
To install the Intel Management Engine Interface, please follow the steps below.

Step 1. Select **Intel Management Engine Interface** from the list

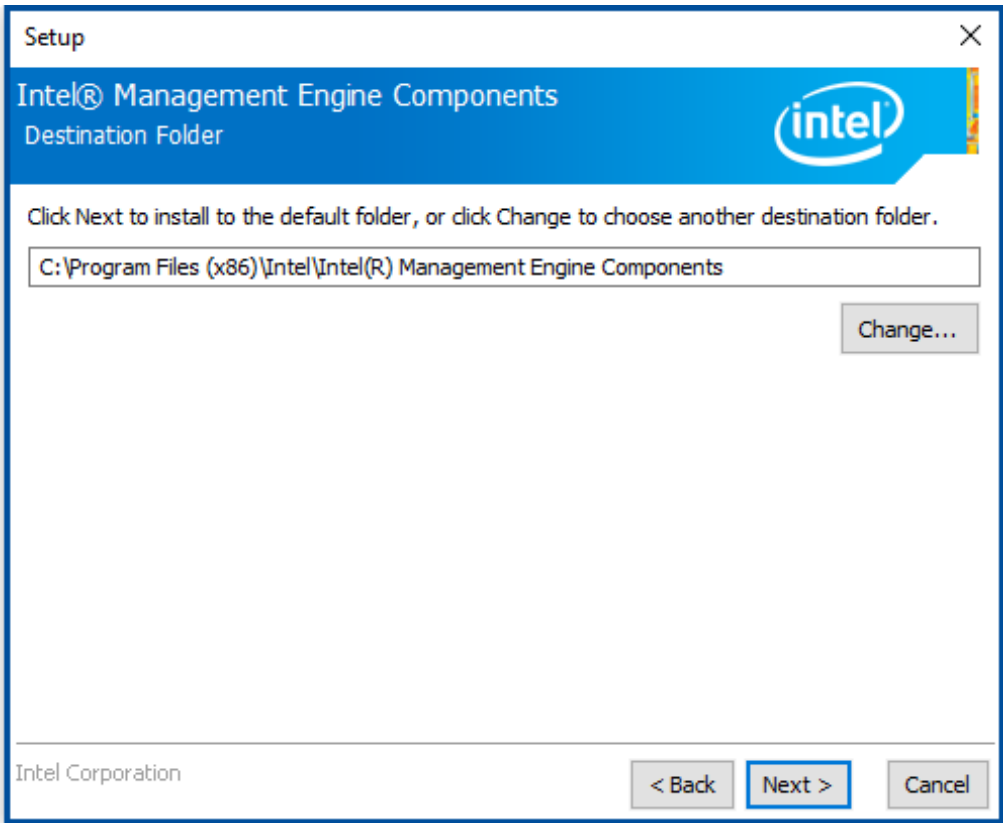
Step 2. Select setup language you need. Click **Next** to continue.



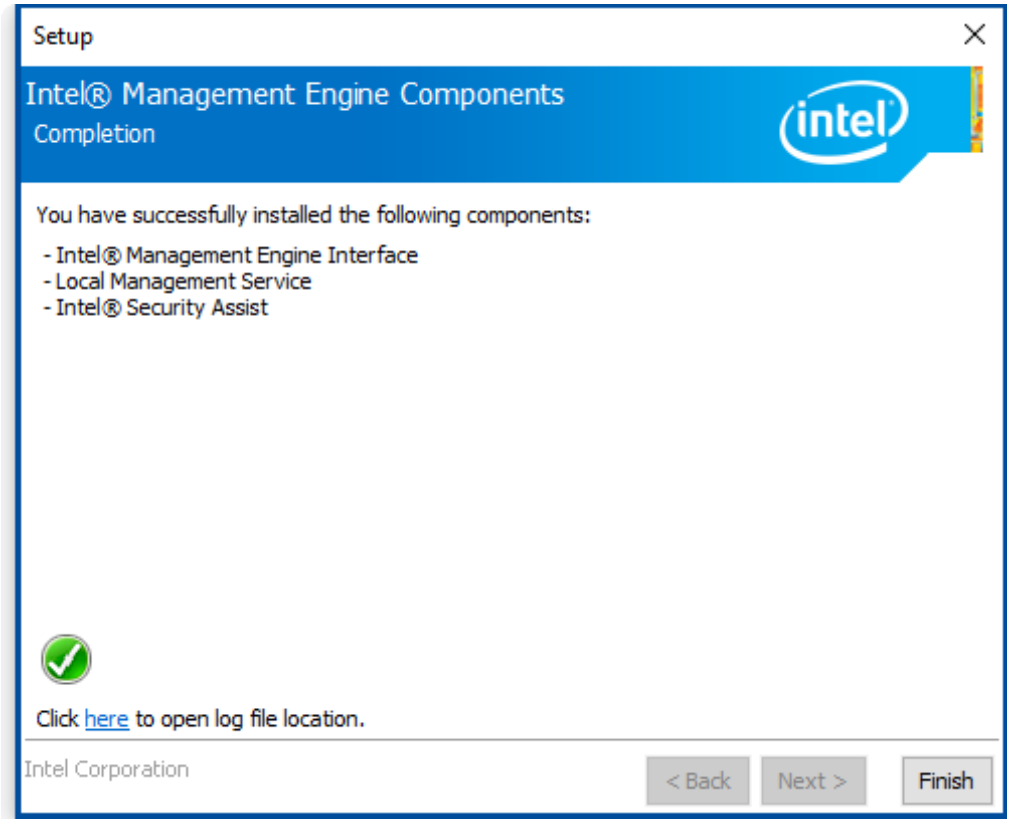
Step 3. Choose **I accept the terms in the License Agreement** and click **Next** to begin the installation.



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



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



Chapter 5 Touch Screen Installation

This chapter describes how to install drivers and other software that will allow your touch screen work with different operating systems.

