FabiaTech Corporation

IPC Solution

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Small Cube System

Fanless Series

FX5638 User' Manual

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Version: 1.3
Part Number: FX5638X

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- Description of you peripheral attachments
- Description of your software (operating system, version, application software, etc.) and BIOS configuration
- Description of the symptoms (Extract wording any message)

For updated BIOS, drivers, manuals, or product information, please visit us at www.fabiatech.com

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Chapter 1 Introducing the FX5638 System

Overview

The FX5638x is an embedded system with Intel® Core™ i5 -4422E (Haswell) CPU module inside. This user's manual provides information on the physical features, installation, and BIOS setup of the FX5638.

Built to unleash the total potential of the 4th generation Intel® Core™ i5 Processor, Able to support 1.8 GHz CPU, this system supports two 10/100/1000M Base –TX LAN ports, PCIE Mini Card connector for Wireless/GPRS modules, two SATA ports (One for CFAST, and one for SATA SSD or Hard disk), four USB 2.0 and four 4 3.0 ports, Audio, two So-DIMM sockets supports up to 16 GB DDR3L RAM, two HD and VGA display ports.

Each FX5638x has four ports for I/O communications. Two RS-232C ports and two RS232/RS422/ RS485 ports are available.

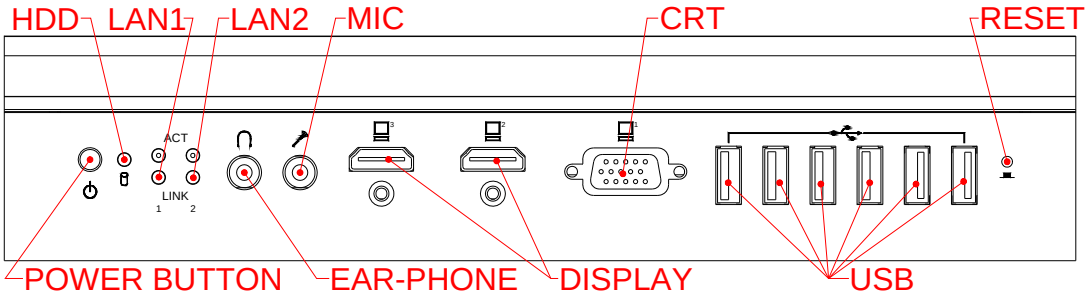
The FX5638x is perfect for ATM machines, KIOSK, point-of-sales/point-of- information, gaming and infotainment, measurement technology, lotteries, banking and Thin Client and Embedded Control.

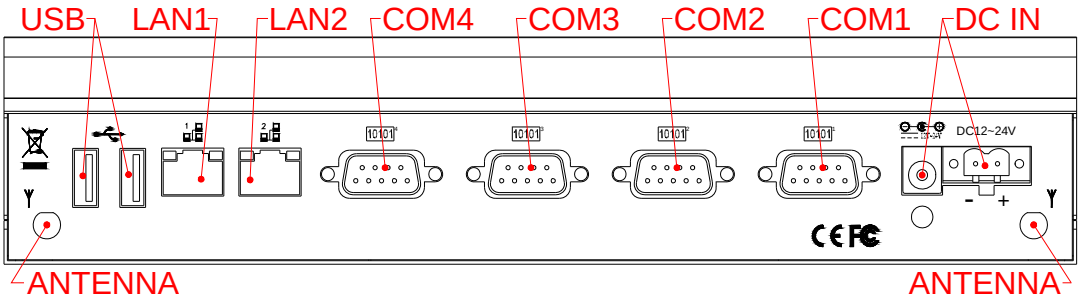
Series Comparison Table

Model	FX5638
Processor	Intel ® i5-4422E™ (HasWell)
Clock Speed	1.8 GHz
Intel® Turbo Boost Technology 2.0: (Max Frequency)	2.9 GHz
*Memory 204 Pin-DIMM*2(Max.)*	*DDR3L/1333,1600/1.35V 8GB/16GB*
Graphics Display	*CRT/Two HD(Intel HD4600)*
Chipset	QM87
Storage Space	*One CFAST & One SATA Socket*
USB	*Four USB (3.0) & Four USB(2.0) ports*
Audio	*Ear-Phone & MIC-In*
RJ45 LAN port	*Two 10/100/1000M Base –TX LAN (Intel I210)*
PCIE Mini Card	*One m-PCIe Socket & One SIM Card Socket*
Multi I/O	*Two RS-232 & Two RS232/RS422/RS485*
Watchdog Timer	*Yes*
Half size mini PCIE Module Adapter kits	*AK1006* *PN:0606010028G*
Wall Mount Kit	*FX5501K1* *P/N: 0606010009G*
Panel Mount Kit#1	*FX5504K1* *P/N: 0606010012G*
Panel Mount Kit#2	*FX5407K3* *P/N: 0606010038R*
Rack Mount Kit	*FX5622K1* *P/N: 0606010024G*
Operating Temperature	-20~+50℃(-4~122℉)
Dimensions (Unit: mm) W X D X H	250 x 180 X 52

Layout

➢ a. FX5638





Specifications

- ***Processor Board –***

  4th Generation Intel® Core™ i5-4422E (Dual Core 1.8GHz,3MB L3 Cache, 25 Watts and support Intel® Turbo Boost Technology up to 2.9GHz) low power processor with 8GB DDR3L-RAM (Two So-DIMM sockets support up to 16GB DDR3L maximum)

- ***I/O Outlets –***

  Two 10/100/1000 Base-TX Ethernet LAN ports with RJ45

  Four USB 3.0 and Four USB 2.0 ports

  Two RS-232 and Two RS232/422/485 ports with DB9

  Two HD display ports and one VGA display with DB15

  Two audio connectors for Earphone, and Microphone-in

  One PCIE Mini card socket modules, especially for WLAN/GPRS module

  One DC-In jack connector, one 2-pin terminal block and 1 power button

- ***LED Indicator –***

  One HD/CFAST access LED, and two LAN Link LED

- ***Storage Bay-***

  One CFAST socket for CFAST Compact Flash modules

  One 2.5" SATA hard disk space

- ***Power requirement –***

  +12 ~ +24V DC, 3.75A maximum (1.75A typical) with 19V input voltage

- ***Dimensions -***

  FX5638- 250mm (W) x 180mm (D) x 52mm (H)

Packing List

Upon receiving the package, verify the following things. Should any of the mentioned happens, contact us for immediate service.

- Unpack and inspect the FX5638 package for possible damage that may occur during the delivery process.
- Verify the accessories in the package according to the packing list and see if there is anything missing or incorrect package is included.
- If the cable(s) you use to install the FX5638 is not supplied from us, please make sure the specification of the cable(s) is compatible with the FX5638 system.

