LPC P-cap Series User Manual

Panel PC, Intel® Braswell Celeron®3160, IP65 Compliant

Bezel & Wide Range Power Input

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Warning!

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

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

Disclaimer

This information in this document is subject to change without notice. In no event shall ELGENS Co.,Ltd. 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.

Packing List

Accessories (as ticked) included in this package are:
☐ Panel Mounting Kits
☐ 3 Pin Male Terminal Block
☐ Optional Adapter
☐ Other._____(please specify)

Safety Precautions

Follow the messages below to avoid your systems from damage:

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

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Chapter 1 Getting Started

1.1 Brief Description of LPC P-cap Series

The LPC P-cap series is a power-optimized and delivers robust performance-per-watt for embedded HMI, powered by a Celeron® N3160 Quad Core 1.6 GHz processor. It comes with a mSATA slot and a SATA 2.5-inch hard disk drive, up to 8GB DDR3 memory, audio jack, 2 Ethernet, DC input, and 4 USB 3.0 ports. The unit supports Win 7 Pro/ WES7 / Win 8 / Win 10. The fanless touch panel computer is ideal for use as Web Browser, Terminal and HMI at all levels of automation control.

1.2 System Specifications

Model Number	LPC-P121S-01	LPC-P150S	LPC-P156W	LPC-P156W-01
Max Resolution	1024*768	1024*768	1366*768	1920*1080
Color	16.7M	16.2M	16.7M	16.2M
Luminance	350 nits	420 nits	300 nits	400 nits
View Angle	160/160	160/160	160/170	140/120
Contrast Ratio	800	800	500	500

Model Number	LPC-P170S	LPC-P173W	LPC-P185W	LPC-P190S	LPC-P215W
Max Resolution	1280*1024	1920*1080	1920*1080	1280*1040	1920*1080
Color	16.7M	16.7M	16.7M	16.7M	16.7M
Luminance	350 nits	400 nits	350 nits	350 nits	250 nits
View Angle	160/170	140/160	189/189	160/170	189/189
Contrast Ratio	1000	600	1000	1000	5000

Computing	
Processor	Intel Celeron® N3160 SoC CPU
System Memory	1 x SO-DIMM, up to 8 GB DDR3L
Storage	1 x SATA3 (6.0Gb/s) 1 x mSATA (full size mini-PCIe)
External I/O Port	4 x USB 3.0 2 x GbE LAN (RTL8111G) 1 x Display Port 1 x HDMI **3 x RS-232 (COM2/3/4)** **1 x RS-422/485 (COM1 default RS-485, adjustable to RS-422 by BIOS)**

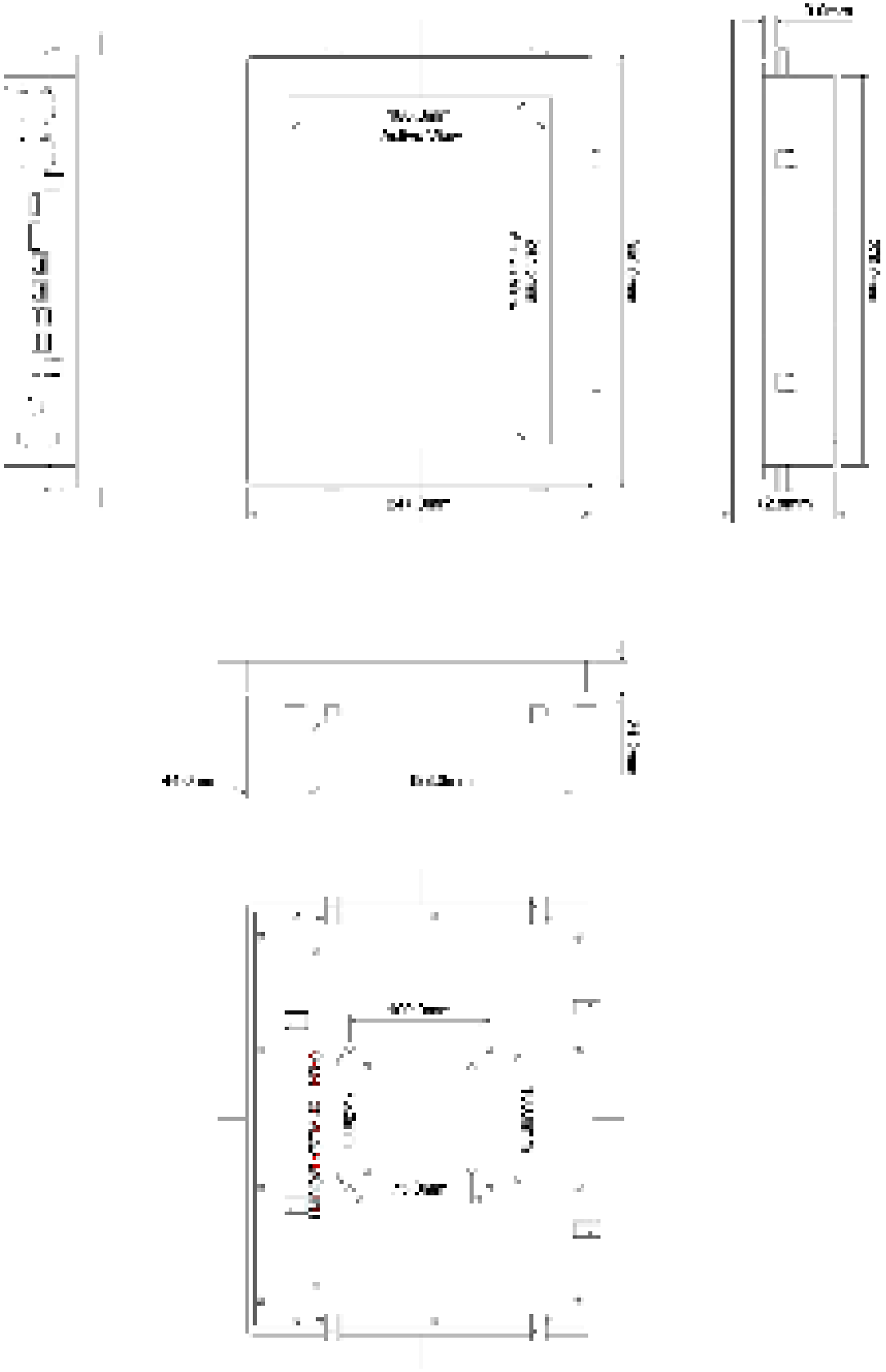
	1 x Audio 1 x Power press button 1 x 3-Pin Power Input
Expansion Slots	None
OS support	Win 7 Pro/ WES7 / Win 8 / Win 10
Touch Screen	
Type	5 Wire Res with USB Interface
Light Transmission	85%
Power Supply	
Power Input	DC 9~36V Wide Range Power Input
Mechanical	
Construction	Metal
IP Rating	Front Panel compliant IP65
Mounting	Panel/VESA
Environmental	
Operating Temperature	0~50 °C
Storage Temperature	-20~70 °C
Storage Humidity	10~90% @40 ° C non-condensing
Order Information	
LPC-P121S-01	12.1" P-cap Panel PC, Celeron® N3160, 1024 x 768 Reso, 350 nits LED backlight, 4 COM, 4 USB, 2 LAN, DC 9~36V with 3-pin Power Terminal Block
LPC-P150S	15" P-cap Panel PC, Celeron® N3160, 1024 x 768 Reso, 420 nits LED backlight, 4 COM, 4 USB, 2 LAN, DC 9~36V with 3-pin Power Terminal Block
LPC-P156W	15.6" P-cap Panel PC, Celeron® N3160, 1366 x 768 Reso, 300 nits LED backlight, 4 COM, 4 USB, 2 LAN, DC 9~36V with 3-pin Power Terminal Block
LPC-P156W-01	15.6" P-cap Panel PC, Celeron® N3160, 1920 x 1080 Reso, 400 nits LED backlight, 4 COM, 4 USB, 2 LAN, DC 9~36V with 3-pin Power Terminal Block
LPC-P170S	17" P-cap Panel PC, Celeron® N3160, 1024 x 768 Reso, 420 nits LED backlight, 4 COM, 4 USB, 2 LAN, DC 9~36V with 3-pin Power Terminal Block
LPC-P173W	17.3" P-cap Panel PC, Celeron® N3160, 1920 x 1080 Reso, 400 nits LED backlight, 4 COM, 4 USB, 2 LAN, DC 9~36V with 3-pin Power Terminal Block
LPC-P185W	18.5" P-cap Panel PC, Intel® Celeron® N3160, 1920 x 1080 Reso, 350 nits LED backlight, 4 COM, 4 USB, 2 LAN, DC 9~36V with 3-pin Power Terminal Block
LPC-P190S	19" P-cap Panel PC, Celeron® N3160, 1024 x 768 Reso, 420 nits LED backlight, 4 COM, 4 USB, 2 LAN, DC 9~36V with 3-pin Power Terminal Block
LPC-P215W	21.5" P-cap Panel PC, Celeron® N3160, 1920 x 1080 Reso, 250 nits LED

	backlight, 4 COM, 4 USB, 2 LAN, DC 9~36V with 3-pin Power Terminal Block
WFK-024	Wi-Fi kits w/ cable & Antenna (2.4GHz, 802.11 b/g/n, 1T1R)
WFK-524	Wi-Fi kits w/ cable & Antenna (2.4 & 5GHz, 802.11 a/b/g/n/ac + BT, 2T2R)
PB-936	Power Board for Input on board fuse / Input reverse protection / Over current protection / Output short circuit protection

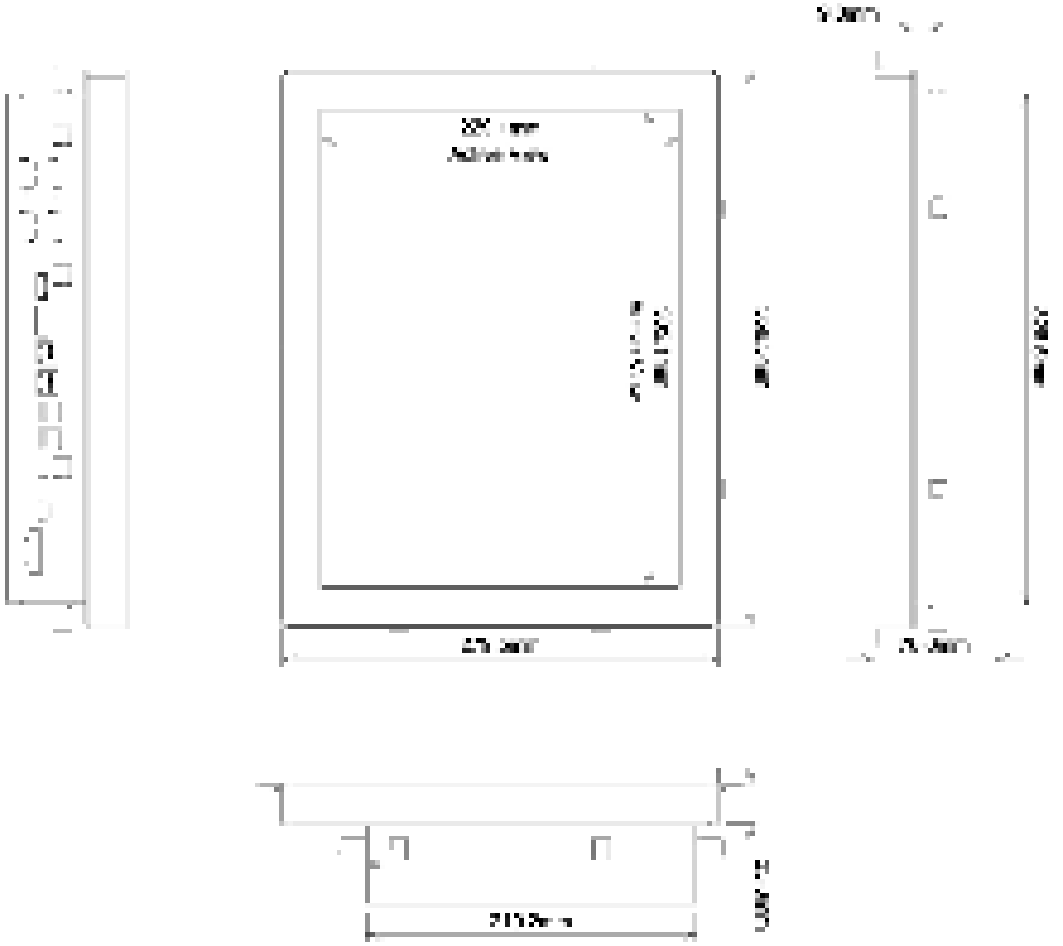
Order Information	
LPC-PxxxS/W	-H / -OB / -G / -AG / -AR / -B / -V / -T
xxx = size, For example, 10.1” = 101	
S = Dimension Ratio Square = 4:3 or 5:4	
W= Dimension Ration Wide = 16:9 or 16:10	
H = High Brightness 1000 nits LED backlight	
OB = Optical Bonding	
G = Glass without touch	
AG = Anti-Glare	
AR = Anti-Reflection	
B = Power Board for ■ Input on board fuse ■ Input reverse protection ■ Over current ■ Output short circuit protection	
V = Vandal Proof Glass	
T = Backside Heatsink for Operating Temperature 60°C	