5.1 Windows 8.1/10 Universal Driver Installation for PenMount 6000 Series

Before installing the Windows 8.1/10 driver software, you must have the Windows 8.1/10 system installed and running on your computer. You must also have one of the following PenMount 6000 series controller or control boards installed: PM6500, PM6300.

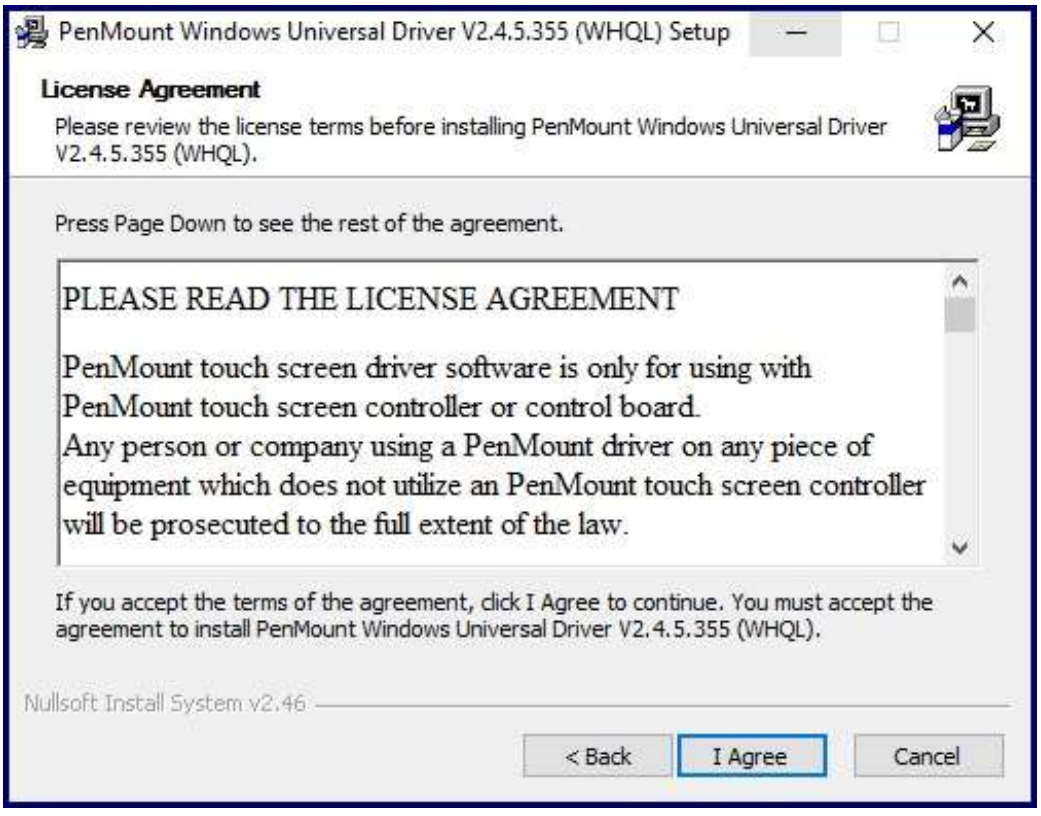
Resistive Touch

If you have an older version of the PenMount Windows 7 driver installed in your system, please remove it first. Follow the steps below to install the PenMount DMC6000 Windows 7 driver.

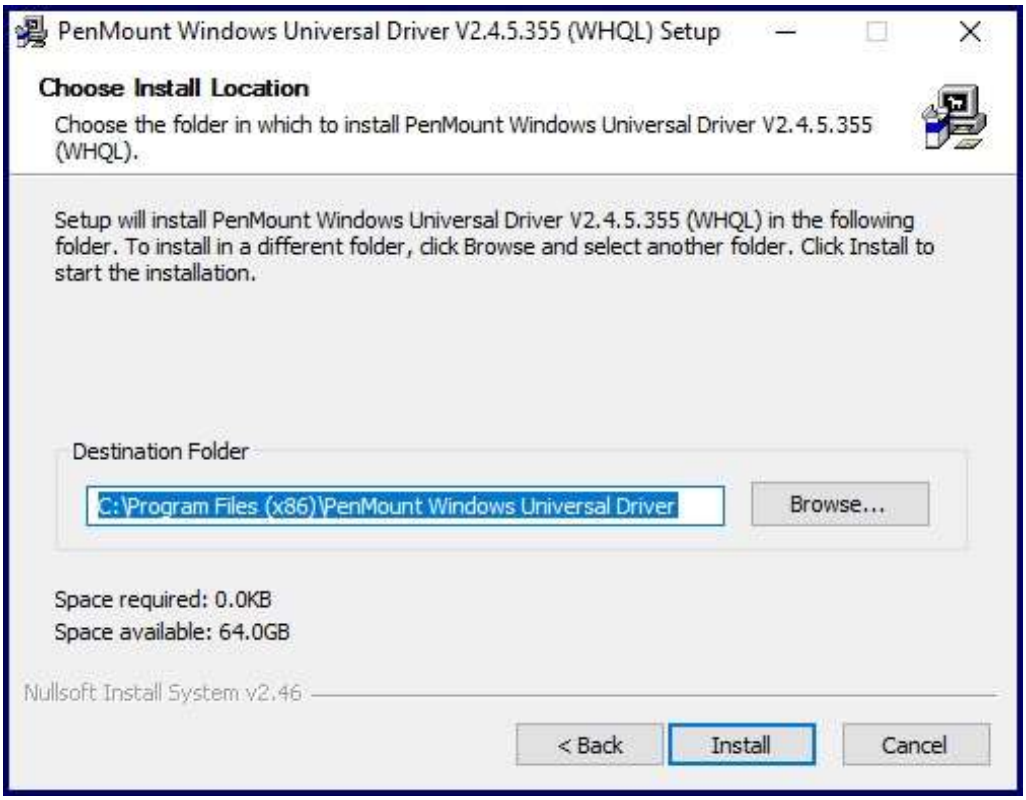
Step 1. Insert the product CD, the screen below would appear. Click **Touch Panel Driver** from the list.

