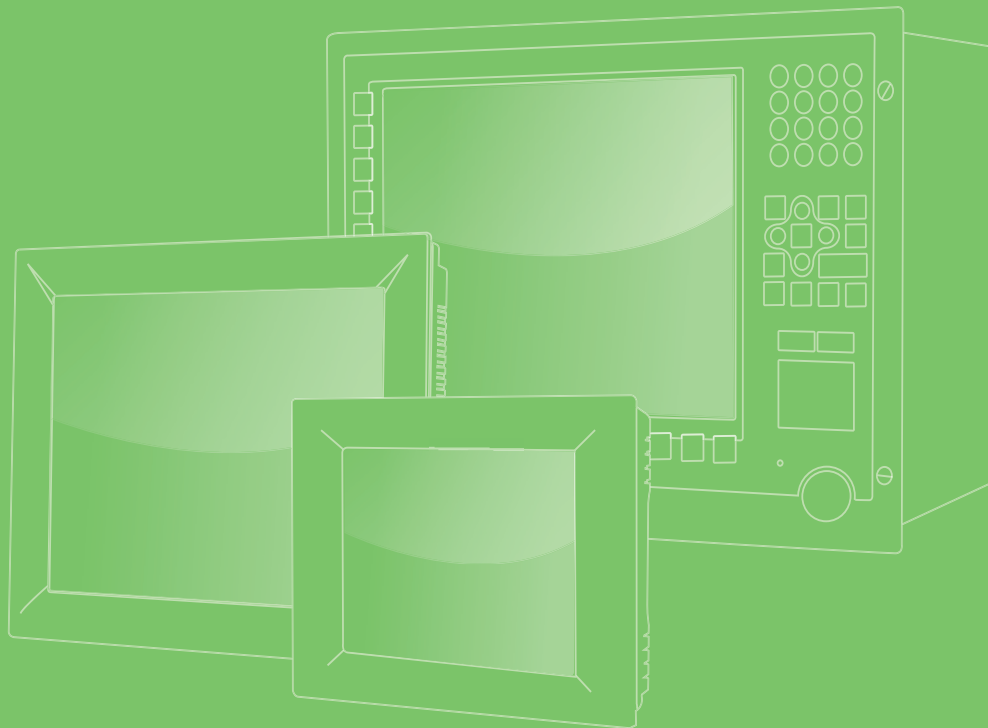


User Manual



TPC-2000 Series

TPC-B200-J12AE

TPC-B200-E12AE

TPC-2121T

TPC-2151T

TPC-2181W

**Industrial Modular Touch Panel
Computer with Intel® Atom™/
Celeron® Processor**

ADVANTECH

Enabling an Intelligent Planet

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This Manual Covers the Following Models:

Computing Box:

- TPC-B200-E12AE
- TPC-B200-J12AE

Pre-configured System (Computing Box + Panel):

- TPC-2121T-J12BE
- TPC-2151T-J12BE
- TPC-2181W-J12BE

Product Warranty (2 years)

Advantech warrants to you, the original purchaser, that each of its products will be free from defects in materials and workmanship for two years from the date of purchase.

This warranty does not apply to any products which have been repaired or altered by persons other than repair personnel authorized by Advantech, or which have been subject to misuse, abuse, accident or improper installation. Advantech assumes no liability under the terms of this warranty as a consequence of such events.

Because of Advantech's high quality-control standards and rigorous testing, most of our customers never need to use our repair service. If an Advantech product is defective, it will be repaired or replaced at no charge during the warranty period. For out-of-warranty repairs, you will be billed according to the cost of replacement materials, service time and freight. Please consult your dealer for more details.

If you think you have a defective product, follow these steps:

1. Collect all the information about the problem encountered. (For example, CPU speed, Advantech products used, other hardware and software used, etc.) Note anything abnormal and list any onscreen messages you get when the problem occurs.
2. Call your dealer and describe the problem. Please have your manual, product, and any helpful information readily available.
3. If your product is diagnosed as defective, obtain an RMA (return merchandise authorization) number from your dealer. This allows us to process your return more quickly.
4. Carefully pack the defective product, a fully-completed Repair and Replacement Order Card and a photocopy proof of purchase date (such as your sales receipt) in a shippable container. A product returned without proof of the purchase date is not eligible for warranty service.
5. Write the RMA number visibly on the outside of the package and ship it prepaid to your dealer.

Declaration of Conformity

CE

This product has passed the CE test for environmental specifications when shielded cables are used for external wiring. We recommend the use of shielded cables. This kind of cable is available from Advantech. Please contact your local supplier for ordering information.

FCC Class A

Note: This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.\

甲類警語

警告使用者：這是甲類資訊產品，在居住的環境中使用時，可能會造成射頻干擾，在這種情況下，使用者會被要求採取某些適當對策。

Technical Support and Assistance

1. Visit the Advantech web site at www.advantech.com/support where you can find the latest information about the product.
2. Contact your distributor, sales representative, or Advantech's customer service center for technical support if you need additional assistance. Please have the following information ready before you call:
 - Product name and serial number
 - Description of your peripheral attachments
 - Description of your software (operating system, version, application software, etc.)
 - A complete description of the problem
 - The exact wording of any error messages

Safety Instructions

1. Read these safety instructions carefully.
2. Keep this User Manual for later reference.
3. Disconnect this equipment from any AC outlet before cleaning. Use a damp cloth. Do not use liquid or spray detergents for cleaning.
4. For plug-in equipment, the power outlet socket must be located near the equipment and must be easily accessible.
5. Keep this equipment away from humidity.
6. Put this equipment on a reliable surface during installation. Dropping it or letting it fall may cause damage.
7. The openings on the enclosure are for air convection. Protect the equipment from overheating. **DO NOT COVER THE OPENINGS.**
8. Make sure the voltage of the power source is correct before connecting the equipment to the power outlet.
9. Position the power cord so that people cannot step on it. Do not place anything over the power cord.
10. All cautions and warnings on the equipment should be noted.
11. If the equipment is not used for a long time, disconnect it from the power source to avoid damage by transient overvoltage.
12. Never pour any liquid into an opening. This may cause fire or electrical shock.
13. Never open the equipment. For safety reasons, the equipment should be opened only by qualified service personnel.
14. If one of the following situations arises, get the equipment checked by service personnel:
 - The power cord or plug is damaged.
 - Liquid has penetrated into the equipment.
 - The equipment has been exposed to moisture.
 - The equipment does not work well, or you cannot get it to work according to the user's manual.
 - The equipment has been dropped and damaged.
 - The equipment has obvious signs of breakage.

15. DO NOT LEAVE THIS EQUIPMENT IN AN ENVIRONMENT WHERE THE STORAGE TEMPERATURE MAY GO BELOW -20° C (-4° F) OR ABOVE 60° C (140° F). THIS COULD DAMAGE THE EQUIPMENT. THE EQUIPMENT SHOULD BE IN A CONTROLLED ENVIRONMENT.
16. CAUTION: DANGER OF EXPLOSION IF BATTERY IS INCORRECTLY REPLACED. REPLACE ONLY WITH THE SAME OR EQUIVALENT TYPE RECOMMENDED BY THE MANUFACTURER, DISCARD USED BATTERIES ACCORDING TO THE MANUFACTURER'S INSTRUCTIONS.
17. Please Keep the monitor out of direct sunlight, very strong bright lights and away from any other heat source. Lengthy exposure to this type of environment may result in discoloration and damage to the monitor.

The sound pressure level at the operator's position according to IEC 704-1:1982 is no more than 70 dB (A).

DISCLAIMER: This set of instructions is given according to IEC 704-1. Advantech disclaims all responsibility for the accuracy of any statements contained herein.

Caution! *Danger of explosion if battery is incorrectly replaced. Replace only with the same or equivalent type recommended by the manufacturer. Dispose of used batteries according to the manufacturer's instructions.*



Danger d'explosion si la pile est remplacée de façon incorrecte. Remplacez seulement avec le même type ou équivalent recommandé par le fabricant. disposer des piles usagées selon les instructions du fabricant.

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Chapter 1

General Information

1.1 Introduction

TPC-2000 Touch Panel Computer is a state-of-the-art Modular designed Human Machine Inter-face featuring displays ranging from 12" to 23.8" and Intel Atom™/Celeron® CPU provides slim yet high performance system.

The key features are as follows:

- **Modular Design**
Front panel and computing box are modularized, providing flexibility, upgradability, easy maintenance and quick customization.
- **Intel® Atom™ E3940 1.60GHz Quad-core/ Celeron® J3455 1.50GHz Quad-core Processor with 4GB DDR3L SDRAM**
Latest Intel technology.
- **mPCIe Slot**
Internally mounted computer expansion cards. Supports 6 Gbit/s speeds.
- **Fanless Design**
With low-power processor, the system requires no fan, ensuring operation reliability and minimal dust ingress that could cause damage.
- **Bright Display**
The TFT LED LCD display meets demands in industrial environments for clear interfaces with wide operating temperature and isolation protection.

1.2 Specification

1.2.1 System Kernel

- **CPU:** Intel® Atom™ E3940 1.60GHz or Celeron® J3455 1.50GHz Quad-core Processor
- **BIOS:** AMI UEFI BIOS
- **VGA:** Integrated in Intel® HD Graphics 500
- **Ethernet:** 10/100/1000Base-T x 2
- **Watchdog Timer:** EC watchdog timer; 1 ~ 255 sec (system)
- **Storage:**
 - M.2 (2242) SATA slot x 1
 - 2.5" SATA SSD slot x 1
 - CFast Slot x1 (Optional by iDoor)
- **I/O Ports:**
 - RS-232/422/485 x 2
 - USB 3.0 x 2
 - USB 2.0 x 2
 - Audio line out x 1
 - Display port 1.4 out x 1
 - 10/100/1000 Base-T LAN x 2 (2 x Intel® I210)

1.2.2 O/S support

Windows 10 IoT Enterprise LTSC

1.2.3 Certification and Environment

Certification

- FCC Class A
- CE certificated
- UL
- CCC
- BSMI
- IP66-rated front bezel

Environment

- **Operating Temperature:**
TPC-2000 with Celeron® J3455 1.50GHz 0 ~ 50°C (-32~122°F)
TPC-2000 with Atom™ E3940 1.6GHz -20 ~ 60°C (-4~140°F)
- **Storage Temperature:**
-30 ~ 70°C (-22 ~ 158°F)
- **Humidity:** 10 ~ 95% RH @ 40°C, non-condensing
- **Vibration:**
With SSD: 1 Grms (5 ~ 500 Hz)
(Operating, random vibration)

1.3 LCD & Touch Specifications

Table 1.1: Specifications

LCD Panel	Display Size	12	"15	"17	"19"
	Display Type	XGA TFT LED LCD	XGA TFT LED LCD	SXGA TFT LED LCD	SXGA TFT LED LCD
	Aspect Ratio	4:3		5:4	
	Max.Resolu-tion	1024 x 768	1024 x 768	1280 x 1024	1280 x 1024
	Max. Color	16.2M	16.7M	16.7M	16.7M
	Luminance	600 cd/m ²	300 cd/m ²	350 cd/m ²	350 cd/m ²
	Viewing Angle(H/V)	178°/178°	176°/176°	160°/140°	170/160
	Backlight Life	50,000 hr	70,000 hr	50,000 hr	50,000hr
	Contrast Ratio	1000:1	2000:1	800:1	1000:1
Touchscreen	Type	5-Wire resistive	PCAP	PCAP	5-Wire resistive
	Light Trans-mission	Above 75%	90% ± 3%	90% ± 3%	Above 75%
	Anti-Glare Treatment	Yes	Yes	Yes	Yes
	Built-In iKey	N/A	Yes	Yes	N/A
Expandibility	WiFi/NFC Sup-port on Front Panel	Optional (Please contact Advantech for more information.)			

Table 1.2: Specifications

LCD Panel	Display Size	15.6	"18.5	"21.5	"23.8"
	Display Type	FHD TFT LED LCD	HD TFT LED LCD.	FHD TFT LED LCD	FHD TFT LED LCD
	Aspect Ratio	16:9			
	Max.Resolu-tion.	1920 x 1080	1366 x 768	1920 x 1080	1920 x 1080
	Max. Color	16.7M	16.7M	16.7M	16.7M
	Luminance	450 cd/m ²	250 cd/m ²	250 cd/m ²	350 cd/m ²
	Viewing Angle (H/V)	170°/170°	170°/160°	178°/178°	178°/178°
	Backlight Life	50,000 hr	30,000 hr	50,000 hr	30,000 hr
	Contrast Ratio	800:1	1000:1	1000:1	1000:1
	Touchscreen	Type	PCAP	PCAP	PCAP
Light Trans-mission		90% ± 3%	90% ± 3%	90% ± 3%	90% ± 3%
Anti-Glare Treatment		Yes	Yes	Yes	Yes
Built-In iKey		Yes	Yes	Yes	Yes
Expandibility	WiFi/NFC Support on Front Panel	Optional (Please contact Advantech for more information.)			

1.4 Power

- **Input Voltage:** 24V_{DC} +/- 20%
- **Typical:**
 - 24 V_{DC} @ 2.5 Amp

1.5 I/O Port Arrangement

The arrangement of the I/O ports is shown in Figure 1.1

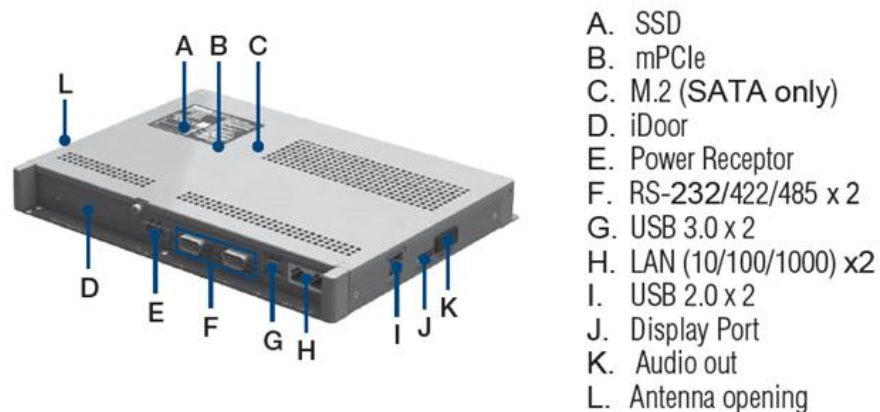


Figure 1.1 I/O Port Arrangement

1.6 Panel Mounting

1. There is an adhesive waterproof gasket on the Mg front bezel. Make sure the waterproof gasket is in position before installing TPC into the panel opening.
2. Install the TPC into the panel opening.
3. Retrieve the clamps and long screws from the accessory pack. Hook the clamps into the holes located on the four sides of the bezel. Insert screws into every clamp and tighten them to fasten the clamp in place. These screws will push the mounting panel and secure the unit.
4. The suggested mounting panel thickness is less than 6 mm (0.236 in).

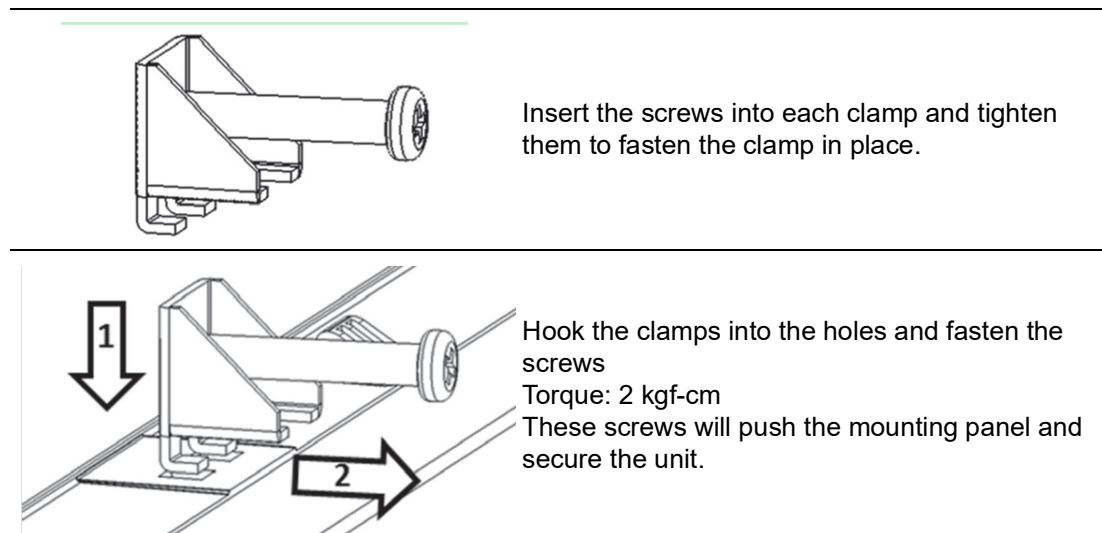
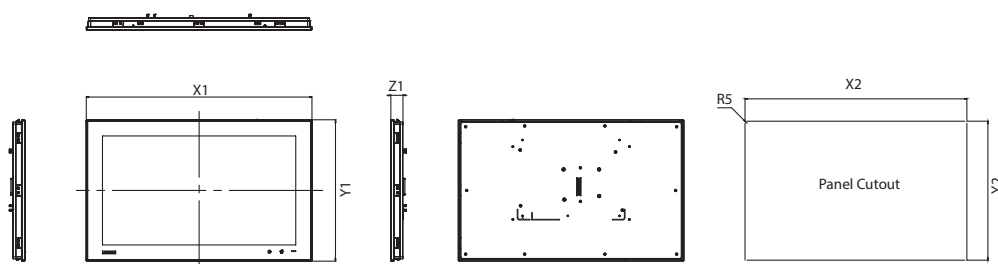