Note: after you install the FX5638, it is recommended that you keep the diskette or CD that contains drivers and document files, and keep the document copies, or unused cables in the carton for future use.

The following lists the accessories that may be included in your FX5638 package. Some accessories are optional items that are only shipped upon order.

- One FX5638x embedded system.
- One AC to DC power adapter, 1 AC power cord, and 1 pair of cable-tie.
- One pack of 4 fixed screws.(2 for SATA HDD and 2 for mini PCIe card)
- One 2-pin apartable terminal block. (Pitch :5.08mm)
- One compact disc includes software utility and manual.

Optional Items for All FX5638x:

- AK1006- Half size mini PCIE module adapter kits. (PN: 0606010028G)
- FX5501K1- Wall Mounting Kit.(P/N: 0606010009G)
- FX5504K1- Panel Mounting kit#1 (VESA 75*75/100*100).(P/N: 0606010012G)
- FX5407K3- Panel Mounting kit#2 (VESA 50*50/75*75 /100*100). (P/N:0606010038R)
- FX5622K1- Rack Mounting Kit.(P/N: 0606010024G)

Chapter 2 Hardware Installation

This chapter introduces the system connectors & jumper settings, and guides you to apply them for field application.

Before Installation

Before you install the system, make sure you follow the following descriptions.

1. Before removing the cover, shut down the operation System and disconnect power switch to off and unplug AC-to DC Adapter cable.

2. Install or unplug any connector, CFAST Compact Flash, and hard disk be sure that the power is disconnected or power switch to off from the system. If not, this may damage the system.

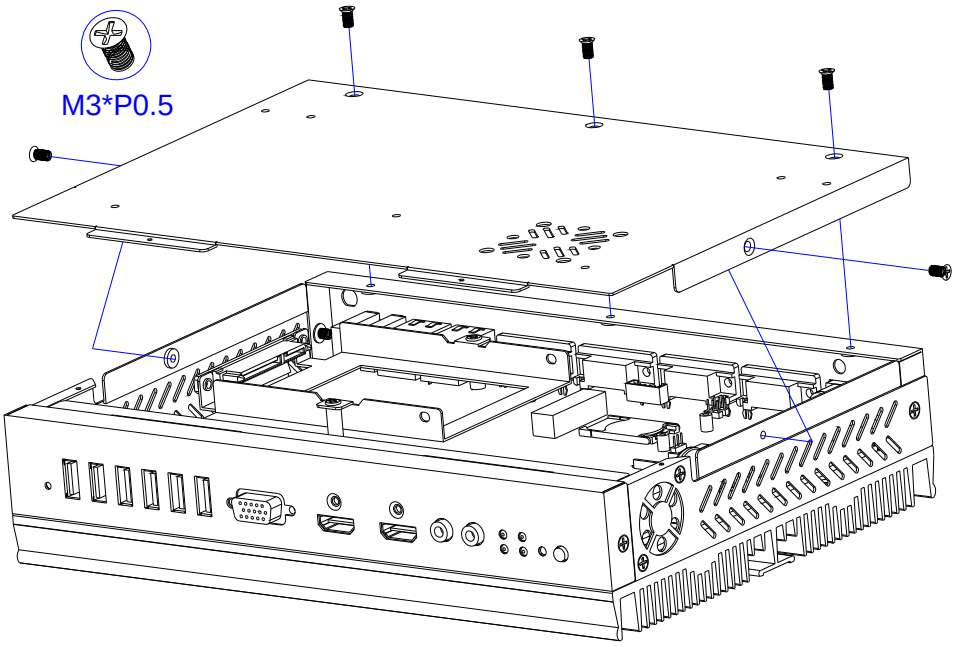
3. The ESD (Electricity Static Discharge) may be created from human body that touches the board. It may do damage to the board circuit.

□ To install Hardware- remove the bottom cover

If you are installing following hardware items, you can remove the bottom cover. They include SATA 2.5" HDD inside, mini PCIE WLAN or GPRS module, and DDR3L-RAM module to the FX5638. (Please see the spots circled.)

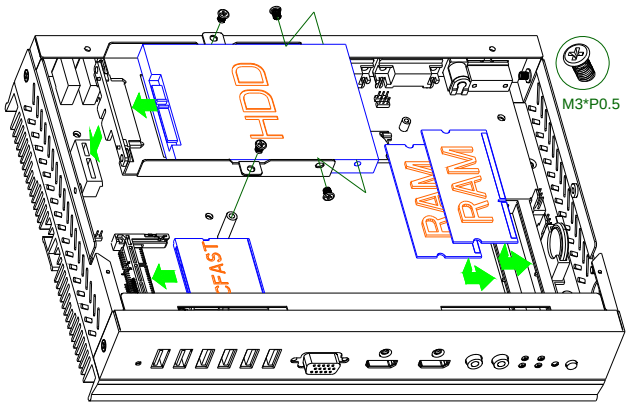
a. Unscrew Bottom cover

FX5638- Use a cross-head screwdriver to remove five screws that secures the bottom cover.



b. Installing hard disk: SATA Hard disk, SSD or CFAST

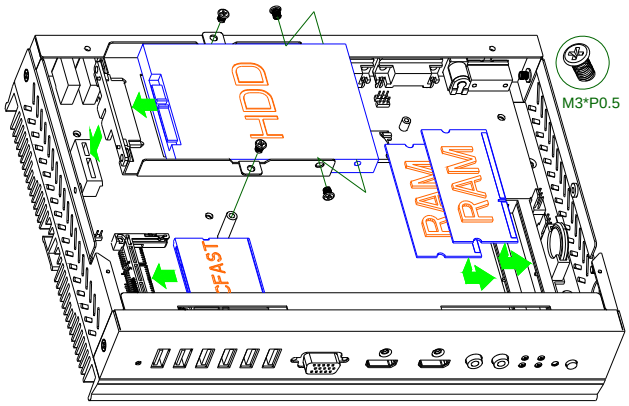
Faster Screws up the Hard disk or SSD device to HDD metal frame before plug to the SATA connector then insert to SATA slot and screws up metal frame to system. See following figure.