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

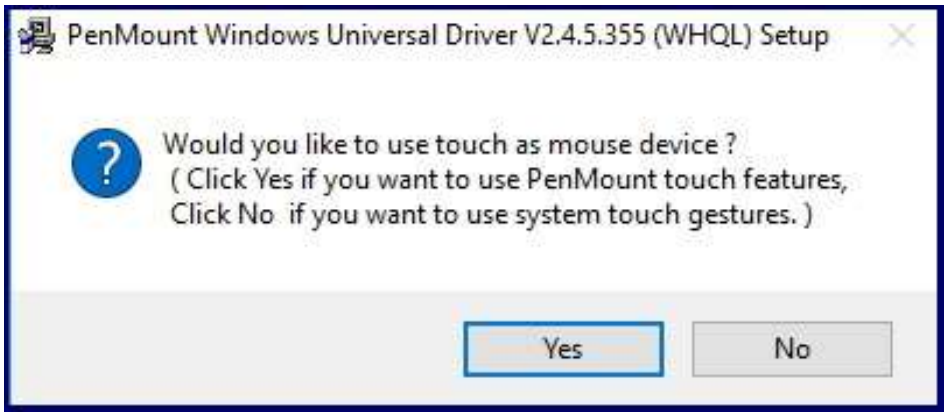
Step 4. Read the license agreement. Click **I Agree** to agree the license agreement.



Step 5. Choose the folder in which to install PenMount Windows Universal Driver. Click **Install** to start the installation.



Step 6. Click **Yes** to continue.



Step 7. Click **Finish** to complete installation.

5.2 Software Functions

Resistive Touch

Upon rebooting, the computer automatically finds the new 6000 controller board. The touch screen is connected but not calibrated. Follow the procedures below to carry out calibration.

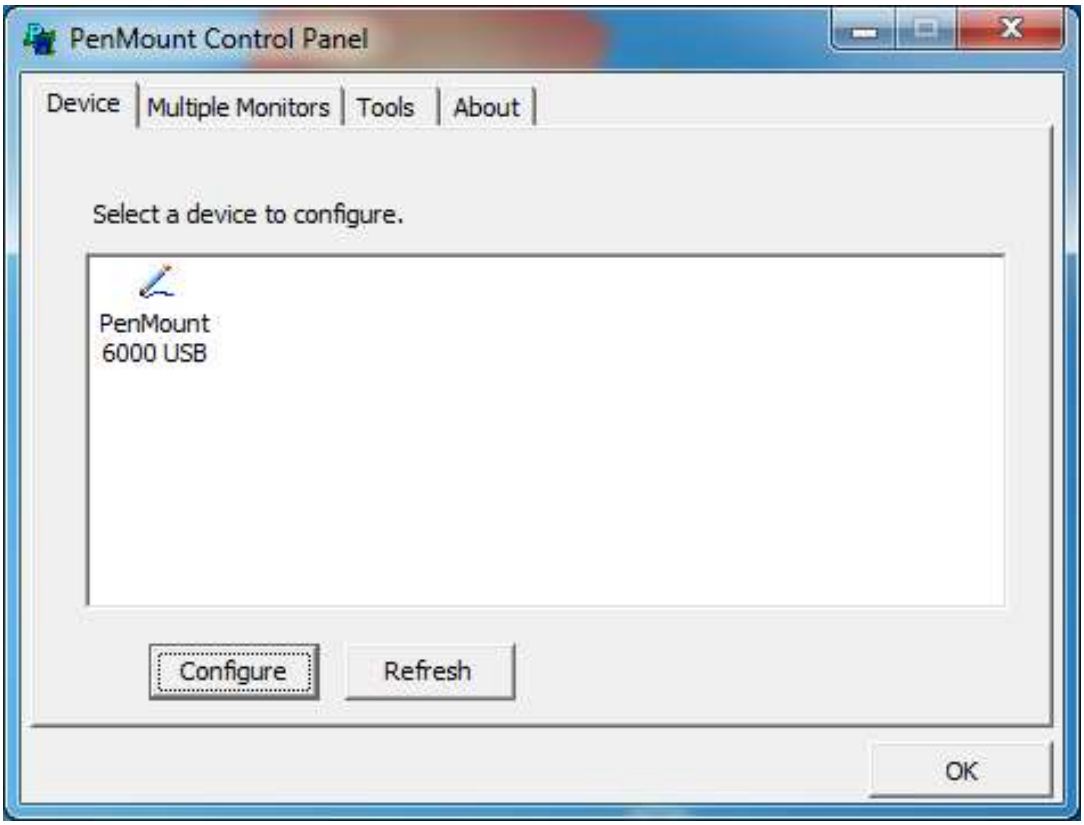
1. After installation, click the PenMount Monitor icon “PM” in the menu bar.
2. When the PenMount Control Panel appears, select a device to “Calibrate.”

PenMount Control Panel(Resistive Touch)

The functions of the PenMount Control Panel are **Device, Multiple Monitors** ,**Tools** and **About**, which are explained in the following sections.

Device

In this window, you can find out that how many devices be detected on your system.