1.3 Dimension

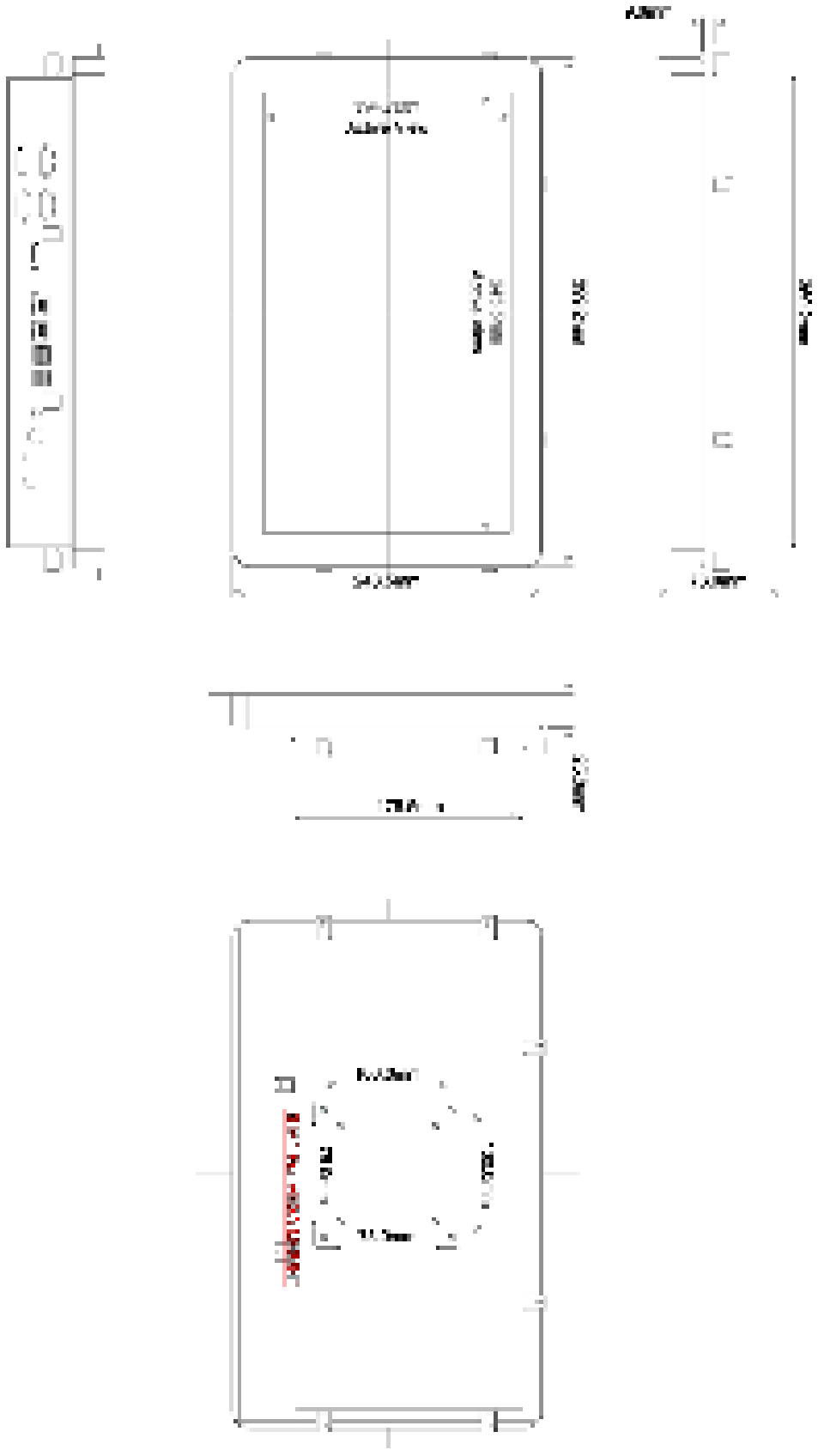
LPC-P121S-01 Drawing



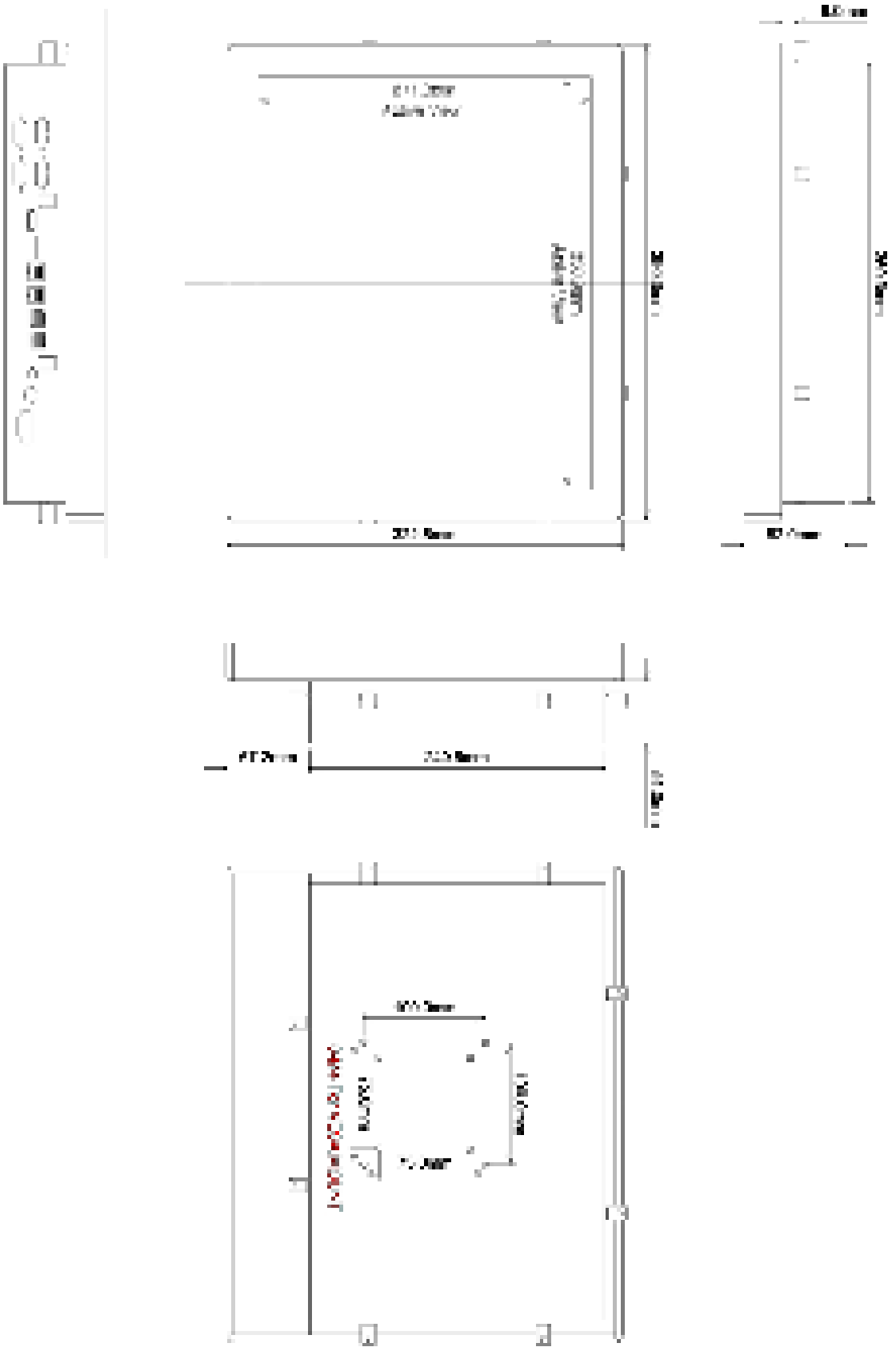
LPC-P150S Drawing



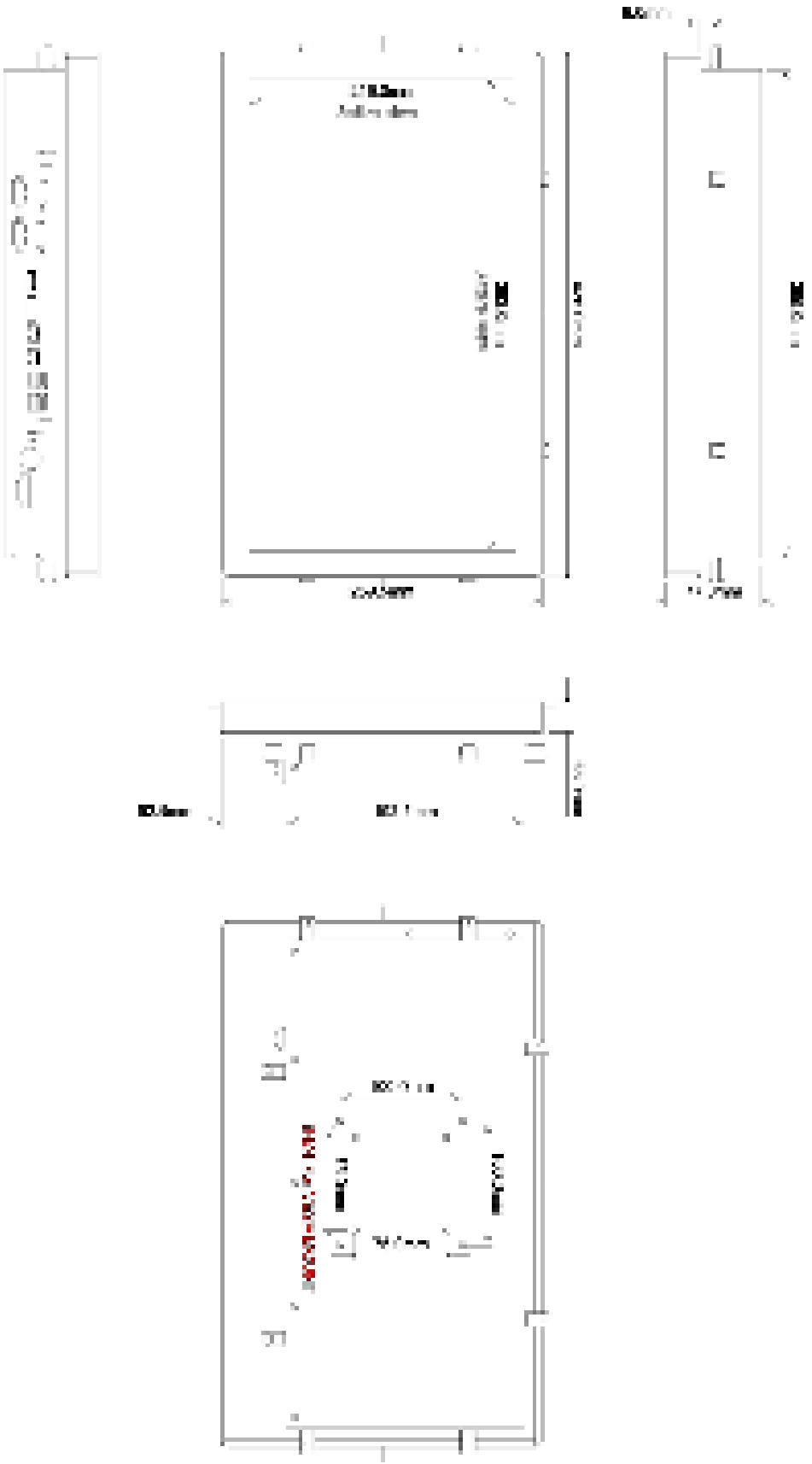
LPC-P156W / 156W-01 Drawing



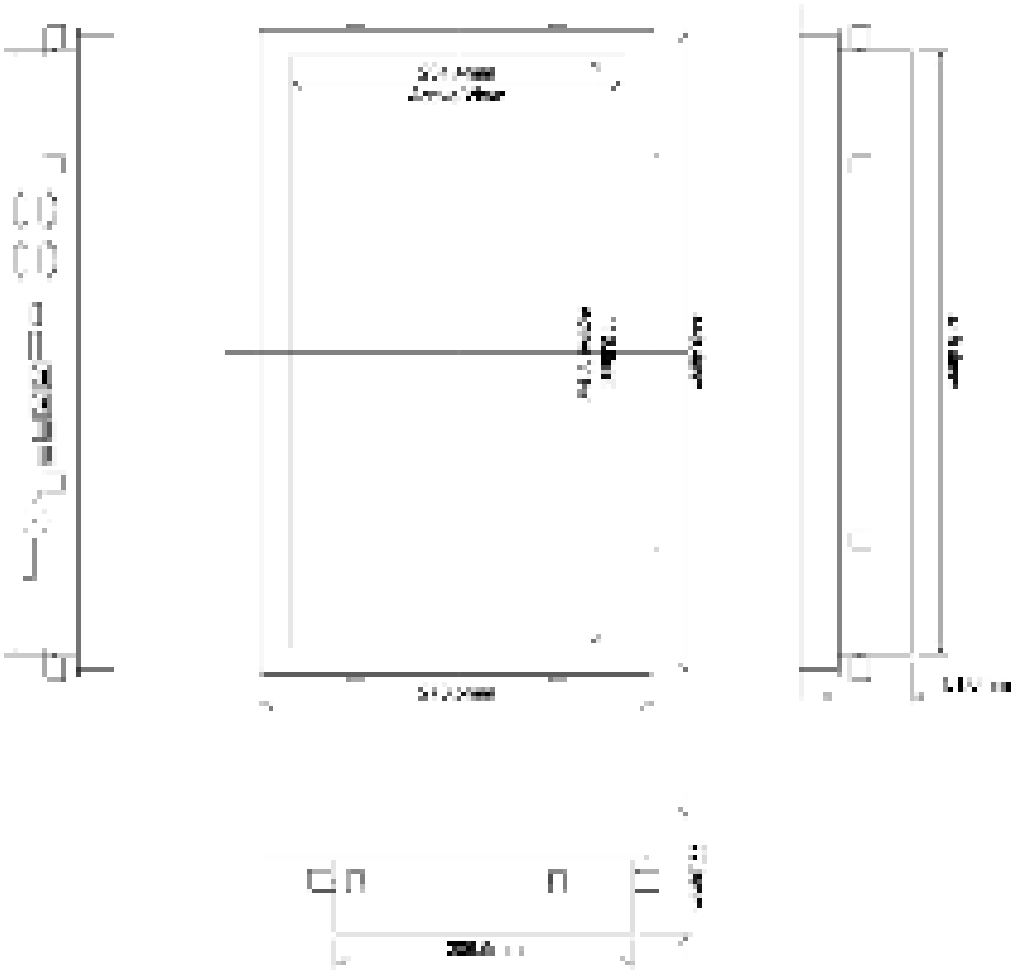
LPC-P170S Drawing



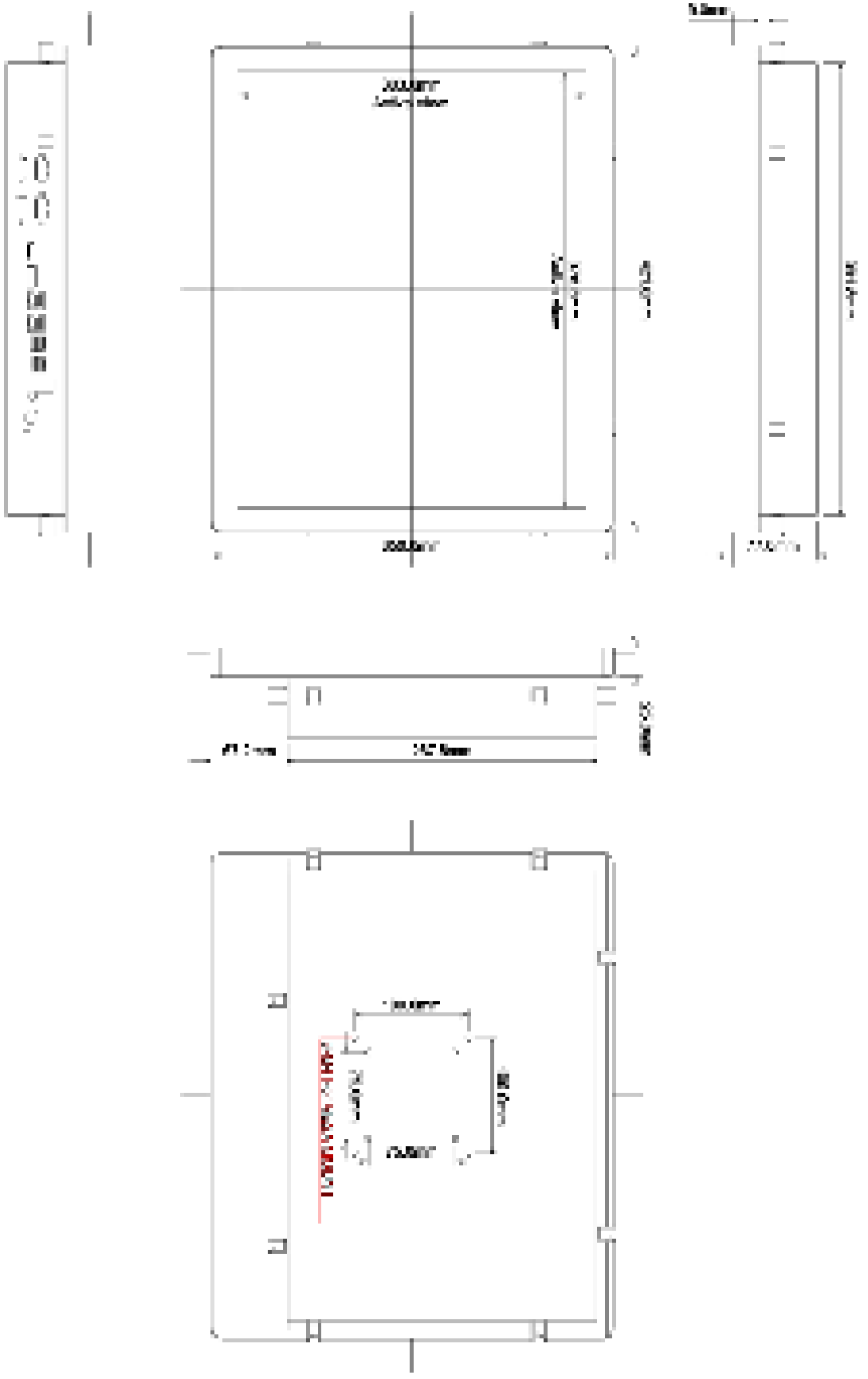
LPC-P173W Drawing



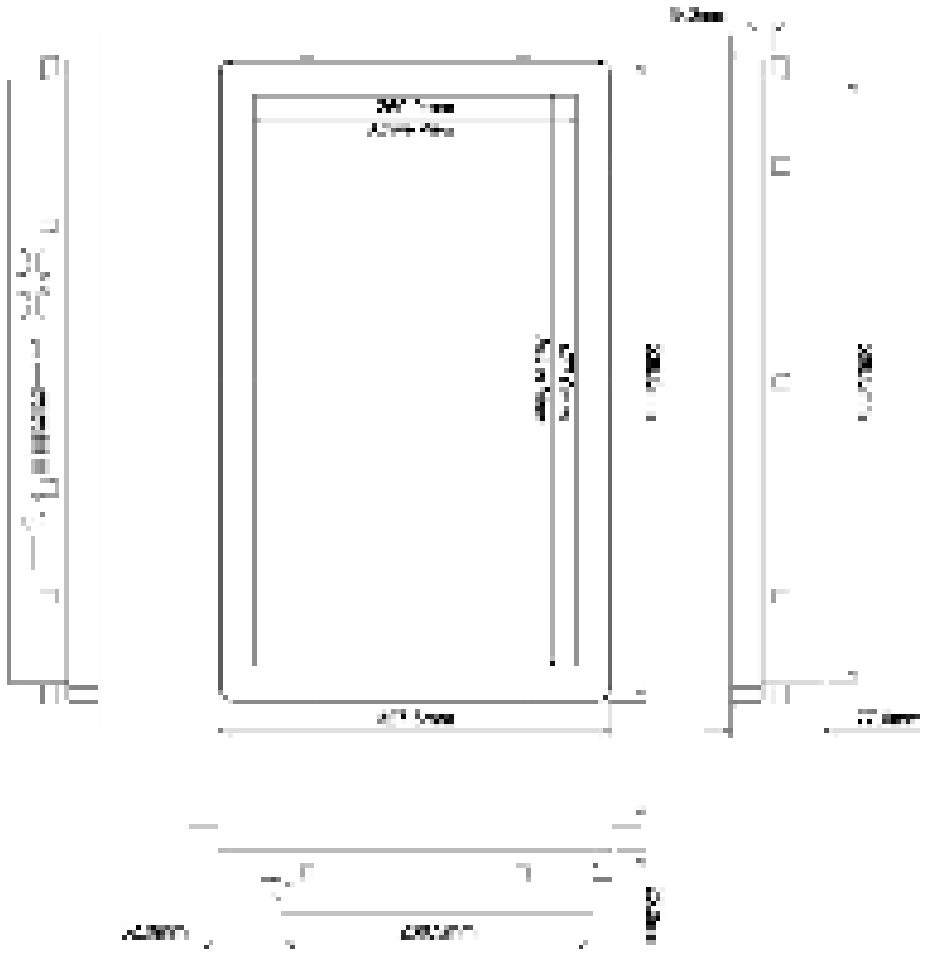
LPC-P185W Drawing

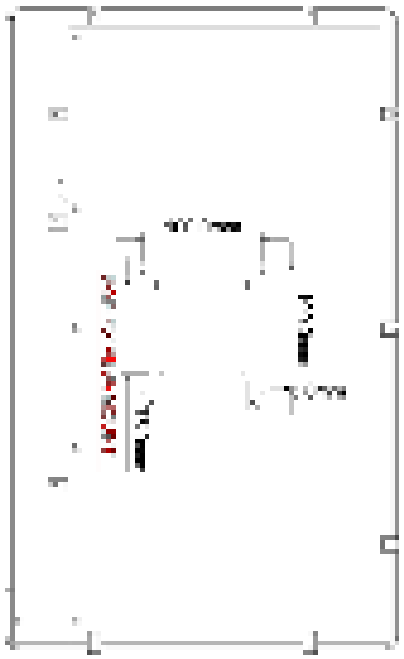


LPC-P190S Drawing

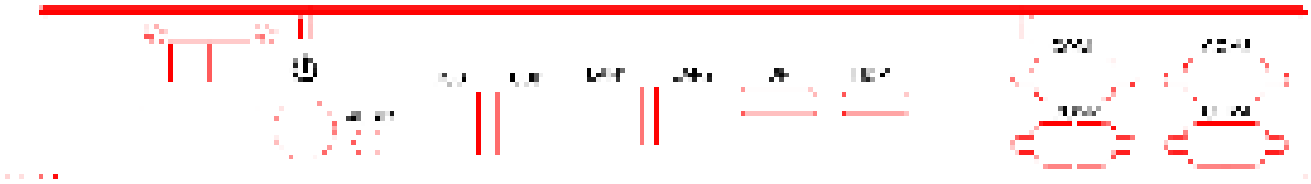


LPC-P215W Drawing

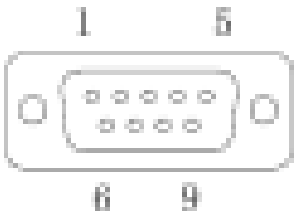




1.4 General Rear IO Placement



COM 1 is RS-485 as below pin definition, adjustable to RS-422 by BIOS



Pin 1 TXD-
Pin 2 TXD+
Pin 3 RXD-
Pin 4 RXD+
Pin 5 GND

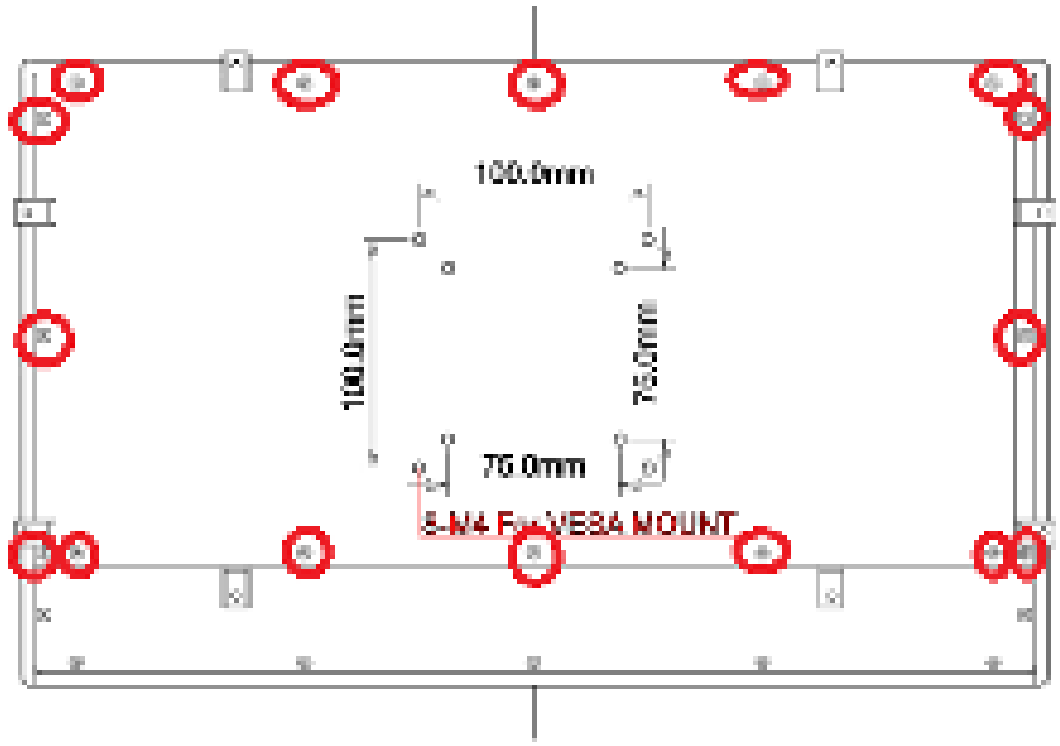
Power input terminal block pin definition is as below.

1.5 Front View of LPC- Pcap Series

1.6 Rear View of LPC- Pcap Series

1.7 Installation of HDD (Below example is LPC-P185W)

1.7.1 Remove screws from below red circles.



Notice : below screws located in right and left side should be removed as well.

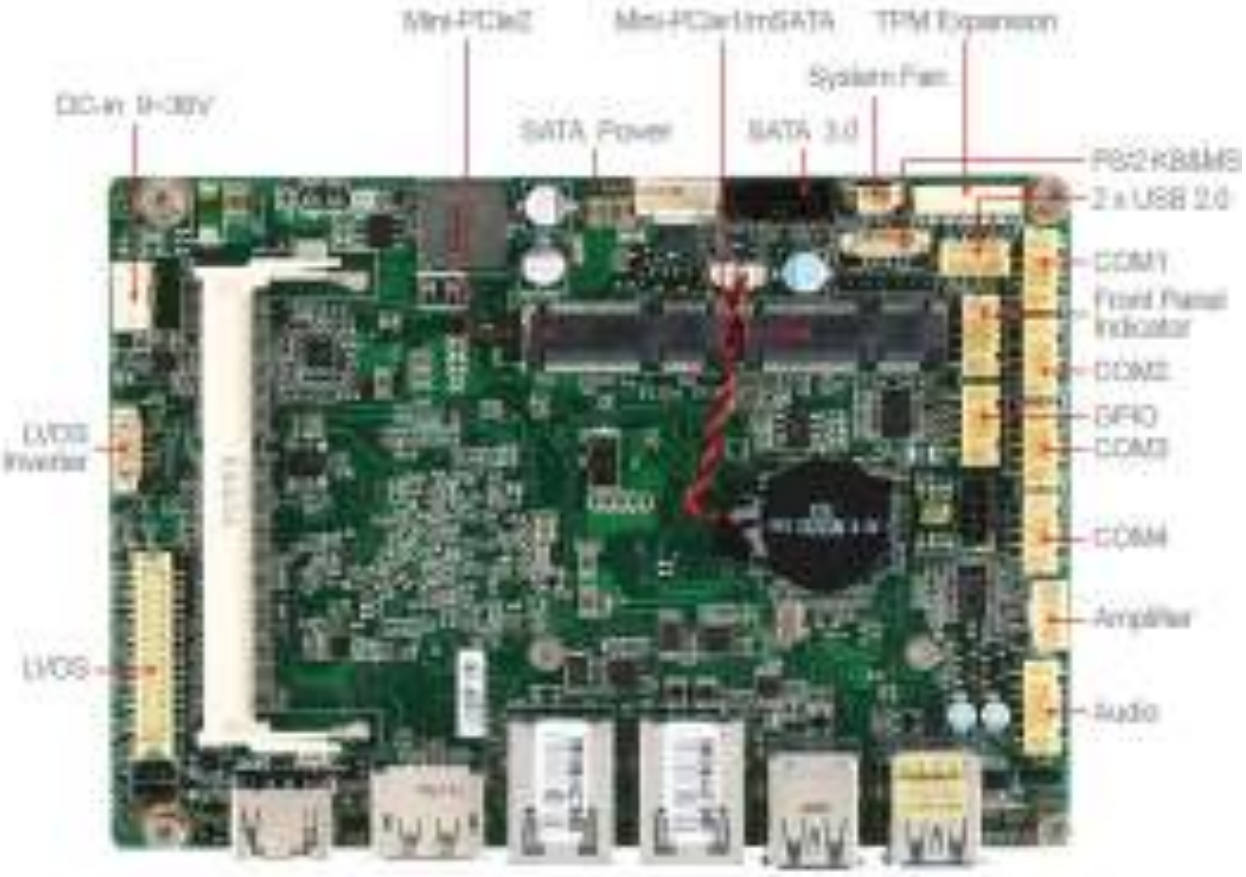
1.7.2 After remove the casing, we will see as below.

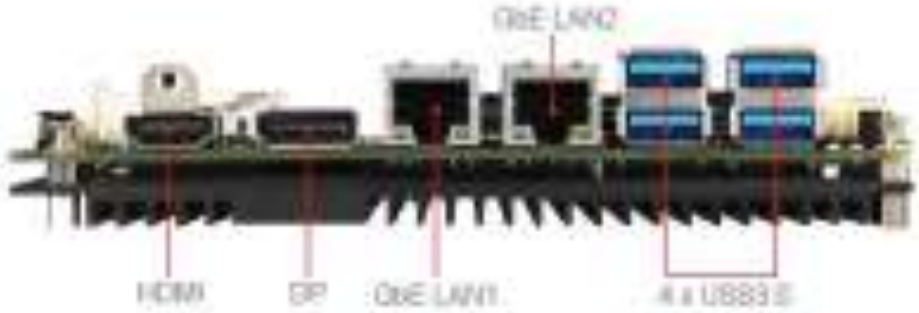
- HDD is designed to fix with mounting bracket.
- DRAM is located the bottom side of main board, as a result, we strongly suggest our client to purchasing DRAM from ELGENS in order to save time & labor cost, and avoid the warranty issue.

Chapter 2 Main Board Introduction

2.1 Mainboard Specification

2.1.1: Mainboard Overview





2.1.2: Mainboard Dimensions-TOP Side

2.1.3: Mainboard Dimensions- IO side

2.1.4: Mainboard Specifications.

Mainboard Specifications	
Board Size	146 mm x 102 mm (3.5-inch size)
Processor	Intel® Celeron® N3160 Processor
Chipset	Integrated in SoC
Memory Support	1 SO-DIMM slot for single-channel DDR3L 1600MHz Up to 8GB

Super I/O	Fintek F81866AD-I
BIOS	AMIBIOS
Storage	1 x SATA 6Gb/s port 1 x mSATA 6Gb/s slot (shared with MINI_PCIE1)
USB	2 x USB 2.0 (2 x internal) 4 x USB 3.0 (4 x rear)
Serial	4 x COM (internal) COM1: RS-232/422/485, 0V/5V/12V COM2~4: RS-232
Network	2 x Realtek RTL8111G GbE LAN
Graphics	HD Graphics integrated in Intel® processor LVDS up to 1920 x 1200 @ 60 Hz HDMI up to 2560 x 1600 @ 60 Hz, 3840 x 2160 @ 30 Hz DisplayPort up to 2560 x 1600 @ 60 Hz, 3840 x 2160 @ 30 Hz Supports three independent displays: LVDS + HDMI + Display Port
Battery	Support CR2477 Li battery by 2-pin header
Audio	Realtek® ALC887-VD2-CG HD Audio Codec 1 x Front audio connector 1 x Amplifier connector
Keyboard /Mouse	1x PS2 keyboard/mouse by 1x6 box pin header
Expansion Bus	2 x Full-size (one w/ mSATA)
Power Management	DC12V~36V input 1 x 2-pin power input connector
Rear Panel I/O	1 x HDMI port 1 x DisplayPort 2 x RJ45 GbE LAN ports 4 x USB 3.0 ports
Watchdog Timer	Software programmable 1 – 255 second by Super I/O
Operation Temperature	0~60 Degree
Humidity	10% - 90%, non-condensing, operating
EMI/EMS	Meet CE/FCC class A

2.2 Jumpers Setting and Connectors

Power Supply

DC-In Power Connector: JPWR1

This connector is used to provide power to the motherboard.

SATA Power Connector: JPW1

This connector is used to provide power to SATA devices.

Connector

Fan Power Connector: SYSFAN1

The fan power connector supports system cooling fan with +12V. When connecting the wire to the connectors, always note that the red wire is the positive and should be connected to the +12V; the black wire is Ground and should be connected to GND. If the motherboard has a System Hardware Monitor chipset onboard, you must use a specially designed fan with speed sensor to take advantage of the CPU fan control.

Serial ATA Connector: SATA1

This connector is a high-speed Serial ATA interface port. Each connector can connect to one Serial ATA device.

Important

Please do not fold the SATA cable into a 90-degree angle. Otherwise, data loss may occur during transmission.

Front Panel Connector: JFP1

This front panel connector is provided for electrical connection to the front panel switches & LEDs and is compliant with Intel Front Panel I/O Connectivity Design Guide.

Front Audio Connector: JAUD1

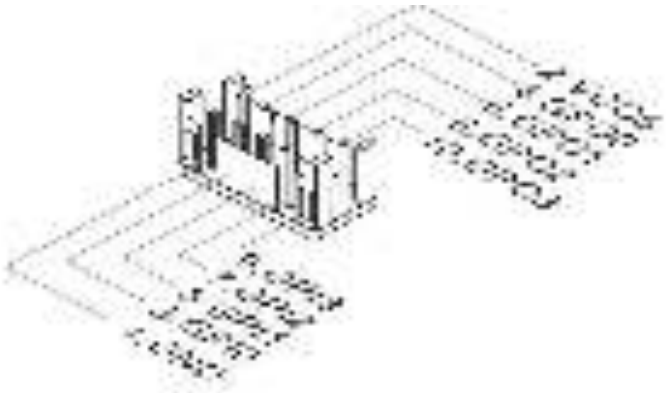
This connector allows you to connect the front panel audio and is compliant with Intel Front Panel I/O Connectivity Design Guide.

Audio Amplifier Connector: JAMP1

The connector is used to connect audio amplifiers to enhance audio performance.

GPIO Connector: JGPIO1

This connector is provided for the General-Purpose Input/Output (GPIO) peripheral module.



RS232 Serial Port Connector: JCOM2, JCOM3, JCOM4

This connector is a 16550A high speed communications port that sends/receives 16 bytes FIFOs. You can attach serial devices to it through the optional serial port bracket.

PIN	SIGNAL	DESCRIPTION
1	[illegible]	[illegible]
2	[illegible]	[illegible]
3	[illegible]	[illegible]
4	[illegible]	[illegible]
5	GND	[illegible]
6	[illegible]	[illegible]
7	[illegible]	[illegible]
8	[illegible]	[illegible]
9	[illegible]	[illegible]

RS232/422/485 Serial Port Connector: JCOM1

This connector is a 16550A high speed communications port that sends/receives 16 bytes FIFOs. You can attach a serial device to it through an optional serial port bracket.

RS232

PIN	SIGNAL	DESCRIPTION
1		
2		
3		
4		
5		
6		
7		
8		
9		

RS422

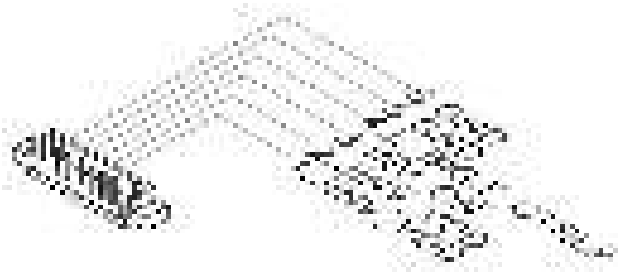
PIN	SIGNAL	DESCRIPTION
1		
2		
3		
4		
5		
6		
7		
8		
9		

RS485

PIN	SIGNAL	DESCRIPTION
1		
2		
3		
4		
5		
6		
7		
8		
9		

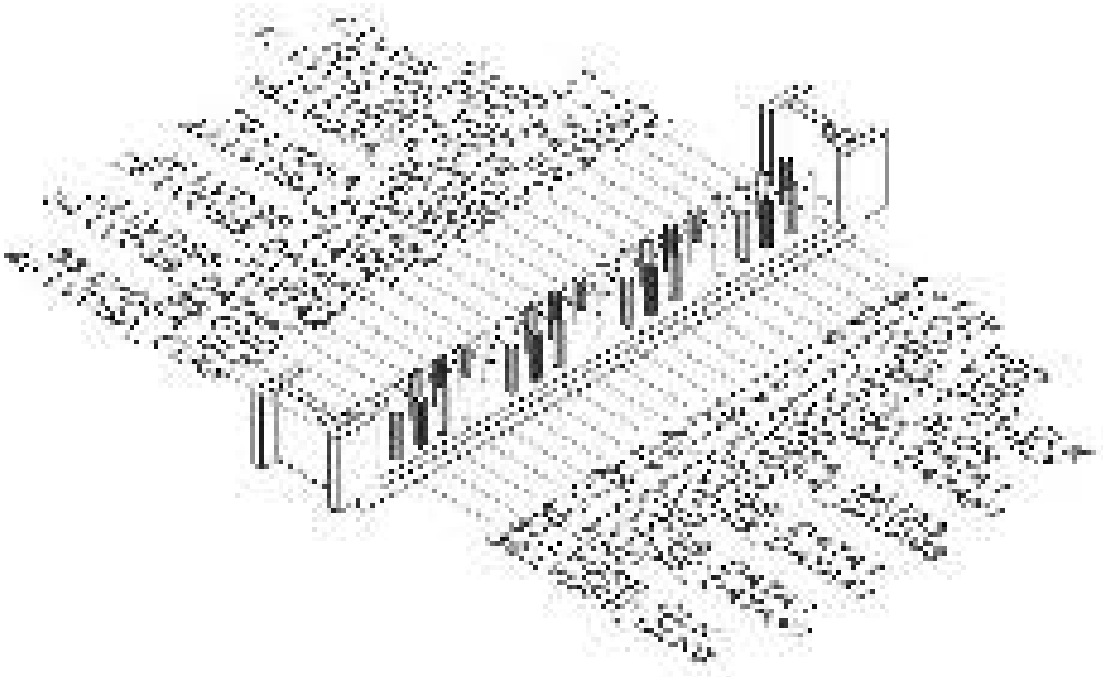
LVDS Inverter Connector: JINVDD1

The connector is provided for LCD backlight options.



LVDS Connector: JLVDS1

The LVDS (Low Voltage Differential Signal) connector provides a digital interface typically used with flat panels. After connecting an LVDS interface flat panel to the JLVDS1, be sure to check the panel datasheet and set the LVDS jumper to proper power voltage.



Important

Pin 12 is a detect pin. When using a customized LVDS cable, pin 12 should be asignal ground with a low impedance. Otherwise, LVDS will not function.

Keyboard/Mouse Connector: JKBMS1

This connector is provided to connect a keyboard and a mouse.

USB 2.0 Header: JUSB1

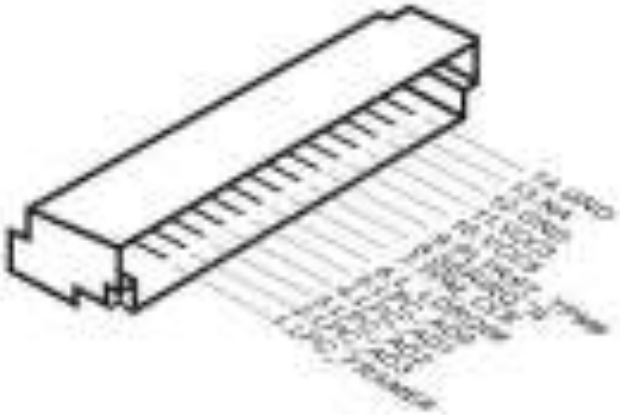
This connector, compliant with Intel I/O Connectivity Design Guide, is ideal for connecting high-speed USB interface peripherals such as USB HDD, digital cameras, MP3 players, printers, modems and the like.

Important

Note that the pins of VCC and GND must be connected correctly to avoid possible damage.

LPC Debug Port Connector: JLPC1 (With TPM Support)

This connector works as LPC debug port and supports TPM modules through an adapter.



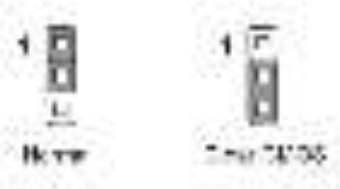
Jumper

Important

Avoid adjusting jumpers when the system is on; it will damage the motherboard.

Clear CMOS Jumper: JCMOS1

There is a CMOS RAM onboard that has a power supply from an external battery to keep the data of system configuration. With the CMOS RAM, the system can automatically boot OS every time it is turned on. If you want to clear the system configuration, set the jumper to clear data.