Figure 1.2 Panel mounting

1.7 Dimensions and Cutout

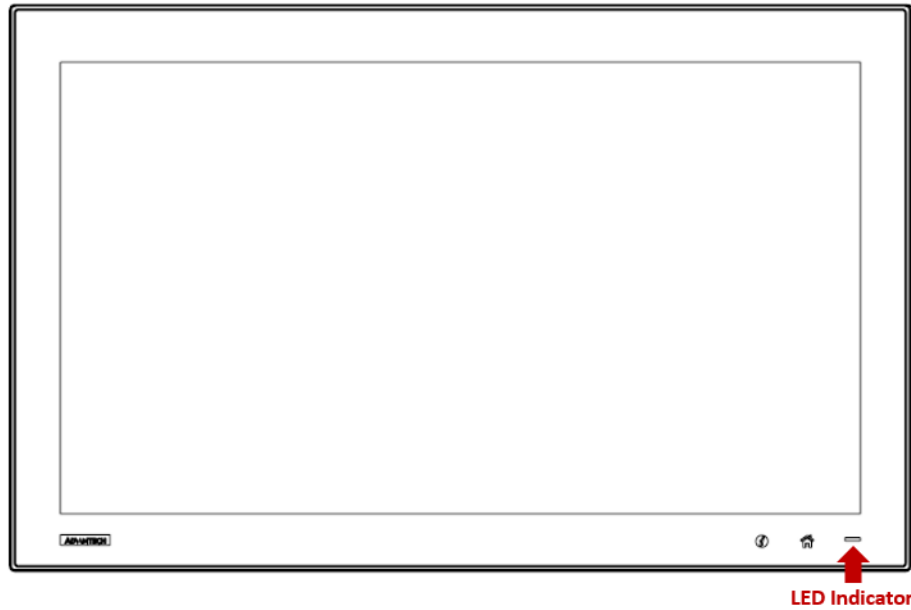
Dimensions

Unit: mm



Display Type	System Dimensions			Panel Mount	
	X1	Y1	Z1	X2	Y2
12" (XGA)	311.8	238	27.1	303	229
15" (XGA)	383.2	307.3	27.5	374.5	298.5
15.6" (HD)	419.7	269	30.	412.4	261.7
15.6" (FHD)	419.7	269	30.	412.4	261.7
17" (SXGA)	410.4	343.4	28.3	401.3	334.8
18.5" (HD)	488	309	30.3	479.3	300.3
19" (SXGA)	454	379.8	51.5	443.5	369.3
21.5" (FHD)	558.4	349.8	30.3	550.3	341.8
23.8" (FHD)	595.9	374.1	30.3	587	365.3

1.8 LED indicators on optional FPM-Display module



ACPI Sleep States	Definition	Color of LED Indicator
S0	Normal Powered-On State	Blue
S3	Suspend to RAM	Orange
S4	Suspend to Disk	Orange
S5	Soft Off	Orange

Chapter 2

System Setup

2.1 Transport and Unpacking

When accepting a delivery, please check the packaging for visible damage and check the delivery for completeness by comparing it with your order. If you notice any shipping damage or inconsistencies between the contents and your order, please inform the responsible delivery service immediately.

During transportation, the TPC should be protected from excessive mechanical stress. If the TPC is transported or stored without packaging, shocks, vibrations, pressure and moisture may impact the unprotected unit. A damaged packaging indicates that ambient conditions have already had a massive impact on the device. Therefore, please use the original packaging during transportation and storage.

If the TPC is transported in cold weather or is exposed to extreme variations in temperature, make sure that moisture (condensation) does not build up on or inside the HMI device. Moisture can result in short-circuits in electrical circuits and damage the device. To avoid that, please store the TPC in a dry place and bring the TPC to room temperature before starting it up. If condensation occurs, a delay time of approximately 12 hours must be allowed to make sure the TPC is completely dry before the TPC is switched on.

2.2 System Setup

Note! *If you purchase the Computing Box (TPC-B200) & Panel (FPM-Display) separately, please simply use the five screws of 1930001361 to connect the Computer Box and Panel.*



1. Unscrew the cover of the box module and remove the HDD bracket.



Figure 2.1 Install SSD - 1



Figure 2.2 Install SSD - 2

2. Fasten SSD onto the disk tray with the SSD screws.

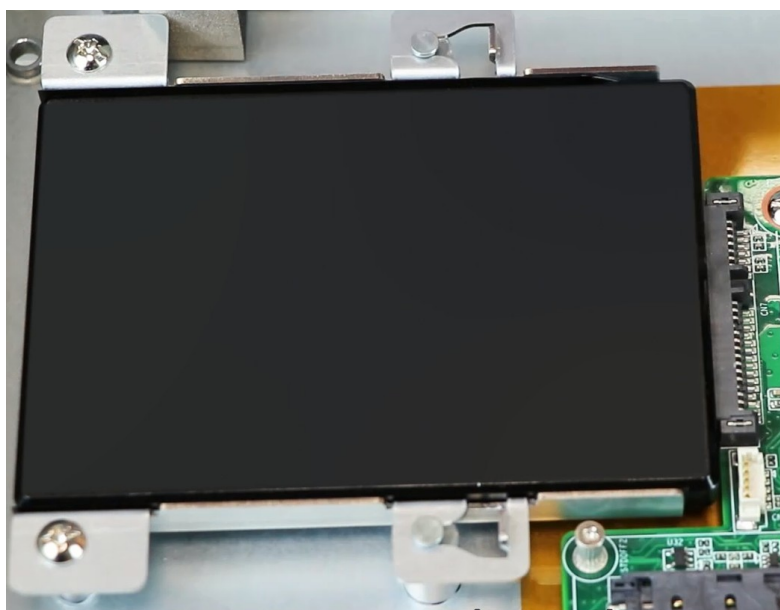


Figure 2.3 Install SSD - 2

Warning! It is suggested turning OFF the system power to plug in or pull out the memory card.



Il est suggéré de désactiver l'alimentation du système que vous branchez ou retirez le carte mémoire.

3. Attach the box module to the panel module via the board-to-board connector.



4. Connect the power connector to 24 VDC power lines. The power lines can either be from a power adapter or an in-house power source.

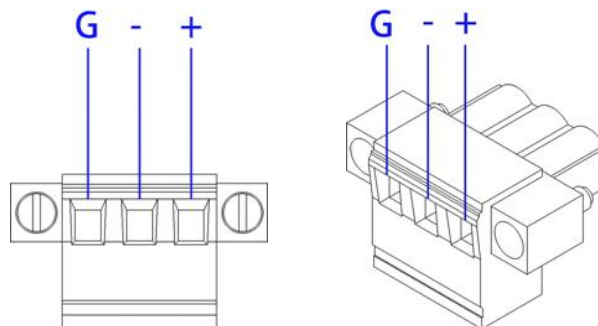


Figure 2.4 Power connector and pin assignment

5. Plug the power wire into the system power receptor.

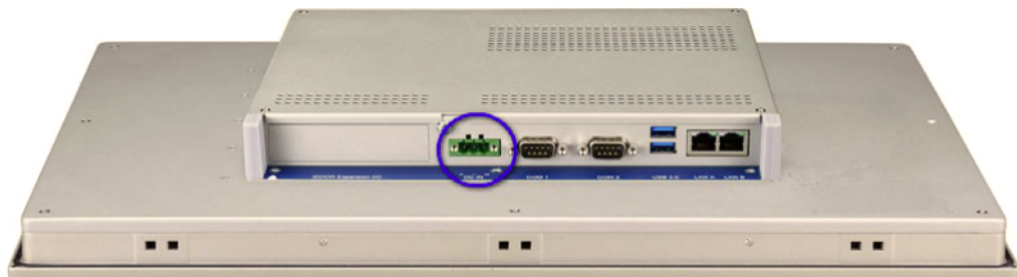


Figure 2.5 Power receptor & button pin assignment

6. Attach power to the system.
7. Calibrate the touchscreen. (only applicable to 12.1")

2.3 Driver Installation

2.3.1 Chipset, Graphics, ME, and LAN Driver Installation

Relevant drivers must be installed for full functionality. Install the chipset, graphics, ME, and LAN drivers individually. The drivers can be downloaded from the TPC-5000 product page of the Advantech website.

(A touch driver is needed only for 12" touch panels.)

2.3.2 Watchdog Driver Installation

If the Advantech watchdog driver is not pre-installed on the TPC system, users will need to install the driver.

Follow the steps outlined below to install the Advantech watchdog driver.

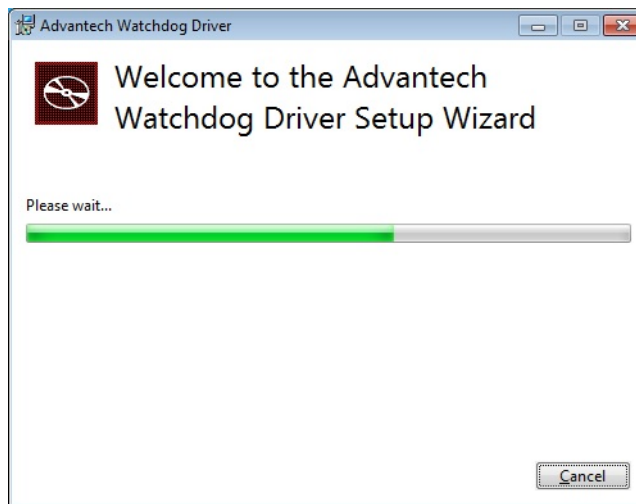
1. Verify that the computer meets the hardware and software requirements to run the Advantech watchdog driver.
2. If you do not already have the installer for the Advantech watchdog driver, download it from the Advantech website.
3. From the Control Panel, remove any existing installation of the Advantech watchdog driver from the computer.
4. With administrator-level privileges, run the installer for the Advantech watchdog driver.

Below is an example of the Advantech watchdog driver setup. To stop the setup process at any time, click the "Cancel" button on the pop-up screen. The setup program will stop the procedure automatically.

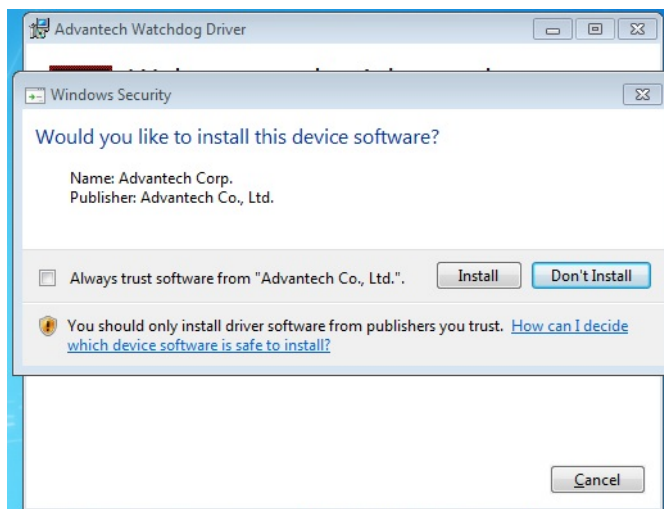
1. Open the setup program. When the setup program is running, click the **Next** button on the Advantech Watchdog Driver Setup Wizard pop-up screen.



2. Wait until the Advantech Watchdog Driver Setup Wizard has completed the installation.



3. Click the **Install** button to continue the installation of the Advantech watchdog driver software.

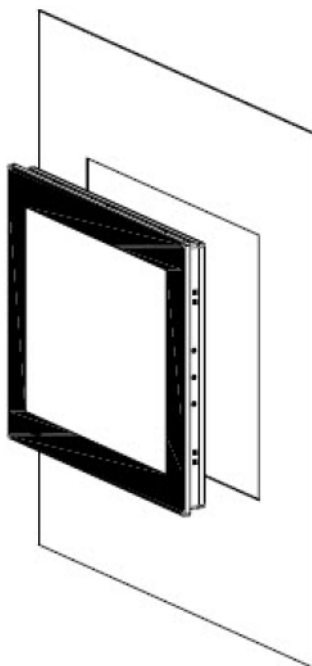


4. Click the **Restart** or **Close** button on the Advantech Watchdog Driver Setup Wizard pop-up screen to complete the setup.

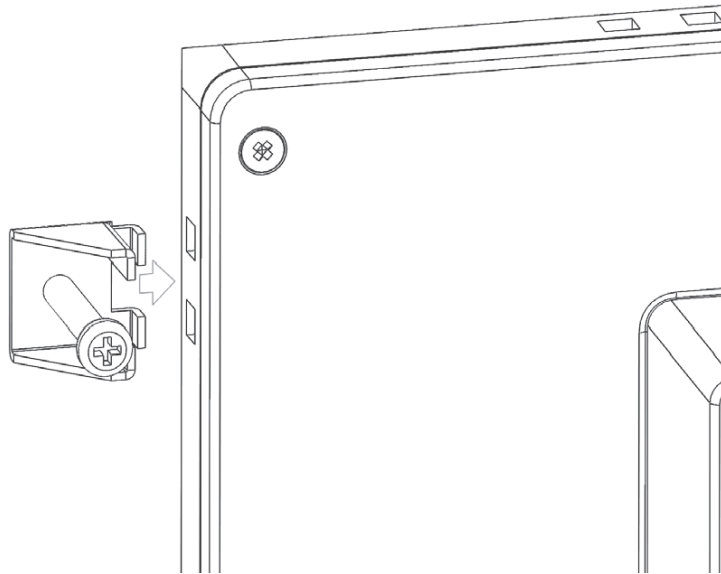


2.4 Panel Mounting

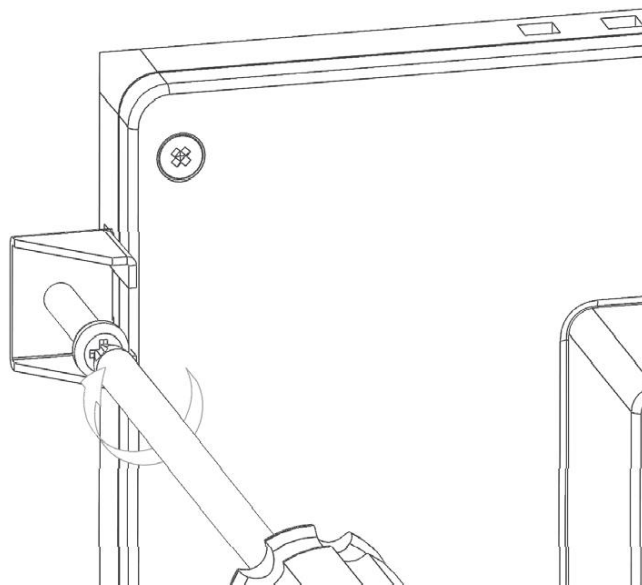
1. Position the TPC against the panel.



2. Insert the clamps into the side of the TPC.



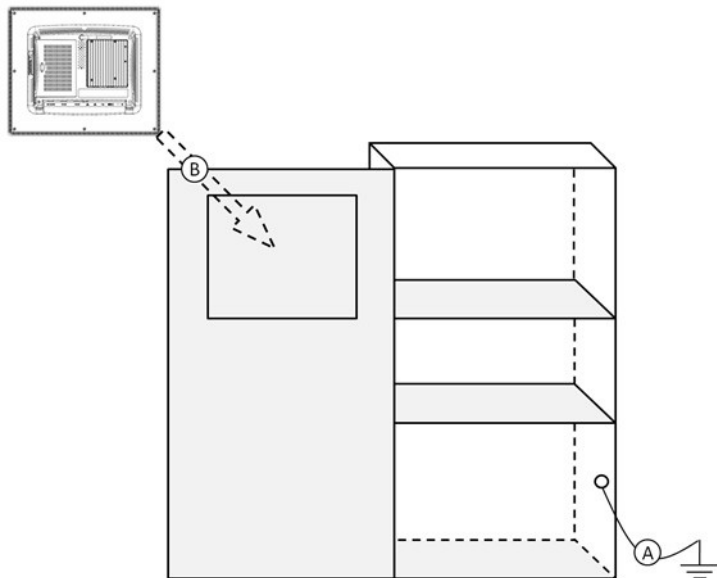
3. Secure the clamp to the panel using the included screws.



2.5 Cabinet Installation and Earth Grounding setup

Follow the following steps to setup TPC system, and please pay attention that Ground pin of TPC system should be connected to earth ground. Under this circumstance, TPC system could have the best performance such as EMI immunity, ESD immunity, Surge immunity and also system isolation. If the TPC system is embedded in the cabinet, the TPC system's ground, cabinet's ground and earth ground should be connected together.

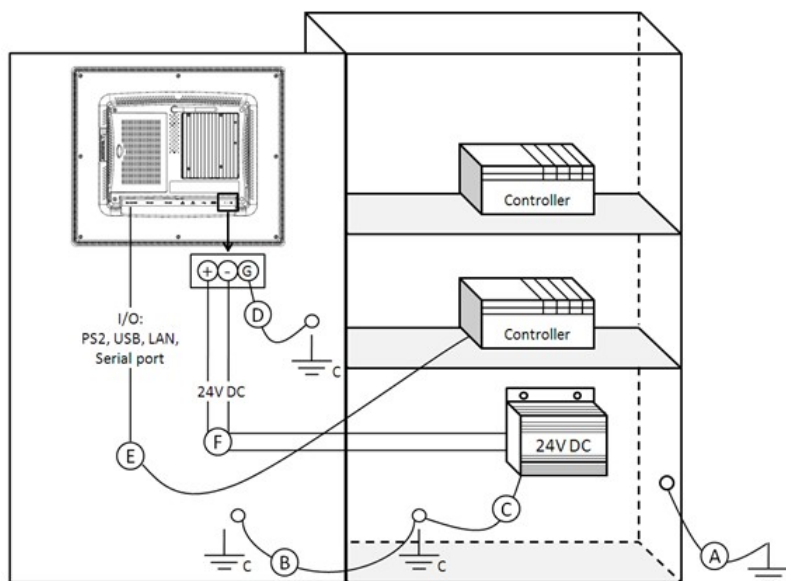
1. Install the TPC system into the cabinet.