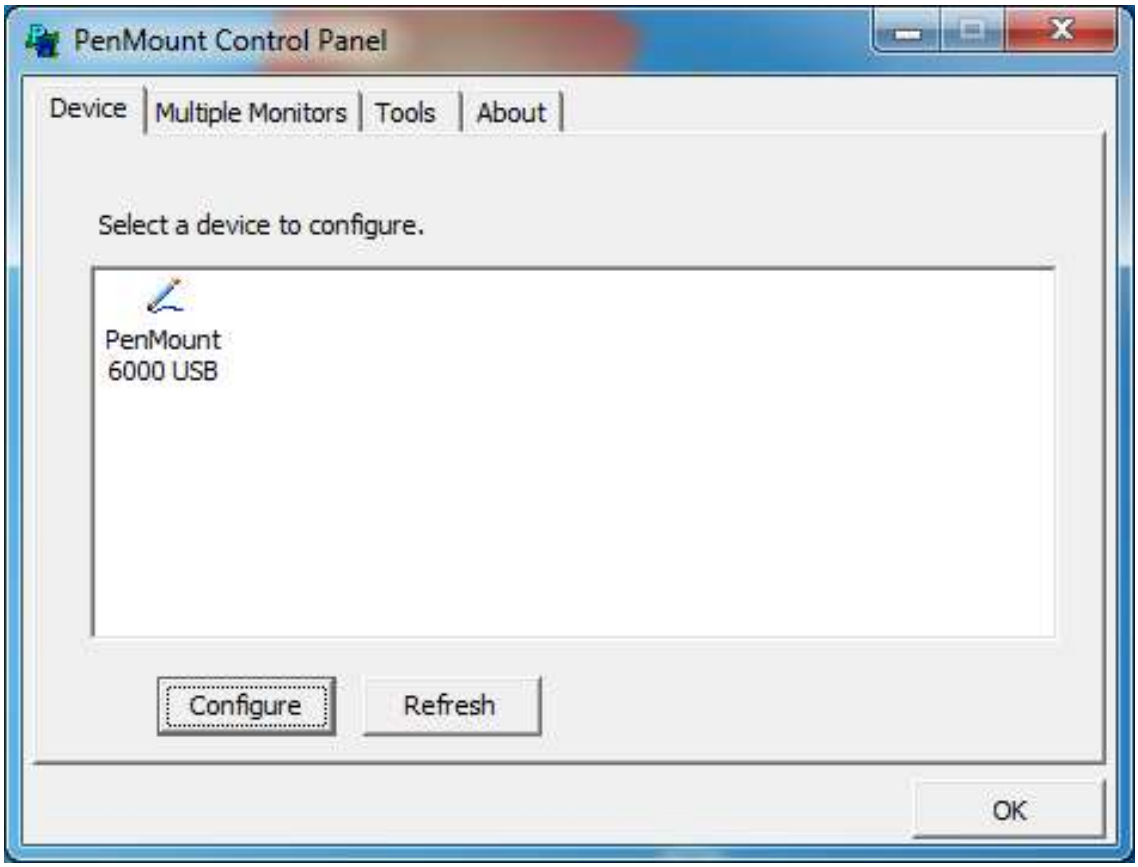


Calibrate

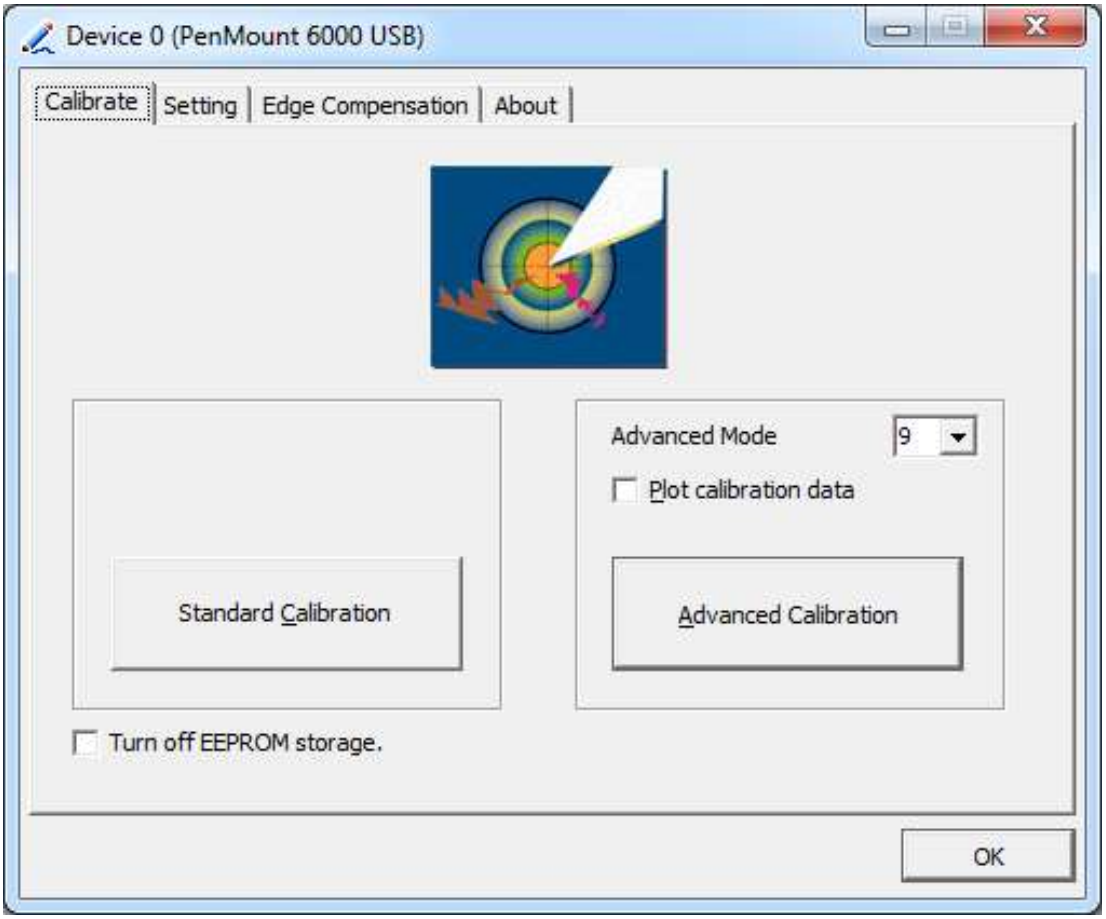
This function offers two ways to calibrate your touch screen. ‘Standard Calibration’ adjusts most touch screens. ‘Advanced Calibration’ adjusts aging touch screens.