Important

You can clear CMOS by shorting 2-3 pin while the system is off. Then return to1-2 pin position. Avoid clearing the CMOS while the system is on; it will damage the motherboard.

AT/ATX Select Jumper: JAT1

This jumper allows users to select between AT and ATX power.

Serial Port Power Jumper: JCOMP1

The jumper specifies the operation voltage of the specified serial port.

LVDS Power Jumper: JVDD1

Use this jumper to specify the operation voltage of the LVDS display.

LVDS Inverter Power Jumper: JINV1

Use this jumper to specify the operation voltage of the LVDS inverter.

Slot

Mini-PCIe (Peripheral Component Interconnect Express) Slot

The Mini-PCIe slot is provided for WiFi modules, Bluetooth modules, TV tuner cards and other Mini-PCIe cards.

- **MINI_PCIE1** supports **Mini-PCIe** and **mSATA** cards.
- **MINI_PCIE2** only supports **Mini-PCIe** cards.

Important

When adding or removing expansion cards, make sure that you unplug the power supply first. Meanwhile, read the documentation for the expansion card to config- ure any necessary hardware or software settings for the expansion card, such as jumpers, switches or BIOS configuration.

Chapter 3 BIOS Setup

3.1 BIOS setup

This chapter provides information on the BIOS Setup program and allows users to configure the system for optimal use:

Users may need to run the Setup program when:

- An error message appears on the screen at system startup and requests users to run SETUP.
- Users want to change the default settings for customized features.

Important

Please note that BIOS update assumes technician-level experience.

As the system BIOS is under continuous update for better system performance, the illustrations in this chapter should be held for reference only.

Entering Setup

Power on the computer and the system will start POST (Power On Self Test) process. When the message below appears on the screen, press <DEL> or <F2> key to enter Setup.

Press <DEL> or <F2> to enter SETUP

If the message disappears before you respond and you still wish to enter Setup, restart the system by turning it OFF and On or pressing the RESET button.You may also restart the system by simultaneously pressing <Ctrl>, <Alt>, and<Delete> keys.

Important

The items under each BIOS category described in this chapter are under continuous update for better system performance. Therefore, the description may be slightly different from the latest BIOS and should be held for reference only.

Control Keys

← →	Select Screen
↓ ↑	Select Item
Enter	Select
+,-	Change Option
F1	General Help
F7	Previous Values
F9	Optimized Defaults
F10	Save & Exit
ESC	Exit

Getting Help

After entering the Setup menu, the first menu you will see is the Main Menu.

Main Menu

The main menu lists the setup functions you can make changes to. You can use the arrow keys (↑↓) to select the item. The on-line description of the highlighted setup function is displayed at the bottom of the screen.

Sub-Menu

If you find a right pointer symbol appears to the left of certain fields that means a sub-menu can be launched from this field. A sub-menu contains additional options for a field parameter. You can use arrow keys (↑↓) to highlight the field and press <Enter> to call up the sub-menu. Then you can use the control keys to enter values and move from field to field within a sub-menu. If you want to return to the main menu, just press the <Esc >.

General Help <F1>

The BIOS setup program provides a General Help screen. You can call up this screen from any menu by simply pressing <F1>. The Help screen lists the appropriate keys to use and the possible selections for the highlighted item. Press <Esc> to exit the Help screen.

The Menu Bar

- **Main**

Use this menu for basic system configurations, such as time, date, etc.

- **Advanced**

Use this menu to set up the items of special enhanced features.

- **Boot**

Use this menu to specify the priority of boot devices.

- **Security**

Use this menu to set supervisor and user passwords.

- **Chipset**

This menu controls the advanced features of the onboard chipsets.

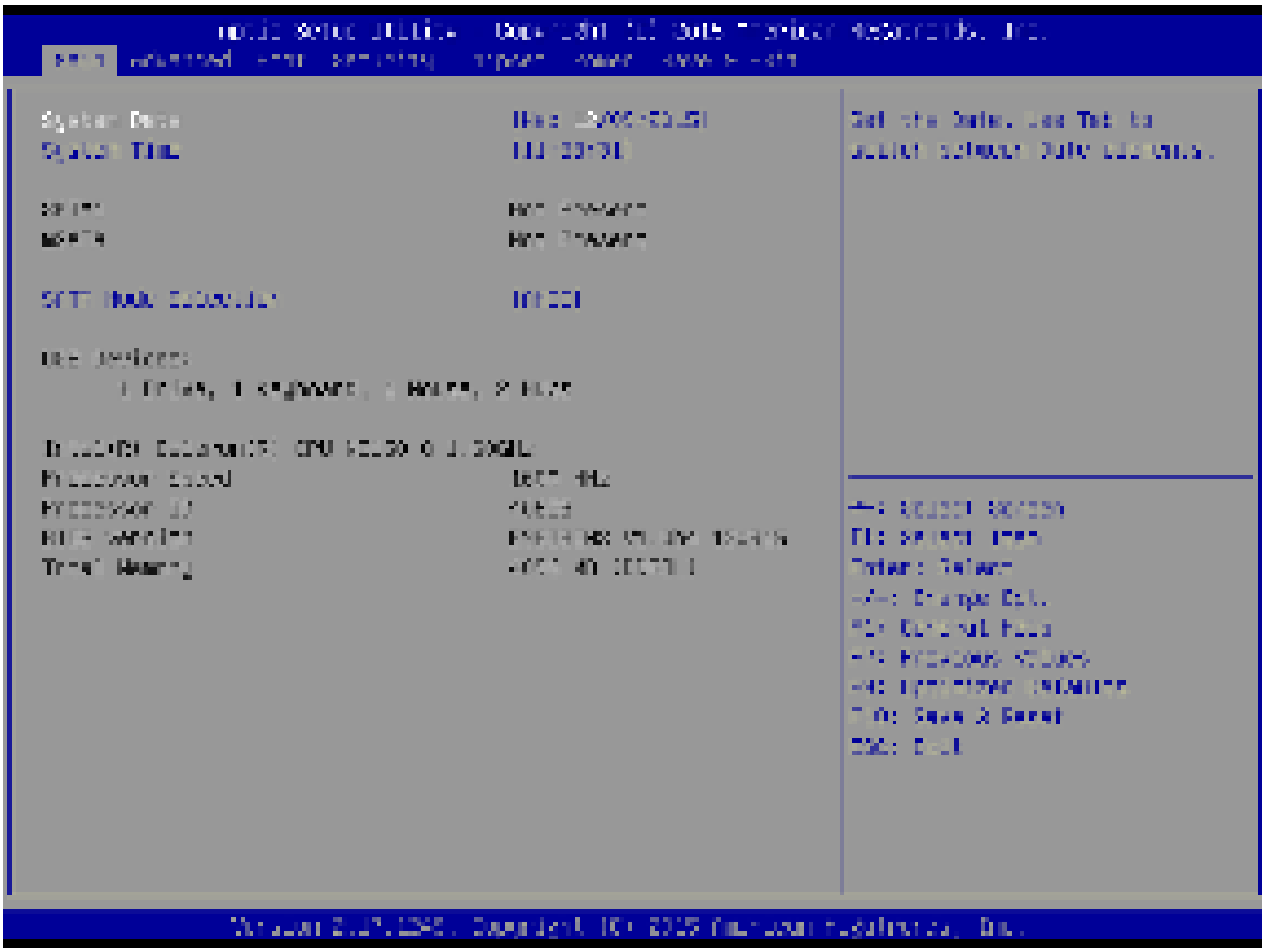
- **Power**

Use this menu to specify your settings for power management.

- **Save & Exit**

This menu allows you to load the BIOS default values or factory default settings into the BIOS and exit the BIOS setup utility with or without changes.

Main



▸ **System Date**

This setting allows you to set the system date. The date format is <Day>, <Month>,<Date> <Year>.

▸ **System Time**

This setting allows you to set the system time. The time format is <Hour> <Minute> <Second>.

▸ **SATA Mode Selection**

This setting specifies the SATA controller mode.

Advanced

▸ **Full Screen Logo Display**

This BIOS feature determines if the BIOS should hide the normal POST messages with the motherboard or system manufacturer's full-screen logo.

When it is enabled, the BIOS will display the full-screen logo during the boot-up sequence, hiding normal POST messages.

When it is disabled, the BIOS will display the normal POST messages, instead of the full-screen logo. Please note that enabling this BIOS feature often adds 2-3 seconds of delay to the booting sequence. This delay ensures that the logo is displayed for a sufficient amount of time. Therefore, it is recommended that you disable this BIOS feature for a faster boot-up time.

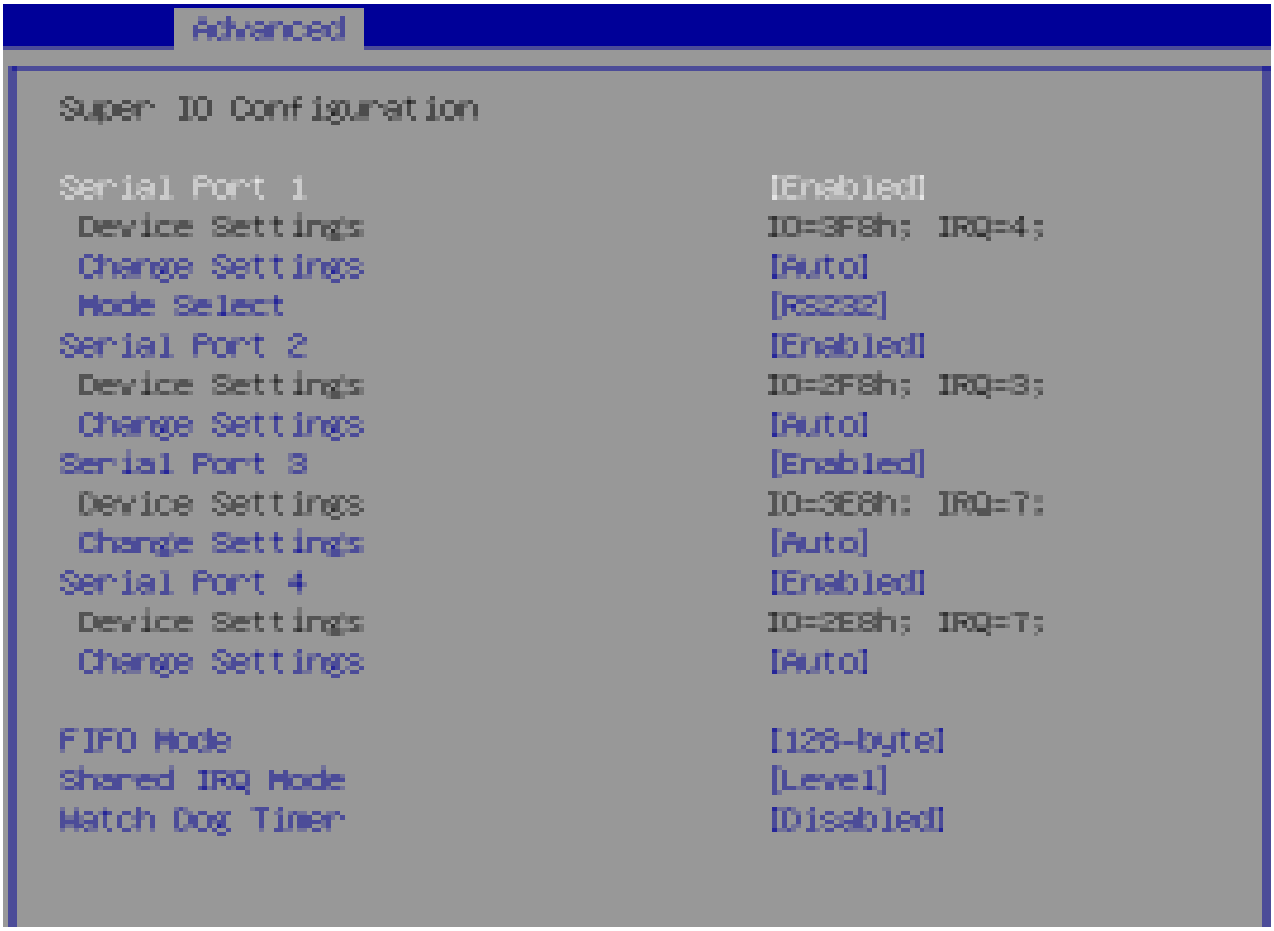
▸ **Bootup NumLock State**

This setting is to set the Num Lock status when the system is powered on. Setting to [On] will turn on the Num Lock key when the system is powered on. Setting to [Off] will allow users to use the arrow keys on the numeric keypad.

▸ **Option ROM Messages**

This item is used to determine the display mode when an optional ROM is initialized during POST. When set to [Force BIOS], the display mode used by AMI BIOS is used. Select [Keep Current] if you want to use the display mode of optional ROM.

- **Super IO Configuration**



- **Serial Port 1/ 2/ 3/ 4**

This setting enables/disables the specified serial port.

- **Change Settings**

This setting is used to change the address & IRQ settings of the specified serial port.

- **Mode Select**

Select an operation mode for the specified serial port.

- **FIFO Mode**

This setting controls the FIFO data transfer mode.

- **Shared IRQ Mode**

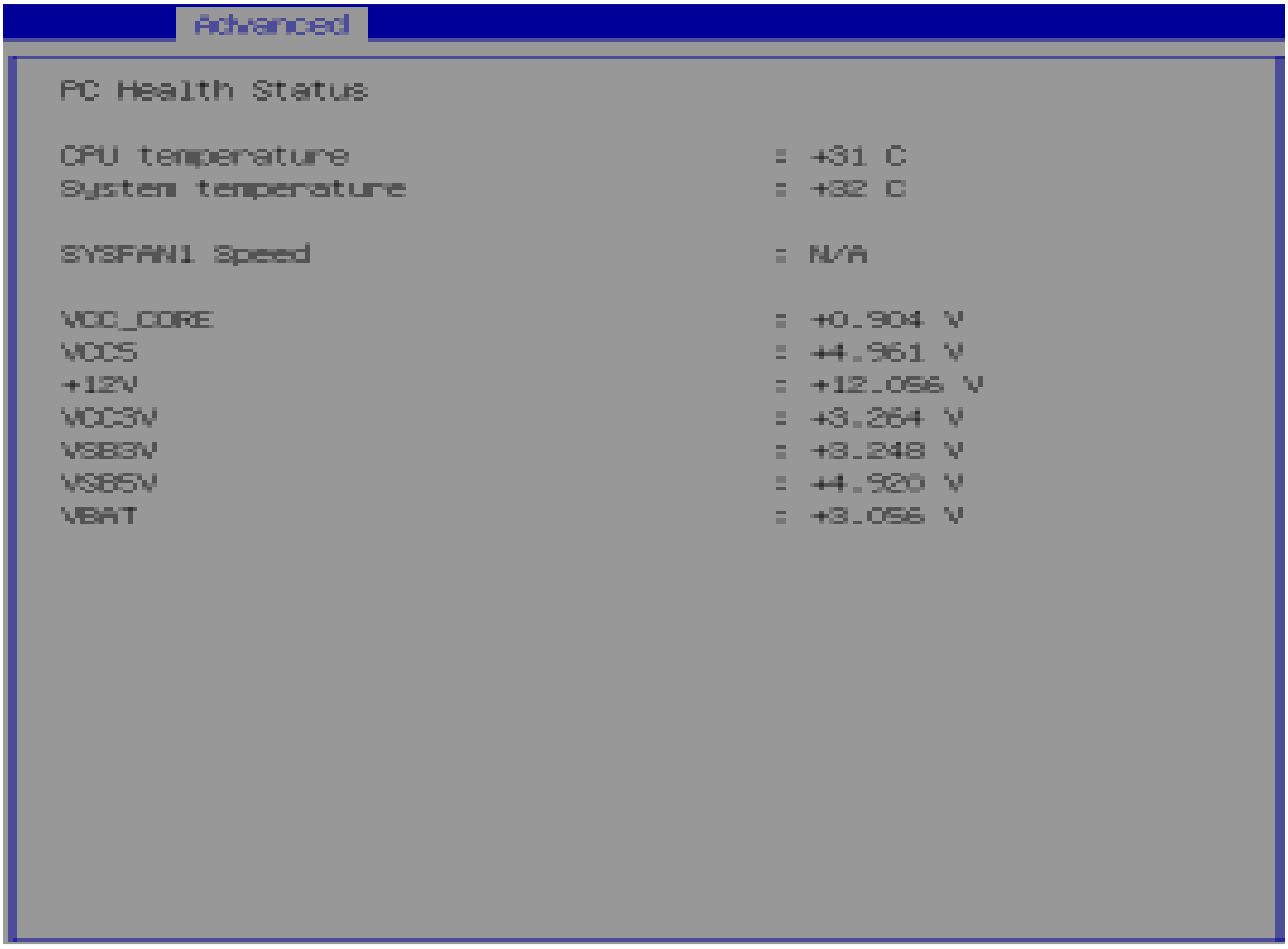
This setting provides the system with the ability to share interrupts among its serial ports.

- **Watch Dog Timer**

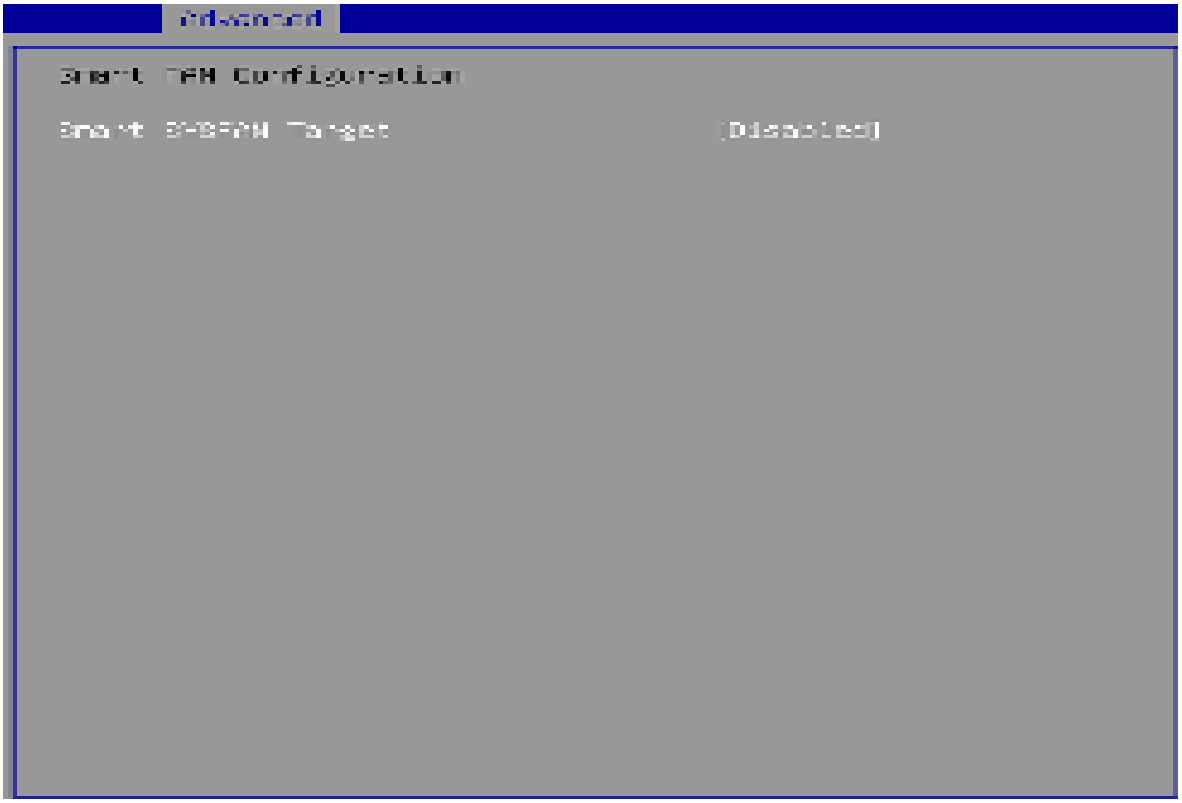
You can enable the system watch-dog timer, a hardware timer that generates a reset when the software that it monitors does not respond as expected each time the watch dog polls it.

- **H/W Monitor**

These items display the current status of all monitored hardware devices/ components such as voltages, temperatures and all fans' speeds.



- **Smart Fan Configuration**



▸ **Smart SYSFAN Target**

This setting enables/disables the Smart Fan function. Smart Fan is an excellent feature which will adjust the CPU/system fan speed automatically depending on the current CPU/system temperature, avoiding the overheating to damage your system.

▸ **CPU Configuration**

▸ **Intel Virtualization Technology**

Virtualization enhanced by Intel Virtualization Technology will allow a platform to run multiple operating systems and applications in independent partitions. With virtualization, one computer system can function as multiple “Virtual” systems.

▸ **EIST**

EIST (Enhanced Intel SpeedStep Technology) allows the system to dynamically adjust processor voltage and core frequency, which can result in decreased average power consumption and decreased average heat production. When disabled, the processor will return the actual maximum CPUID input value of the processor when queried.

- **PCI/PCIE Device Configuration**

- **Legacy USB Support**

Set to [Enabled] if you need to use any USB 1.1/2.0 device in the operating system that does not support or have any USB 1.1/2.0 driver installed, such as DOS and SCO Unix.

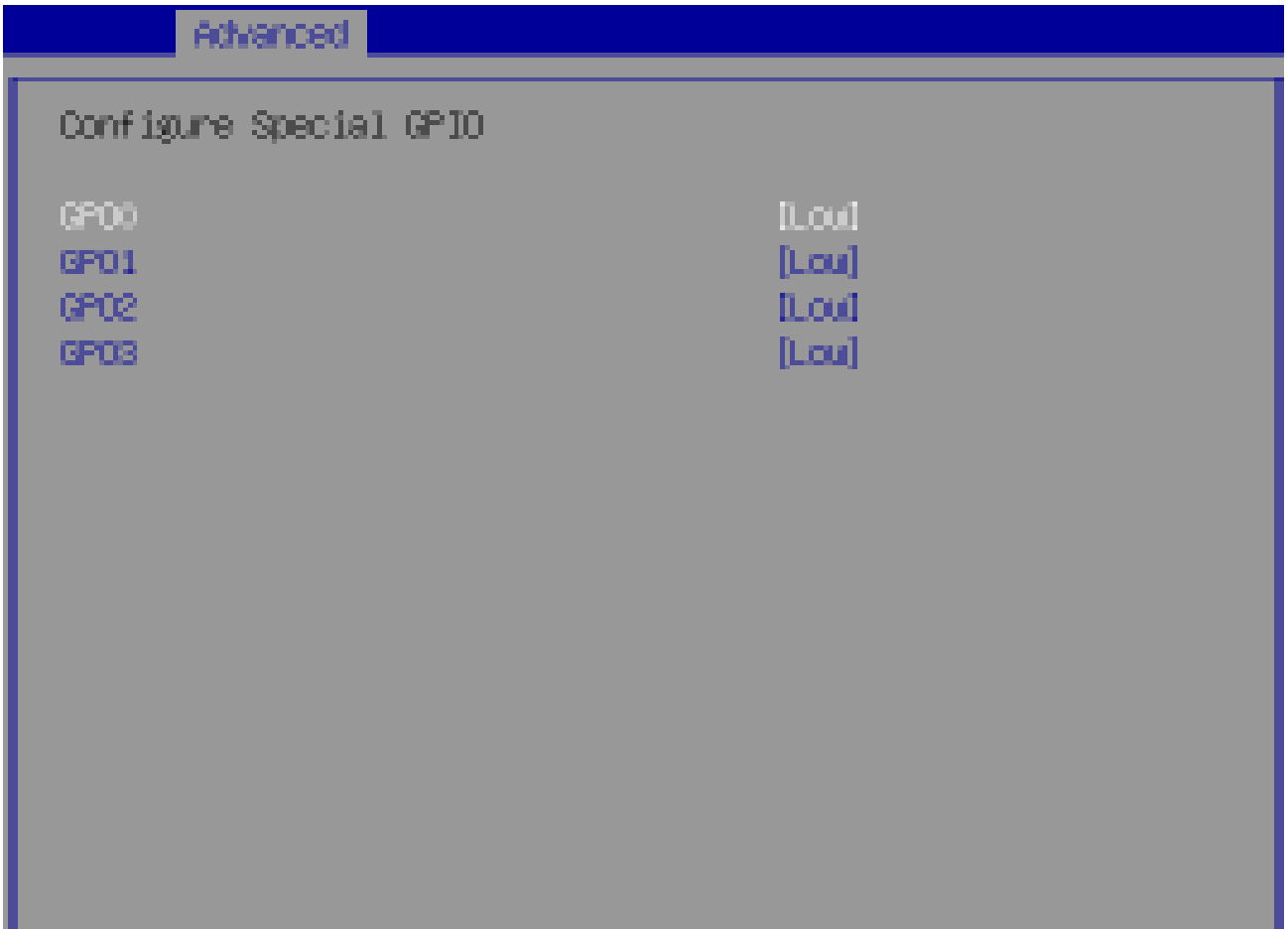
- **Audio Controller**

This setting enables/disables the onboard audio controller.

- **Launch OnBoard LAN OpROM**

These settings enable/disable the initialization of the onboard/onchip LAN Boot ROM during bootup. Selecting [Disabled] will speed up the boot process.

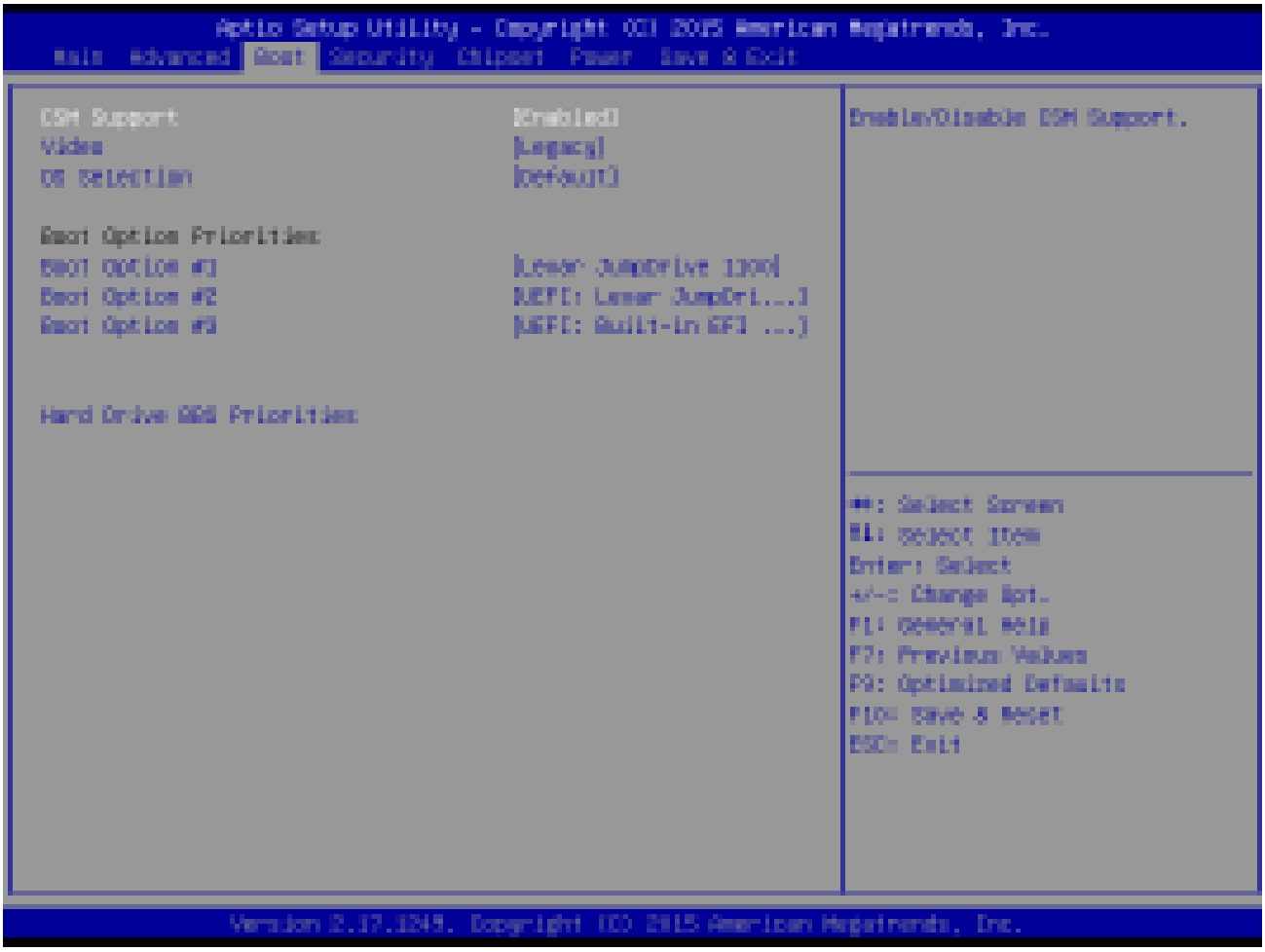
▶ **GPIO Group Configuration**



▶ **GPO0 ~ GPO3**

These settings control the operation mode of the specified GPIO.