Note: 1. Use caution when handling the hard disk to prevent damage to SATA connector as you inserted hard disk. Be careful with the orientation when installing connector.
2. The CFAST Compact Flash socket supports CFAST Compact Flash Modules.

c. Installing Memory: So-DIMM Socket for DDR3L RAM Modules

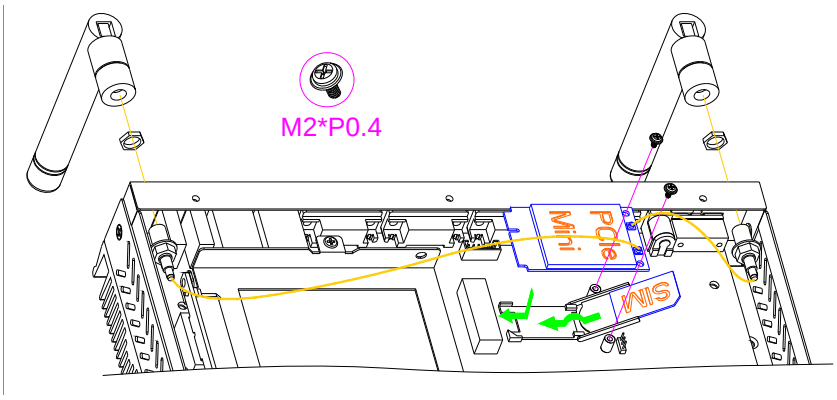
If you may extend additional memory to system, see as following figure. The 204 pin So-DIMM sockets support 4GB to 8GB (Two So-DIMM Max.16GB) DDR3L RAM module. Installing memory module to So-DIMM socket of down side, when only one memory module. We recommend that installing dual channel RAM module made by the same part number and manufacturer.



d. Installing PCIe Mini Card Module

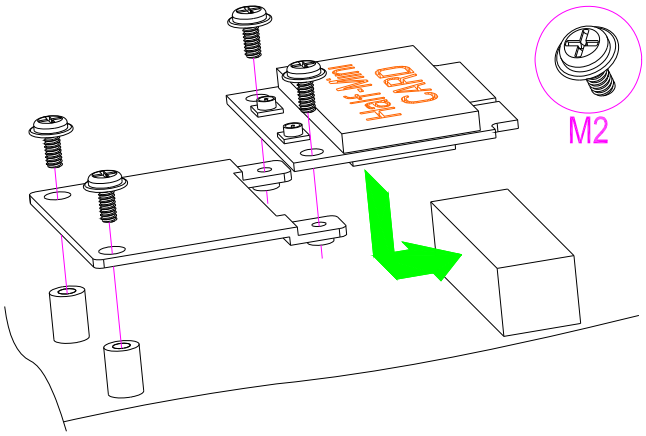
FX5638 supports PCIe mini card socket; you may extend additional PCIe mini card module and SIM card to system. Connect to the antenna cable from rear and front side antenna holes to GPRS or Wireless LAN module and install the SIM card for GPRS. See following figures.

✧ ***d1. Installing PCIe Mini Card and SIM card***



Note: 1. When installing PCIe GPRS Mini card on FX5638 system these is need the installing the SIM Card to SIM socket (Front side) of system.
2. The insert SIM card into the SIM card socket. Make sure that the SIM card is properly inserted and that golden contact area on the card is facing downwards.

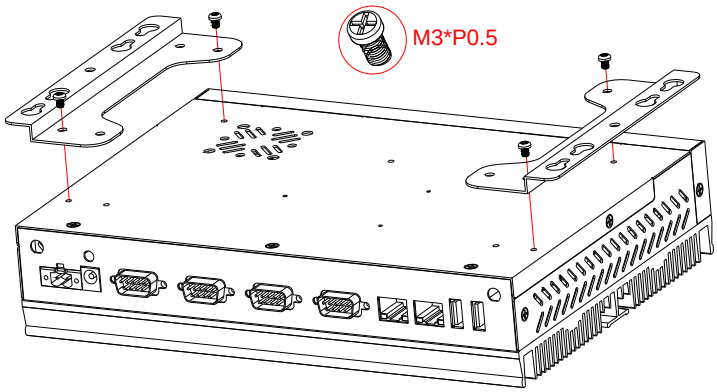
✧ ***d2. Installing AK1006 kit (Optional): For Half Size Mini PCIe module***



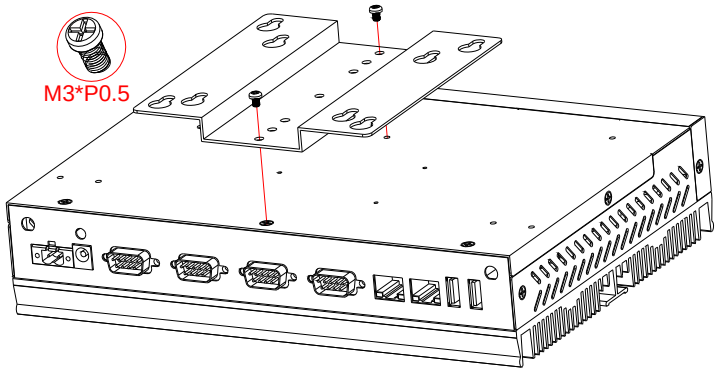
e. Installing the universal fixers on FX5638

Please refer to the down side figure for installing the FX5638 with universal fixers.