Step A: Connect the cabinet to earth ground.

Step B: Embed null TPC system into the cabinet without any I/O cable and power.

2. System wiring.



- Step A: Connect the cabinet to earth ground.
 Step B: Ensure that all cabinets have been grounded together.
 Step C: Connect the ground of the power supply to the cabinet.
 Step D: Connect the ground pin of TPC system to the cabinet.
 Step E: Connect the I/O to the controller if needed.
 Step F: Connect the V+ and V- of power supply to TPC system.
 While completing step A to F step by step, you can supply power to TPC system now.

Caution! Ensure that all wires follow the installation guidelines or damage to the system may occur.



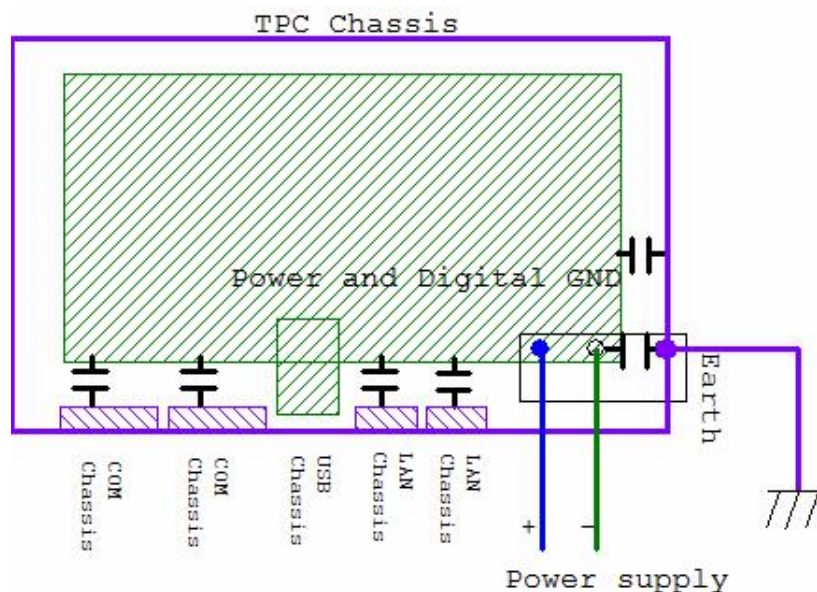
Caution! If you need to install device or Mini PCIe card on the TPC system, please double check the voltage between V- and earth ground, if the voltage is not almost equal with each other, we suggest to short V- and earth ground with wiring.



2.6 Power/Digital Ground and Earth Ground

The purpose is to block all the external interference on the chassis, and prevent any possibility of bad grounding design to cause electric shock of people. This is so called level 1 isolation which consumer PCs do not implement.

1. TPC Chassis and Earth (Power pin3) are short,
2. TPC Chassis and Power / Digital GND are OPEN.



The TPC is an industrial grade product, designed to prevent external interference and the possibility of electric shock. To complete the isolation design, we need to consider the following:

1. The Ethernet is isolated, a LAN connection will not impact the isolation design.
2. For general USB devices, to solve EMI and ESD issues, they are designed as a chassis and digital short. But the TPC prevents damage to USB devices, ESD

and EMI solutions are designed to use the Power GND as a vent path to ensure Power GND and Chassis GND will not have potential difference abnormalities.

3. For COM ports, since there are different COM port designs, long distance connection causes voltage level differences between the two COM port chassis. So the shell ground of cable must be isolated to the signal digital ground

In real cases, many customers may break the level 1 isolation by 3rd party device or cable design, in this situation, we need to consider making all the GND short (power GND/Digital GND/Earth GND), and ensure customers have good Earth GND connection.

2.7 Installation of extension

2.7.1 Installation of M.2(2242) SSD

1. Remove the 2 screws of rear cover.



Figure 2.6 Install M.2 SSD -1

2. Remove the rear cover.
3. Insert the M.2 (2242) SSD and tighten the screws in the screw holes.

2.7.2 Installation of iDoor

1. Remove the box cover.



Figure 2.7 Install iDoor -1

2. Remove the blank slot cover for iDoor.



Figure 2.8 Install iDoor -2

3. Insert iDoor module.

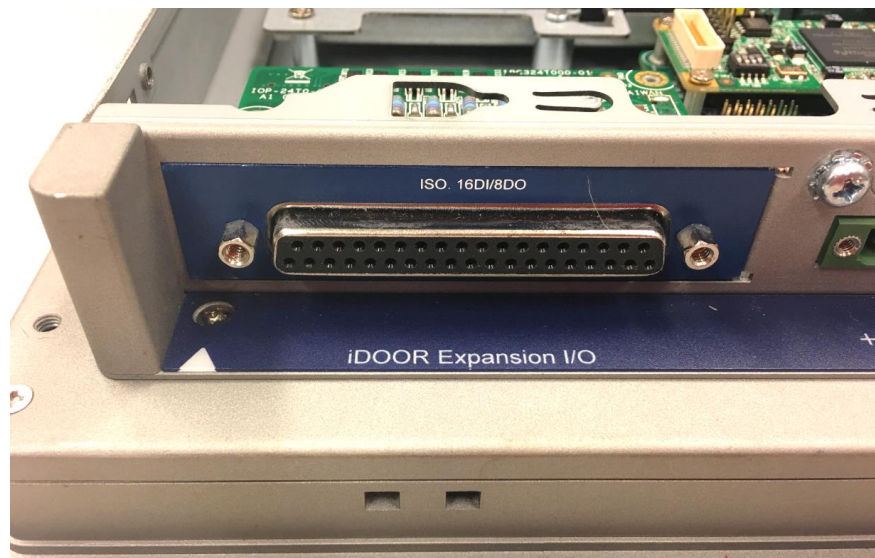


Figure 2.9 Install iDoor -3

4. Tighten two screws to affix the module in place.

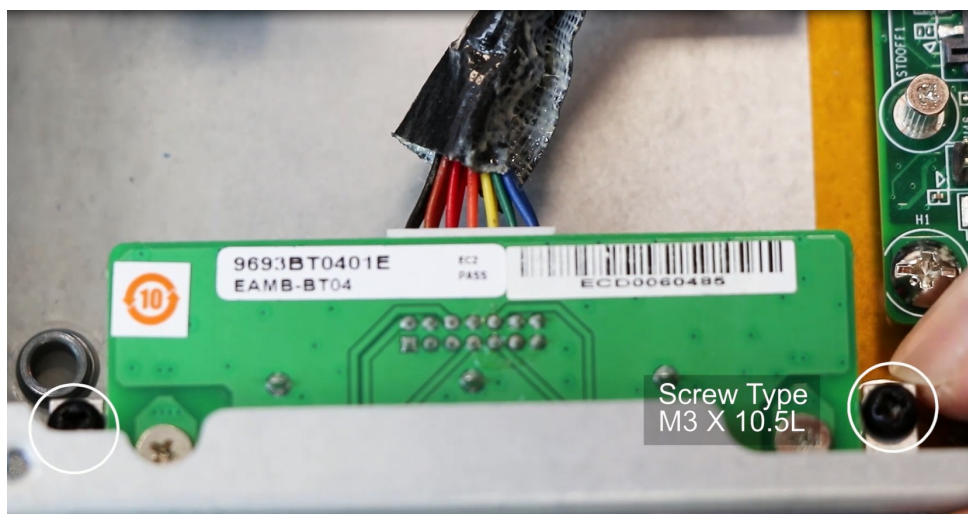


Figure 2.10 Install iDoor -4

5. Install iDoor mPICE module and plug in the power cable of iDoor mPICE module.

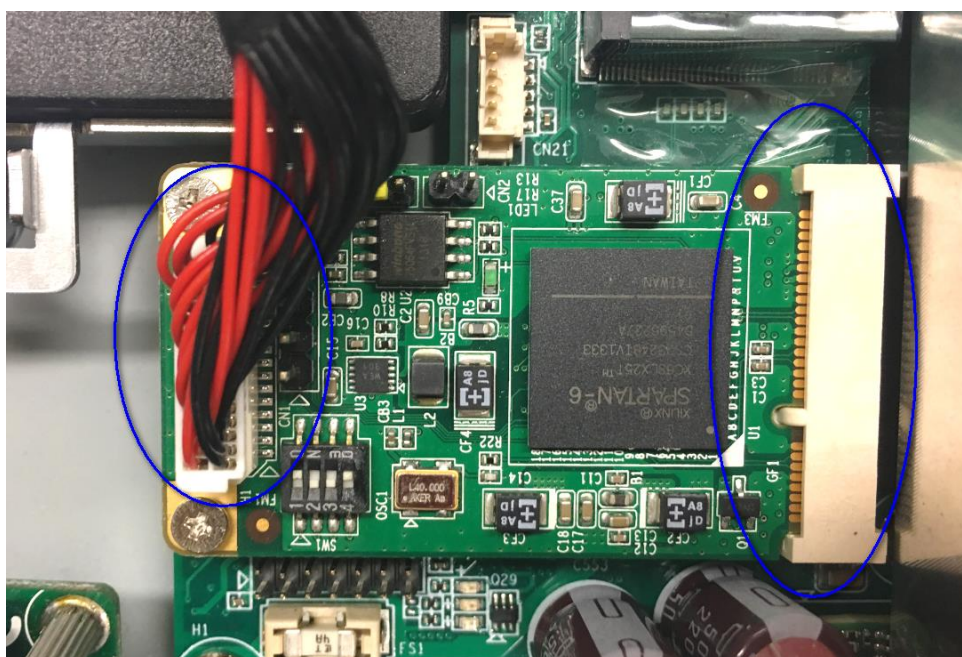


Figure 2.11 Install iDoor -6

Chapter 3

BIOS Setup

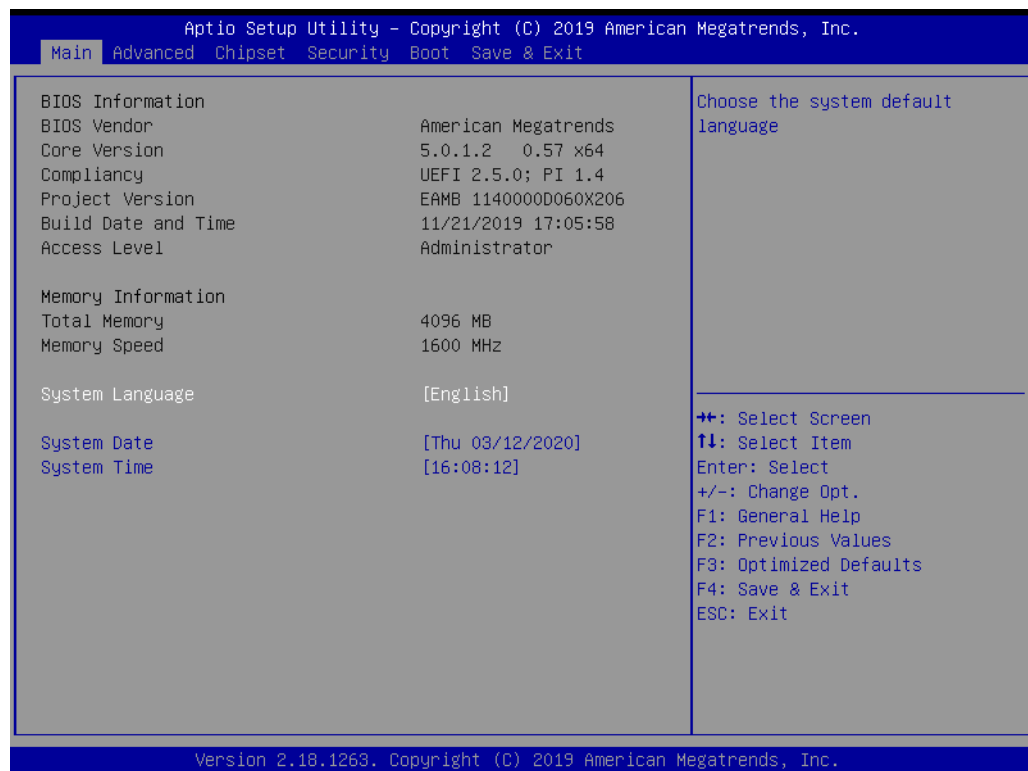
This chapter illustrates the basic navigation of the BIOS Setup Utility on TPC-2000 series. TPC-2000 series BIOS ROM has a built-in setup program that allows users to modify the basic system configuration. This information is stored in flash ROM so it retains setup information when the power is turned off.

3.1 Entering Setup

Turn on the computer and check for the patch code. If there is a number assigned to the patch code, it means that the BIOS supports your CPU. If there is no number assigned to the patch code, please contact an Advantech application engineer to obtain an up-to-date patch code file. This will ensure that your CPU's system status is valid. After ensuring that you have a number assigned to the patch code, press and you will immediately be allowed to enter Setup.

3.1.1 Main Setup

When you first enter the BIOS Setup Utility, you will enter the Main setup screen. You can always return to the Main setup screen by selecting the Main tab. There are two Main Setup options. They are described in this section. The Main BIOS Setup screen is shown below.



The Main BIOS setup screen has two main frames. The left frame displays all the options that can be configured. Grayed-out options cannot be configured; options in blue can. The right frame displays the key legend.

Above the key legend is an area reserved for a text message. When an option is selected in the left frame, it is highlighted in white. Often a text message will accompany it.

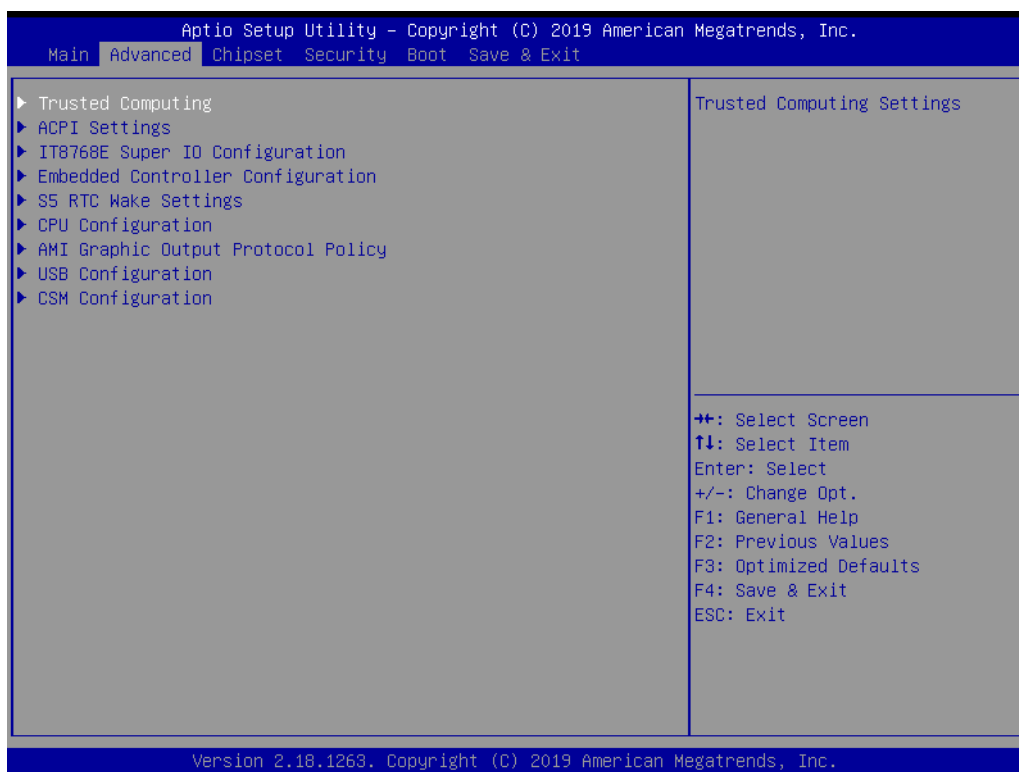
■ System Time / System Date

Use this option to change the system time and date. Highlight System Time or System Date using the <Arrow> keys. Enter new values through the keyboard. Press the <Tab> key or the <Arrow> keys to move between fields. The date

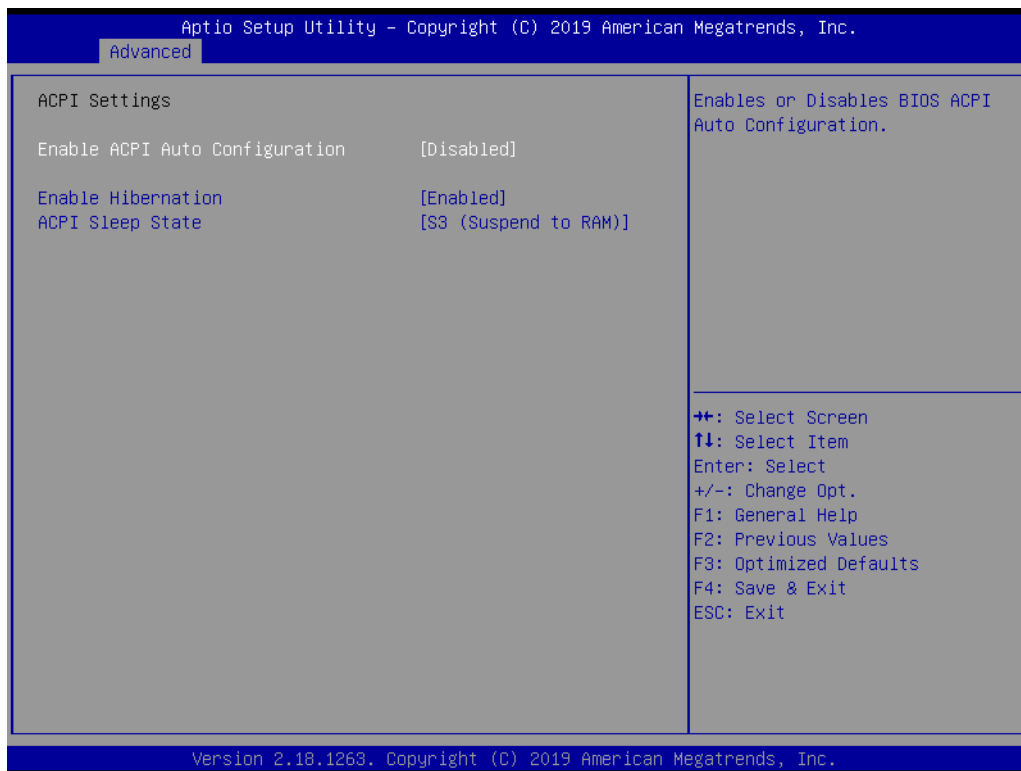
must be entered in MM/DD/YY format. The time must be entered in HH:MM:SS format.