Boot



- **CSM Support**

This setting enables/disables the support for Compatibility Support Module, a part of the Intel Platform Innovation Framework for EFI providing the capability to support legacy BIOS interfaces.

- **Video**

This setting selects the video mode.

- **OS Selection**

This setting allows users to select the Operating System.

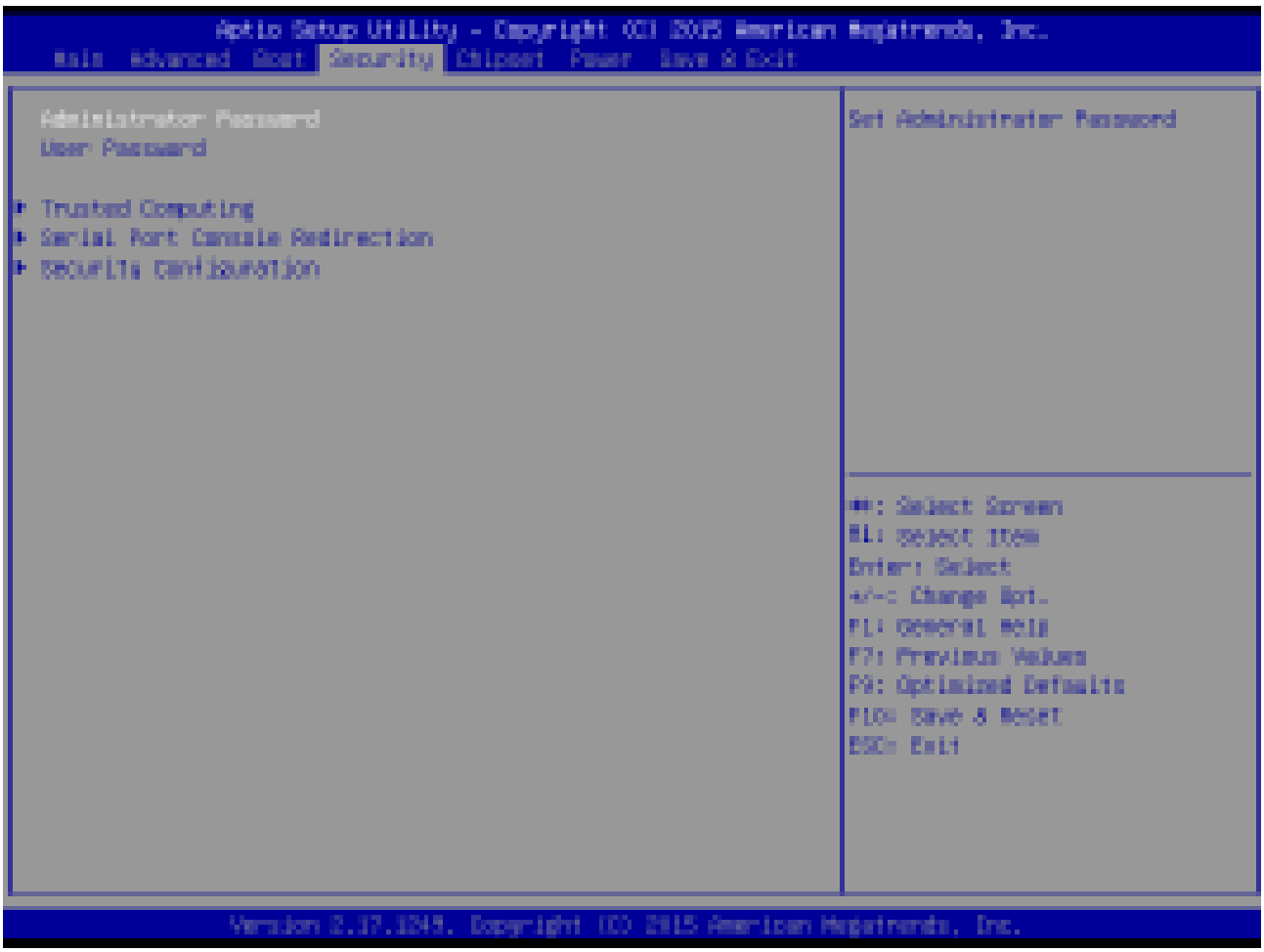
- **Boot Option Priorities**

This setting allows users to set the sequence of boot devices where BIOS attempts to load the disk operating system.

- **Hard Drive BBS Priorities**

This setting allows users to set the priority of the specified devices. First press <Enter> to enter the sub-menu. Then you may use the arrow keys (↑↓) to select the desired device, then press <+>, <-> or <PageUp>, <PageDown> key to move it up/down in the priority list.

Security



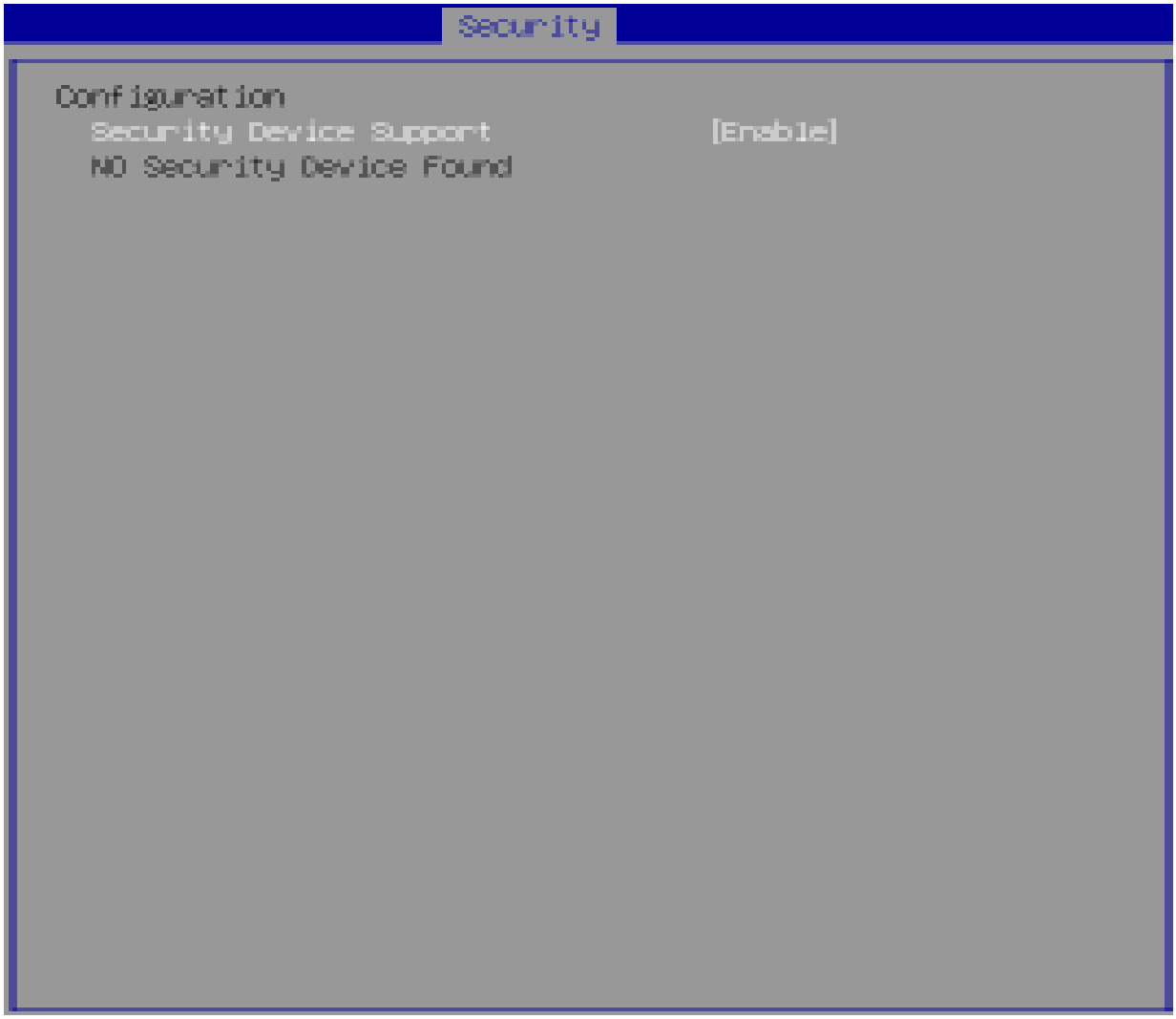
- **Administrator Password**

Administrator Password controls access to the BIOS Setup utility.

- **User Password**

User Password controls access to the system at boot and to the BIOS Setup utility.

Trusted Computing



Security Device Support

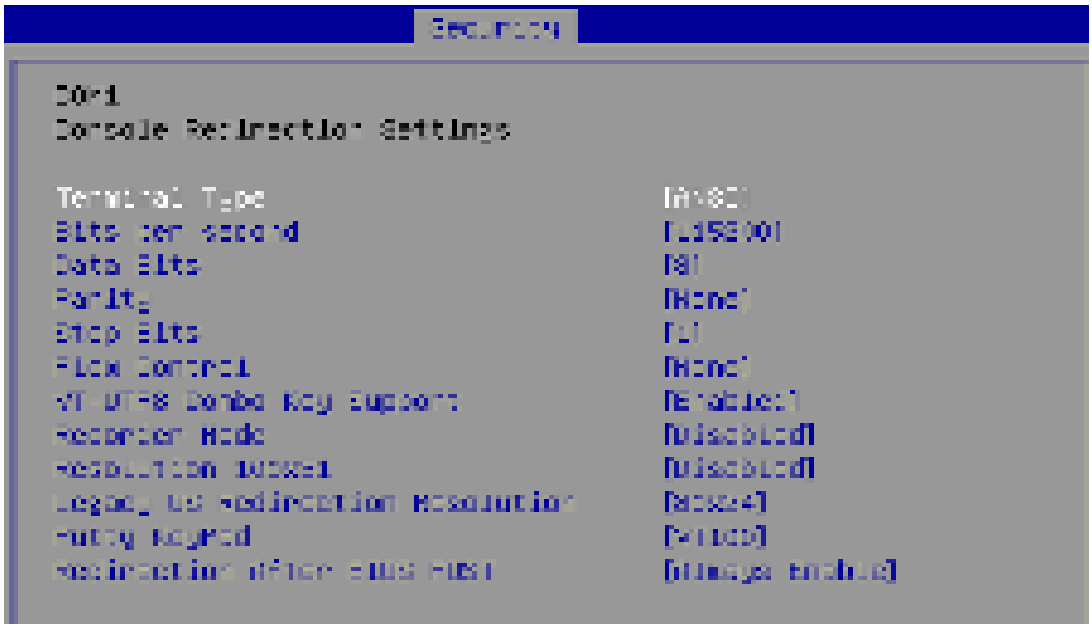
This setting enables/disables BIOS support for security device. When set to [Disable], the OS will not show security device. TCG EFI protocol and INT1A interface will not be available.

▶ **Serial Port Console Redirection**

▶ **Console Redirection**

Console Redirection operates in host systems that do not have a monitor and keyboard attached. This setting enables/disables the operation of console redirection. When set to [Enabled], BIOS redirects and sends all contents that should be displayed on the screen to the serial COM port for display on the terminal screen. Besides, all data received from the serial port is interpreted as keystrokes from a local keyboard.

▶ **Console Redirection Settings**



▶ **Terminal Type**

To operate the system's console redirection, you need a terminal supporting ANSI terminal protocol and a RS-232 null modem cable connected between the host system and terminal(s). This setting specifies the type of terminal device for console redirection.

▶ **Bits per second, Data Bits, Parity, Stop Bits**

This setting specifies the transfer rate (bits per second, data bits, parity, stop bits) of Console Redirection.

▶ **Flow Control**

Flow control is the process of managing the rate of data transmission between two nodes. It's the process of adjusting the flow of data from one device to another to ensure that the receiving device can handle all of the incoming data. This is particularly important where the sending device is capable of sending data much faster than the receiving device can receive it.

▶ **VT-UTF8 Combo Key Support**

This setting enables/disables the VT-UTF8 combination key support for ANSI/VT100 terminals.

▶ **Recorder Mode, Resolution 100x31**

These settings enable/disable the recorder mode and the resolution 100x31.

▶ **Legacy OS Redirection Resolution**

This setting specifies the redirection resolution of legacy OS.

▶ **Putty Keypad**

PuTTY is a terminal emulator for Windows. This setting controls the numeric keypad for use in PuTTY.

▶ **Redirection After BIOS POST**

This setting determines whether or not to keep terminals' console redirection running after the BIOS POST has booted.

Security Configuration

- **TXE FW Version**

The setting shows the firmware information of the Intel Trusted Execution Engine (TXE).

- **TXE HMRFPO**

The setting enables/disables TXE HMRFPO (Host ME Region Flash Protection Override).

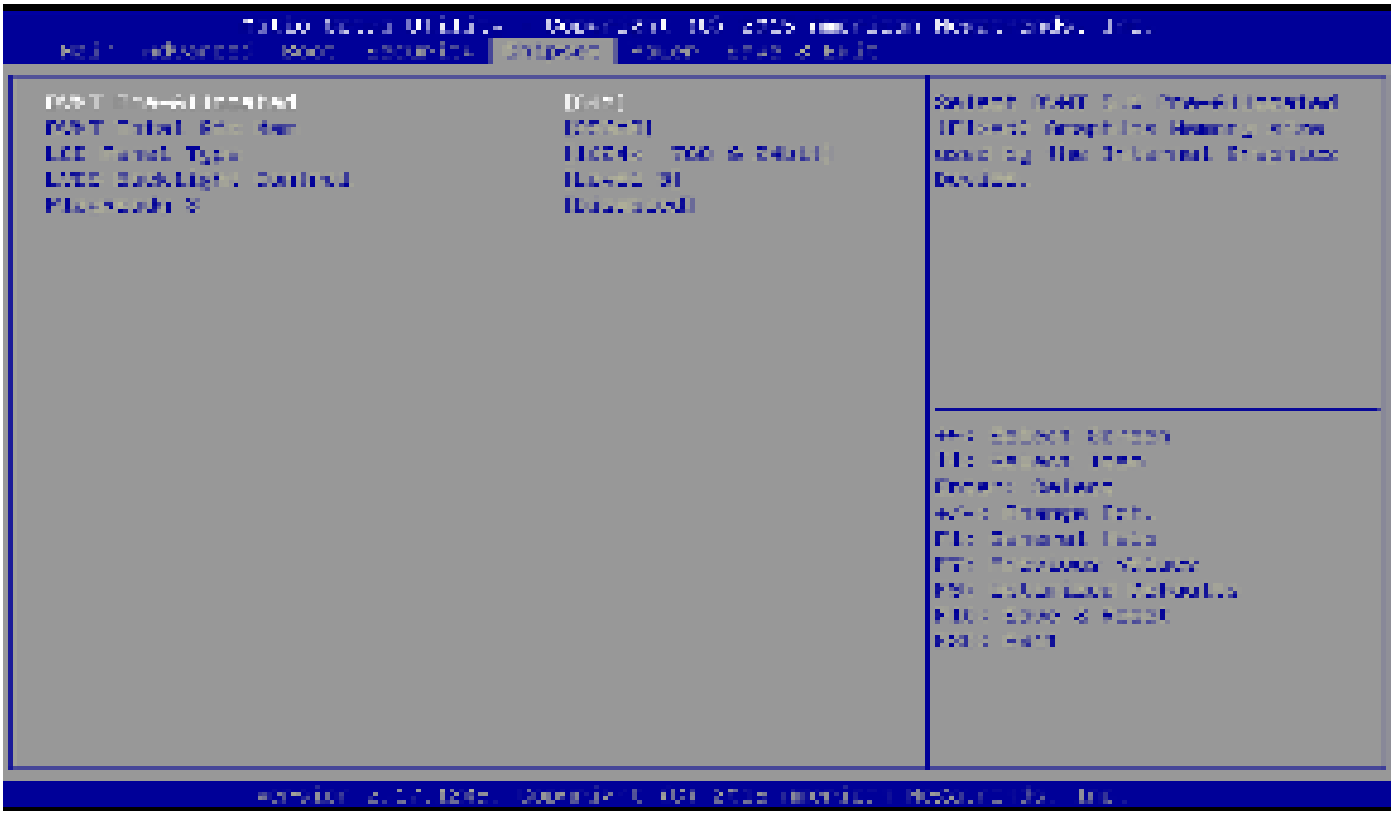
- **TXE Firmware Update**

This setting enables/disables TXE FW update.

- **TXE EOP Message**

This setting determines whether or not to send EOP (Exchange Online Protection) message before entering OS.

Chipset



- **DVMT Pre-Allocated**

This setting defines the DVMT pre-allocated memory. Pre-allocated memory is the small amount of system memory made available at boot time by the system BIOS for video. Pre-allocated memory is also known as locked memory. This is because it is "locked" for video use only and as such, is invisible and unable to be used by the operating system.

- **DVMT Total Gfx Mem**

This setting specifies the memory size for DVMT.

- **LCD Panel Type**

This setting specifies the LCD panel type.

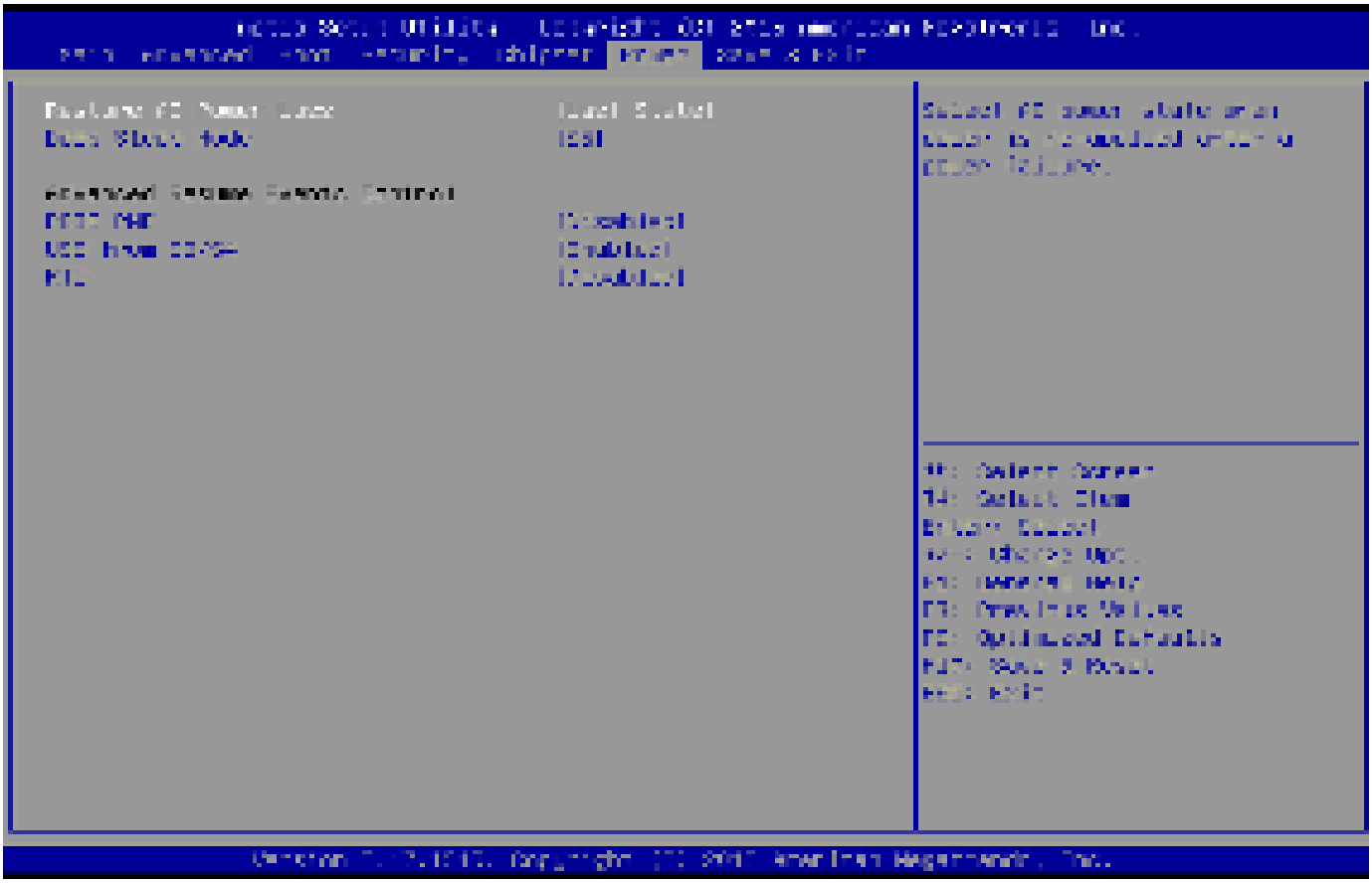
- **LVDS Backlight Control**

This setting controls the intensity of the LVDS backlight.

- **PlayReady 3 (for Windows 10 only)**

This setting enables/disables Microsoft's PlayReady 3 technology. PlayReady is a content protection technology from Microsoft that includes encryption, output protection and Digital Rights Management (DRM). Window's PlayReady 3.0 DRM can support 4K content but use more restrictive digital rights management technology to curb illegitimate streams at the same time.

Power



▸ **Restore AC Power Loss**

This setting specifies whether your system will reboot after a power failure or interrupt occurs. Available settings are:

[Power Off]	Leaves the computer in the power off state.
[Power On]	Leaves the computer in the power on state.
[Last State]	Restores the system to the previous status before power failure or interrupt occurred.

- **Deep Sleep Mode**

The setting enables/disables the Deep S5 power saving mode. S5 is almost the same as G3 Mechanical Off, except that the PSU still supplies power, at a minimum, to the power button to allow return to S0. A full reboot is required. No previous content is retained. Other components may remain powered so the computer can “wake” on input from the keyboard, clock, modem, LAN, or USB device.

** Advanced Resume Events Control **

- **PCIE PME**

This field specifies whether the system will be awakened from power saving modes when activity or input signal of onboard PCIE PME is detected.

- **USB from S3/S4**

The item allows the activity of the USB device to wake up the system from S3/ S4 sleep state.

- **RTC**

When [Enabled], your can set the date and time at which the RTC (real-time clock) alarm awakens the system from suspend mode.

Save & Exit

- **Save Changes and Reset**

Save changes to CMOS and reset the system.

- **Discard Changes and Exit**

Abandon all changes and exit the Setup Utility.

- **Discard Changes**

Abandon all changes.

- **Load Optimized Defaults**

Use this menu to load the default values set by the motherboard manufacturer specifically for optimal performance of the motherboard.

- **Save as User Defaults**

Save changes as the user's default profile.

- **Restore User Defaults**

Restore the user's default profile.

- **Launch EFI Shell from filesystem device**

This setting helps to launch the EFI Shell application from one of the available file system devices.

Chapter 4 USB 3.0 driver installation

SOP of USB 3.0 driver installation prior to Win 7 by Smart kit

Purpose:

The original Windows 7 is imcompatible with USB 3.0, the program “MSI Smart Tool Kits“ will help you to compile USB 3.0 driver into your original Windows 7, in order to avoid the system failure when you install OS. This tool can make your own bootable Windows 7 USB from your original Windows 7 disk.

Things need to prepare:

Prepare your Windows 7 DVD, and an USB disk at least 8Gb

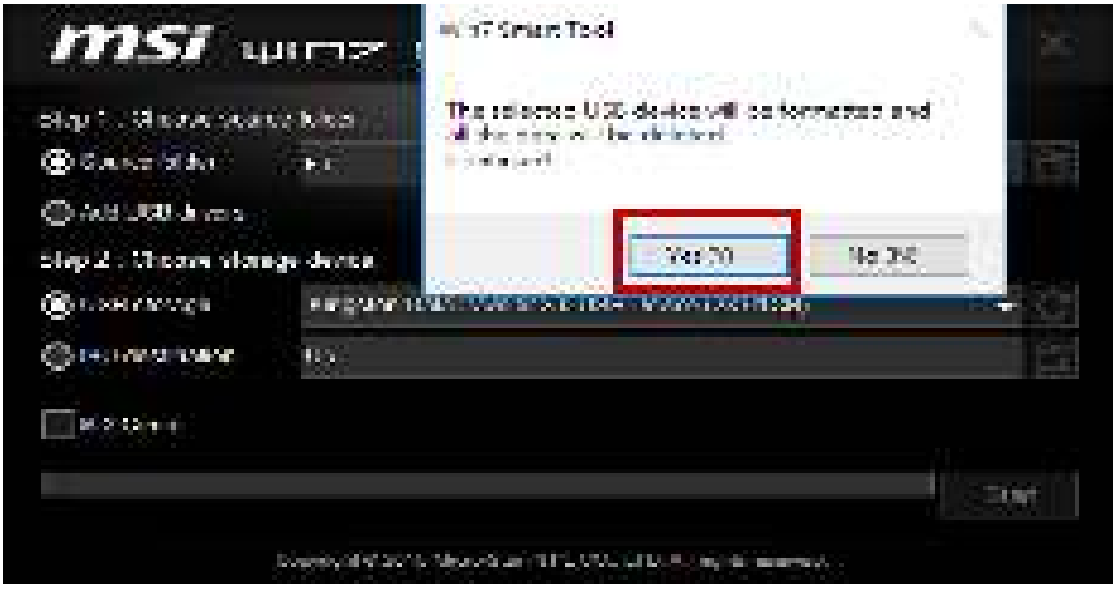
Put the DVD in the DVD-ROM and plug USB into your computer.

Please download “MSI Smart Tool Kits” from the website below:

https://drive.google.com/drive/u/0/folders/0B0ap8HaD1zCCOU5sN2cyZ1JMSjQ

MSI Smart Tool Kits

1. Click ”Source folder” choose the location of your Windows 7 disc.
2.choose ”USB storage” as bootable USB for your Windows 7
3.Click”Start”
4.Click”YES”



Once the status bar reach to 100%, withdraw the USB device and done.