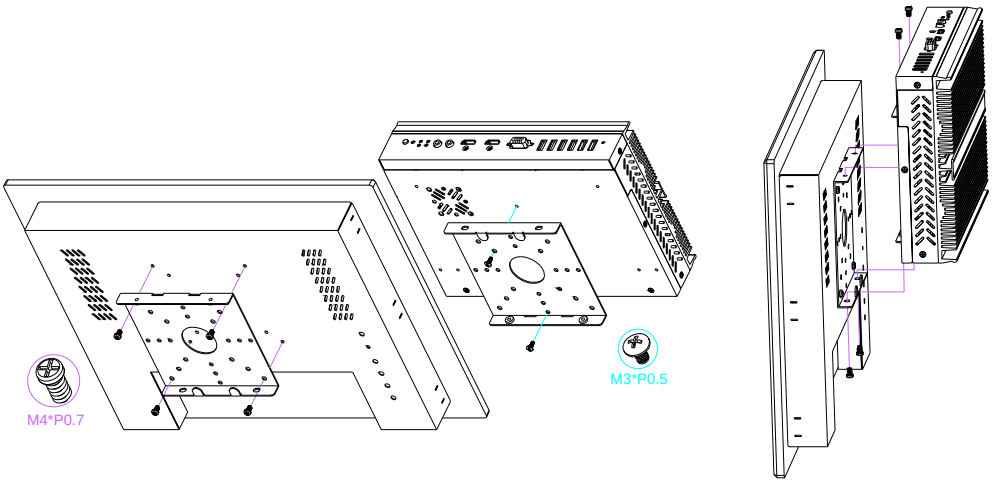
e1. FX5501K1- Wall Mounting Kit



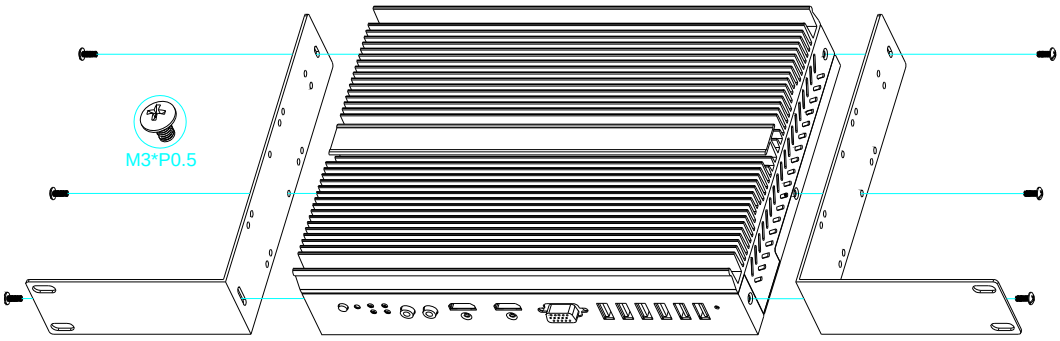
e2. FX5504K1- Panel Mounting Kit#1 (VESA-75*75/100*100)



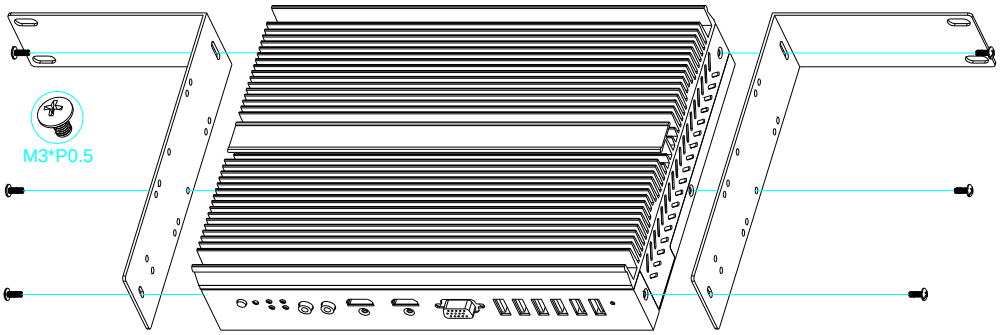
e3. FX5407K3- Panel Mounting Kit#2 (VESA-50*50/75*75/100*100)



e4. FX5622K1- Rack Mounting Kit

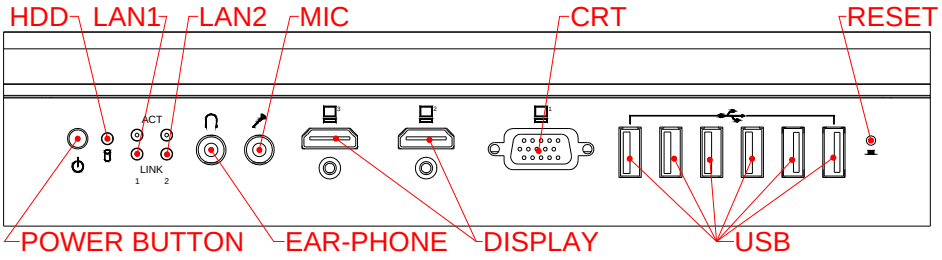


e4-1. FX5622K1- Rack Mounting Kit



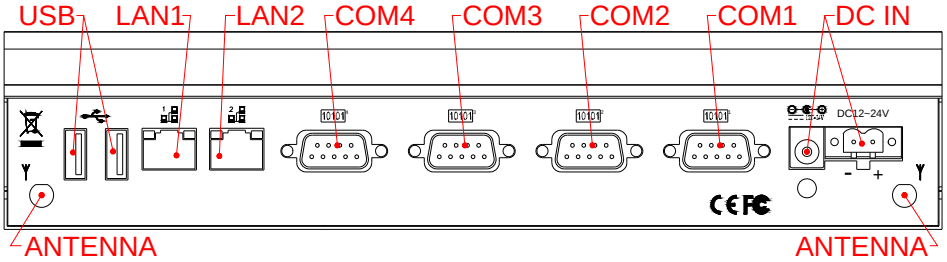
□ LED Indicators (On the Front Panel)

The Power Button and HDD LED have two distinctive statuses: Off for inactivity and blinking light for active operation. And the 4 LED's for LAN ports. The up side LED (Orange) indicates data is being accessed and the down side LED's (Green) indicates on-line status. The LAN1 and LAN2 LED's (Green) indicate on-line/ (Orange) access status of LAN1 and LAN2 respectively.

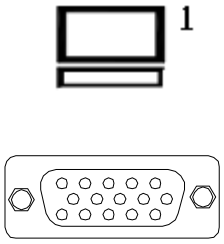


□ I/O Peripheral Connectors

View from the front and rear panel, if you are connecting the monitor, LAN, audio, COM and USB to the FX5638. See following figure and a side pictures.



1. A VGA (CRT) connector is provided for VGA signals.

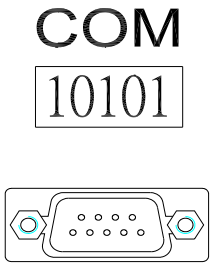


DB15	Signal
1	Red
2	Green
3	Blue
13	Hsync
14	Vsync
12	DDC Data
15	DDC Clock
5 & 10	Digital Ground
6,7,8	Analog Ground
Others	Not Used

2. Connecting the Display2 (HD) and Display3 (HD) port

3. Connecting the COM ports

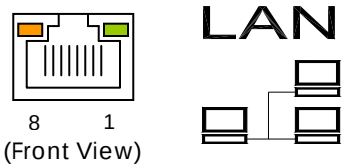
The DB9 COM3/4 is standard RS232 serials port, and the DB9-COM1/2 is designed for multiple proposes. The COM1/2 can select RS232/RS422/RS485 by BIOS CMOS setting. The following tables show the signal connections of these connectors.