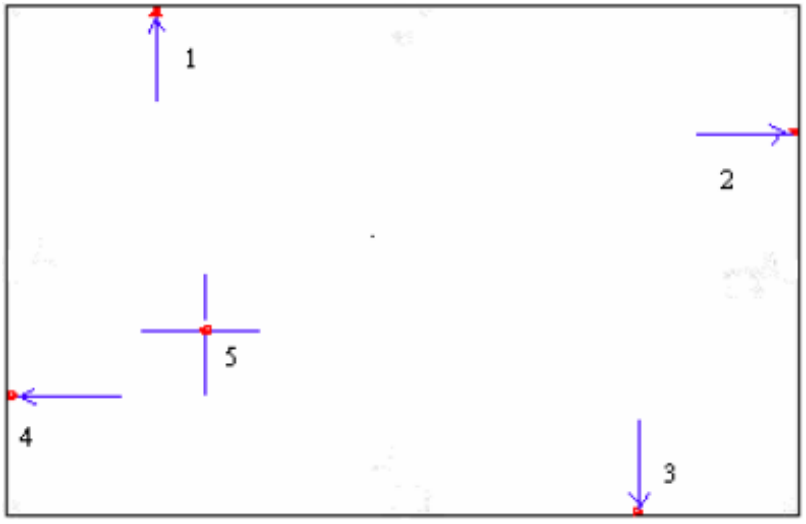
Standard Calibration	**Click this button and arrows appear pointing to red squares. Use your finger or stylus to touch the red squares in sequence. After the fifth red point calibration is complete. To skip, press ‘ESC’.**
Advanced Calibration	**Advanced Calibration uses 4, 9, 16 or 25 points to effectively calibrate touch panel linearity of aged touch screens. Click this button and touch the red squares in sequence with a stylus. To skip, press ESC’.**

Step 1. Please select a device then click “Configure”. You can also double click the device too.



Step 2. Click "**Standard Calibration**" to start calibration procedure

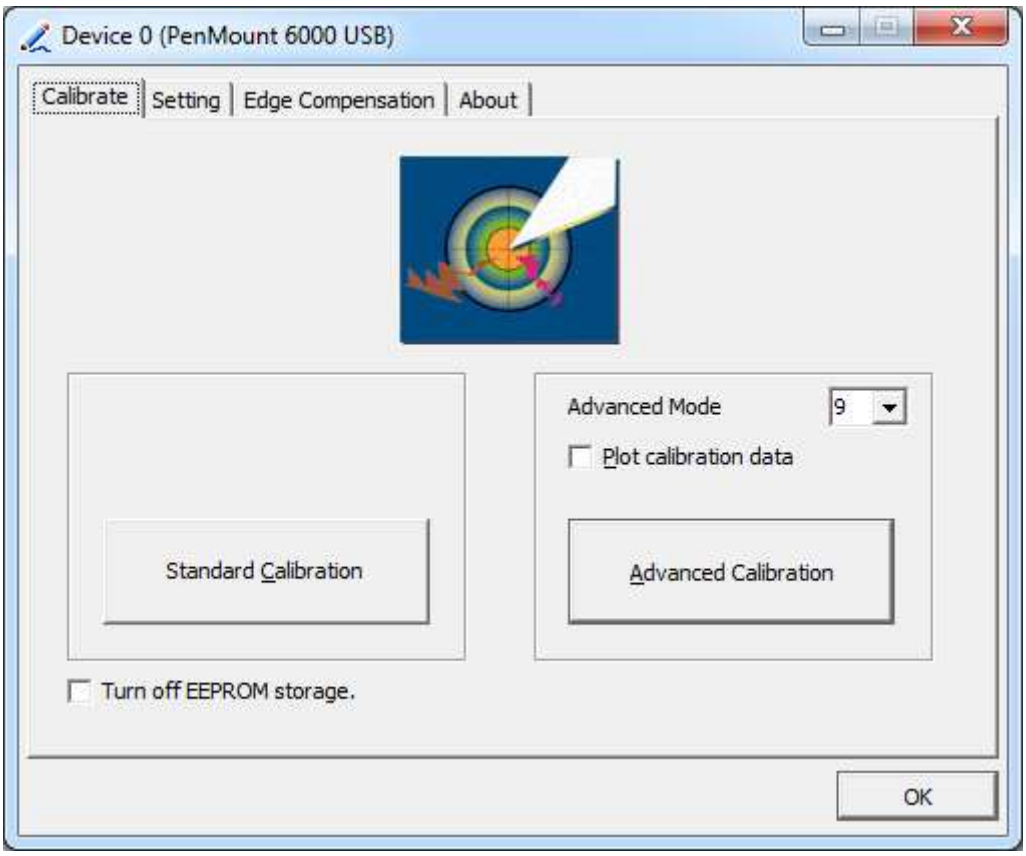




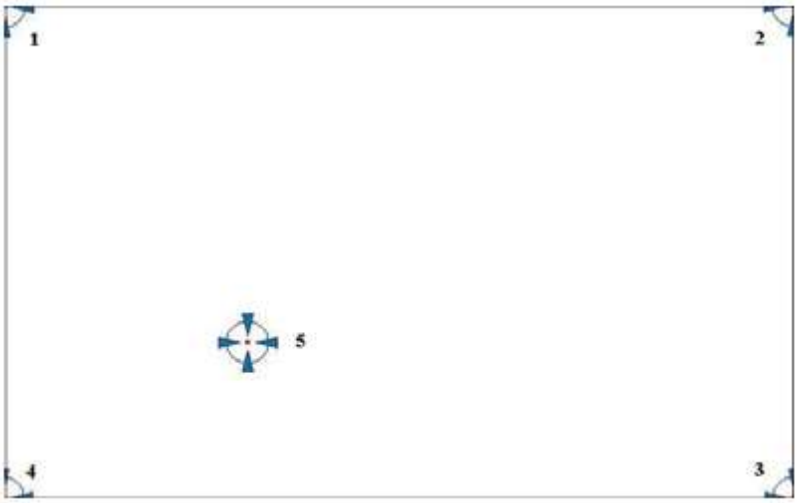
NOTE: The older the touch screen, the more Advanced Mode calibration points you need for an accurate calibration. Use a stylus during Advanced Calibration for

greater accuracy. Please follow the step as below:

Step 3. Select **Device** to calibrate, then you can start to do **Advanced Calibration**.