Step A .

A-1. Plug your modified USB to USB 3.0 port, and keyboard

A-2. Then turn on the LPC series press “Delete” to enter BIOS mode,

A-3. In BIOS mode, go to “Boot” page and select “Hard Drive BBS Priorities”

A-4. Select your Modified USB disk as “Boot Option #1”

A-5. Then go to “Save & Exit” page choose “Save Changes and Reset”

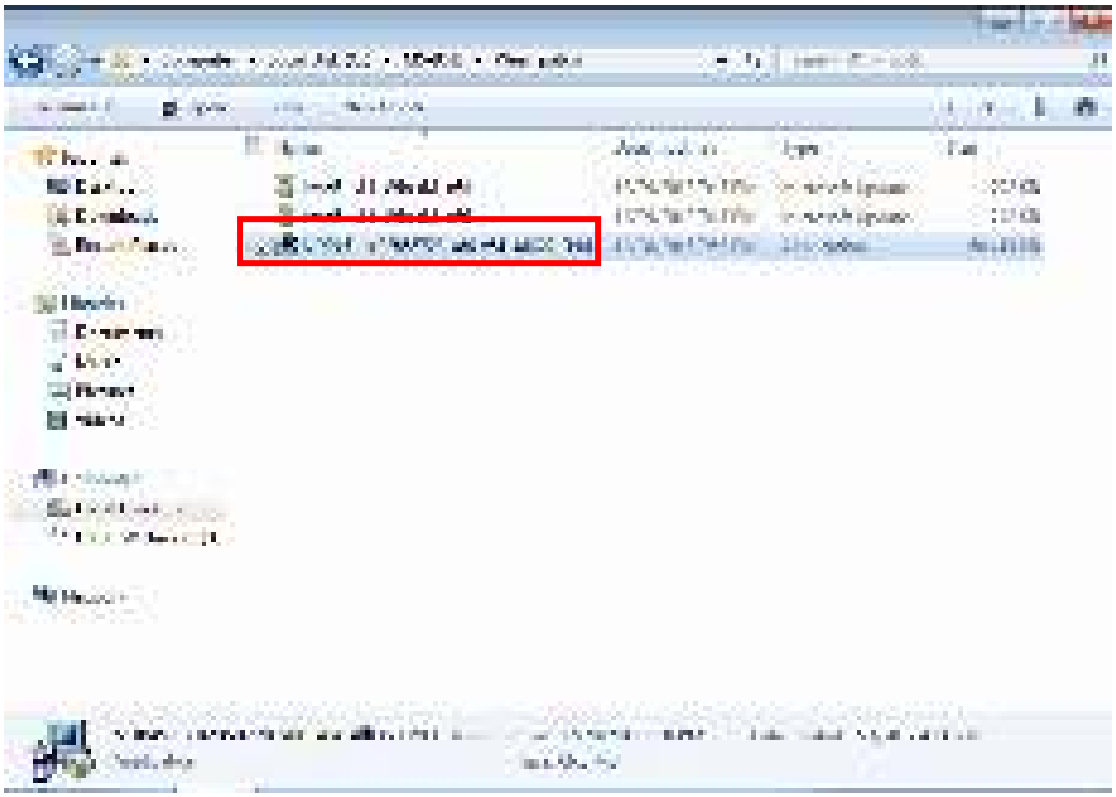
A-6. Then the Win 7 installation will appear on the screen. Now you can install Windows 7 with your keyboard through USB 3.0.

End

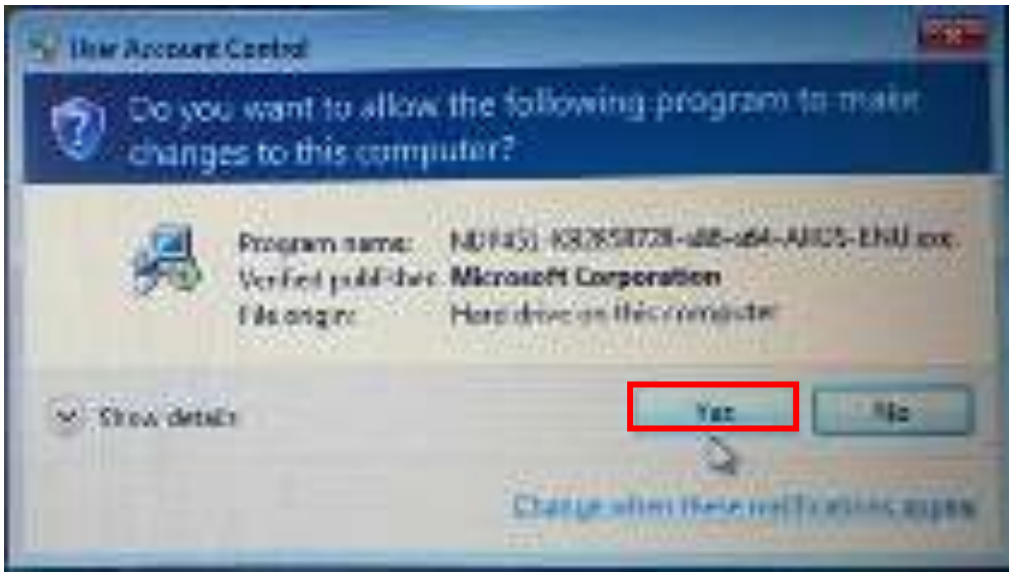
Chapter 5 Installation Drivers

1. Windows 7 Patch Setup

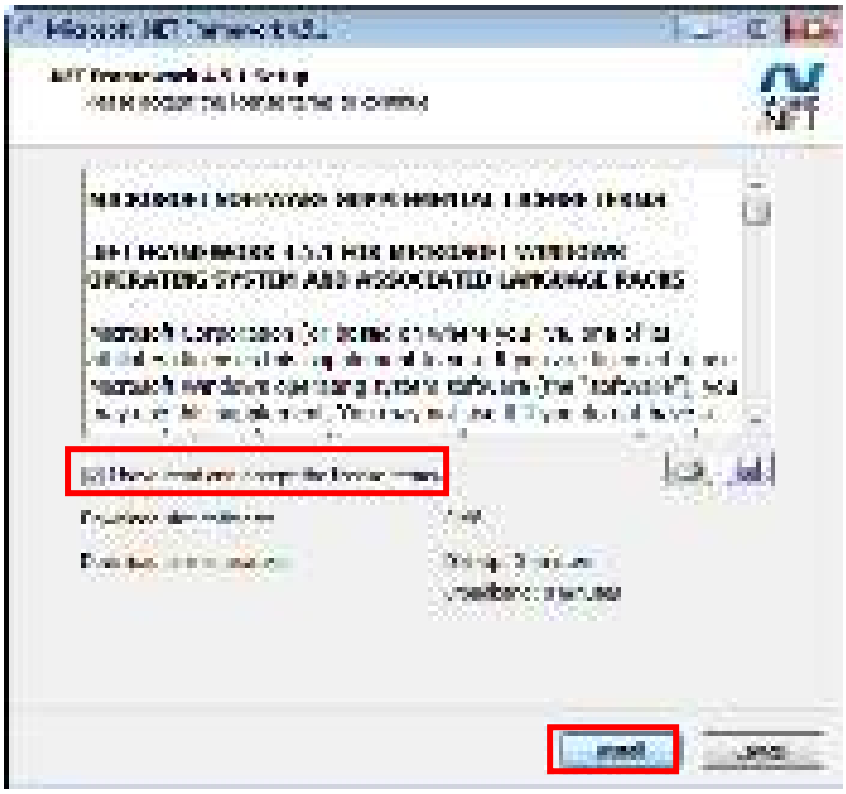
1.1. Go to X:\Win_patch，Choose” NDP451-KB2858728-x86-x64-AllOS-ENU.exe”



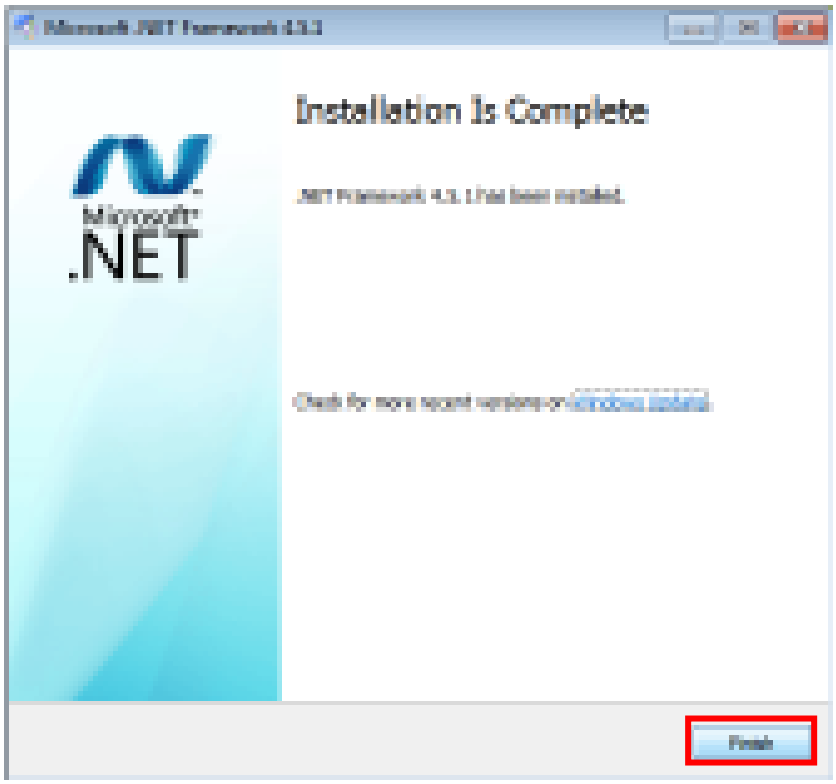
1.2. Choose ”Yes”



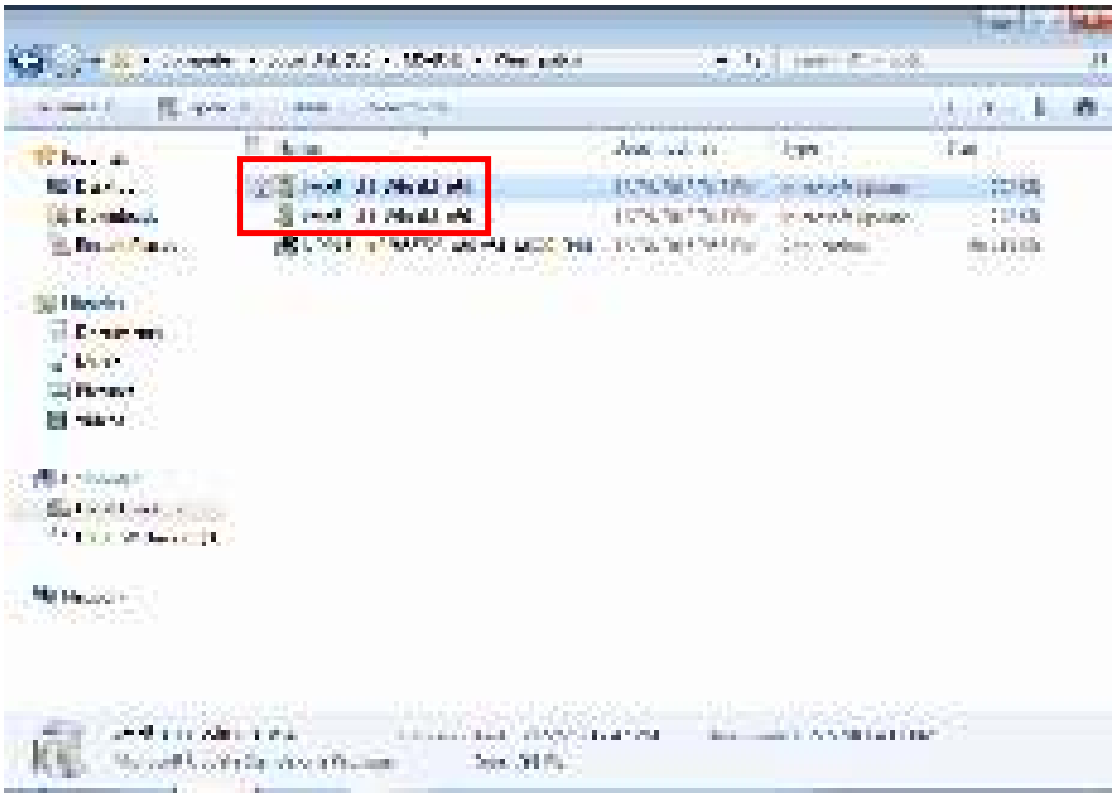
1.3. Choose”I have read and accept the license tems.” Then Choose ”Install”



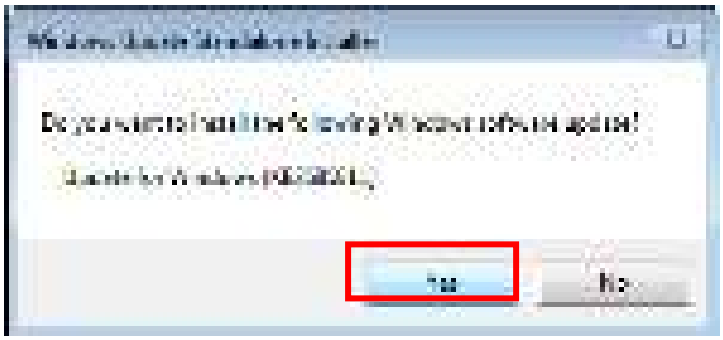
1.4. Then press ”Finish”



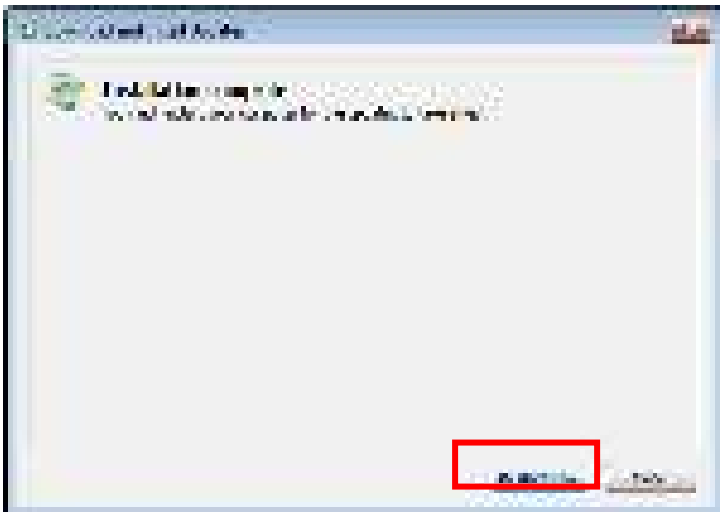
1.5. Choose 32 or 64 Bit installation file



1.6. Choose”Yes”



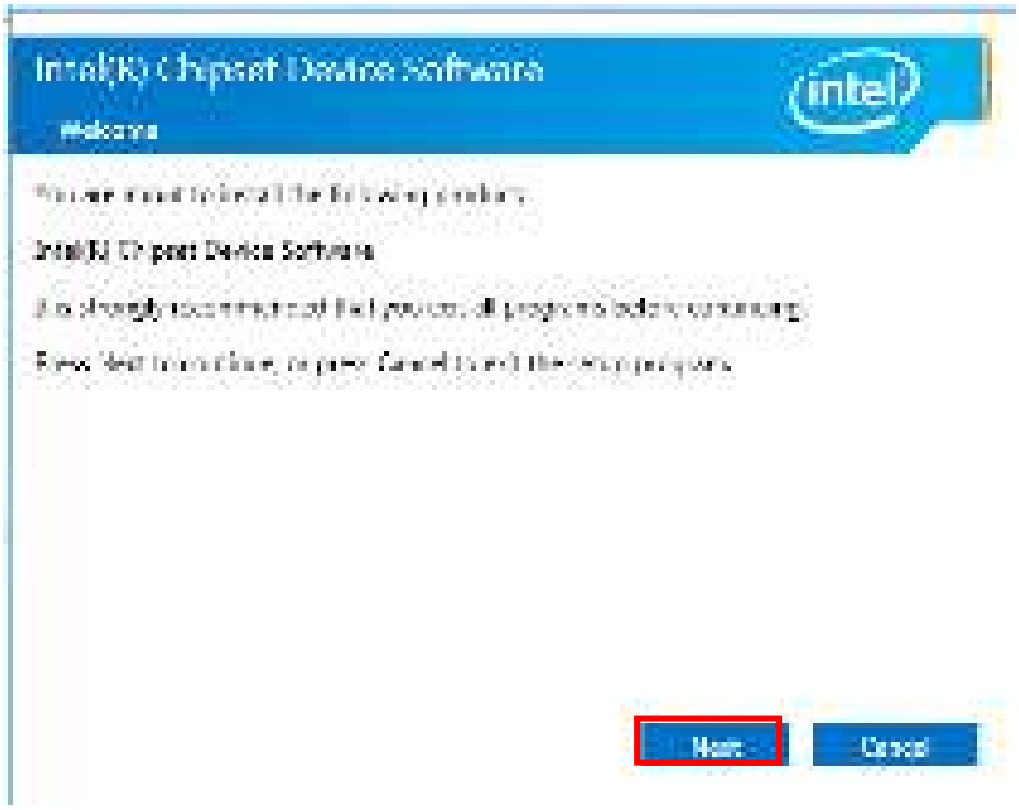
1.7. After installation, choose”Restart Now”



2. Chipset Driver Setup

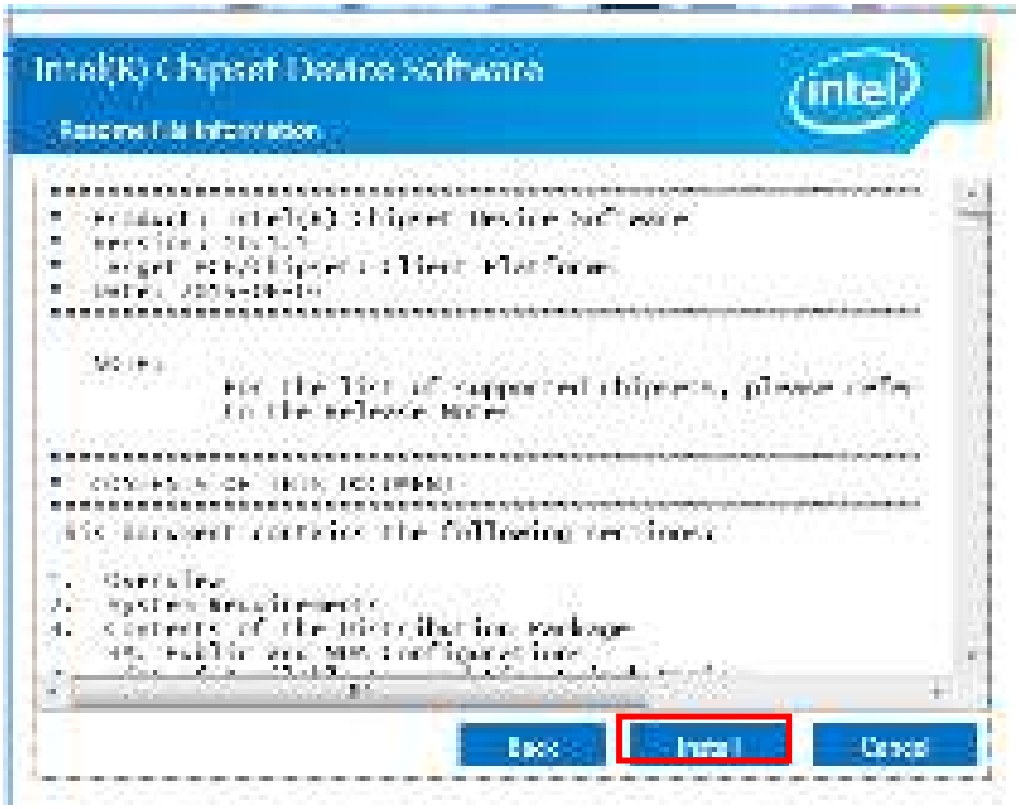
2.1. Go to X:\Chipset\ and choose” SetupChipset.exe”

2.2. Choose”Next”

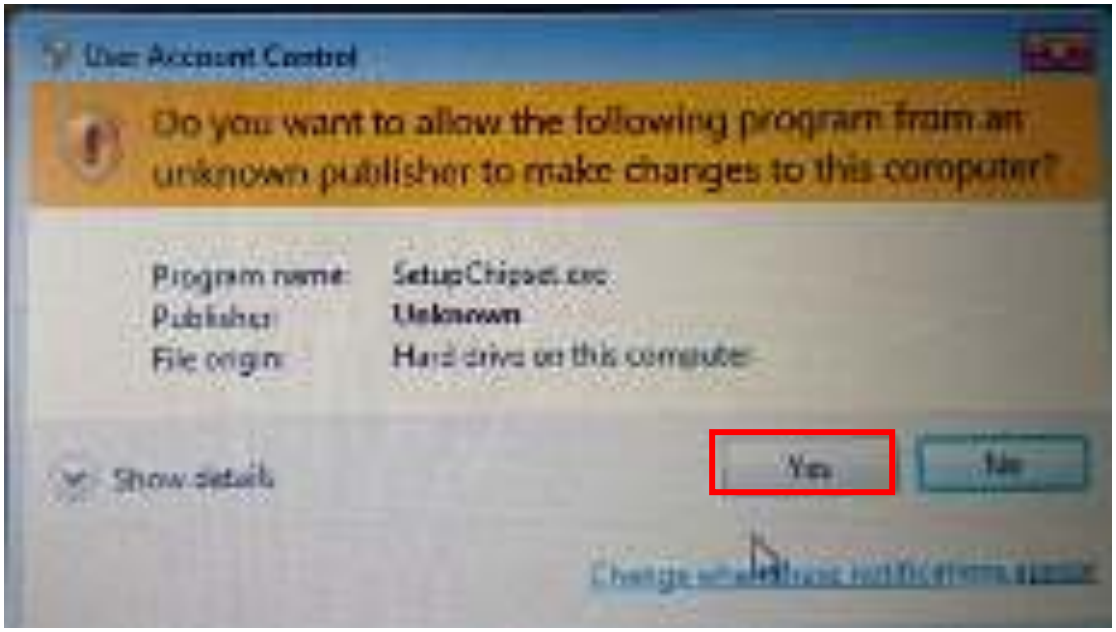


2.3. Choose”Accept”

2.4. Choose”Install”

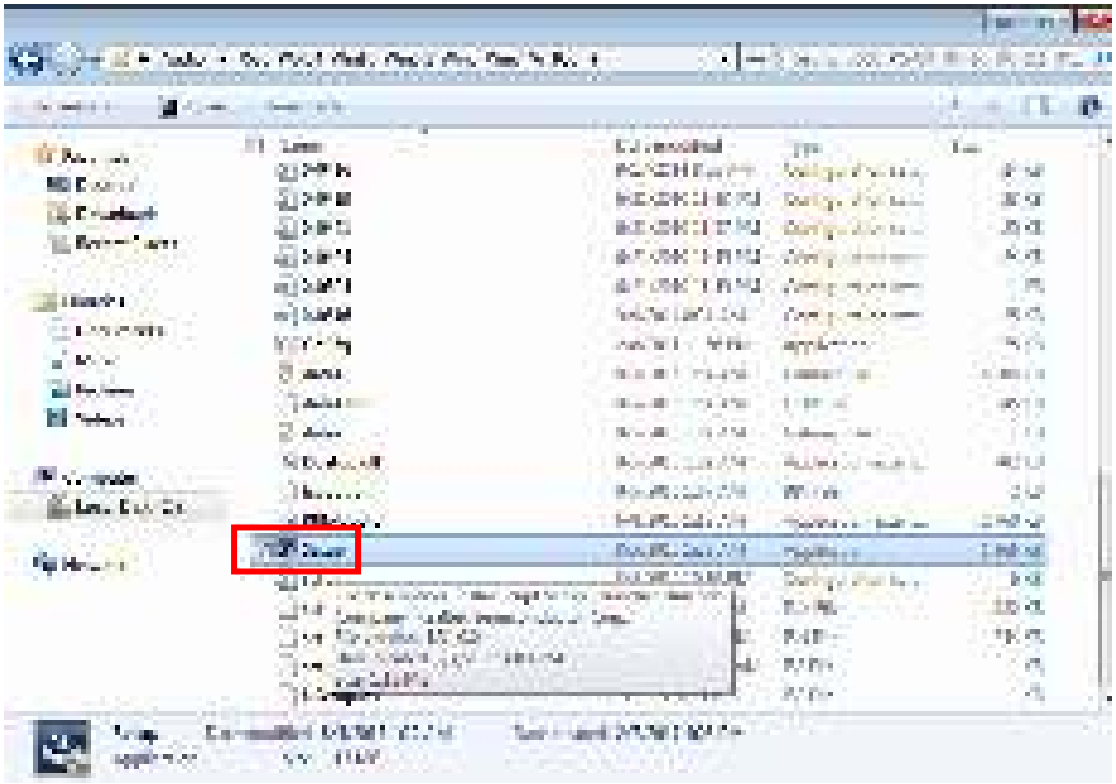


2.5. Choose”Yes”, and wait to complete the installation.

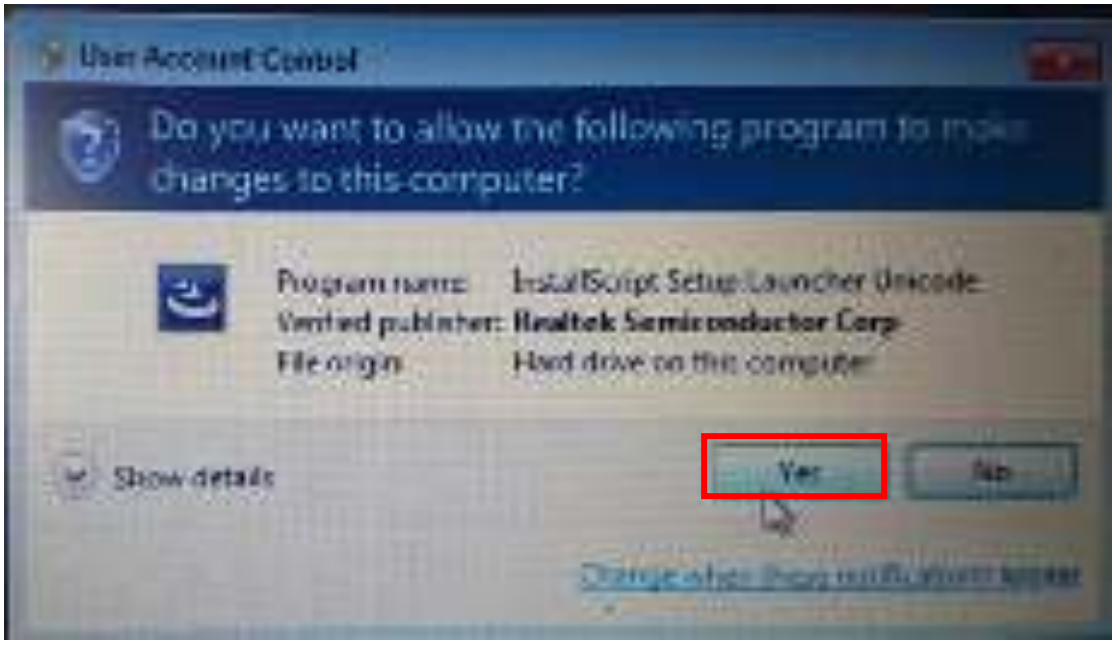


3. Audio Driver Setup

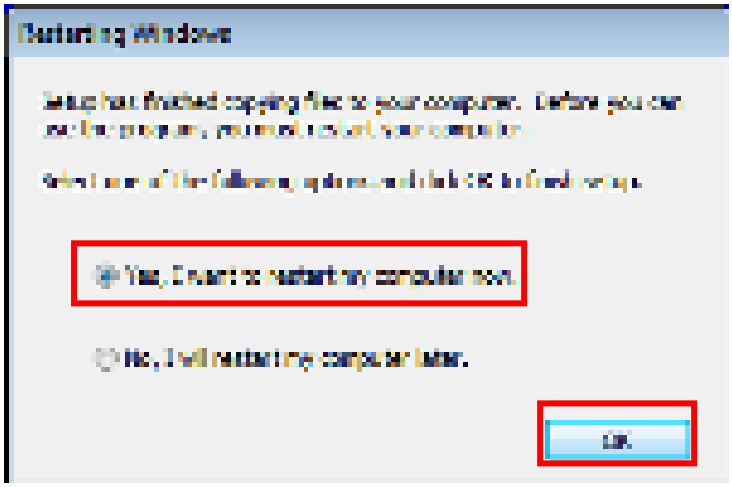
3.1. Go to X:\Audio\ and choose ”Setup.exe”



3.2. Choose”Yes”, and wait until the installation is completed.



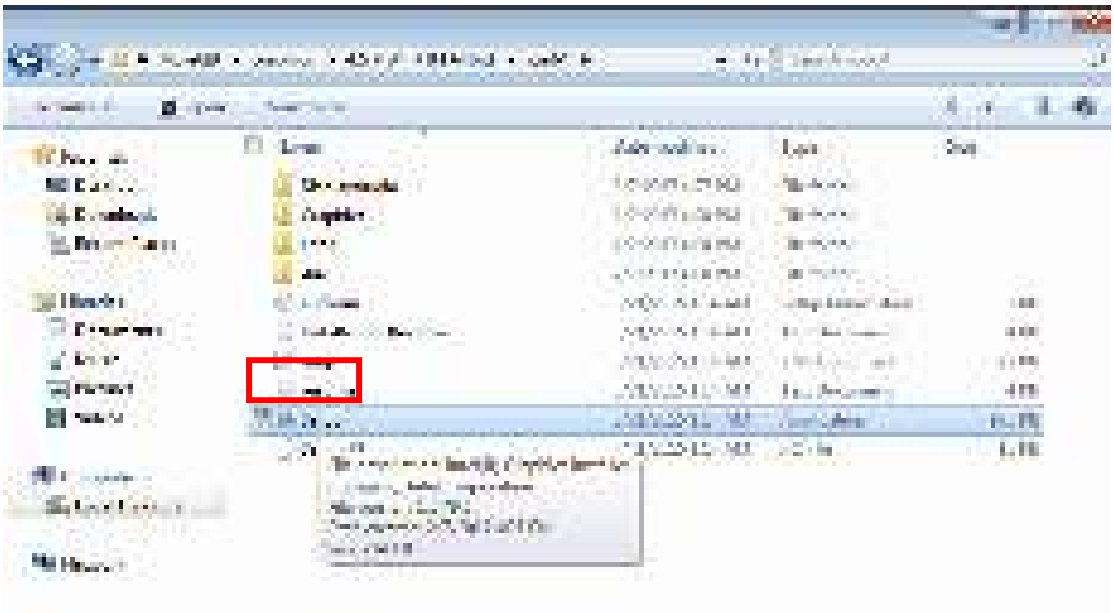
3.3. Choose”Yes, I Want to restart my computer now”, and press”OK” to restart.