DB-9	RS-232 Signal	RS-422	RS-485
1	-DCD		
6	-DSR		
2	RXD	RX-	485-
7	-RTS	TX-	
3	-TXD	RX+	485+
8	-CTS	TX+	
4	-DTR		
9	-RI		
5	Ground		
Case	Case Ground		

4. Connecting the Giga-LAN ports

The RJ45 connector with 2 LED's for LAN. The left side LED (orange) indicates data is being accessed and the right side LED (green) indicates on-line status. (On indicates on-line and off indicates off-line)

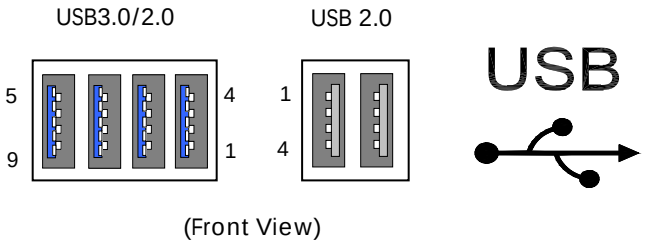


The following lists the pin assignment of RJ45.

LAN1/LAN2	Signal	LAN1/LAN2	Signal
1	TPTX+	5	TPTX1-
2	TPTX -	6	TPRX -
3	TPRX+	7	TPRX1+
4	TPTX1+	8	TPRX1-

5. Connecting the USB 2.0 & 3.0 Ports

The system supports a eight port USB connector. Any USB device can be attached to USB ports as plug-and-play function is supported. The front side port USB #1~#4 can support USB2.0/3.0, USB#5/6 and rear side USB # 7/8 support USB 2.0.



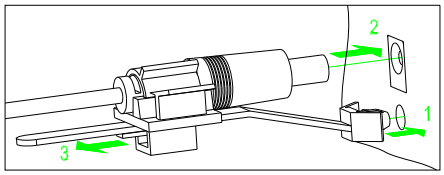
USB	Signal
Pin 1	USBV
Pin 2	USBD- (V2.0)
Pin 3	USBD+(V2.0)
Pin 4	USBG
Pin 5	StdA_SSRX-(V3.0)
Pin 6	StdA_SSRX+(V3.0)
Pin 7	USBG (V3.0)
Pin 8	StdA_SSTX-(V3.0)
Pin 9	StdA_SSTX+(V3.0)

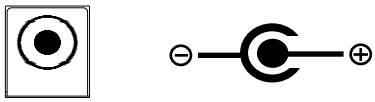
6. Connecting the Audio Mic In/ Ear-Phone Out

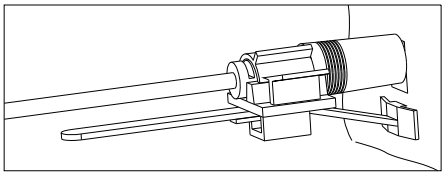
□ Connecting the DC Power and Power Button

Power is supplied through an external AC/DC power adapter or power DC In. Take reference to the technical specification section for information about AC/DC power input voltage. See following figure.

1. DC-Power Jack: Plug External AC/DC power adapter into DC-jack (2) plug the cable into hole (1), then pull up the end of the cable (3).

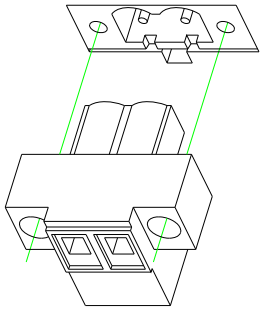


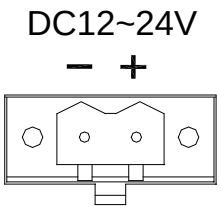




DC +12V~+24V, 80VA minimum

2. DC Power Connector: Use external 2-pin apartable terminal block.

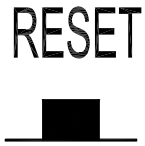




Terminal Block

3. Power Button & Reset Push Button: Pushing the Power button one time will switch the system on and off. And Reset push button is the switch for system reset. Push and release the reset button will make hardware reset system and restart booting the system.

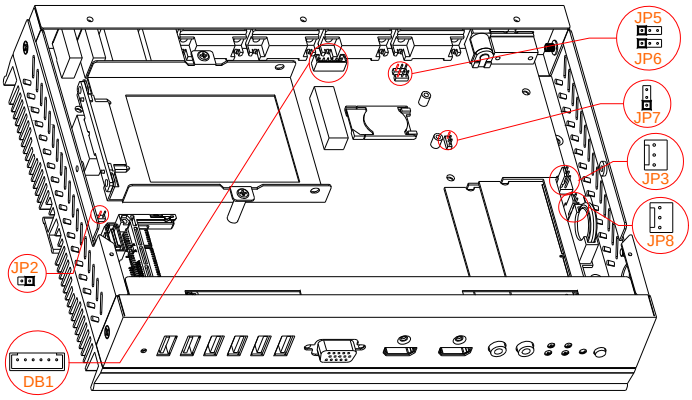
Power button: On/Off



Reset Push Button: Restart

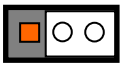
□ Internal Connector and Jumper Setting

The COM1 and COM2 are designed for multiple proposes. Using JP5 (COM1) or JP6 (COM2) is to select RS485 terminator resistor. JP7 is used to select 3VSB /3.3V voltage with PCIE mini card module (See a PCIE mini card module specification.) JP2 is used to clear CMOS data, and other connectors are reserved for other usage.



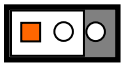
a. JP5/JP6: COM1 and COM2 RS-485 Terminator Resistor Setting

JP5/JP6



1 2 3

RS-485
Terminator
Disabled
Factory Preset



1 2 3

RS-485
Terminator
Enabled

b. JP2: Clear CMOS Setting

You can use JP2 to clear CMOS data. The CMOS stores information such as system date, time, and boot up device, password… which include set up with the BIOS. To clear the CMOS, set JP2 to close and then open before system powers off. The default setting is open.

JP2

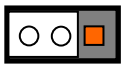
Factory Preset

Clear CMOS Data

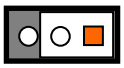
c. JP7: Select 3VSB/3.3V Voltage for PCIE Mini Card Module

When installing the PCIE Mini card module, if the card doesn't work properly (See a PCIE module card specification pin-24 3.3VAUX.), you can select 3VSB/3.3V voltage. (Defaulted 2, 3 closed.)

JP7



3.3V StandBy/3.3VSB
Factory Preset



3.3V/Voltage

Chapter 3 BIOS Setup

This chapter describes the BIOS setup.

Overview

BIOS are program located on a Flash memory chip on a circuit board. It is used to initialize and set up the I/O peripherals and interface cards of the system, which includes time, date, hard disk drive, and connected devices such as the video display, diskette drive, USB device, and the USB keyboard. This program will not be lost when you turn off the system.