3.1.2 Advanced BIOS Features Setup

Select the Advanced tab from the TPC-2000 series setup screen to enter the Advanced BIOS Setup screen. You can select any of the items in the left frame of the screen, such as ACPI Settings and hit <enter> to go to the sub menu for that item. You can display an Advanced BIOS Setup option by highlighting it using the <Arrow> keys. All Advanced BIOS Setup options are described in this section. The Advanced BIOS Setup screen is shown below. The sub menus are described on the following pages.



3.1.2.1 ACPI Settings



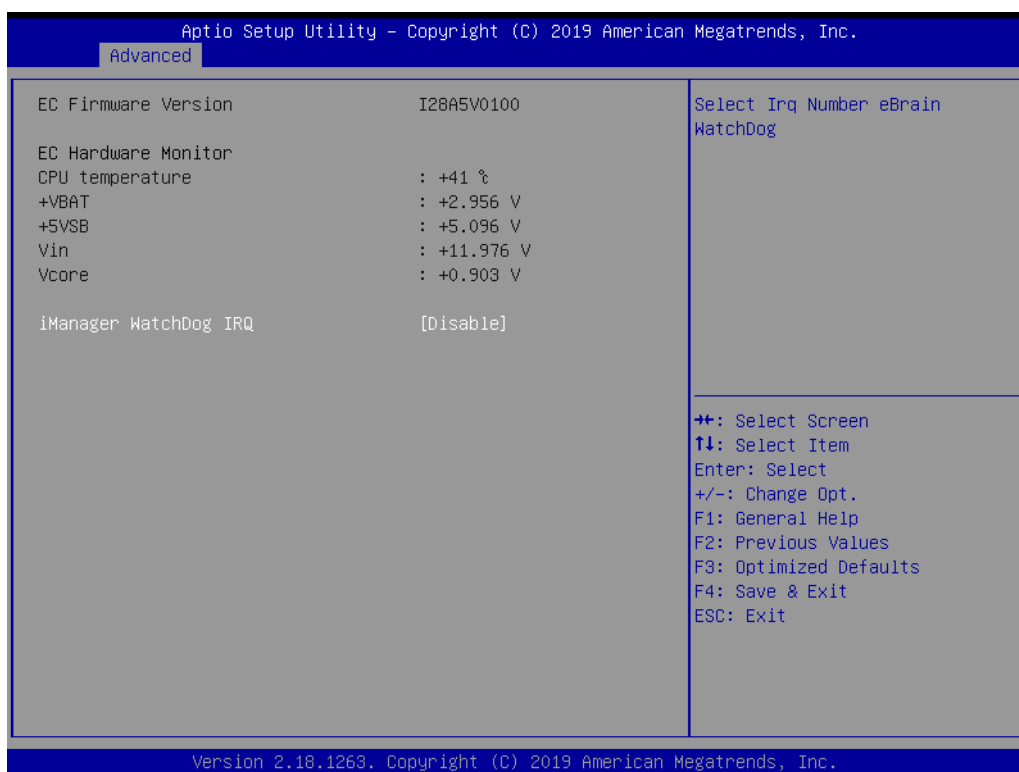
- **Enable ACPI Auto Configuration**
This item allows users to enable or disable “ACPI Auto Configuration”.
- **Enable Hibernation**
This item allows users to enable or disable System ability to hibernate (OS/S4 sleep State). This option may be not effective with some OS.
- **ACPI Sleep State**
This item allows users to select the ACPI sleep state. The system will enter when the SUSPEND button is pressed.

3.1.2.2 Super I/O Configuration



- **Serial Port 1 Configuration**
Set Parameters of Serial Port 1 (COMA)
- **Serial Port 2 Configuration**
Set Parameters of Serial Port 2 (COMB)

3.1.2.3 Embedded Controller Configuration



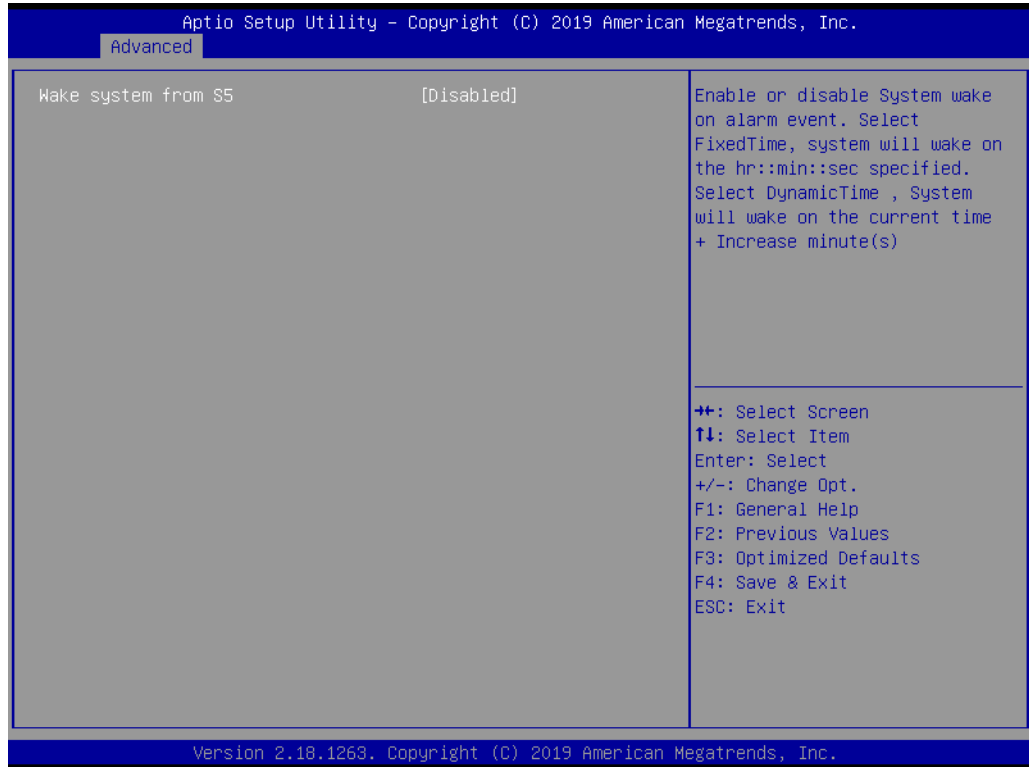
- **EC Hardware Monitor**

This page displays all information about system Temperature/Voltage/Current.

- **iManager WatchDog IRQ**

This item allows users to set the IRQ number of EC watchdog.

3.1.2.4 S5 RTC Wake Settings



- **Wake system with Fixed Time**

Enable or disable System wake on alarm event. Select FixedTime, system will wake on the hr:min:sec specified.

3.1.2.5 CPU Configuration



■ Intel Virtualization Technology

This item allows users to enable or disable Intel Virtualization Technology. When enabled, a VMM can utilize additional hardware capabilities provided by Vander-pool Technology.

3.1.2.6 IDE(SATA) Configuration



- **Serial-ATA (SATA)**
This item allows users to enable or disable SATA devices.
- **SATA Test Mode**
Test Mode enable / disable.
- **SATA Speed Support**
Indicates the maximum speed the SATA controller can support.
- **SATA ODD Port**
SATA ODD is Port0 or Port1.
- **SATA Mode**
This item allows users to select SATA mode selection. (Determines how SATA controller(s) operate)
- **Serial-ATA Port 0 / Port1**
Enable / Disable Serial ATA Port0 / Port1.
- **SATA Port 0 / Port1 HotPlug**
Enable / Disable SATA Port0 / Port1 hotplug function.

Note! Before installing WinCE image, IDE configuration must set SATA Mode to IDE Mode in BIOS to boot successfully.



3.1.2.7 Miscellaneous Configuration



- **OS Selection**

OS Selection to choose =Windows 7 / Windows 10

3.1.2.8 LAN Controller



- **LAN A Controller**

Enable or disable onboard NIC.

- **LAN B Controller**

Enable or disable onboard NIC.

- **Wake on LAN Enable**

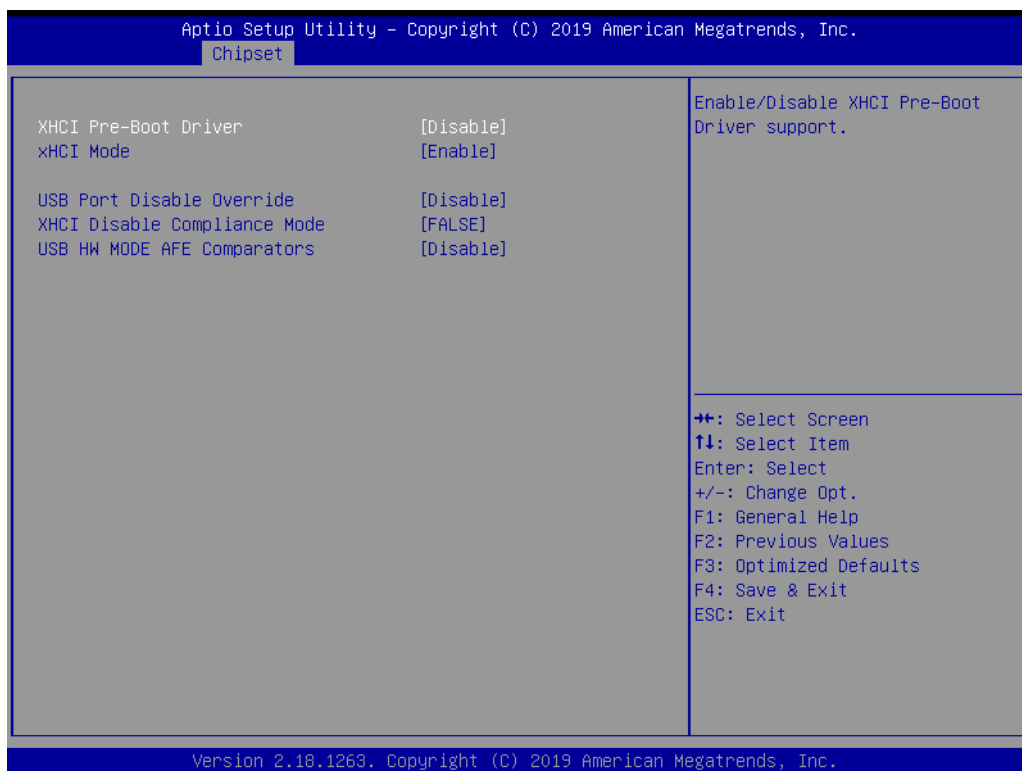
Enable/Disable integrated LAN to wake the system.

3.1.2.9 CSM Configuration



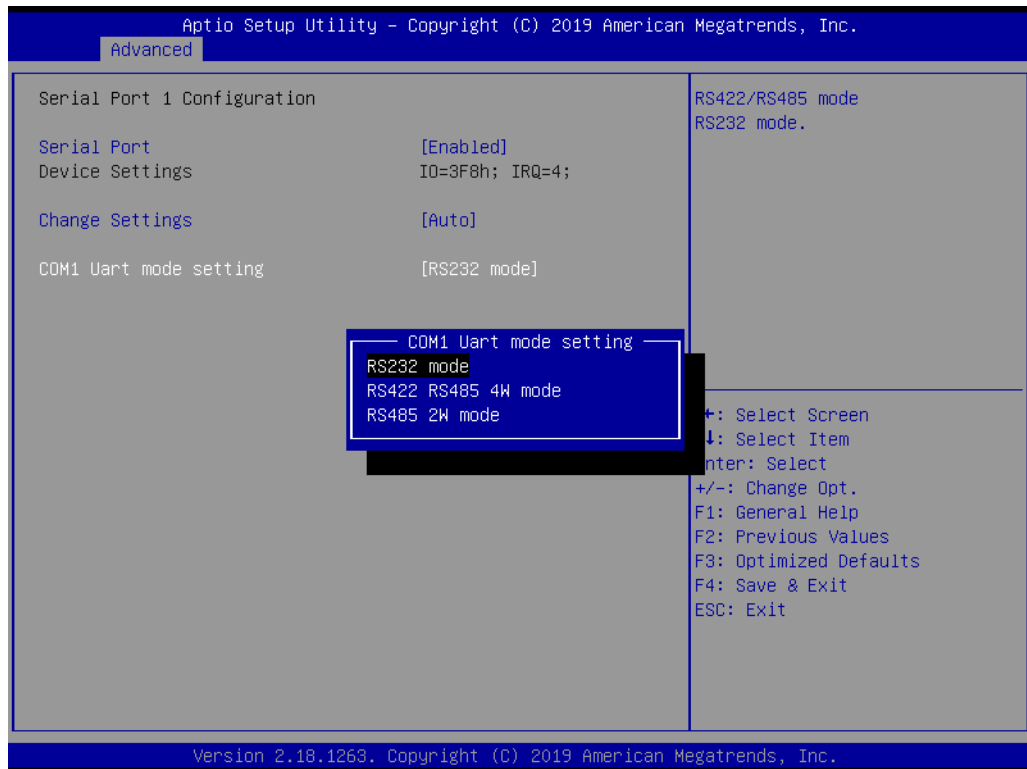
- **CSM Support**
Enable/Disable CSM support.
- **GateA20 Active**
This item is useful when RT code is executed above 1MB. When this is set as "Upon Request", GA20 can be disabled using BIOS services. When it's set as "Always", it does not allow disabling GA20.
- **Option ROM Messages**
Display mode for Option ROM.
- **Boot option filter**
This option controls Legacy/UEFI ROMs priority.
- **Network**
Controls the execution of UEFI and Legacy PXE OpROM.
- **Storage**
Controls the execution of UEFI and Legacy Storage OpROM.
- **Video**
Controls the execution of UEFI and Legacy Video OpROM
- **Other PCI devices**
Determines OpROM execution policy for devices other than Network, Storage, or Video.