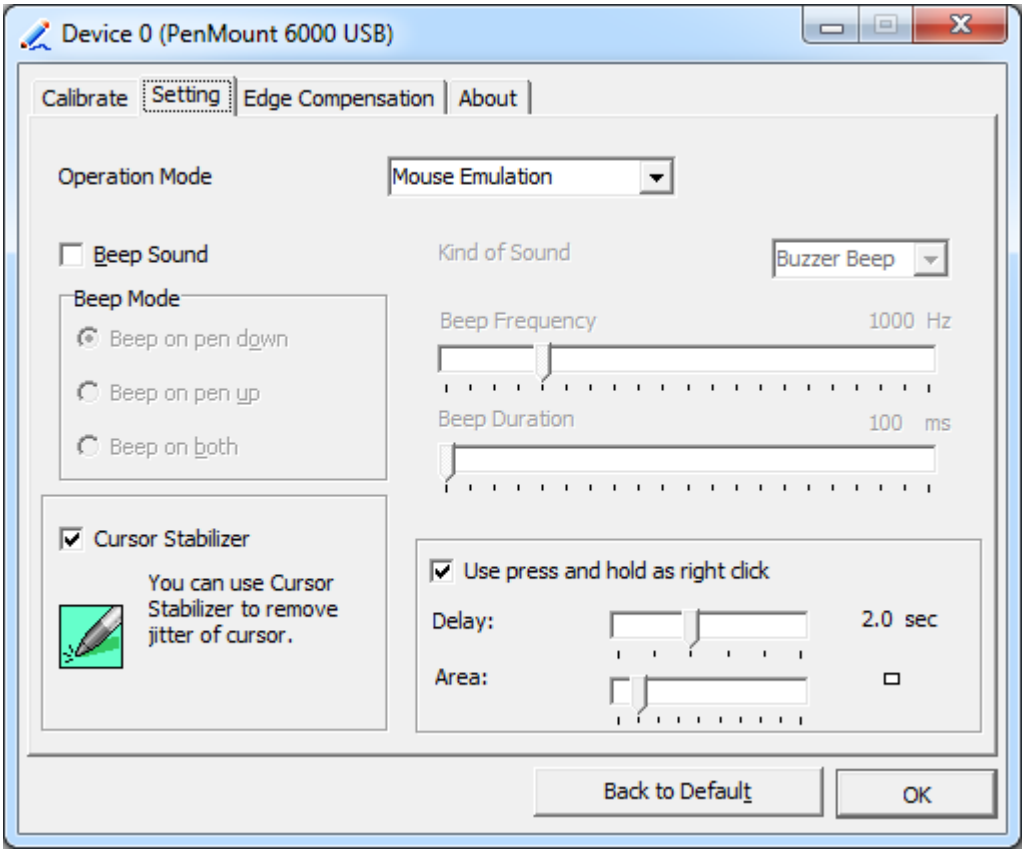
NOTE: Recommend to use a stylus during Advanced Calibration for greater accuracy.



Plot Calibration Data	**Check this function and a touch panel linearity comparison graph appears when you have finished Advanced Calibration. The blue lines show linearity before calibration and black lines show linearity after**

	calibration.
Turn off EEPROM storage	**The function disable for calibration data to write in Controller. The default setting is Enable.**