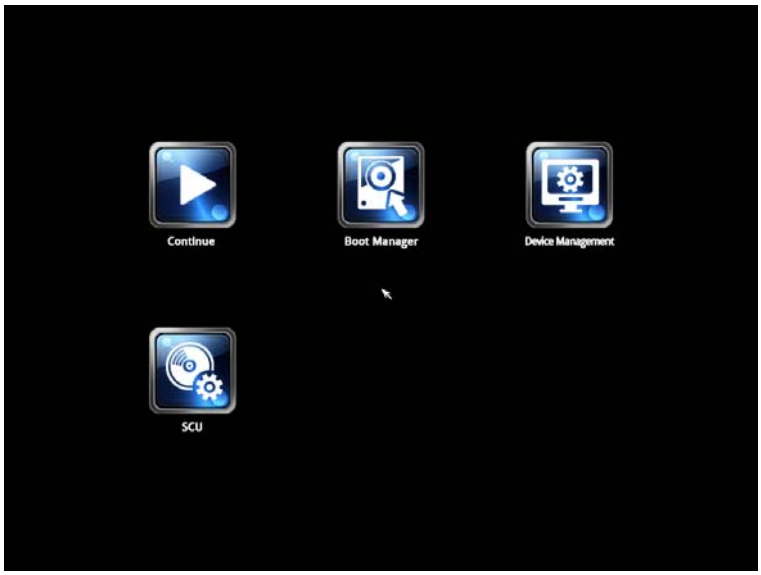
The BIOS provides a menu-driven interface to the console subsystem. The console subsystem contains special software, called firmware that interacts directly with the hardware components and facilitates interaction between the system hardware and the operating system.

The BIOS default values ensure that the system will function at its normal capability. In the worst situation the user may have corrupted the original settings set by the manufacturer.

All the changes you make will be saved in the system RAM and will not be lost after power-off.

When you start the system, the BIOS will perform a self-diagnostics test called Power On Self Test (POST) for all the attached devices, accessories, and the system. Press the [Del] or [ESC] key to enter the BIOS Setup program, and then the main menu will show on the screen.

Note: Change the parameters when you fully understand their functions and subsequence.



Press “ESC” or “Delete” key enter to BIOS Setup screen

☐ Boot Manager Setup

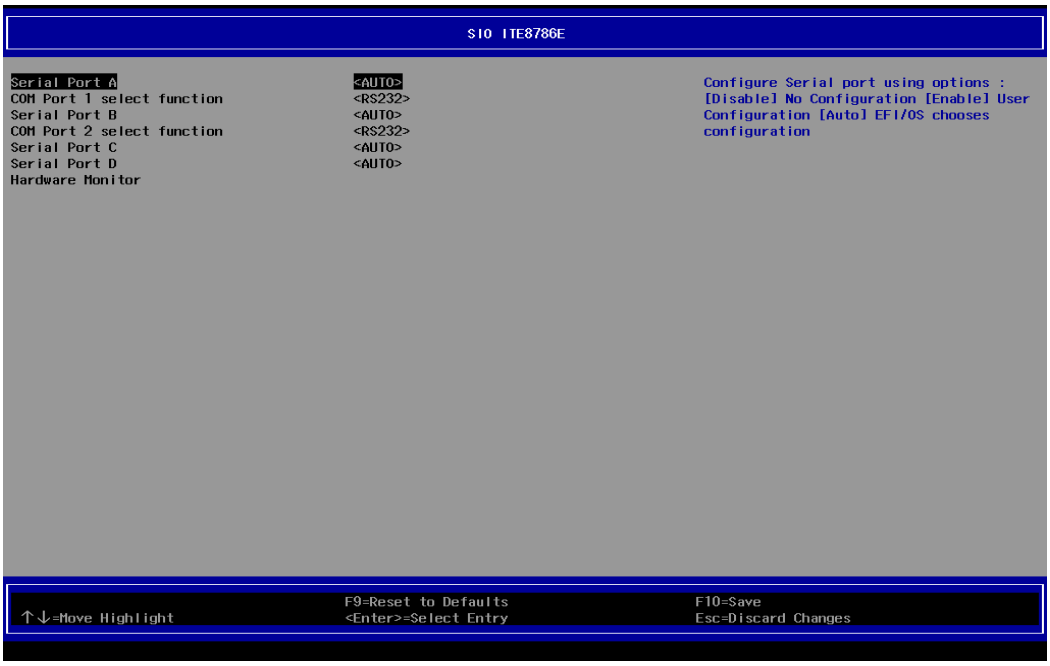
Use this screen to specify the order in which the system checks for the device to boot from. To access this screen, select Boot Option Menu on the Boot Manager Screen and press <Enter>. (Or when select boot device press [F11]).

□ Device Manager Setup

You can use this screen to select options for the Devices List Configuration. Device Manager is a Super I/O chipset on the system board that controls the basic serial port functions, and hardware monitor.

SIO ITE8786E IO Configuration

This section describes the function of Super I/O (ITE8787E) settings.



✧ ***Serial Port A/B***

This item allows users to enable and disable Serial Port A/B (COM1/2). If set to Auto, is EFI/OS chooses configuration.

Available Options: Disabled, Enabled and Auto

Default setting: Auto

Base I/O Address A/B

These fields item can select serial port address I/O, When Serial Port A/B set to Enabled for User configuration.

Available Options: 3F8, 2F8, 3E8, and 2E8

Default setting: 3F8 (Port -A)/2F8 (Port-B)

INTERRUPT A/B

These fields item can select serial port interrupt, When Serial Port A/B set to Enabled for User configuration.

Available Options: IRQ4, and IRQ3

Default setting: IRQ4 (Port -A)/ IRQ3 (Port-B)

✧ ***COM Port 1/2 Select Function***

These fields item can select RS-232, RS-422 and RS-485 of select port 1/2.

Available Options: RS-232, RS-422 and RS485

Default setting: RS-232

✧ ***Serial Port C/D***

This item allows users to enable and disable Serial Port C/D (COM3/4). If set to Auto, is EFI/OS chooses configuration.

Available Options: Disabled, Enabled and Auto

Default setting: Auto

Base I/O Address C/D

These fields item can select serial port address I/O, When Serial Port C/D set to Enabled for User configuration.