3.1.2.10 USB Configuration



3.1.2.11 COM Configuration

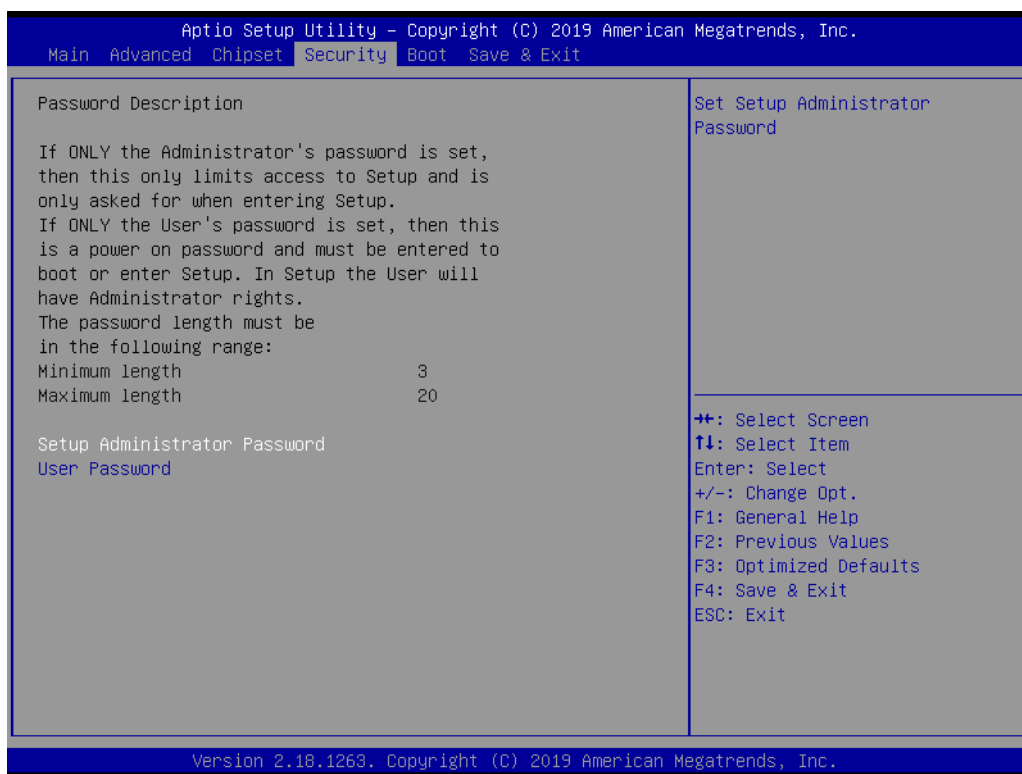




3.1.3 Chipset Configuration



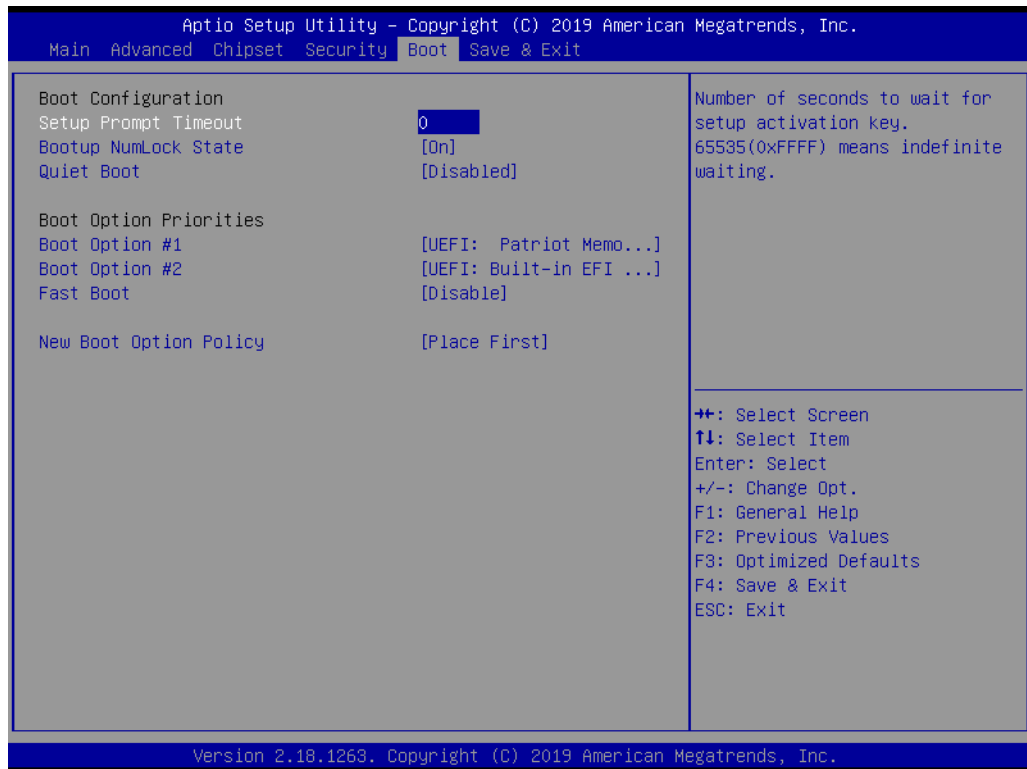
3.1.4 Security



Select Security Setup from the Setup main BIOS setup menu. All Security Setup options, such as password protection and virus protection are described in this section. To access the sub menu for the following items, select the item and press <Enter>:

- Setup Administrator Password
Set Administrator Password.
- User Password
Set User Password.

3.1.5 Boot



- **Setup Prompt Timeout**

Number of seconds that the firmware will wait before initiating the original default boot selection. A value of 0 indicates that the default boot selection is to be initiated immediately on boot. A value of 65535(0xFFFF) indicates that firmware will wait for user input before booting. This means the default boot selection is not automatically started by the firmware.
- **Bootup NumLock State**

Select the keyboard NumLock state.
- **Quiet Boot**

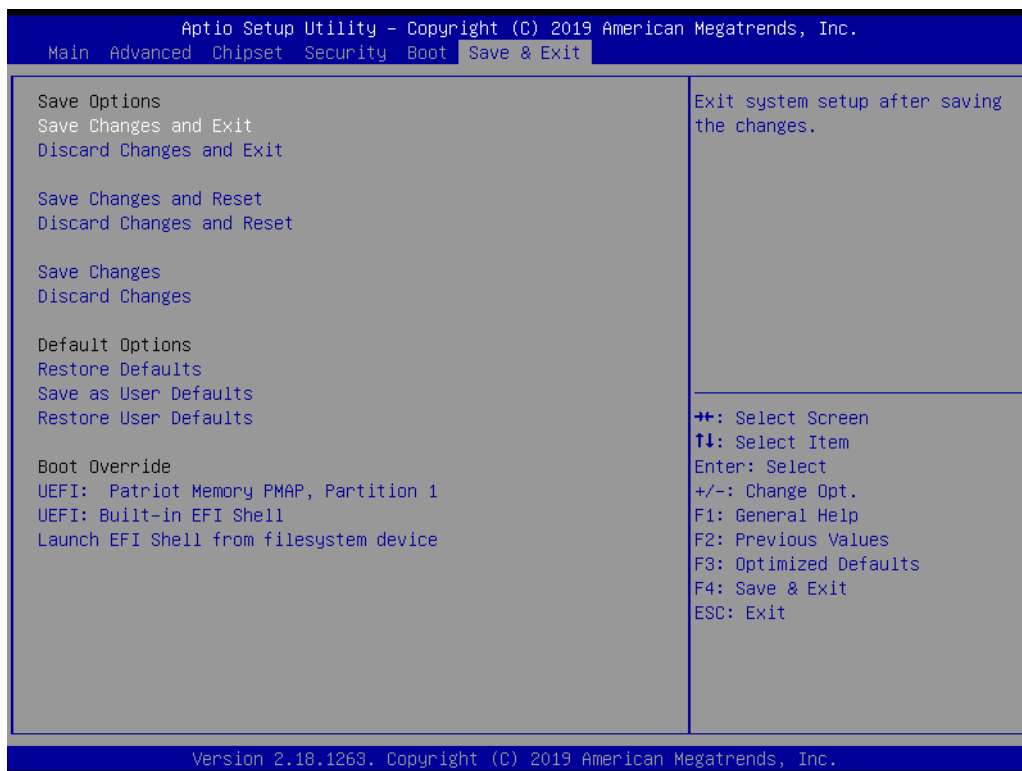
Enables or disables Quiet Boot option.
- **Boot Option #1**

Sets the system boot order
- **Boot Option #2**

Sets the system boot order
- **Fast Boot**

Enables or disables boot with initialization of a minimal set of devices required to launch active boot option. Has no effect for BBS boot options.

3.1.6 Save & Exit



- **Save Changes and Exit**
This item allows you to exit system setup after saving the changes.
- **Discard Changes and Exit**
This item allows you to exit system setup without saving any changes.
- **Save Changes and Reset**
This item allows you to reset the system after saving the changes.
- **Discard Changes and Reset**
This item allows you to rest system setup without saving any changes.
- **Save Changes**
This item allows you to save changes done so far to any of the options.
- **Discard Changes**
This item allows you to discard changes done so far to any of the options.
- **Restore Defaults**
This item allows you to restore/load default values for all the options.
- **Save as User Defaults**
This item allows you to save the changes done so far as user defaults.
- **Restore User Defaults**
This item allows you to restore the user defaults to all the options.
- **Boot Override**
Boot device select can override your boot priority.
- **Launch EFI Shell from files system device**
Attempts to Launch EFI Shell application (Shell.efi) from one of the available file system devices.

3.1.7 Wake up on LAN

Windows 10

Step 1 BIOS Setting

- When power on press “Delete” into BIOS setting
- Advanced
- LAN controller
- Wake on LAN enable
- Select enable
- Save and exit.

Step 2 Settings on Windows

- Go to Control Panel
- Network and Internet
- Network and sharing Center
- Advanced sharing settings
- Turn on network discovery
- Turn on file and printer sharing
- Save and change

Step 3 Settings on System Setting

- Go to System Settings
- Hardware and sound
- Power Options
- System Settings
- Change settings that are currently unavailable
- Un-check “Turn on fast startup”
- Save change

Step 4 Settings on Device Management

- Go to Device Management
- Right click the “LAN card”
- Select “Properties”
- Power Management
- Select the box as shown in the following photo
- Select “OK”

Step 5 Settings on CMD

- Open CMD
- Type “ipconfig /all” to make sure your mac address and IP address.
- You will use the information when you WOL from other computer.
- Connect the RJ-45 cables and ping each other to ensure the connection is successful.

Step 6 Check Connection

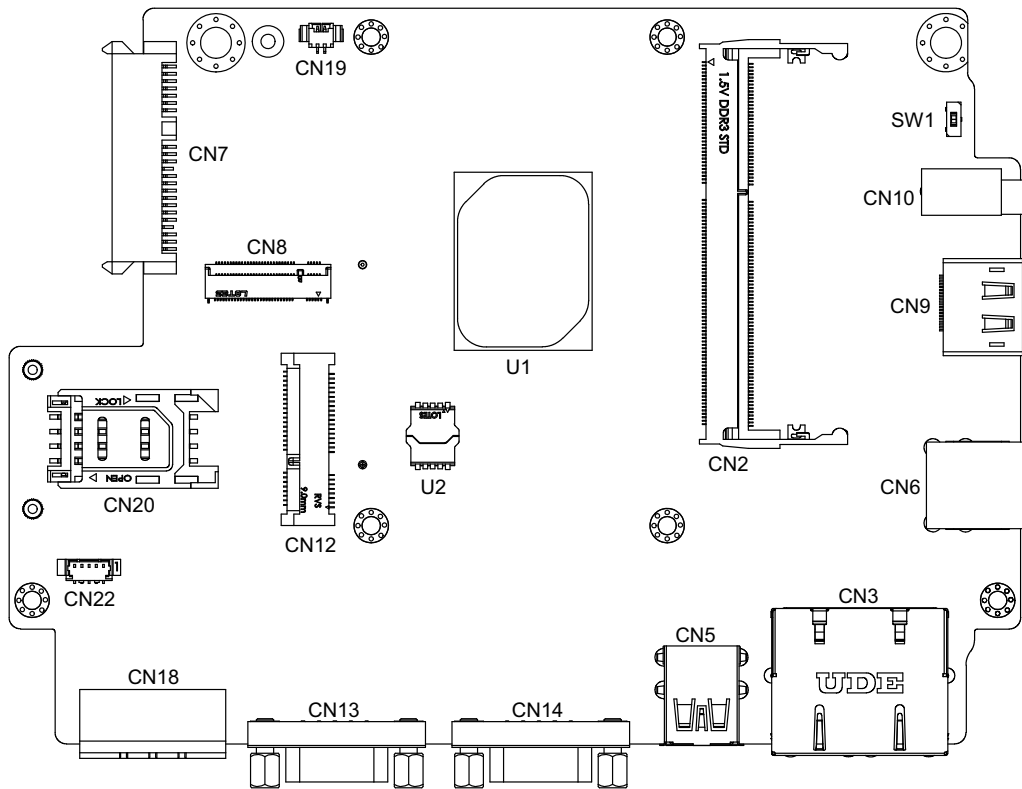
- Connect the RJ-45 cables and ping each other to ensure the connection is successful.

Appendix **A**

Serial Port Settings

A.1 Jumper, Dip switch and Connector location

A.1.1 Board Placement



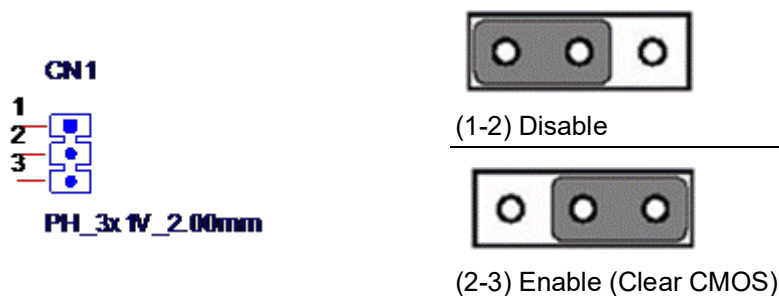
Place	Function
SW1	CMOS Clear Function
CN2	DDR3 SO-DIMM slot
CN3	LAN RJ45 connector
CN5	USB3.0 connector
CN6	USB2.0 connector
CN7	SATA connector
CN8	M.2 B-Key slot
CN9	Display Port
CN10	Audio Out 3.5mm Jack
CN12	Mini PCIE slot
CN13	COM1 RS232/422/485 connector
CN14	COM2 RS232/422/485 connector
CN18	Power in connector
CN19	RTC battery connect
CN20	SIM card slot
CN22	Power button/Reset

A.2 Jumper setting and Description

A.2.1 CMOS Clear Function (CN1)

Table A.1: CMOS Clear Function

Description	This jumper is used to select CMOS Clear Enable/Disable
Default	(1-2)
(2-3)	Enable (Clear CMOS)
(1-2)	Disable

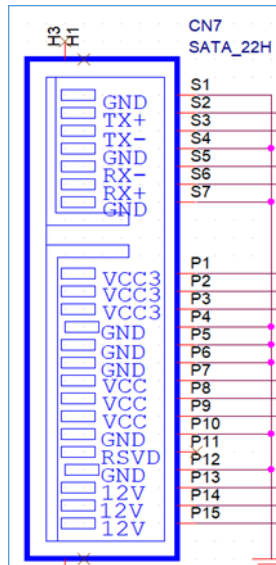


A.3 Connector Pin Definition

A.3.1 SATA connector (CN7)

Table A.2: SATA connector (CN7)

Pin	Signal	Description
S1	GND	system ground
S2	TX+	SATA data transmit positive
S3	TX-	SATA data transmit negative
S4	GND	system ground
S5	RX+	SATA data receive positive
S6	RX-	SATA data receive negative
S7	GND	system ground
P1	3.3V	3.3V power output
P2	3.3V	3.3V power output
P3	3.3V	3.3V power output
P4	GND	system ground
P5	GND	system ground
P6	GND	system ground
P7	5V	5V power output
P8	5V	5V power output
P9	5V	5V power output
P10	GND	system ground
P11	NC	floating
P12	GND	system ground
P13	12V	12V power output
P14	12V	12V power output
P15	12V	12V power output



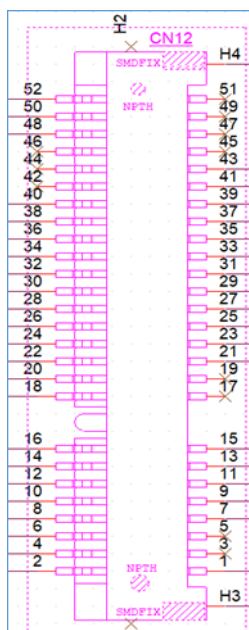
A.3.2 Mini PCIE slot (CN12)

Table A.3: Mini PCIE slot (CN12)

Pin	Signal	Description	Pin	Signal	Description
52	3.3V	3.3V power input	51	NC	floating
50	GND	system ground	49	NC	floating
48	1.5V	1.5V power input	47	NC	floating
46	NC	floating	45	NC	floating
44	NC	floating	43	Reserved	
42	NC	floating	41	3.3V	3.3V power input
40	GND	system ground	39	3.3V	3.3V power input
38	USB2_D+	USB2.0 data positive	37	GND	system ground
36	USB2_D-	USB2.0 data negative	35	GND	system ground
34	GND	system ground	33	PCIE_TX+	PCIE data transmit positive
32	SMBus_DATA	SMBus data	31	PCIE_TX-	PCIE data transmit negative
30	SMBus_CLK	SMBus clock	29	GND	system ground
28	1.5V	1.5V power input	27	GND	system ground
26	GND	system ground	25	PCIE_RX+	PCIE data receive positive
24	3.3V_AUX	3.3V standby power input	23	PCIE_RX-	PCIE data receive negative
22	PCIE_RESET#	mini PCIE device reset input	21	GND	system ground
20	WIFI_DISABLE#	mini PCIE wifi module disable input	19	NC	floating
18	GND	system ground	17	NC	floating
16	SIM_VPP	SIM card programming power input	15	GND	system ground

Table A.3: Mini PCIE slot (CN12)

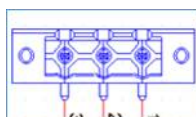
14	SIM_RESET	SIM card reset	13	PCIE_CLK+	PCIE clock output positive
12	SIM_CLK	SIM card clock	11	PCIE_CLK-	PCIE clock output negative
10	SIM_DATA	SIM card data	9	GND	system ground
8	SIM_VCC	SIM card 5V power input	7	PCIE_-CLKREQ#	device pcie clock request output
6	1.5V	1.5V power input	5	NC	floating
4	GND	system ground	3	NC	floating
2	3.3V	3.3V standby power input	1	PCIE_WAKE#	host wake up trigger output



A.3.3 Power-in connector (CN18)

Table A.4: Power-in connector (CN18)

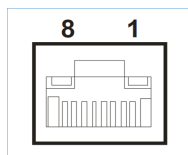
Pin	Signal	Description
1	24V POWER+	24V power positive input
2	24V POWER-	24V power negative input
3	Chassis GND	connect to earth ground



A.3.4 LAN RJ45 connector (CN3)

Table A.5: LAN RJ45 connector (CN3)