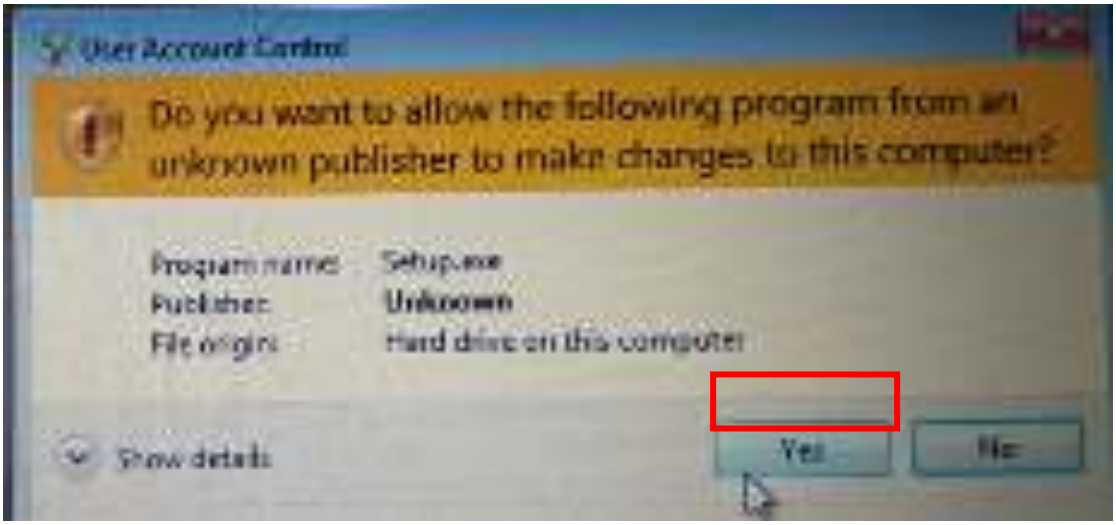
4. Graphics Driver Setup

4.1. Go to X:\Graphics\4277(Win7 8.1 64bit)\win64\ and choose” Setup.exe” according to your OS 32 bits or 64 bits.

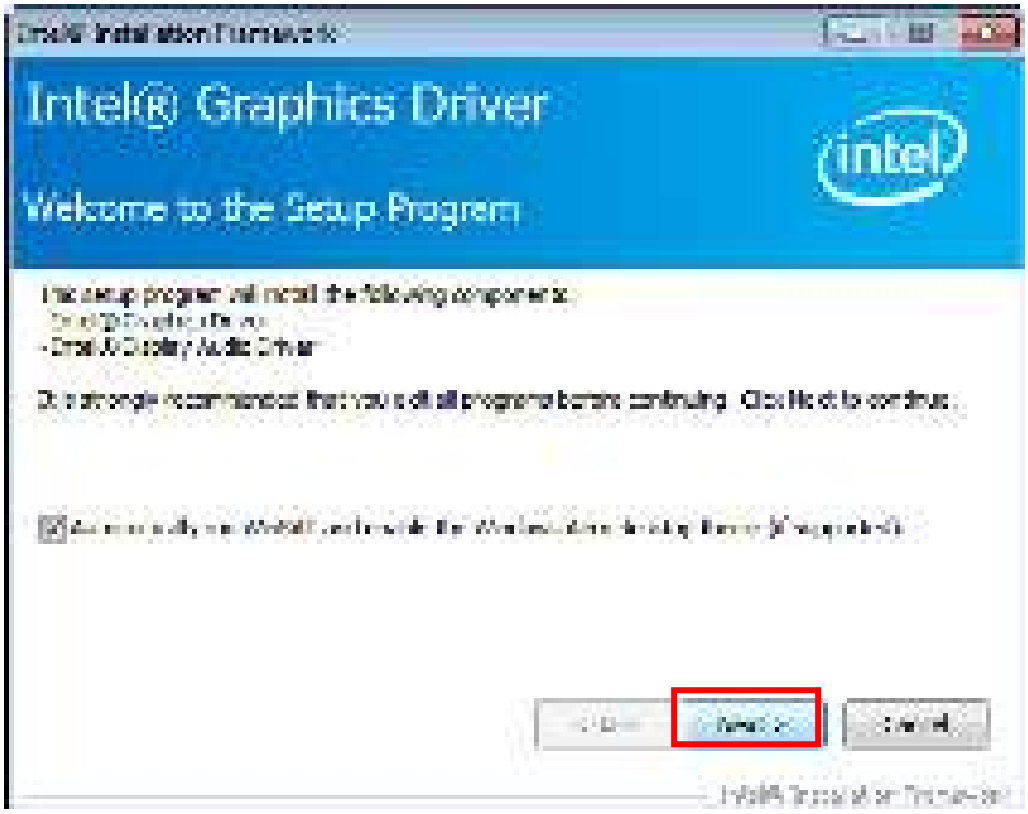
This SOP is based on Win 7 64 Bit.



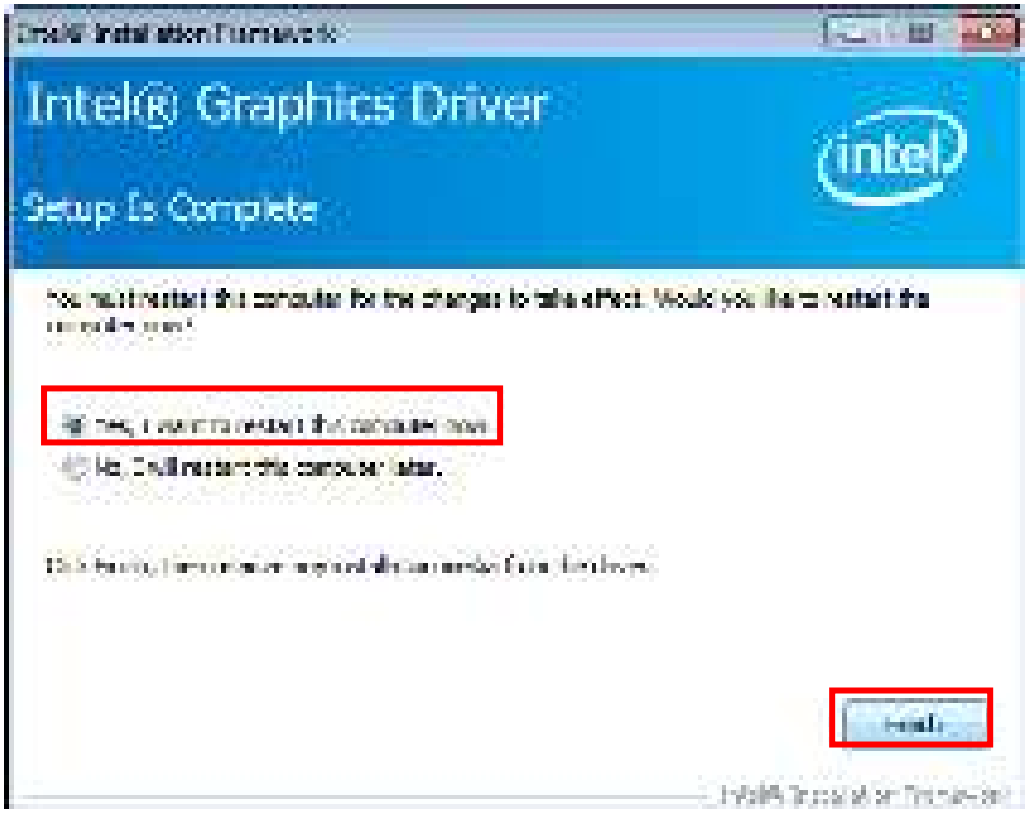
4.2. Choose ”Yes”



4.3. Choose”Next”, and then ”Yes” and ”Next” until the installation is completed.

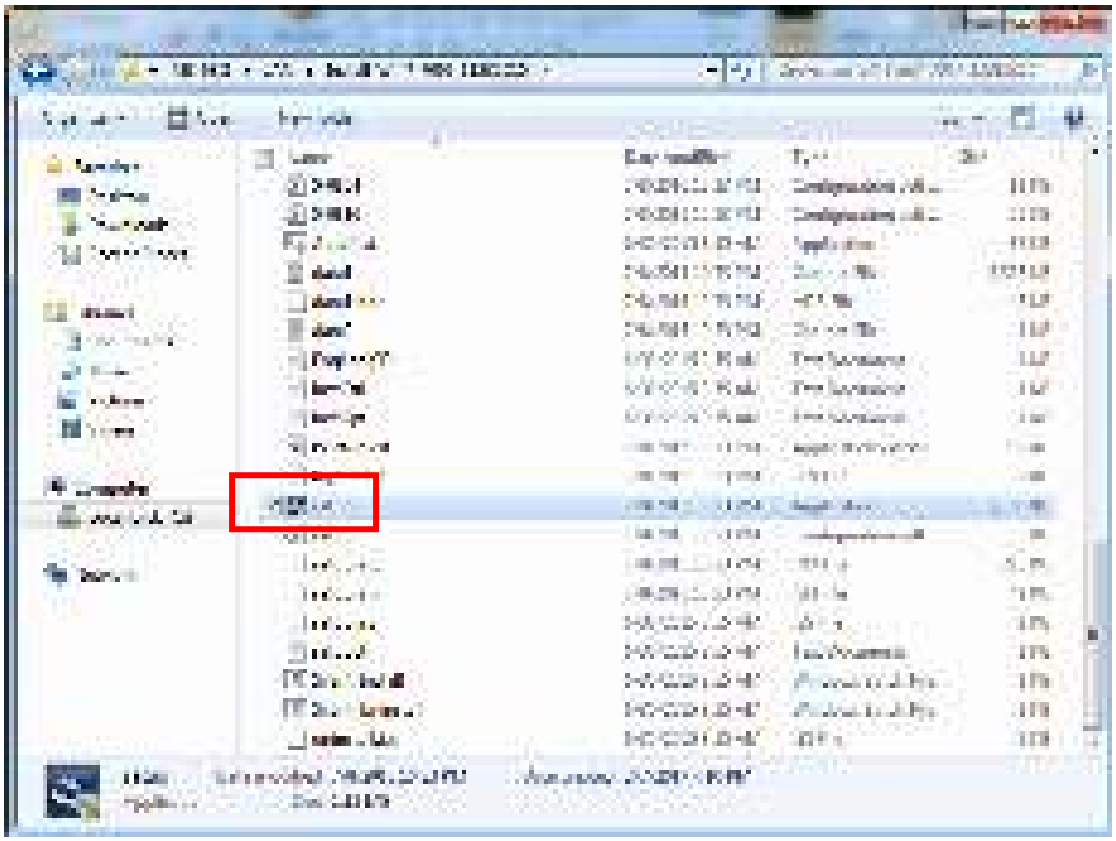


4.4. 點選”Yes, I Want to restart my computer now”後按”Finish”重開機

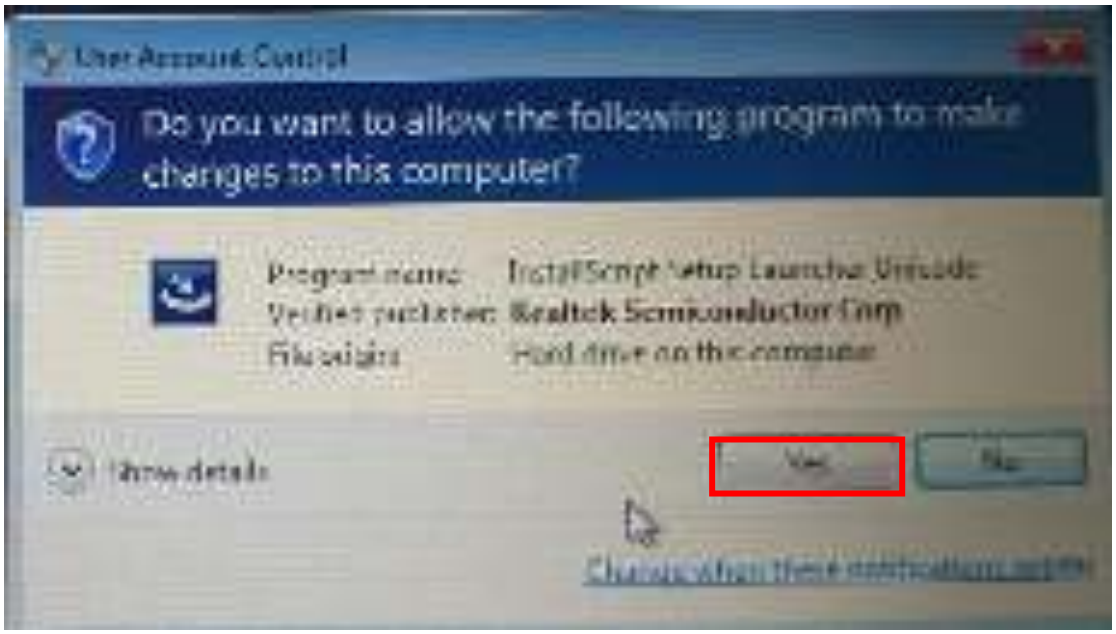


5. LAN Driver Setup

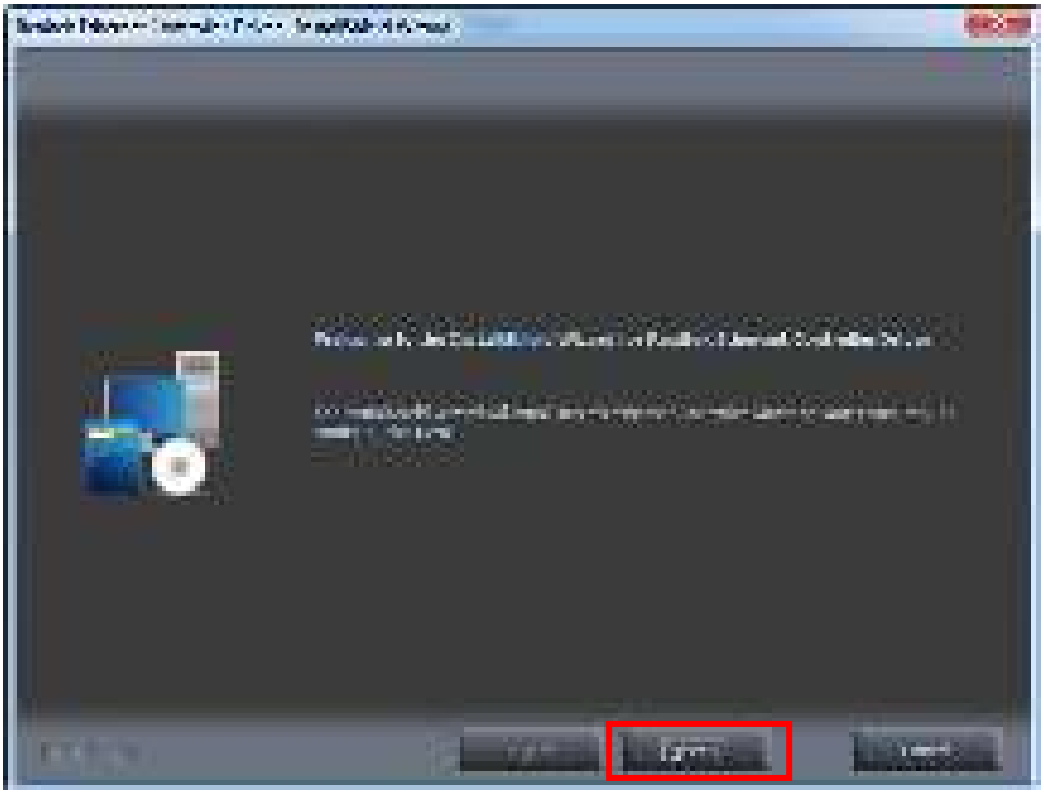
5.1. Go to X:\ LAN\Install_Win7_7097_11232015\ and choose” Setup.exe”



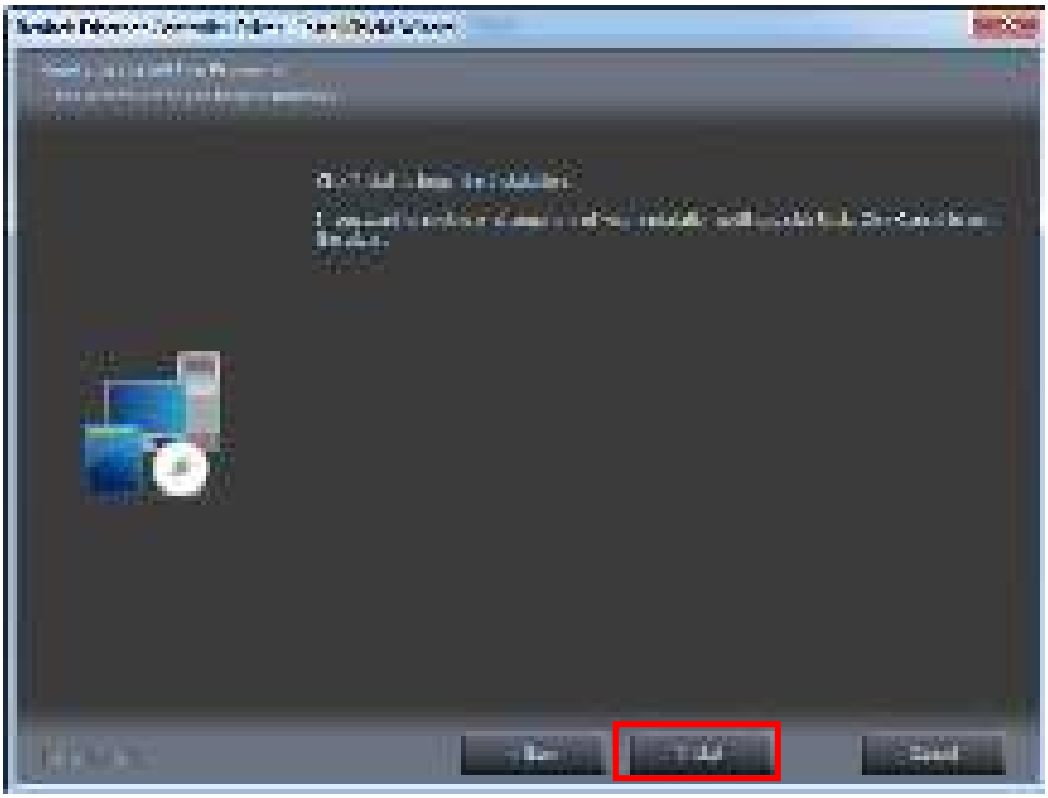
5.2. Choose”Yes”



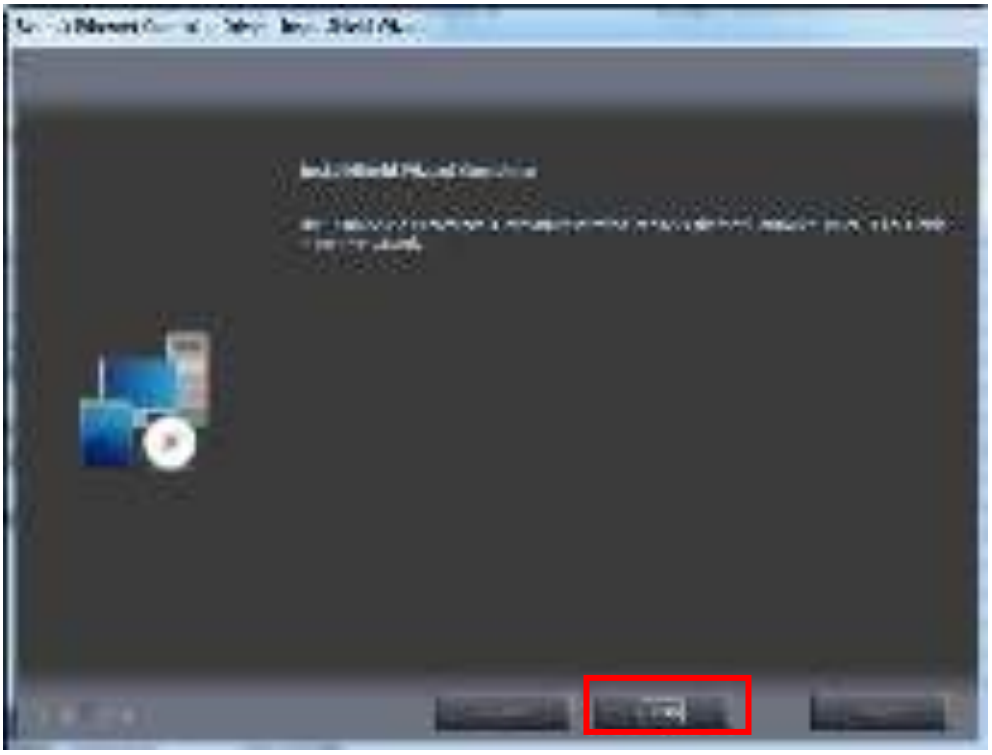
5.3. Choose”Next”



5.4. Choose”Install”



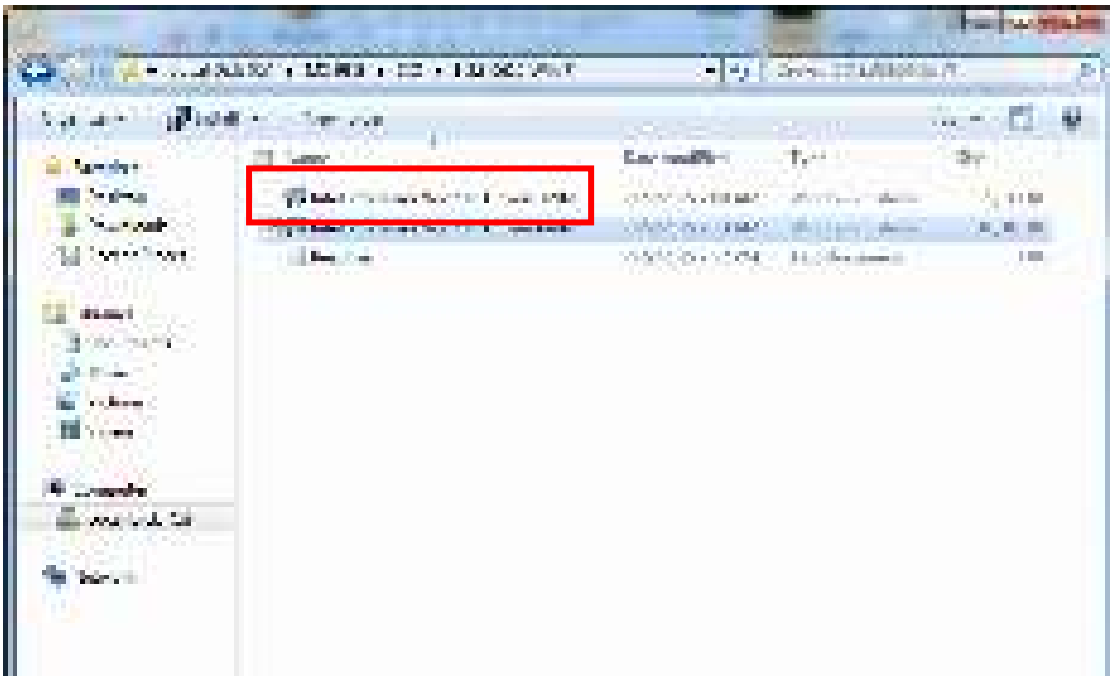
5.5. Choose ”Finish” to complete the installation.