Available Options: 3E8, and 2E8

Default setting: 3E8 (Port -C)/2E8 (Port-D)

INTERRUPT C/D

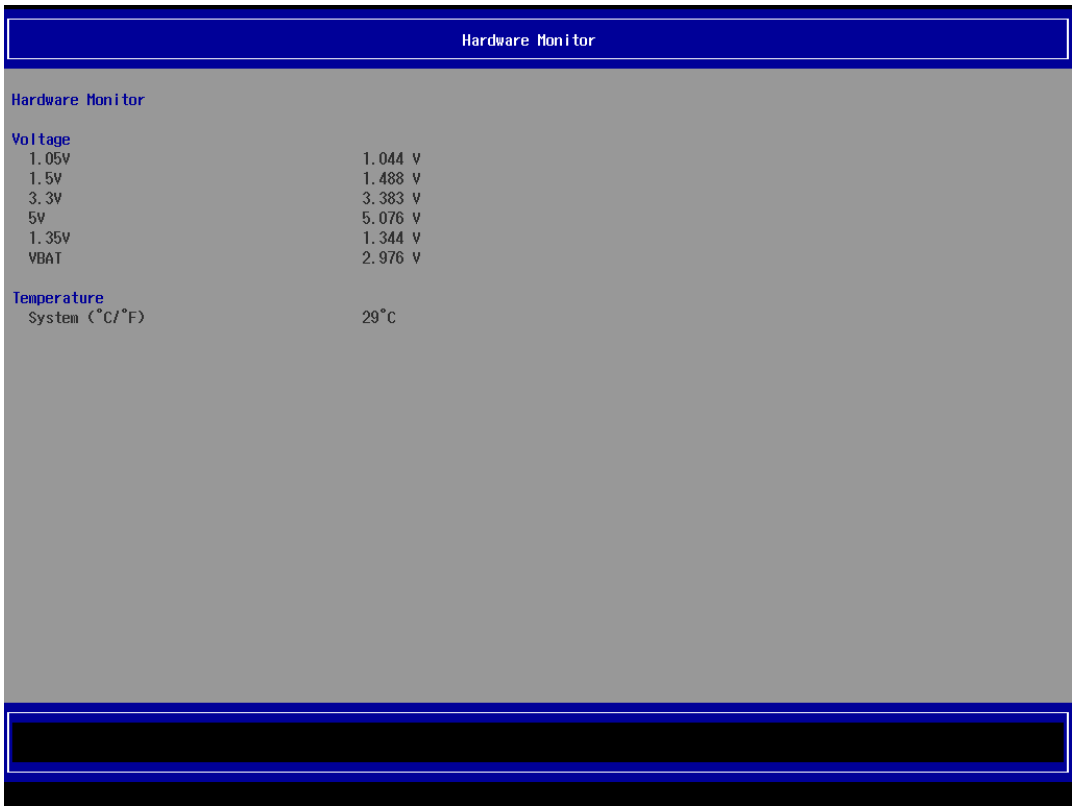
These fields item can select serial port interrupt, When Serial Port C/D set to Enabled for User configuration.

Available Options: IRQ5, and IRQ7

Default setting: IRQ5 (Port -C)/ IRQ7 (Port-D)

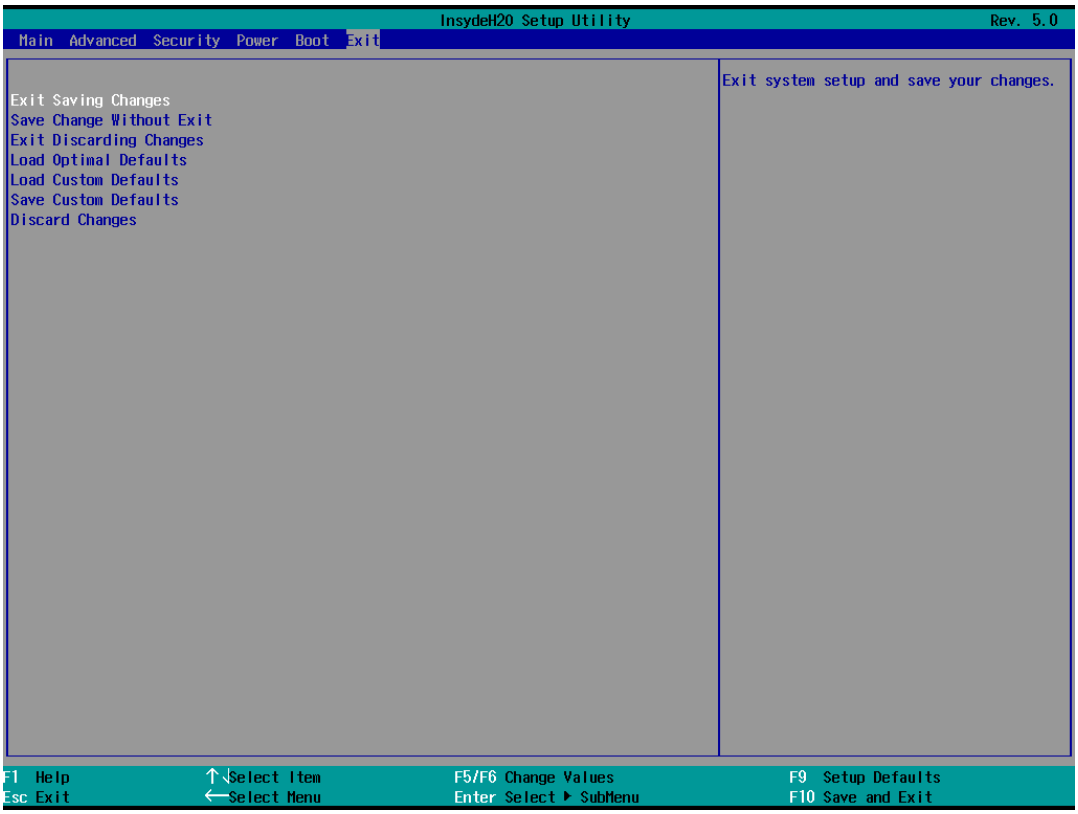
✧ *Hardware Monitor*

On the Hardware Monitor screen, you can monitor the CPU temperature, CPU voltage, and 3.3V voltage...



◻ SCU Setup

On the menu, you can perform the following functions



1. Main
2. Advanced
   - Boot Configuration
   - Peripheral Configuration
   - SATA Configuration
   - Thermal Configuration
   - Video Configuration
   - USB Configuration
   - Chipset Configuration
   - PCI Configuration
   - Console Configuration
   - Chipset PCIE Controller
3. Security
   - Set Supervisor Password
   - Set User Password
4. Power
   - Advanced CPU Control
5. Boot
   - Legacy
6. Exit

- Exit Saving Changes: Exit system setup after saving the changes.F10 key can be used for this operation.
- Save Change Without Exit: Save changes and without exiting system.
- Exit Discarding Changes: Exit system setup without saving any changes. ESC key can be used for this operation.
- Load Optimized Default: to auto configure the system according to optimal setting with pre-defined values. This is also the factory default setting of the system when you receive the board.
- Load Customer Defaults: Load custom BIOS settings you have saved.
- Save Custom Defaults: Allow to save BIOS setting you have made as a profile.
- Discard Changes: Discard changes down so far any of the set questions.