Pin	Signal	Description
1	MDI0+	In BASE-T: Media-dependent interface[0]: 1000BASE-T: In MDI configuration, MDI[0]+/- corresponds to BI_DA+/. In MDI-X configuration MDI[0]+/- corresponds to BI_DB+/-.
2	MDI0-	10BASE-T and 100BASE-TX: In MDI configuration, MDI[0]+/- is used for the transmit pair. In MDIX configuration, MDI[0]+/- is used for the receive pair.
3	MDI1+	In BASE-T: Media-dependent interface[1]: 1000BASE-T: In MDI configuration, MDI[1]+/- corresponds to BI_DB+/. In MDI-X configuration, MDI[1]+/- corresponds to BI_DA+/-.
6	MDI1-	10BASE-T and 100BASE-TX: In MDI configuration, MDI[1]+/- is used for the receive pair. In MDI-X configuration, MDI[1]+/- is used for the transmit pair
4	MDI2+	In BASE-T: Media-dependent interface[3:2]:
5	MDI2-	1000BASE-T: In MDI and in MDI-X configuration, MDI[2]+/-
7	MDI3+	corresponds to BI_DC+/- and MDI[3]+/- corresponds to BI_DD+/-.
8	MDI3-	100BASE-TX: Unused 10BASE-T: Unused



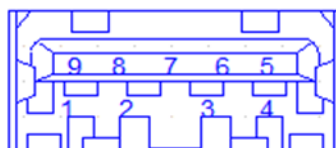
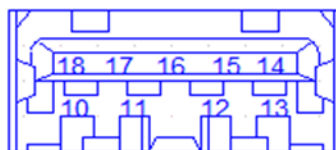
A.3.5 USB3.0 connector (CN5)

Table A.6: USB3.0 connector (CN5)

Pin	Signal	Description
1	VBUS	5V power output
2	USB2_D-	USB2.0 data negative
3	USB2_D+	USB2.0 data positive
4	GND	system ground
5	USB3_RX-	USB3.0 data receive negative
6	USB3_RX+	USB3.0 data receive positive
7	GND	system ground
8	USB3_TX-	USB3.0 data transmit negative
9	USB3_TX+	USB3.0 data transmit positive
10	VBUS	5V power output
11	USB2_D-	USB2.0 data negative
12	USB2_D+	USB2.0 data positive
13	GND	system ground
14	USB3_RX-	USB3.0 data receive negative
15	USB3_RX+	USB3.0 data receive positive
16	GND	system ground

Table A.6: USB3.0 connector (CN5)

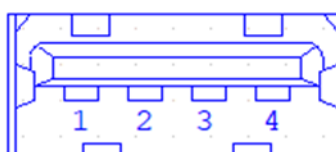
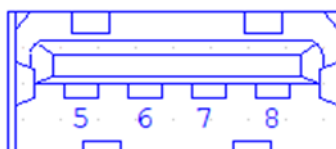
17	USB3_TX-	USB3.0 data transmit negative
18	USB3_TX+	USB3.0 data transmit positive



A.3.6 USB 2.0 connector (CN6)

Table A.7: USB 2.0 connector (CN6)

Pin	Signal	Description
1	VBUS	5V power output
2	USB2_D-	USB2.0 data negative
3	USB2_D+	USB2.0 data positive
4	GND	system ground
5	VBUS	5V power output
6	USB2_D-	USB2.0 data negative
7	USB2_D+	USB2.0 data positive
8	GND	system ground

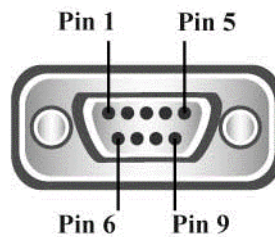


A.3.7 COM1 RS232/422/485 connector (CN13)

A.3.8 COM2 RS232/422/485 connector (CN14)

Pin	Signal for RS232	Description	Signal for RS422 / RS485	Description	Signal for RS485	Description
1	DCD#	data carrier detect	TX-	data transmit negative	D-	data positive
2	RX	data receiver	TX+	data transmit positive	D+	data negative
3	TX	data transmit	RX-	data receiver negative	-	-
4	DTR#	data terminal ready	RX+	data receiver positive	-	-
5	GND	system ground	GND	system ground	GND	system ground
6	DSR#	data set ready	-	-	-	-
7	RTS#	request to send	-	-	-	-
8	CTS#	clear to send	-	-	-	-
9	RI#	ring indicator	-	-	-	-

Legend: "-" = "no data"



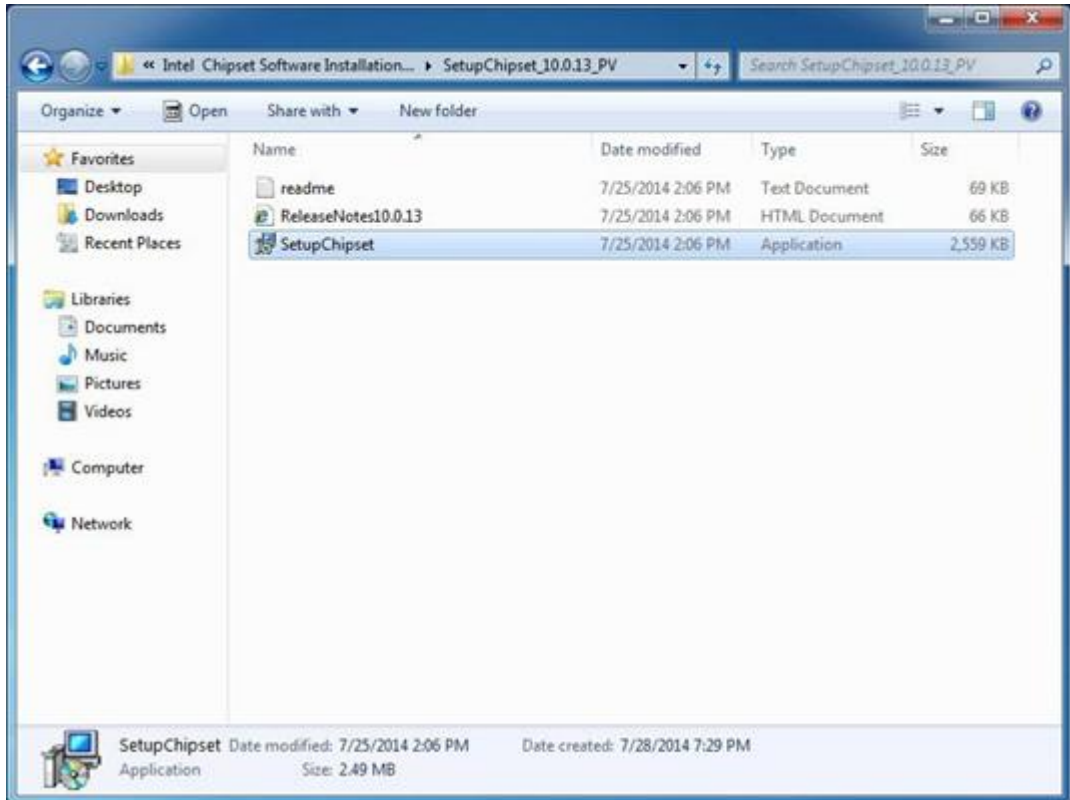
Appendix **B**

Driver Installation and
Config

B.1 Intel Chipset Software Installation Utility Installation

Follow the steps below to install the Intel Chipset Software Installation Utility:

1. Launch <Driver Root Path>\Intel Chipset Software Installation Utility\Setup-Chipset_XX.X.XX_PV.
2. Install SetupChipset.exe.



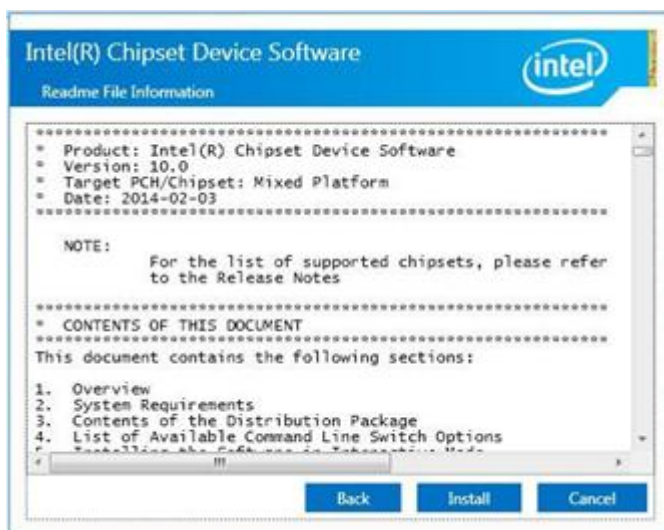
3. Click Next.



- Click Accept.



- Click Install.



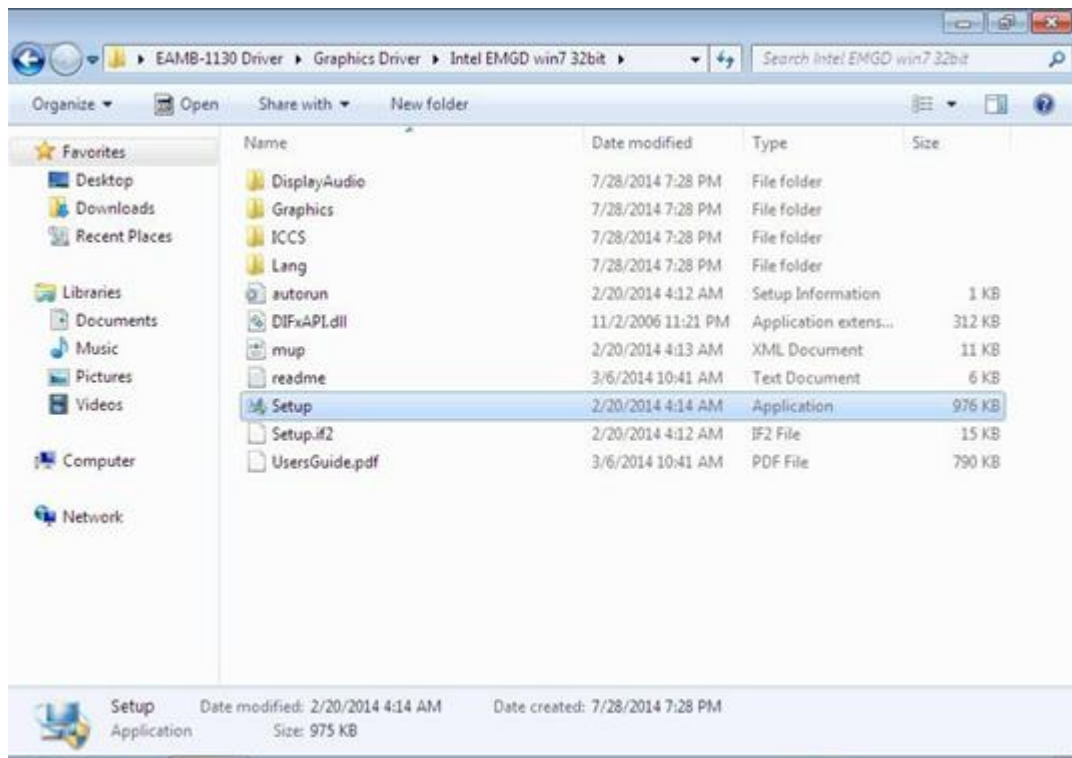
6. Click Finish



B.2 Intel Graphics Driver Installation

Follow the steps below to install the Intel Graphics driver:

1. Launch folder <Driver Root Path>\Graphics Driver\Intel EMGD win7 XX bit\
2. Install Setp.exe



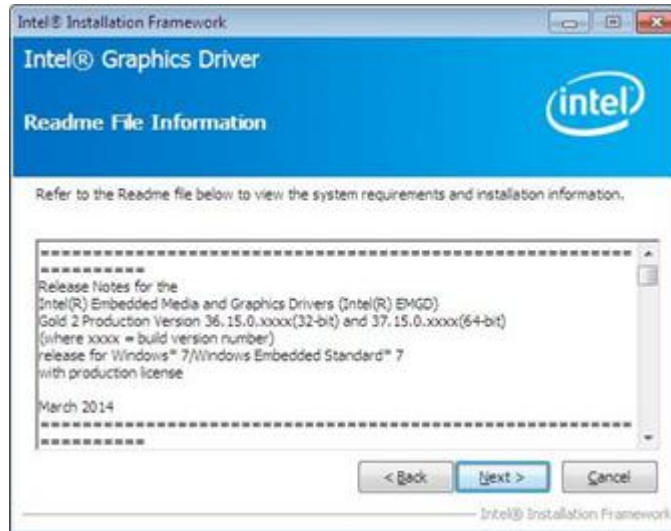
3. Click Next.



4. Click Yes.



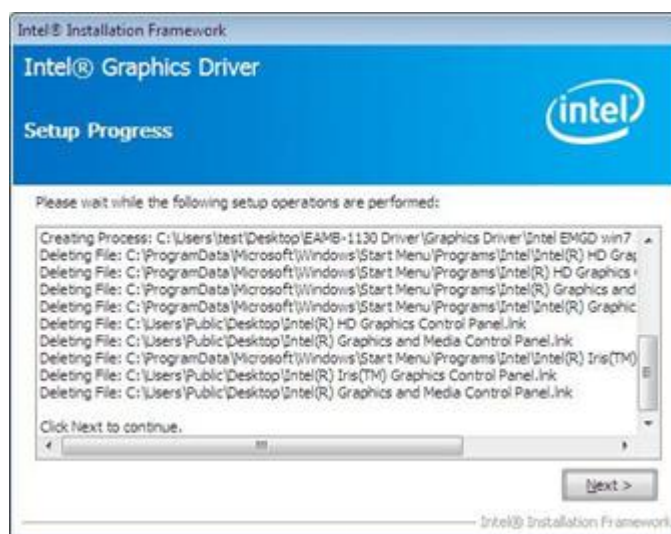
5. Click Next.



6. Click Install.



7. Click Next



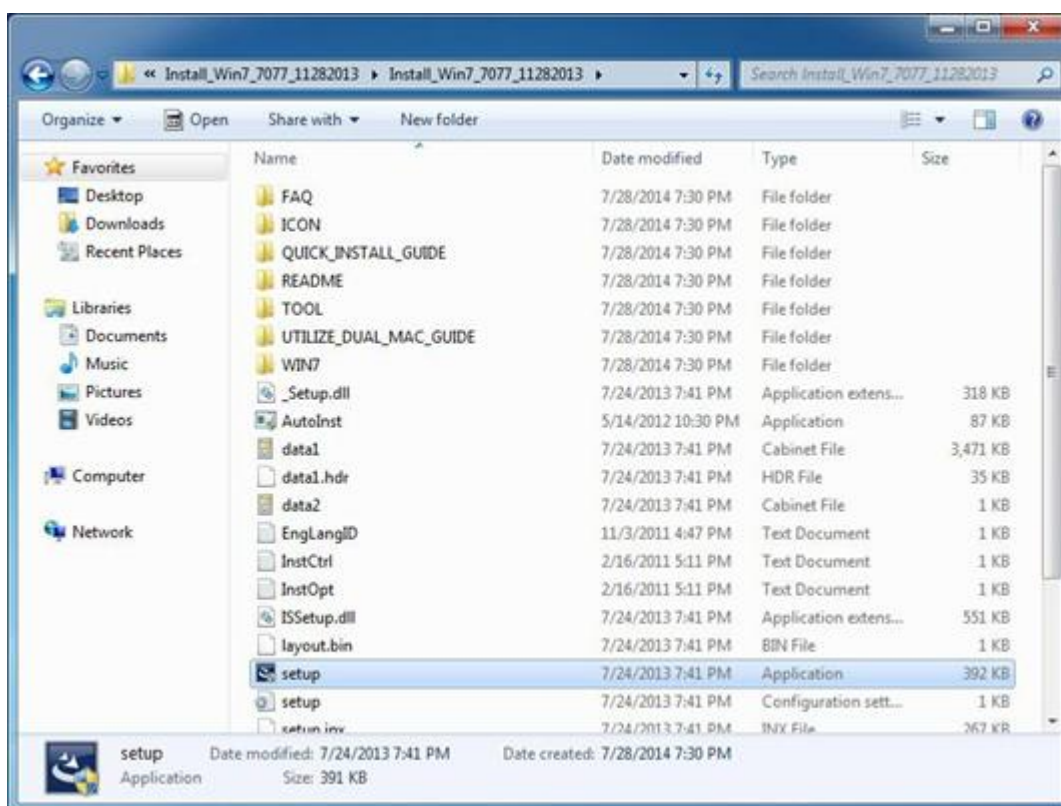
8. Choose Yes, then click Finish to restart



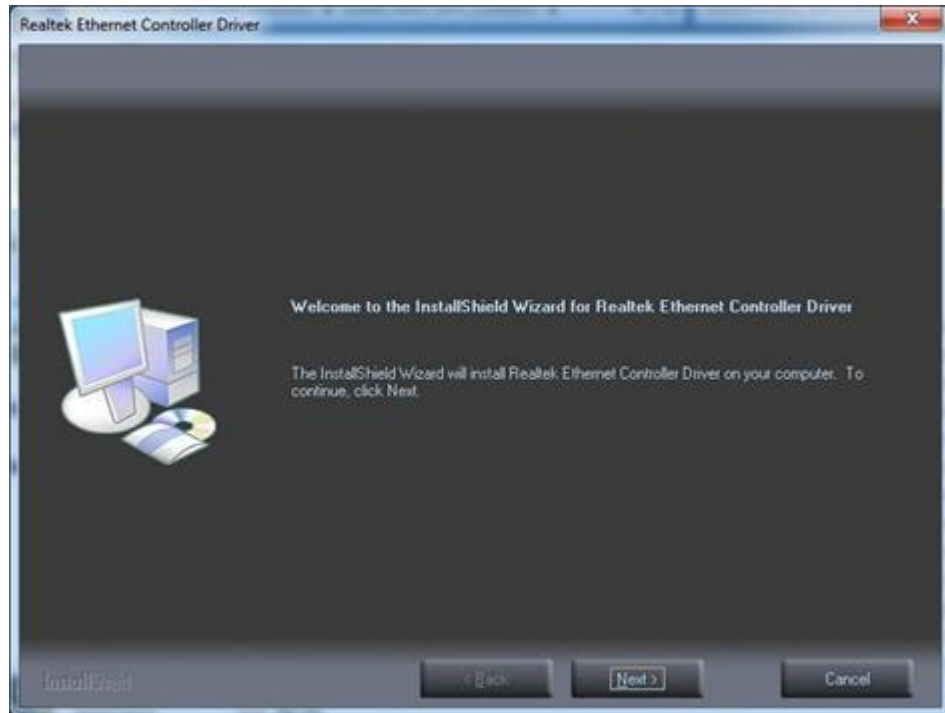
B.3 LAN Driver Installation

Follow the steps below to install the LAN driver:

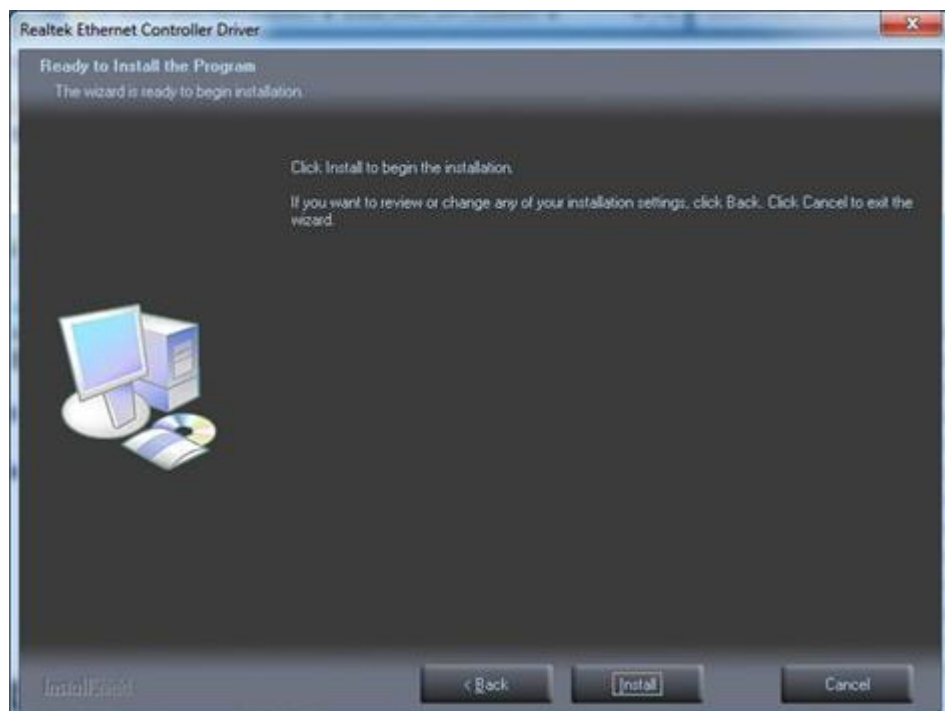
1. Launch folder <Driver Root Path>\LAN\Win7 \Install_Win7_7077_XXX-XXXXXXX
2. Install setup.exe



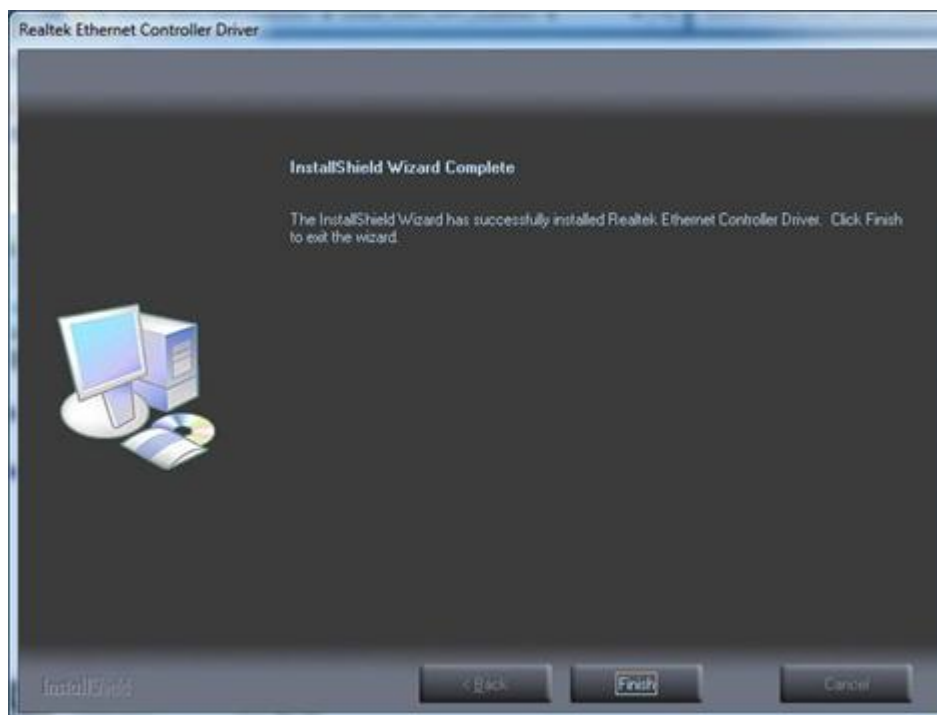
3. Click Next.



4. Click Install.



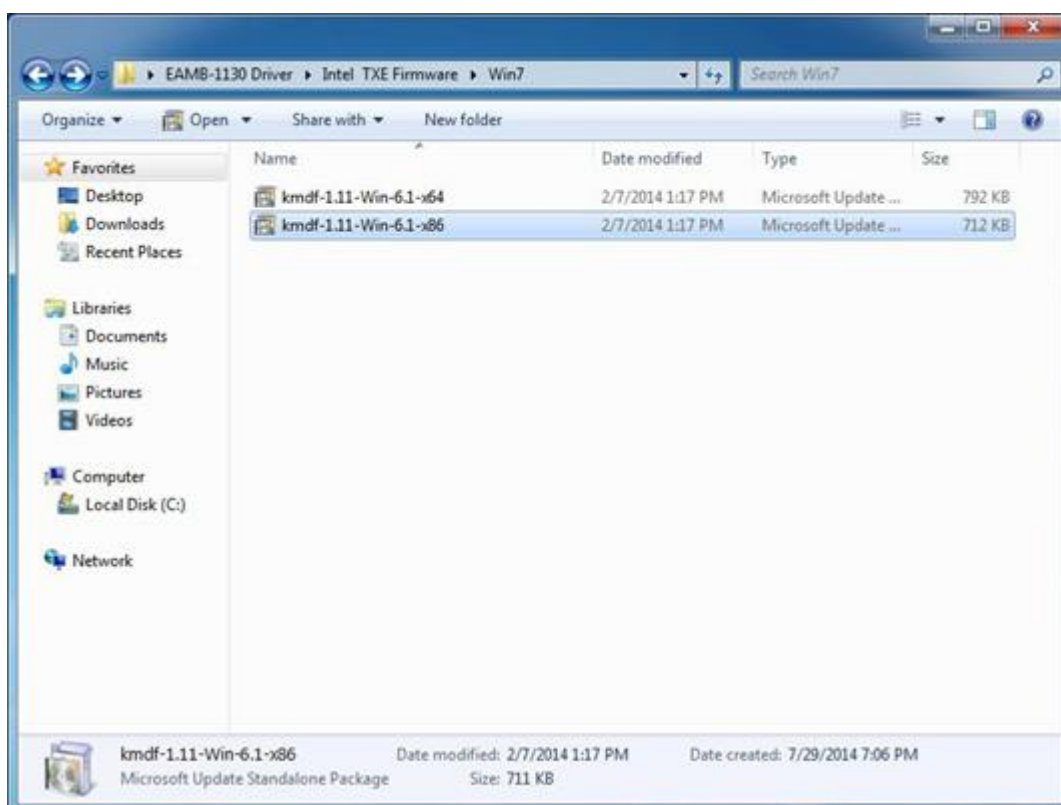
5. Click Finish.



B.4 Intel® Trusted Execution Engine Driver Installation

Follow the steps below to install the Intel Trusted Execution Engine driver:

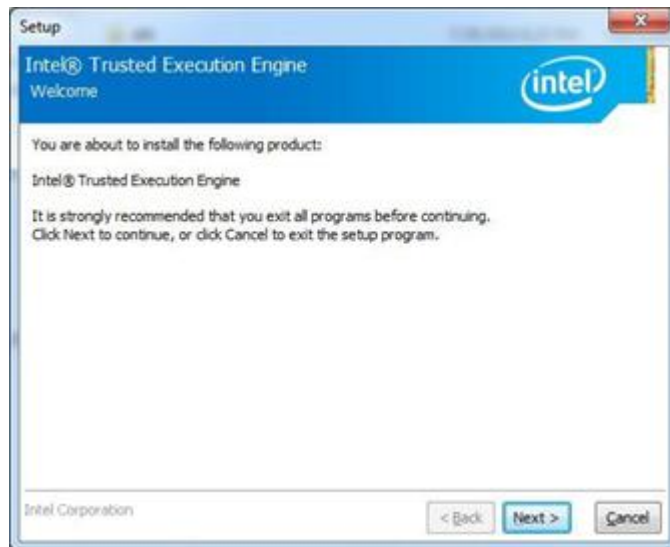
1. Launch folder <Driver Root Path>\TXE\Intel TXE Firmware\Win7
2. Install kmdf-1.11-Win-6.1-x86.msu



3. Click Yes.



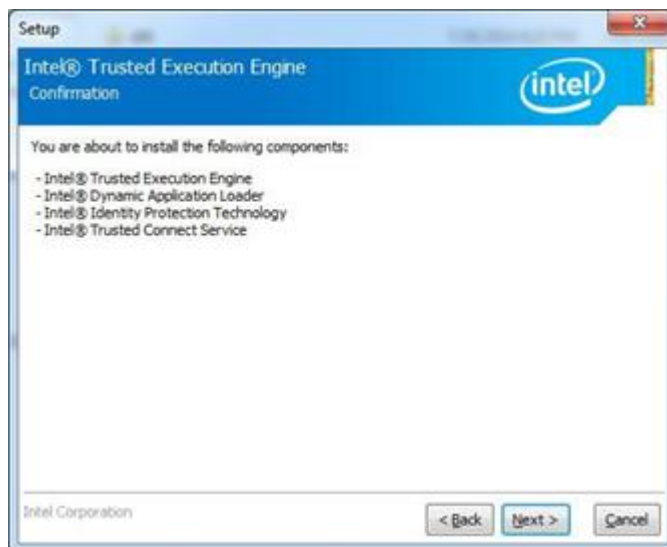
4. Click Next.



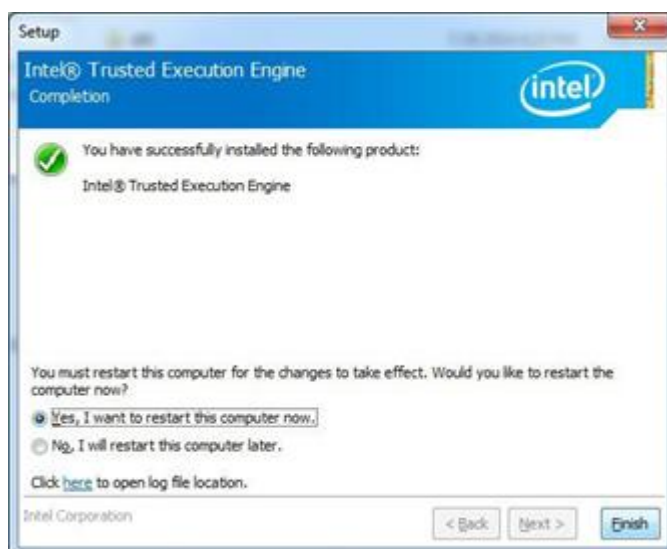
5. Click Next.



6. Click Next



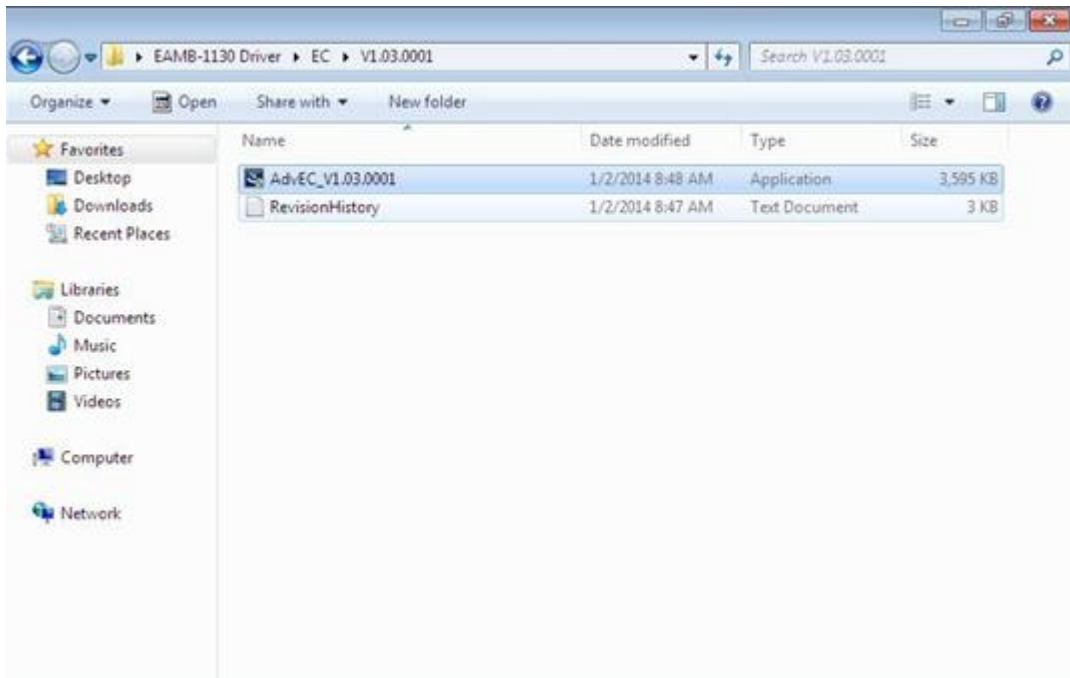
7. Choose Yes, then click Finish to restart.



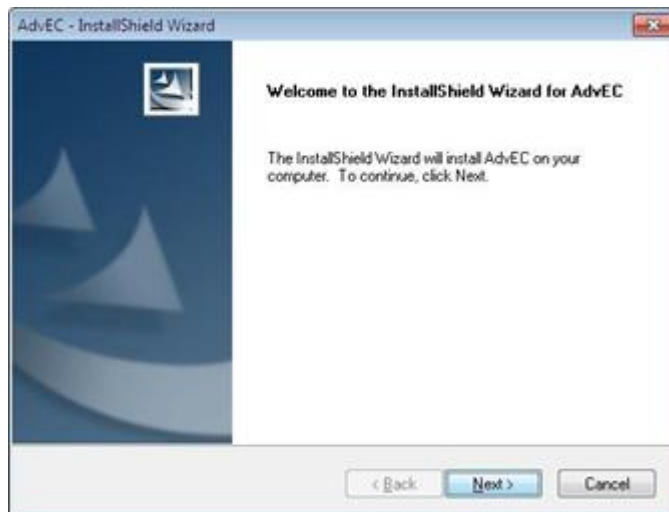
B.5 Advantech EC Driver Installation

Follow the steps below to install the EC drivers:

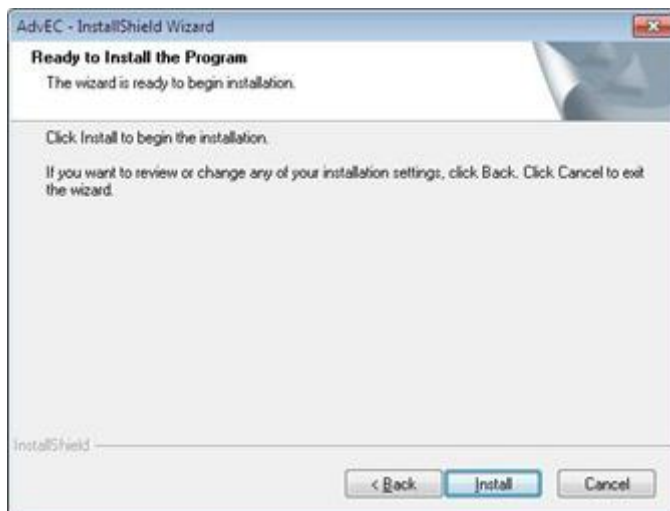
1. Launch folder <Driver Root Path>\EC\Vx.xx.xxxx
2. Install AdvEC_Vx.xx.xxxx.exe



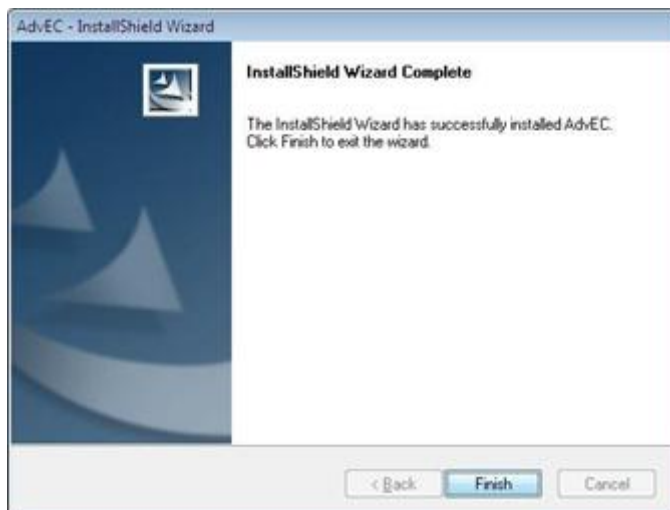
3. Click Next.