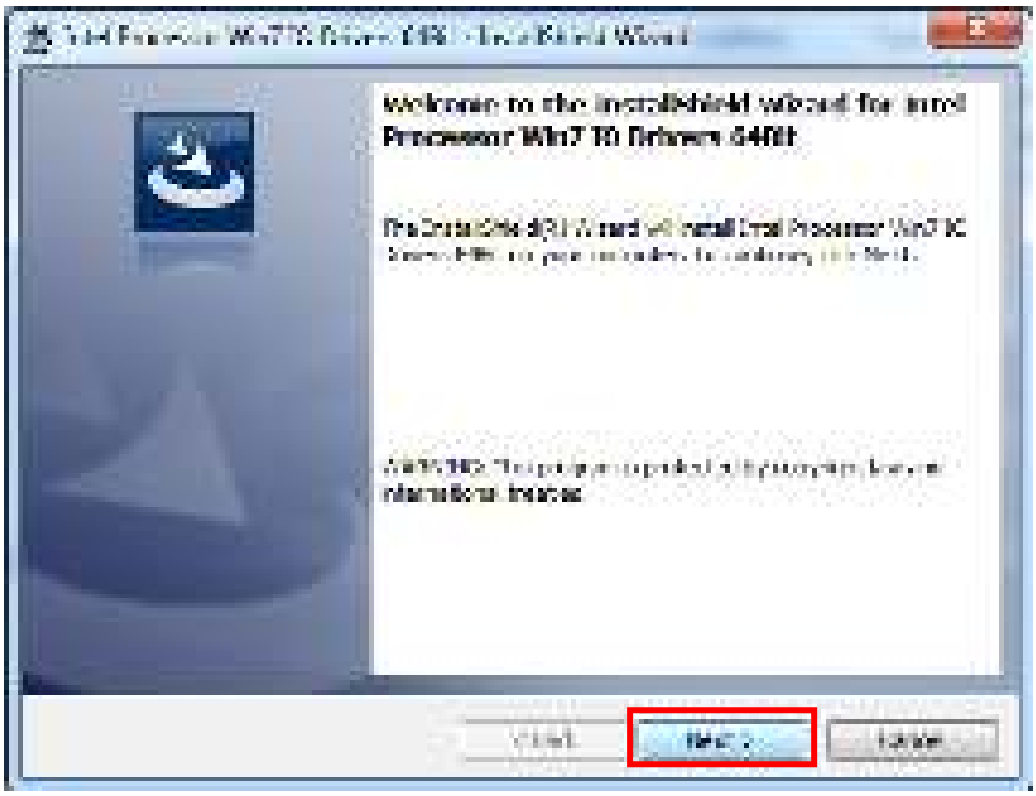
6. SIO Driver Setup

6.1. Go to X:\SIO\1.2.3.0616(Win7)\ and choose ”Intel Processor Win7 IO Drivers 64Bit.msi” according your OS by 32 or 64 Bits.

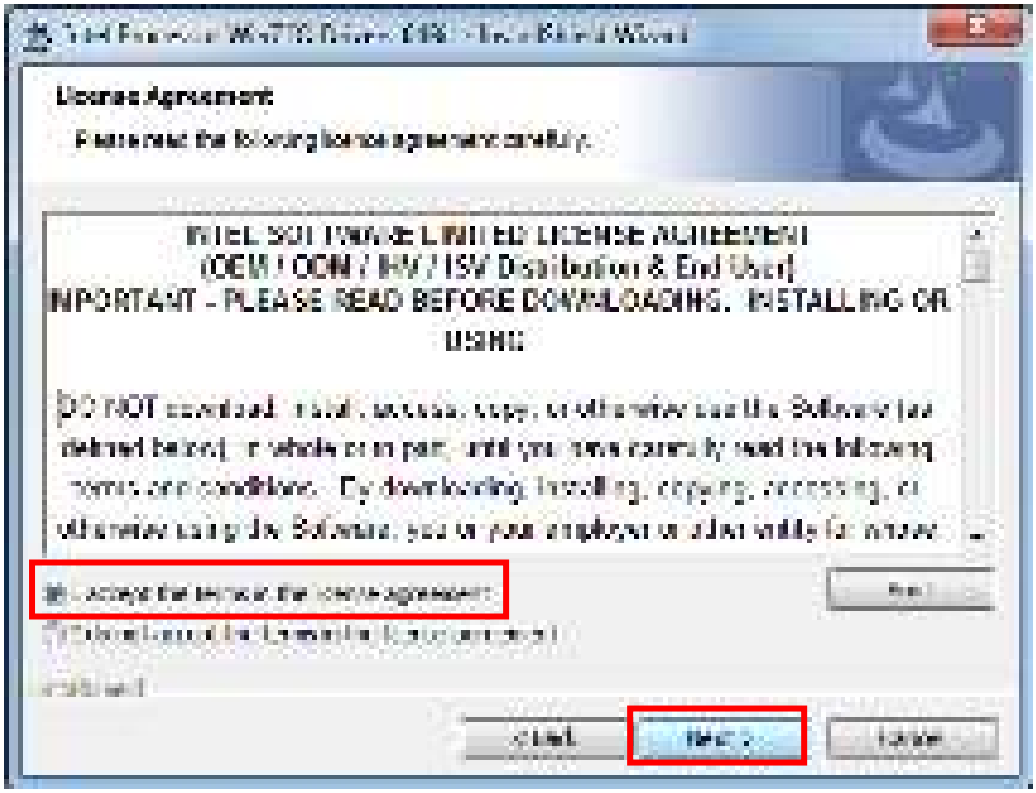
This SOP is based on Win 7 64 Bit.



6.2. Choose ”Next”



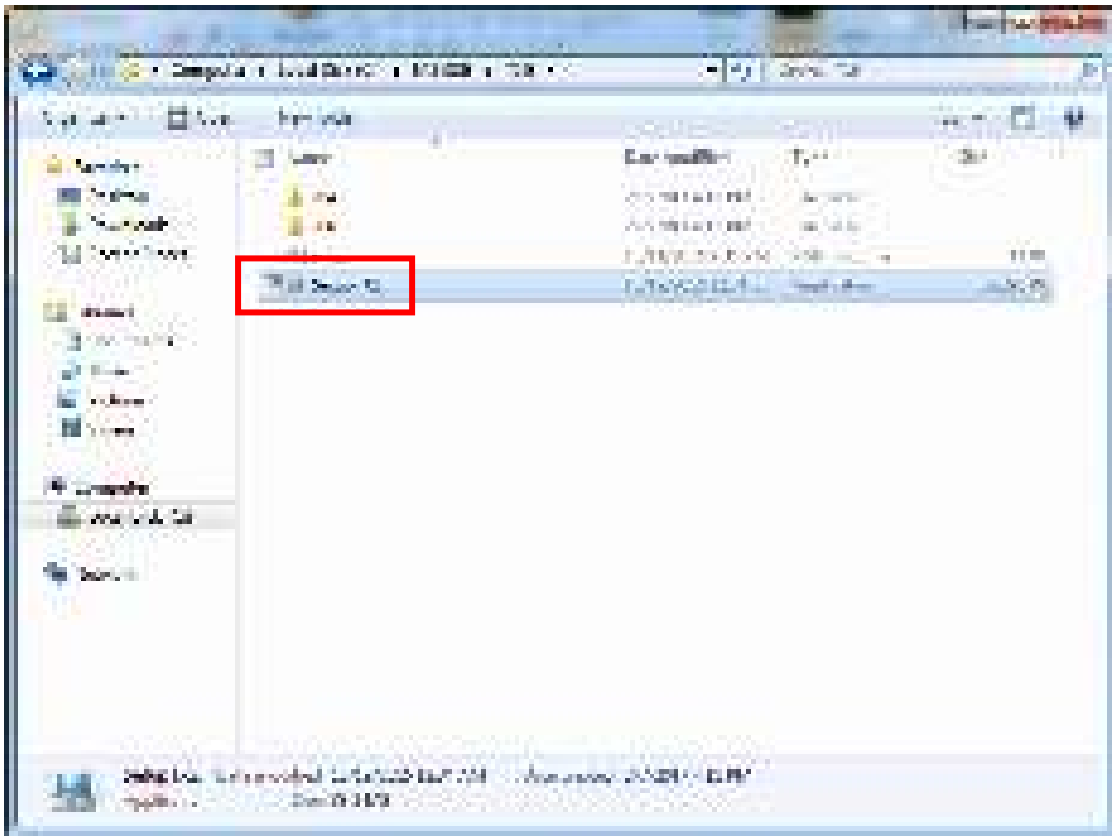
6.3. Choose ”I accept the terms in the license agreement” and ”Next”, ”Install”, ”Yes”, ”OK” until the installation is completed.



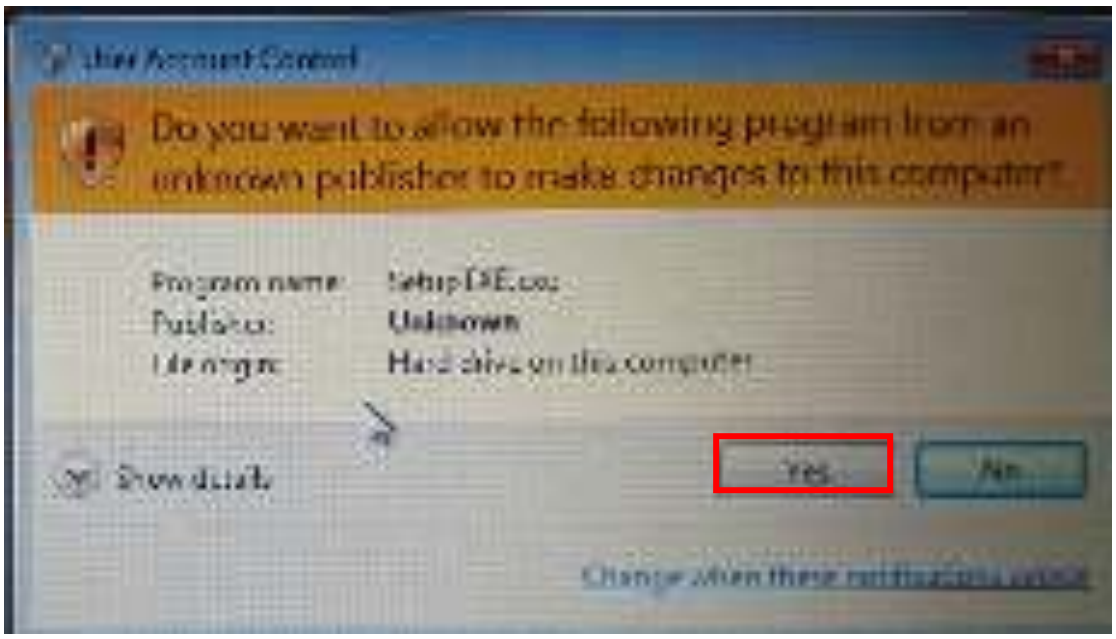
6.4. Choose ”Finish” to complete the installation.

7. TXE Driver Setup

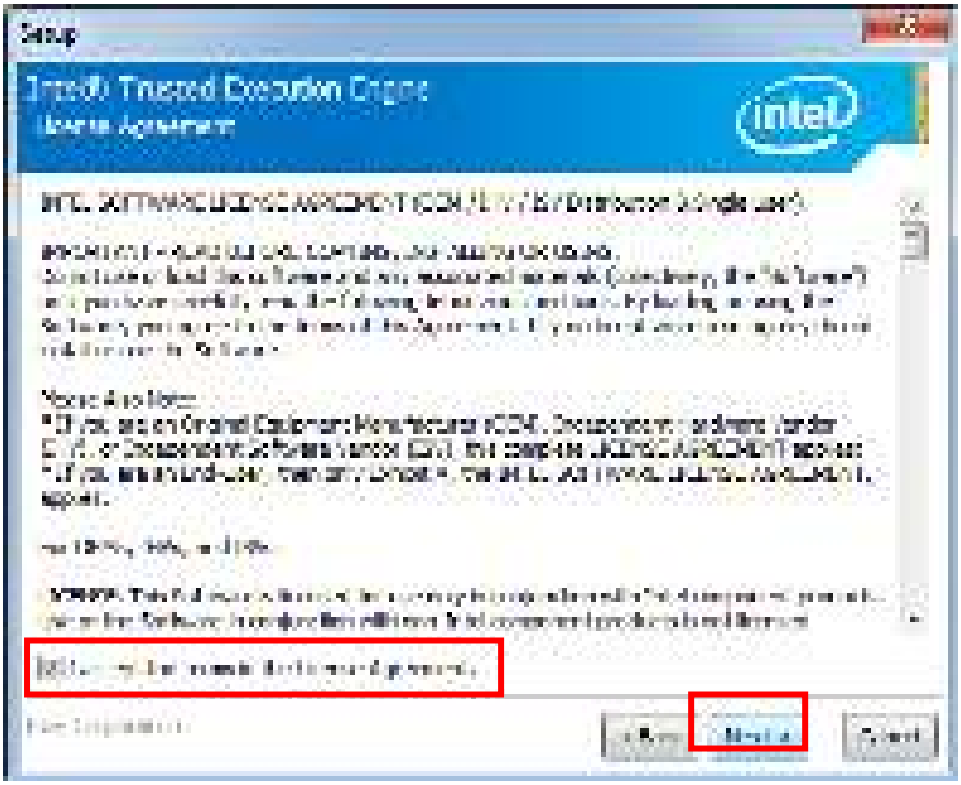
7.1. Go to X:\TXE\ and choose ”SetupTXE.exe”



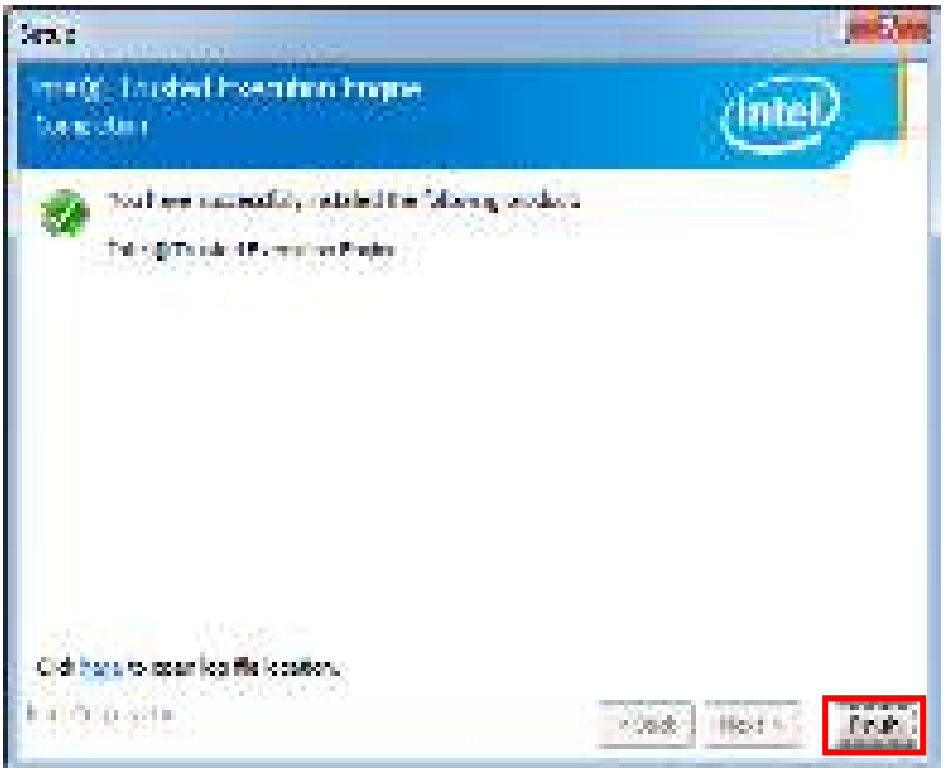
7.2. Choose ”Yes” and ”Next”



7.3. Choose ”I accept the terms in the license agreement” and ”Next” until the installation is completed.

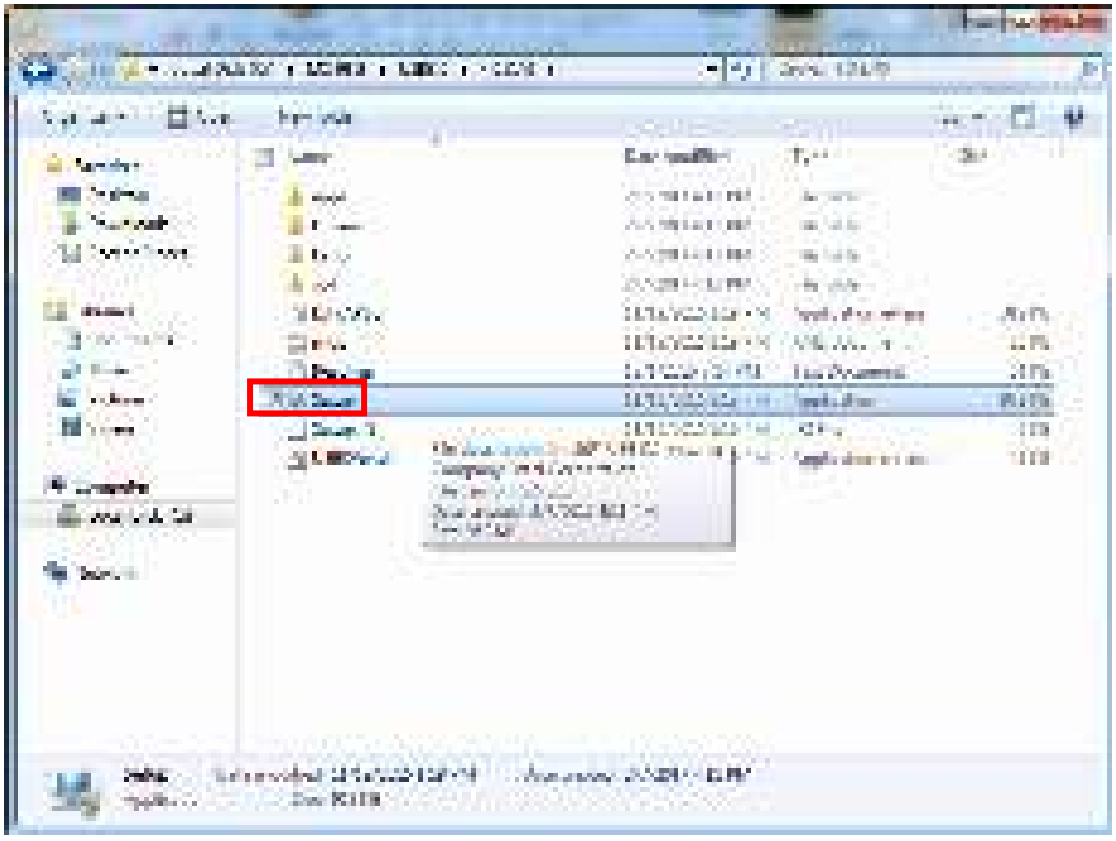


7.4. Choose ”Finish” after the installation.

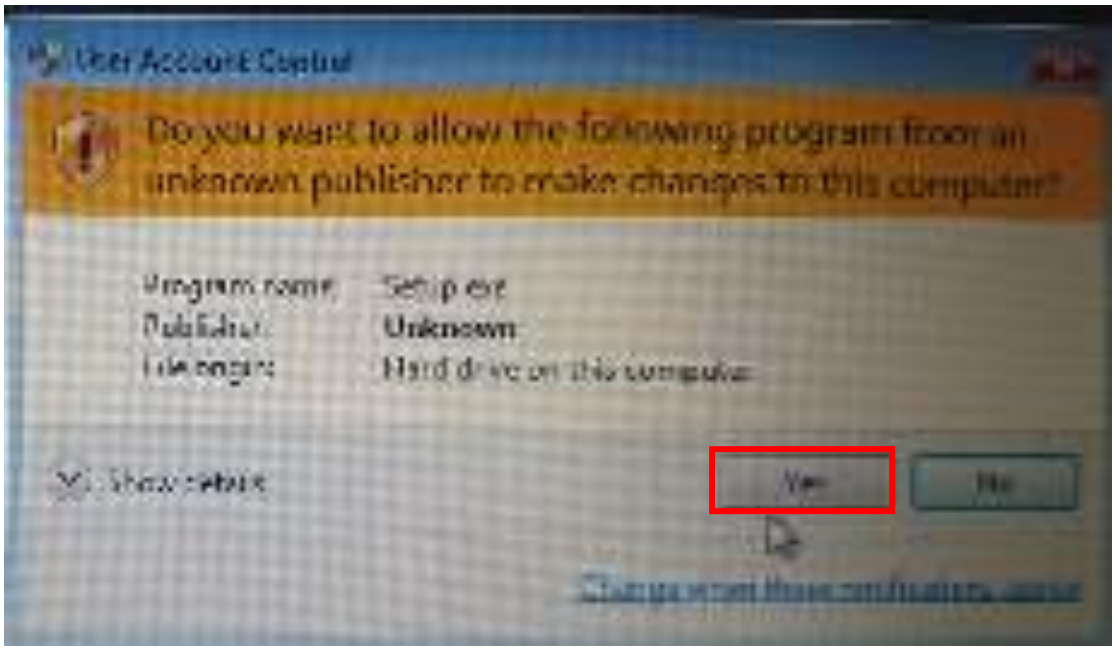


8. USB3.0 Driver Setup

8.1. Go to X:\USB3.0\4.0.3.49\ and choose ”Setup.exe”



8.2. Choose ”Yes” , ”Next” and “Yes” until the installation is completed.



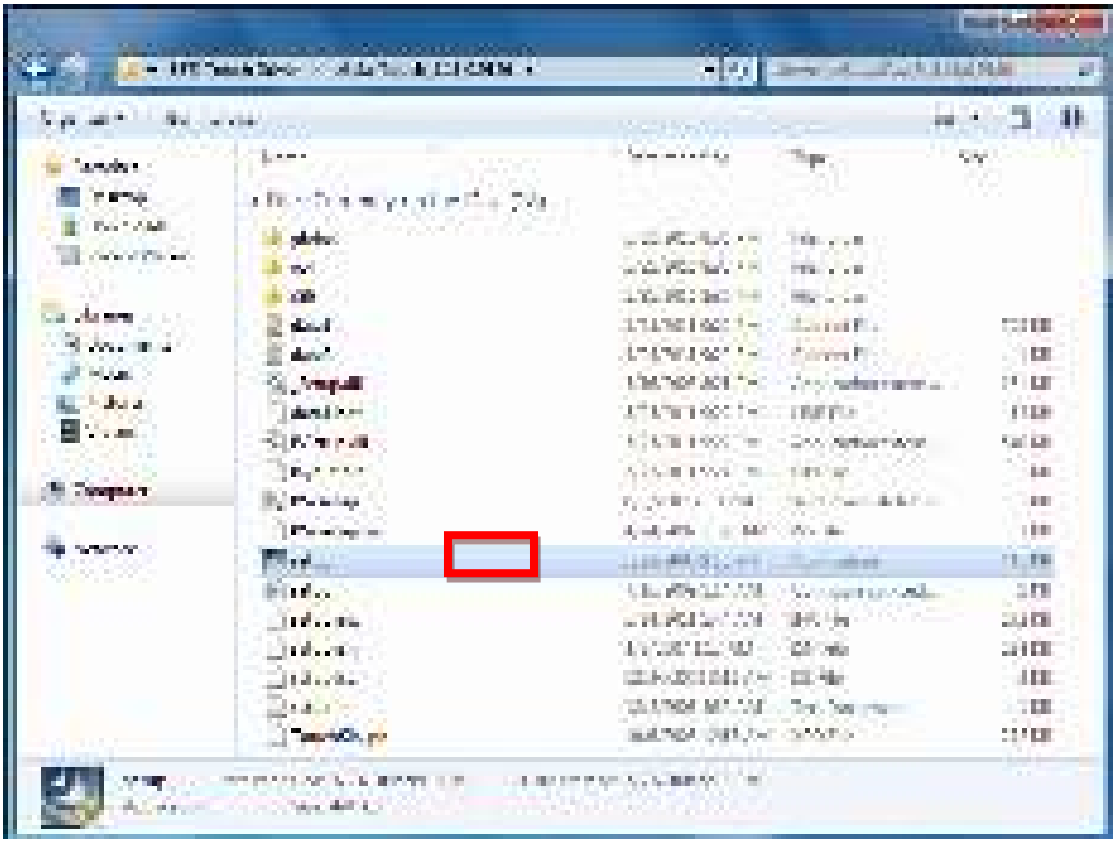
8.3. Choose ”Finish” until the installation is completed.