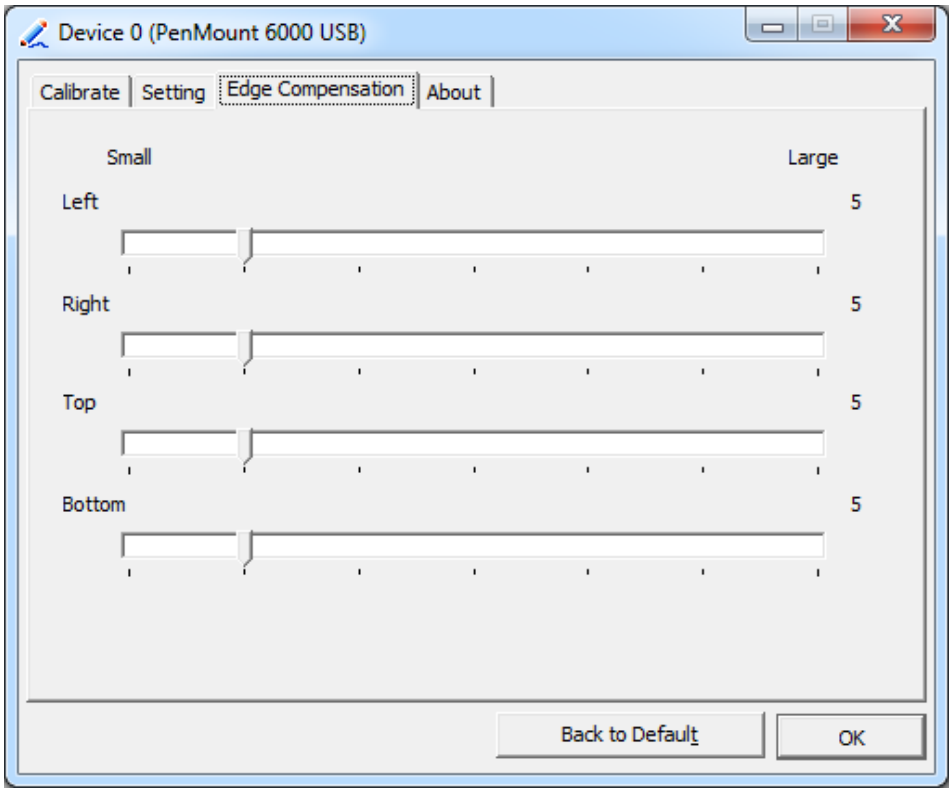
Setting



Touch Mode	**This mode enables and disables the mouse's ability to drag on-screen icons – useful for configuring POS terminals.** **Mouse Emulation – Select this mode and the mouse functions as normal and allows dragging of icons.** **Click on Touch – Select this mode and mouse only provides a click function, and dragging is disables.**
Beep Sound	**Enable Beep Sound – turns beep function on and off** **Beep on Pen Down – beep occurs when pen comes down** **Beep on Pen Up – beep occurs when pen is lifted up** **Beep on both – beep occurs when comes down and lifted up** **Beep Frequency – modifies sound frequency** **Beep Duration – modifies sound duration**
Cursor Stabilizer	**Enable the function support to prevent cursor shake.**
Use press and hold as right click	**You can set the time out and area for you need.**

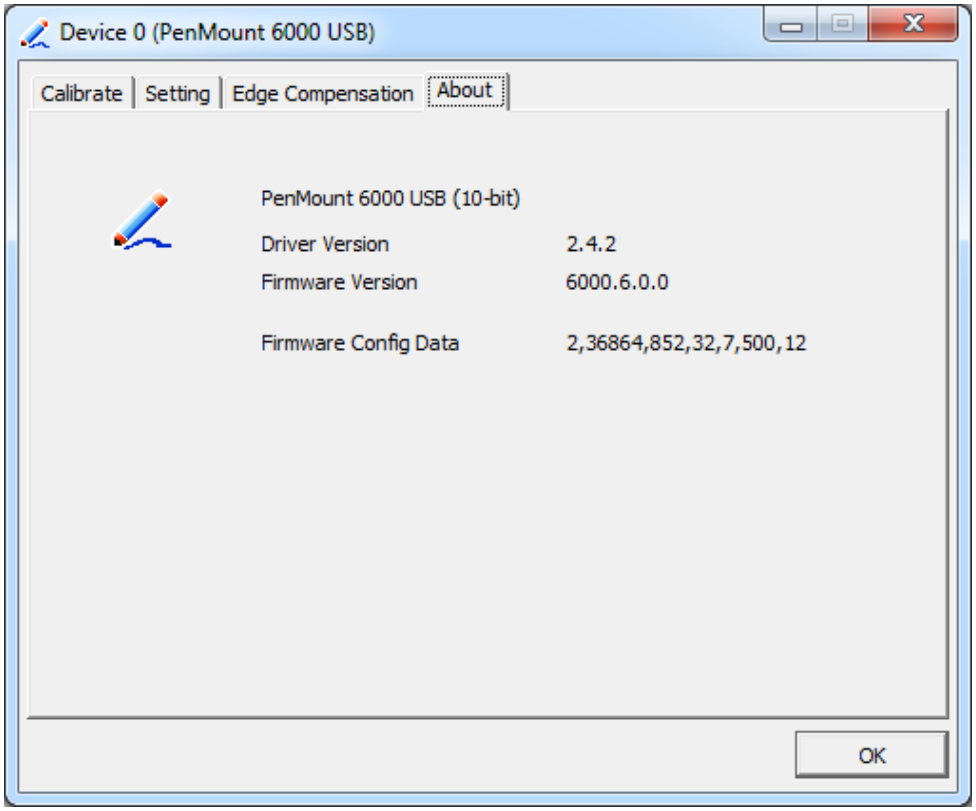
Edge Compensation

You can use Edge Compensation to calibrate more subtly.



About

This panel displays information about the PenMount controller and driver version.



Multiple Monitors

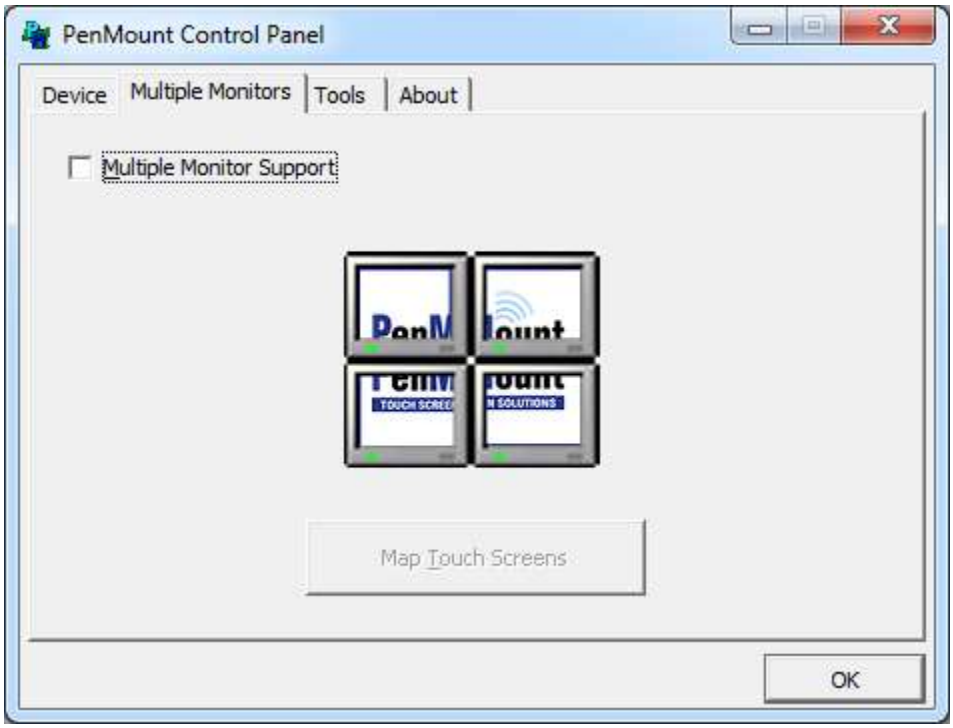
Multiple Monitors support from two to six touch screen displays for one system. The PenMount drivers for Windows 7/8/8.1 support Multiple Monitors. This function supports from two to six touch screen displays for one system. Each monitor requires its own PenMount touch screen control board, either installed inside the display or in a central unit. The PenMount control boards must be connected to the computer COM ports via the USB interface. Driver installation procedures are the same as for a single monitor. Multiple Monitors support the following modes:

Windows Extends Monitor Function
Matrox DualHead Multi-Screen Function
nVidia nView Function

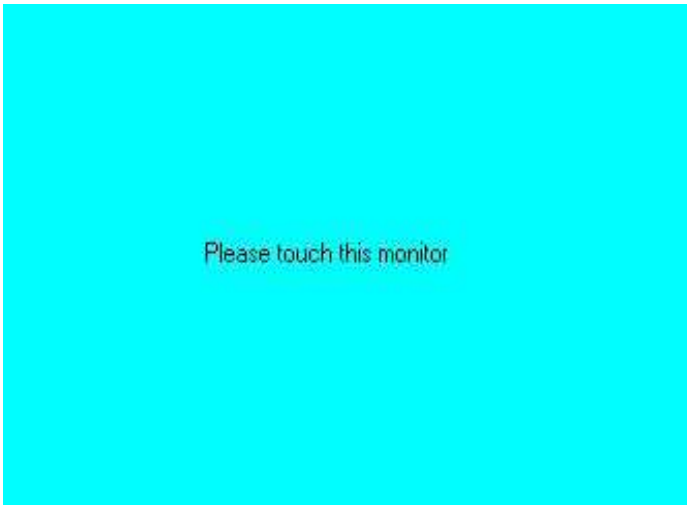
NOTE: The Multiple Monitor function is for use with multiple displays only. Do not use this function if you have only one touch screen display. Please note once you turn on this function the rotating function is disabled.

Enable the multiple display function as follows:

1. Check the **Enable Multiple Monitor Support** box; then click **Map Touch Screens** to assign touch controllers to displays.



2. When the mapping screen message appears, click **OK.**
3. Touch each screen as it displays “Please touch this monitor”. Following this sequence and touching each screen is called **mapping the touch screens.**



4. Touching all screens completes the mapping and the desktop reappears on the monitors.
5. Select a display and execute the “Calibration” function. A message to start calibration appears. Click **OK.**

6. “Touch this screen to start its calibration” appears on one of the screens. Touch the screen.
7. “Touch the red square” messages appear. Touch the red squares in sequence.
8. Continue calibration for each monitor by clicking **Standard Calibration** and touching the red squares.

NOTES:

1. If you use a single VGA output for multiple monitors, please do not use the **Multiple Monitor** function. Just follow the regular procedure for calibration on each of your desktop monitors.
2. The Rotating function is disabled if you use the Multiple Monitor function.
3. If you change the resolution of display or screen address, you have to redo **Map Touch Screens,** so the system understands where the displays are.

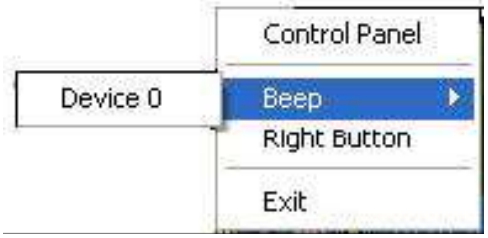
About

This panel displays information about the PenMount controller and this driver version.

PenMount Monitor Menu Icon

The PenMount monitor icon (PM) appears in the menu bar of Windows 7/8/8.1 system when you turn on PenMount Monitor in PenMount Utilities.

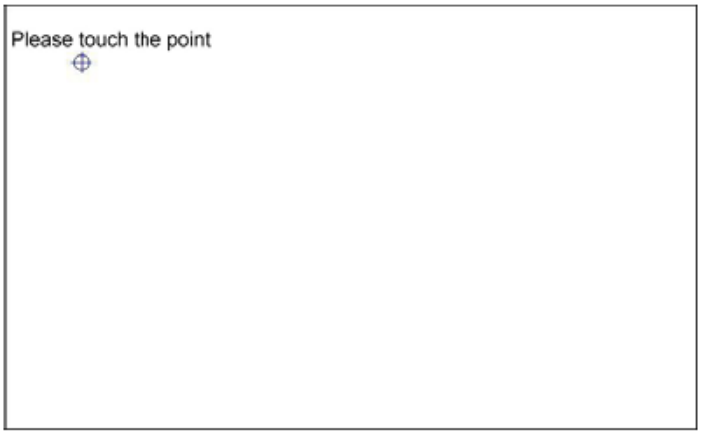
PenMount Monitor has the following function



Control Panel	**Open Control Panel Windows**
Beep	**Setting Beep function for each device**
Right Button	**When you select this function, a mouse icon appears in the right-bottom of the screen.**  **Click this icon to switch between Right and Left Button functions.**
Exit	**Exits the PenMount Monitor function.**

Configuring the Rotate Function

1. Install the rotation software package.
2. Choose the rotate function (0°, 90°, 180°, 270°) in the 3rd party software. The calibration screen appears automatically. Touch this point and rotation is mapped.



NOTE: The Rotate function is disabled if you use Monitor Mapping