4. Click Install.



5. Click Finish.



6. Choose Yes, then click OK to restart.



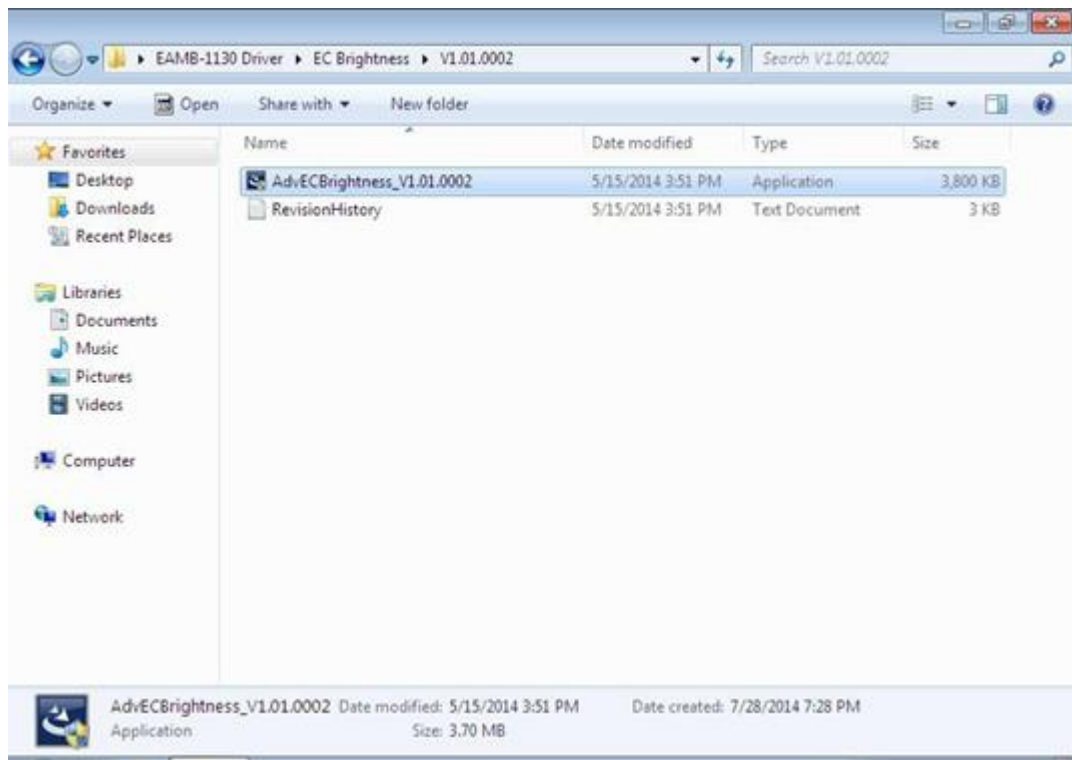
B.6 Advantech EC Brightness Control Tool Installation

Note! The Advantech EC driver must be installed first.

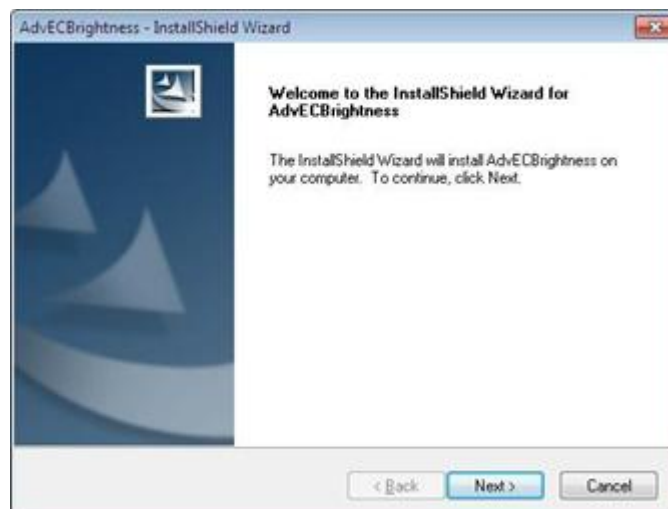


Follow the steps below to install the EC brightness control tool:

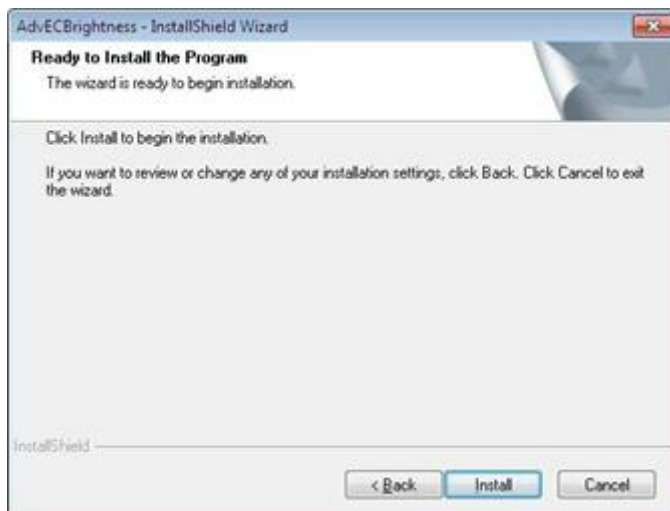
1. Launch folder <Driver Root Path>\EC Brightness\Vx.xx.xxxx
2. Install AdvECBrightness_Vx.xx.xxxx.exe



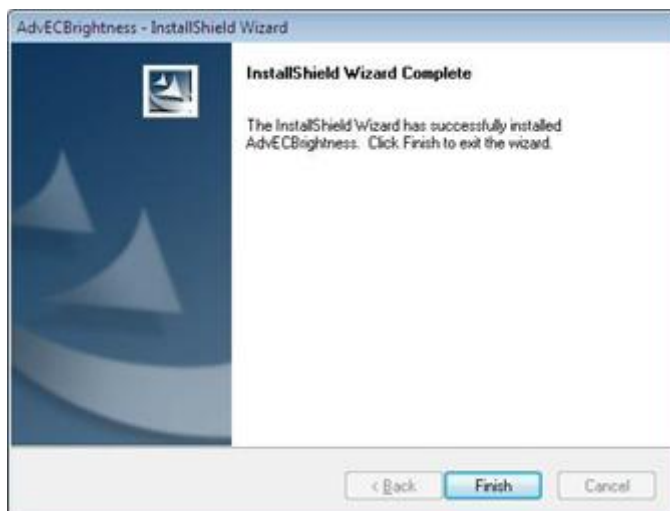
3. Click Next.



4. Click Install.



5. Click Finish.



6. Choose Yes, then click OK to restart



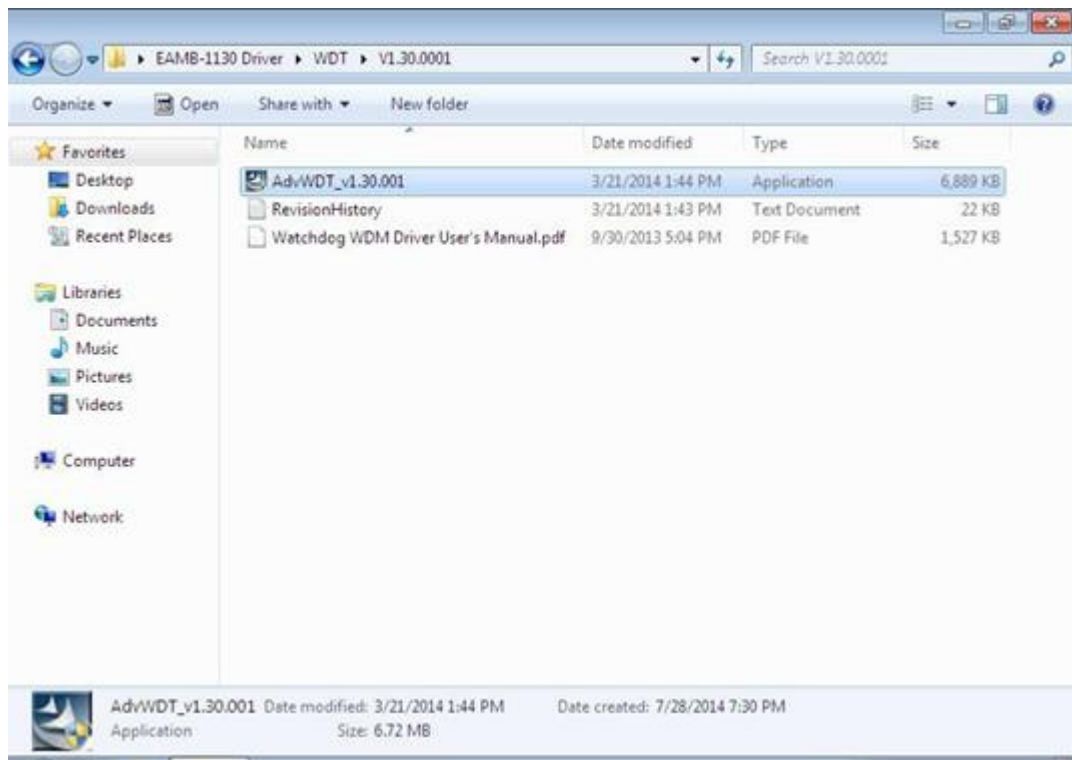
B.7 Advantech EC Watchdog Timer Driver Installation

Note! The EC driver must be installed first.



Follow the steps below to install the EC Watchdog Timer driver:

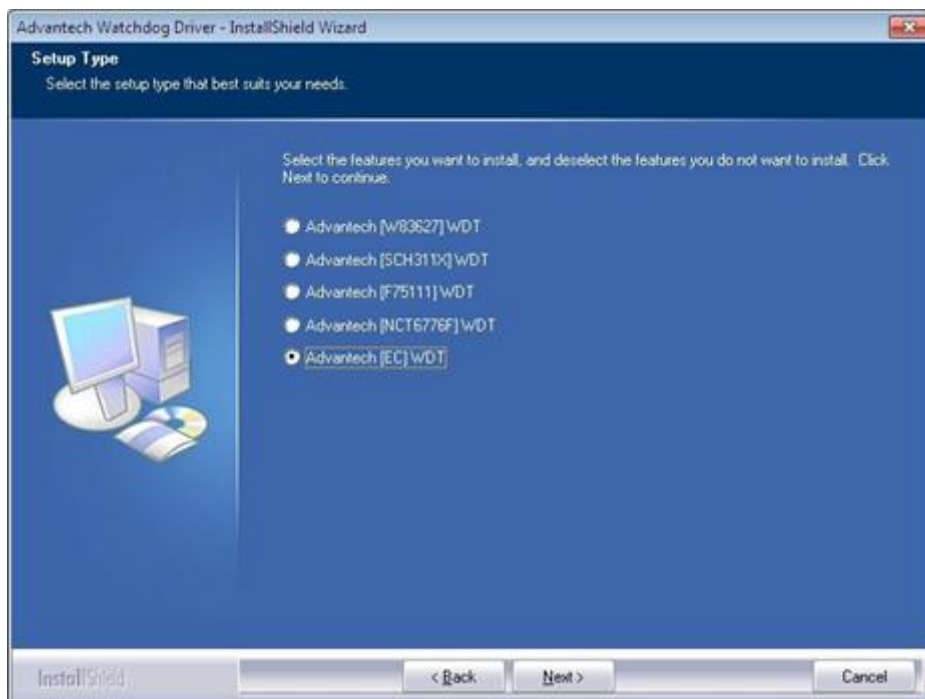
1. Launch folder <Driver Root Path>\WDT\Vx.xx.xxxx
2. Install AdvWDT_Vx.xx.xxxx.exe



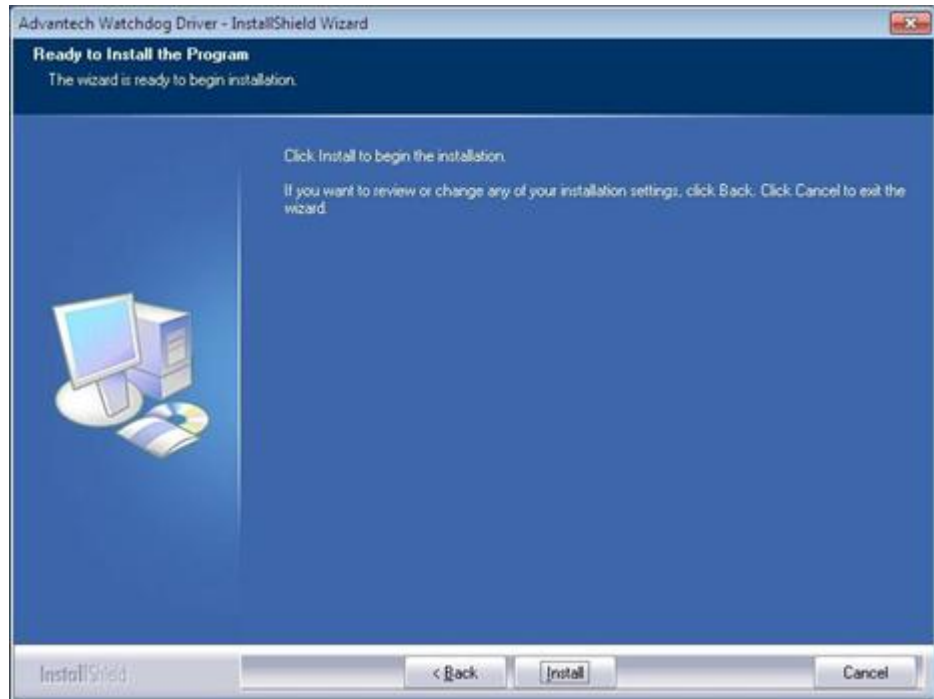
3. Click Next.



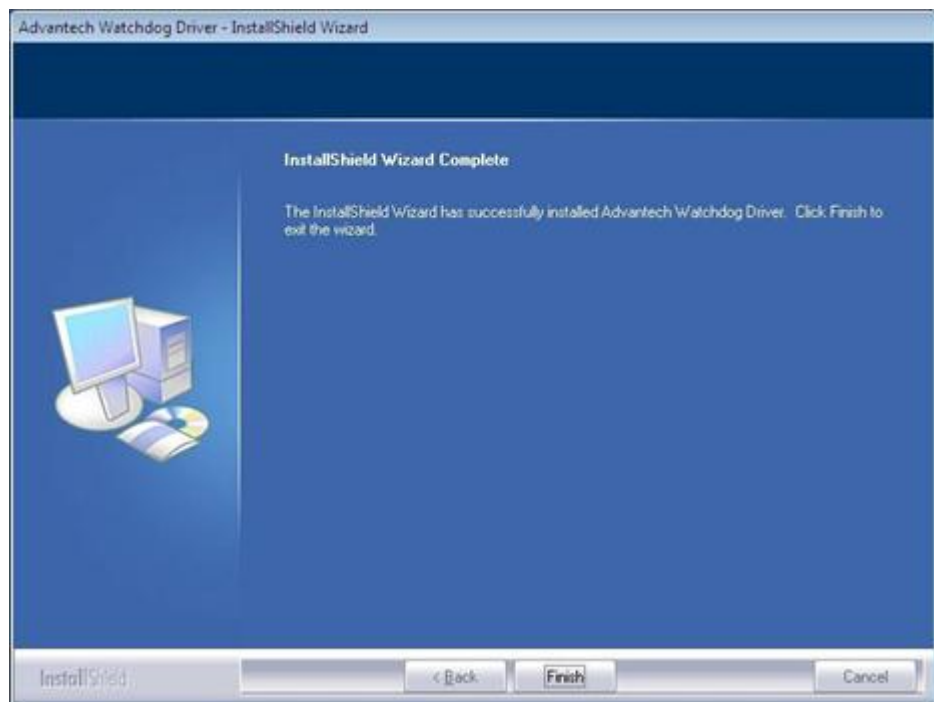
4. Choose Advantech [EC]WDT, then click Next



5. Click Install.



6. Click Finish.



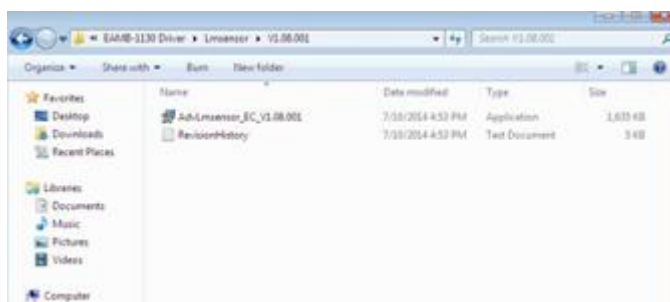
- Choose Yes, then click OK to restart.



B.8 Advantech LMsensor Driver Installation

Follow the steps below to install the LMsensor driver:

- Launch folder <Driver Root Path>\Lmsensor\Vx.xx.xxxx
- Install AdvLmsensor_EC_Vx.xx.xxxx.exe



- Next.



4. Restart.



Note! Go to Advantech's product support page for the detailed driver user manual.



Note! The drivers and utilities used for the panel PCs are subject to change without notice. If in doubt, check Advantech's website or contact our application engineers for the latest information regarding drivers and utilities.



www.advantech.com

Please verify specifications before quoting. This guide is intended for reference purposes only.

All product specifications are subject to change without notice.

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