Chapter 6 Touch Screen Driver Installation

Touch Driver installation for Windows 7

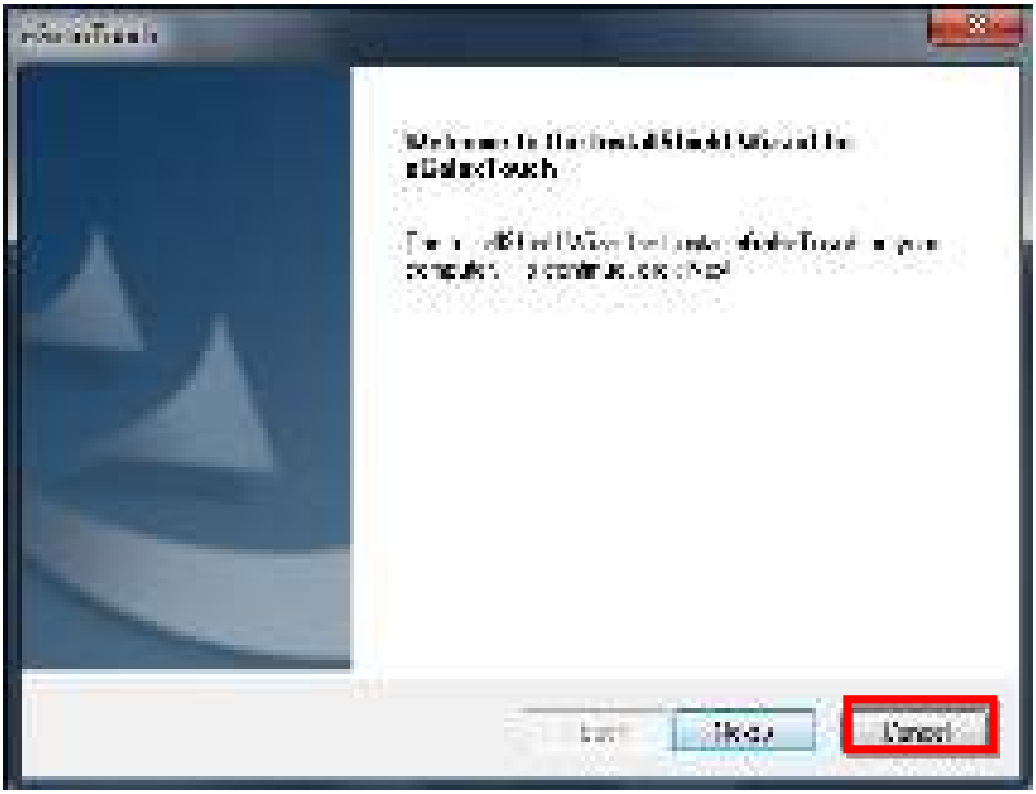
1. Install Touch Driver in DVD ROM

2. Go to file of X:\EETI Touch Driver\eGalaxTouch_5.11.0.9126 , then choose ”setup” (X:\ means DVD location)

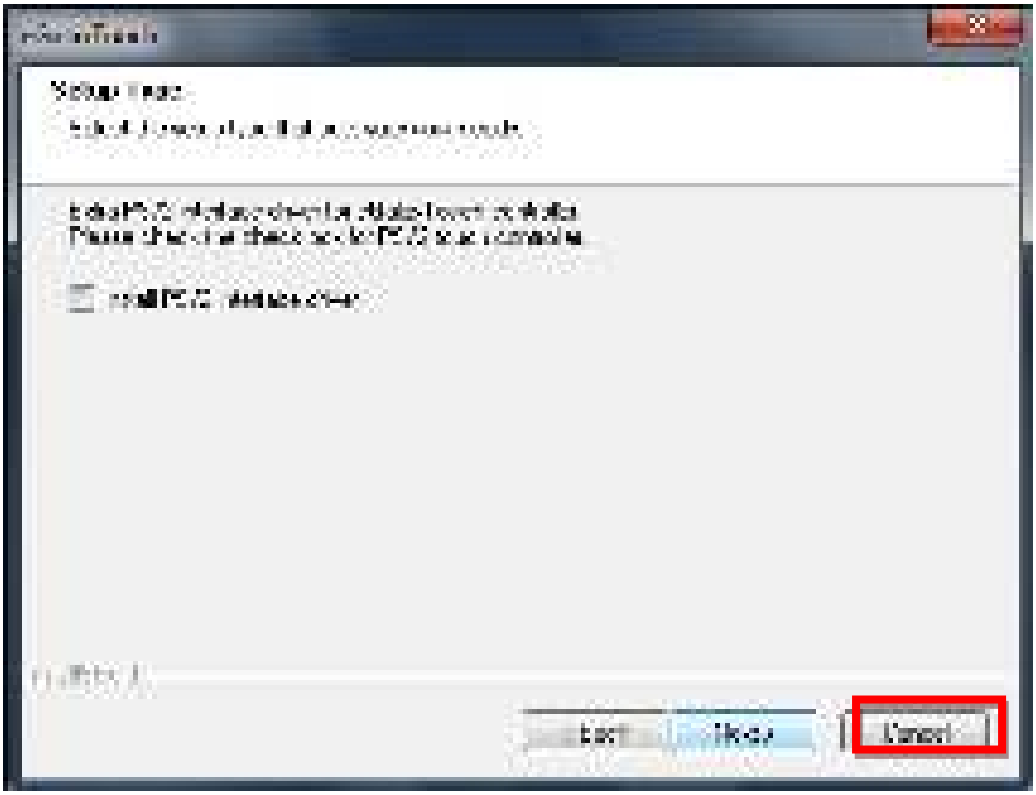


3. Choose ”Yes” to start installation

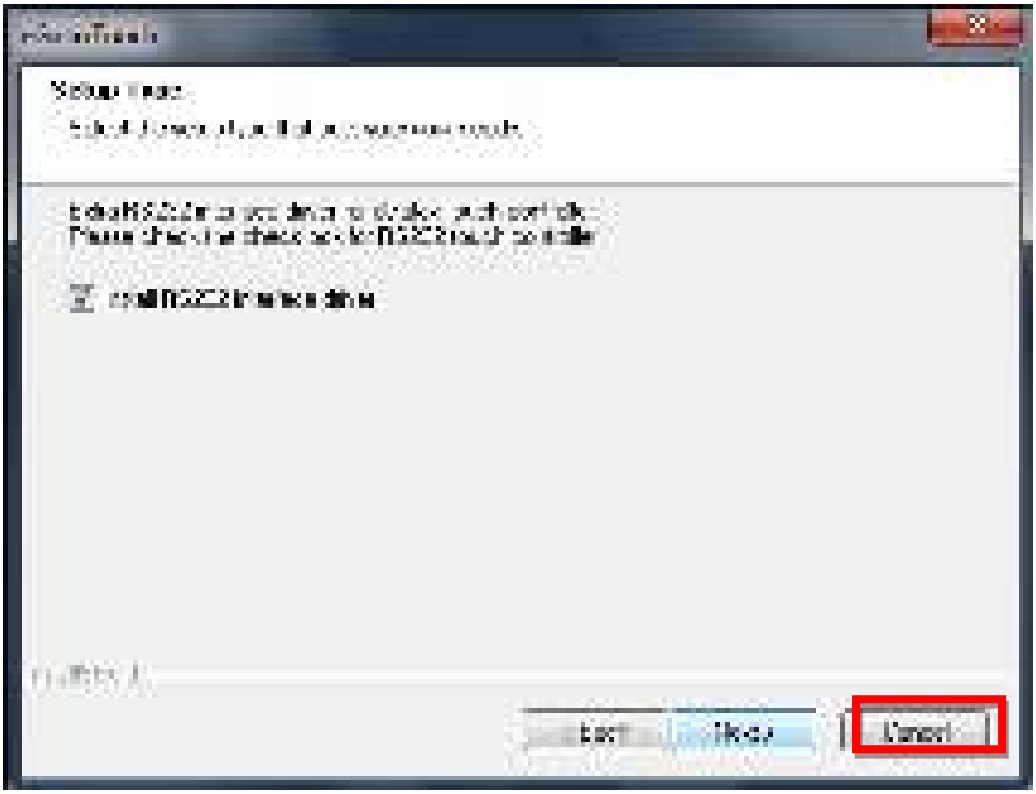
4. Choose ”Next”



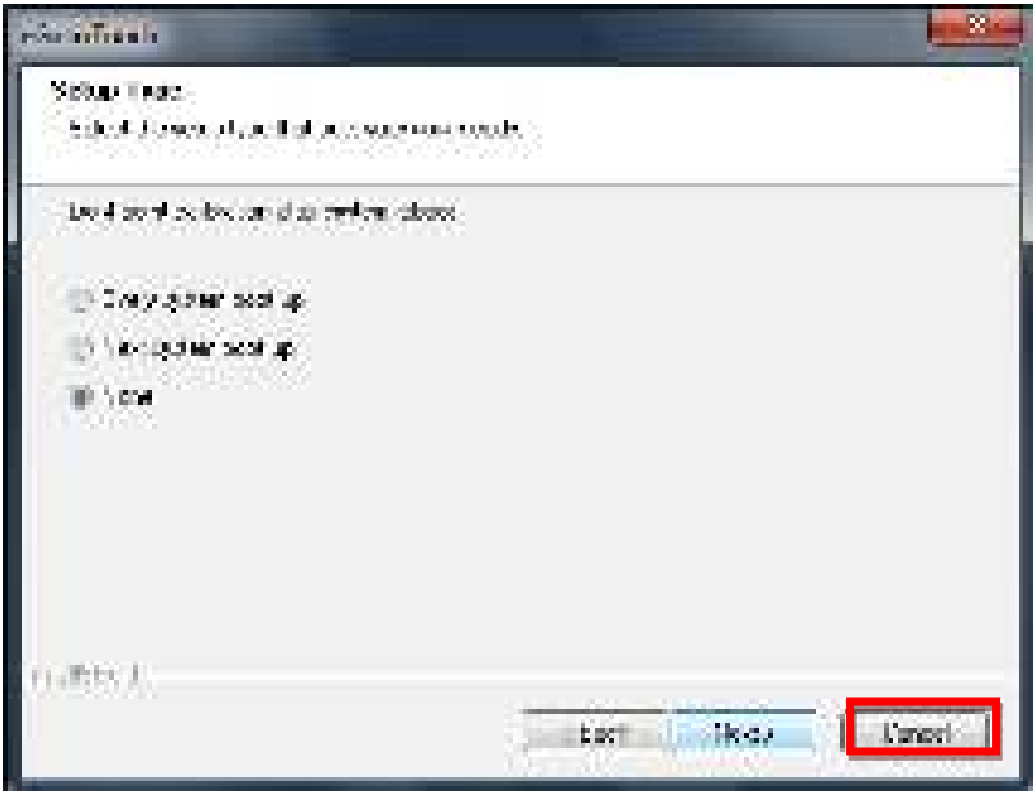
5. Choose “Next”



6. Choose “Next”

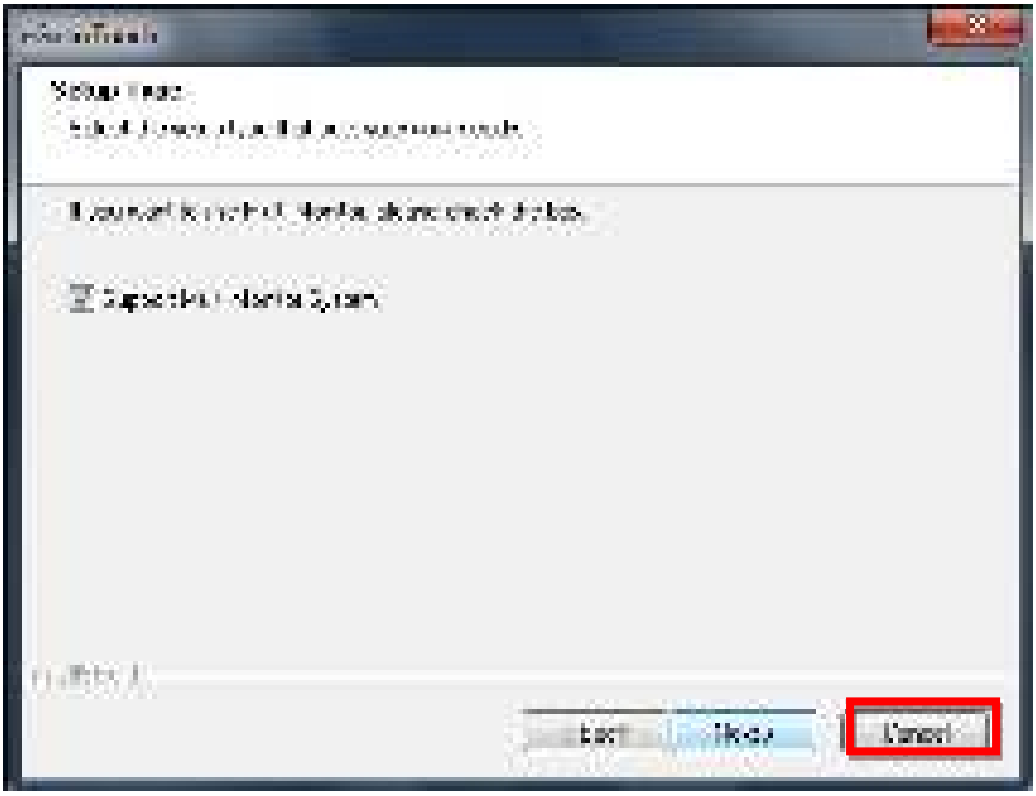


7. Choose “Next”

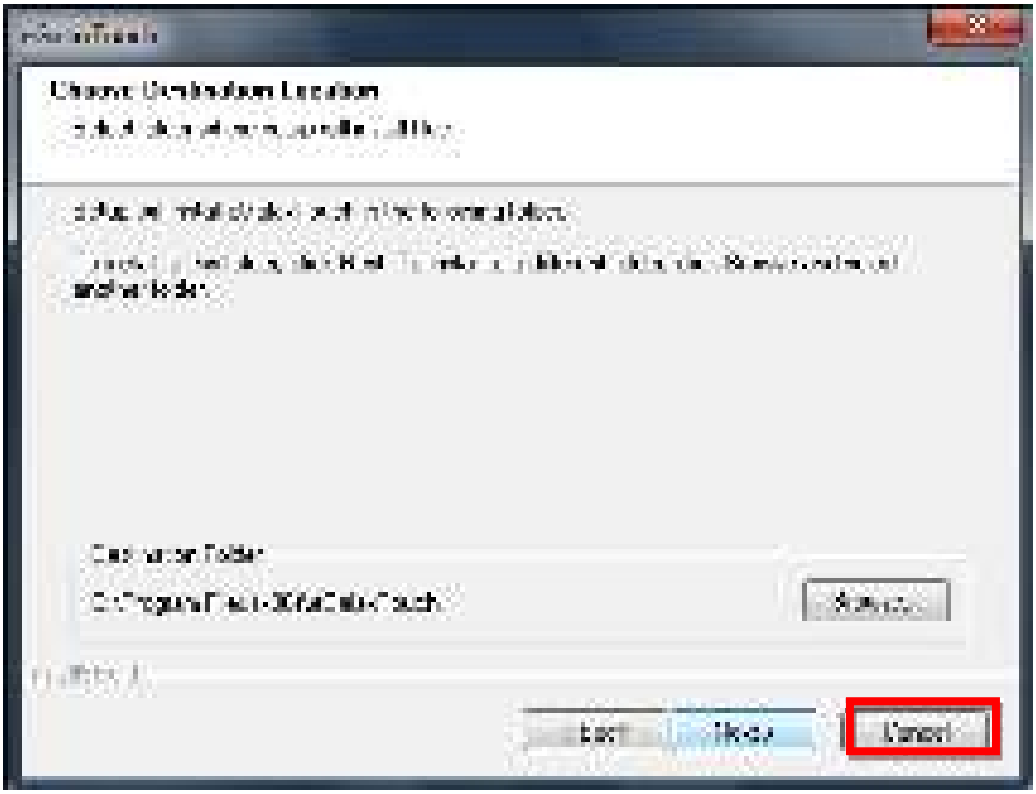


8. Choose “OK”

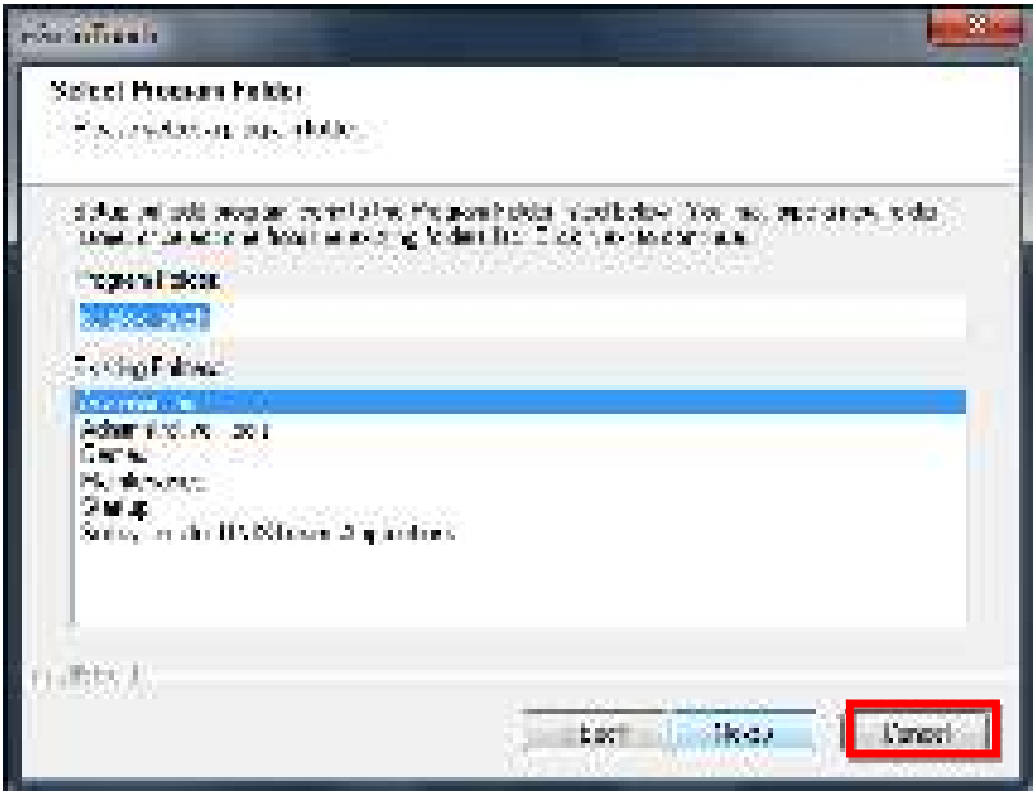
9. Choose “Next””



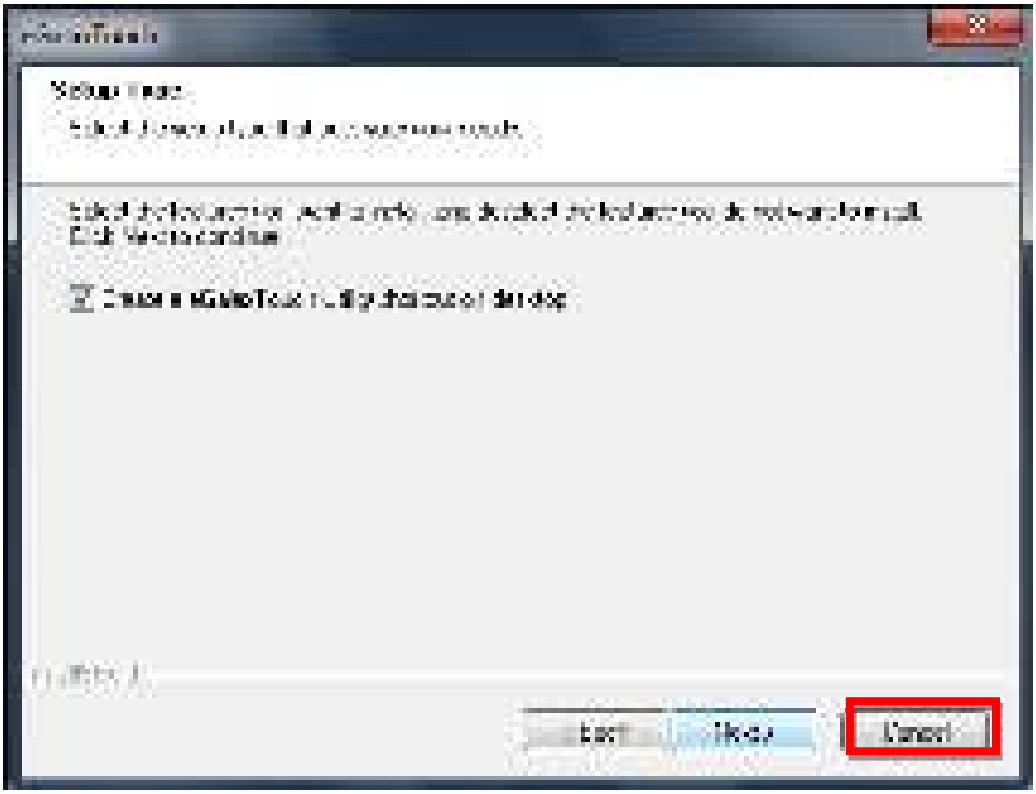
10. Choose “Next”



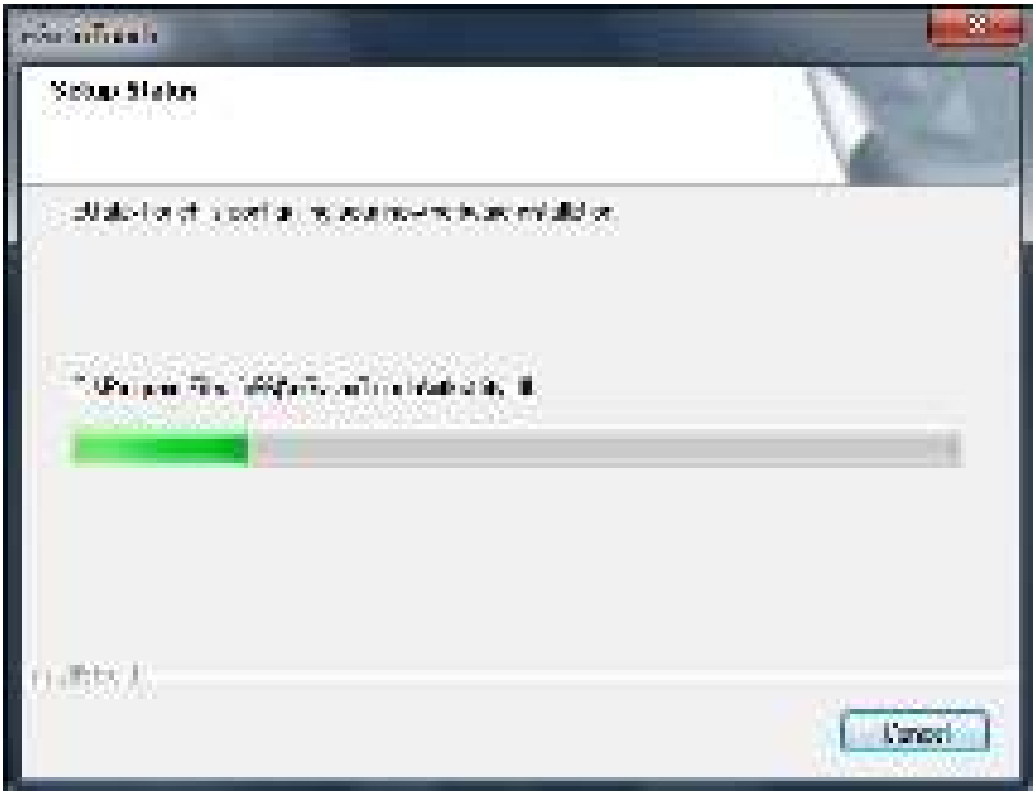
11. Choose “Next”



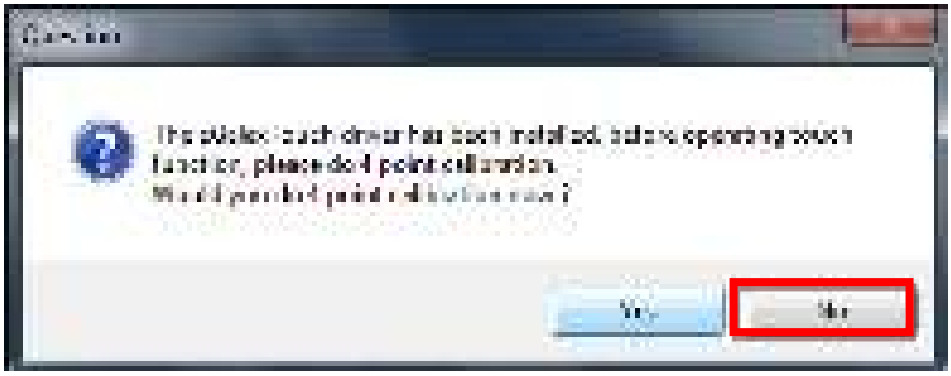
12. Choose “Next””



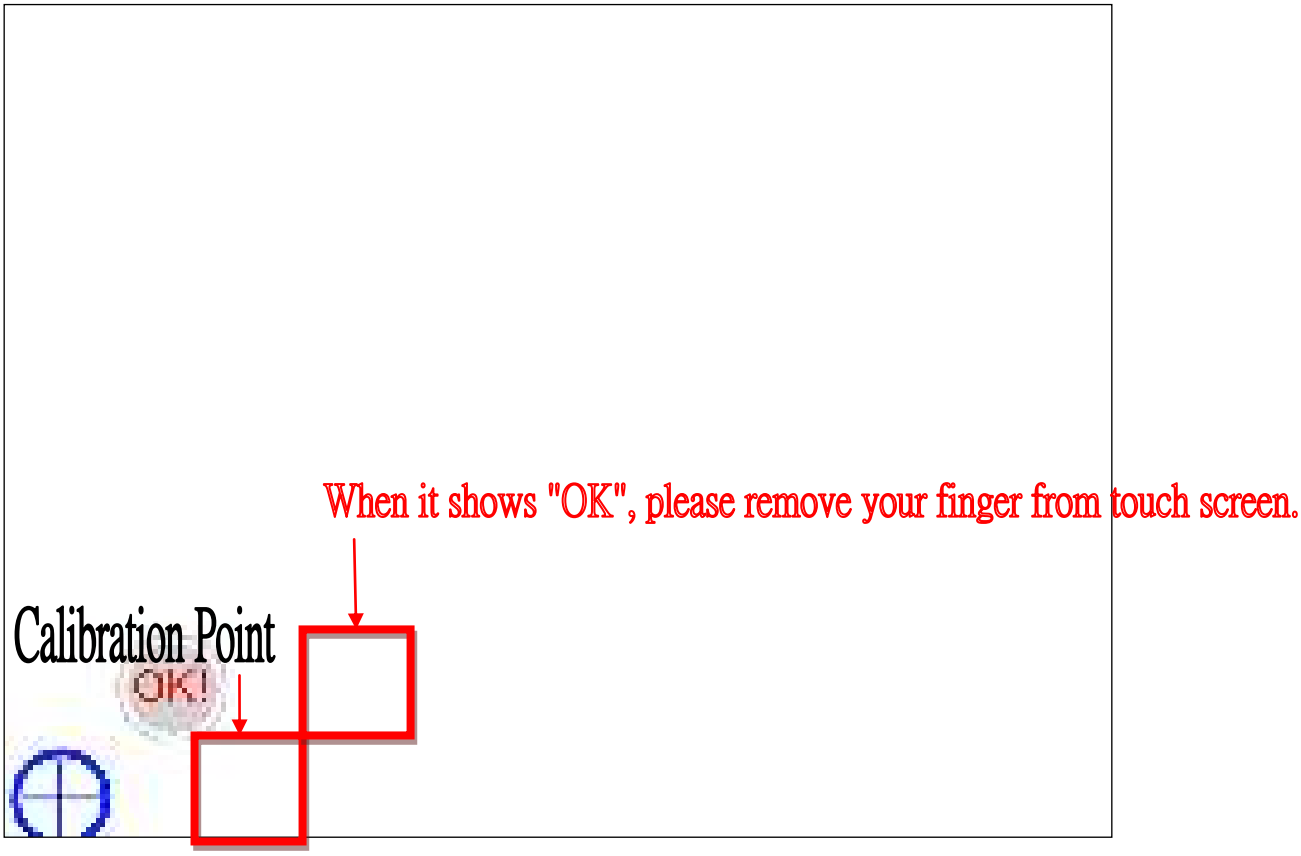
13. Waif for installation to complete



14. Choose ”Yes” for 4 points calibration



15. Please use your finger to press the calibration point. When it shows “OK”, please remove your finger from the touch screen. Please repeat it for next 3 calibration points. It requires totally 4 calibration points for complete touch screen installation.



16. After 4 points calibration, we have completed the touch function installation.

WDT Sample Code

```
SIO_INDEX_Port     equ 04Eh
SIO_DATA_Port      equ 04Fh
SIO_UnLock_Value   equ 087h
SIO_Lock_Value     equ 0AAh
WatchDog_LDN       equ 007h
WDT_UNIT           equ  60h    ;60h=second, 68h=minute, 40h=Disabled Watchdog timer
WDT_Timer          equ  30     ;ex. 30 seconds

Sample code:
;Enable config mode
    mov     dx, SIO_INDEX_Port
    mov     al, SIO_UnLock_Value
    out     dx, al
    jmp     short $+2              ;Io_delay
    jmp     short $+2              ;Io_delay
    out     dx, al
;Change to WDT
    mov     dx, SIO_INDEX_Port
    mov     al, 07h
    out     dx, al
    mov     dx, SIO_DATA_Port
    mov     al, WatchDog_LDN
    out     dx, al
;Acive WDT
    mov     dx, SIO_INDEX_Port
    mov     al, 30h
    out     dx, al
    mov     dx, SIO_DATA_Port
    in      al, dx
    or      al, 01h
    out     dx, al
 ;set timer
    mov     dx, SIO_INDEX_Port
    mov     al, 0F6h
    out     dx, al
    mov     dx, SIO_DATA_Port
    mov     al, WDT_Timer
    out     dx, al
;set UINT
    mov     dx, SIO_INDEX_Port
    mov     al, 0F5h
    out     dx, al
    mov     dx, SIO_DATA_Port
    mov     al, WDT_UNIT
    out     dx, al
;enable reset
    mov     dx, SIO_INDEX_Port
    mov     al, 0FAh
    out     dx, al
    mov     dx, SIO_DATA_Port
    in      al, dx
    or      al, 01h
    out     dx, al
;close config mode
    mov     dx, SIO_INDEX_Port
    mov     al, SIO_Lock_Value
    out     dx, al
```