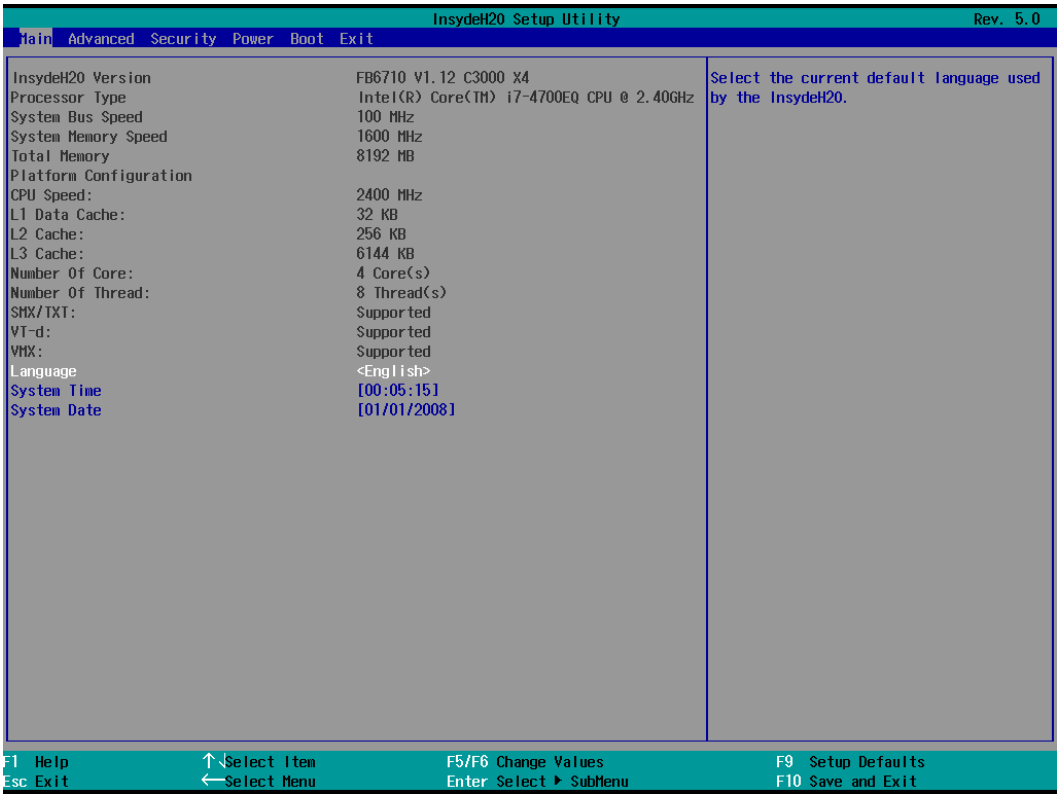
Keyboard Convention

On the BIOS, the following keys can be used to operate and manage the menu:

Item	Function
ESC or DEL	Enter BIOS setup and exit the current menu or message
F1	To display the help menu if you do not know the purpose or function of the item you are going to configure
F5/F6	To select a parameter
F9	Setup default
F10	Save and exit
[↑][↓]	To go upward or downward to the desired item
[←][→]	To go upward or downward to the desired screen
Enter	Select or Enter submenu

Main Setup

This section describes basic system hardware configuration, CPU information, system clock setup and BIOS version information. If the CPU board is already installed in a working system, you will not need to select this option anymore.



System Memory Speed and Total Memory

This option is display-only which is determined by POST (Power On Self Test) of the BIOS.

System Date & Time Setup

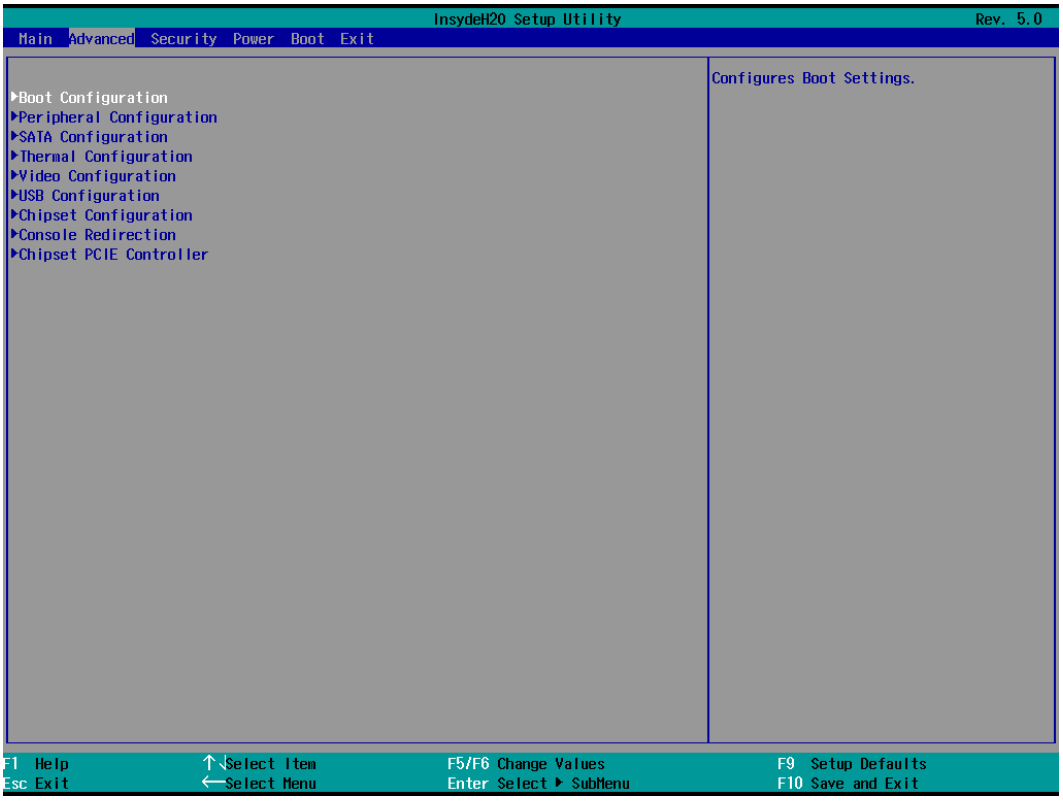
Highlight the <Date> field and then press the [+]/ [-] keys to set the current date. Follow the month, day and year format.

Highlight the <Time> field and then press the [+]/ [-] keys to set the current date. Follow the hour, minute and second format.

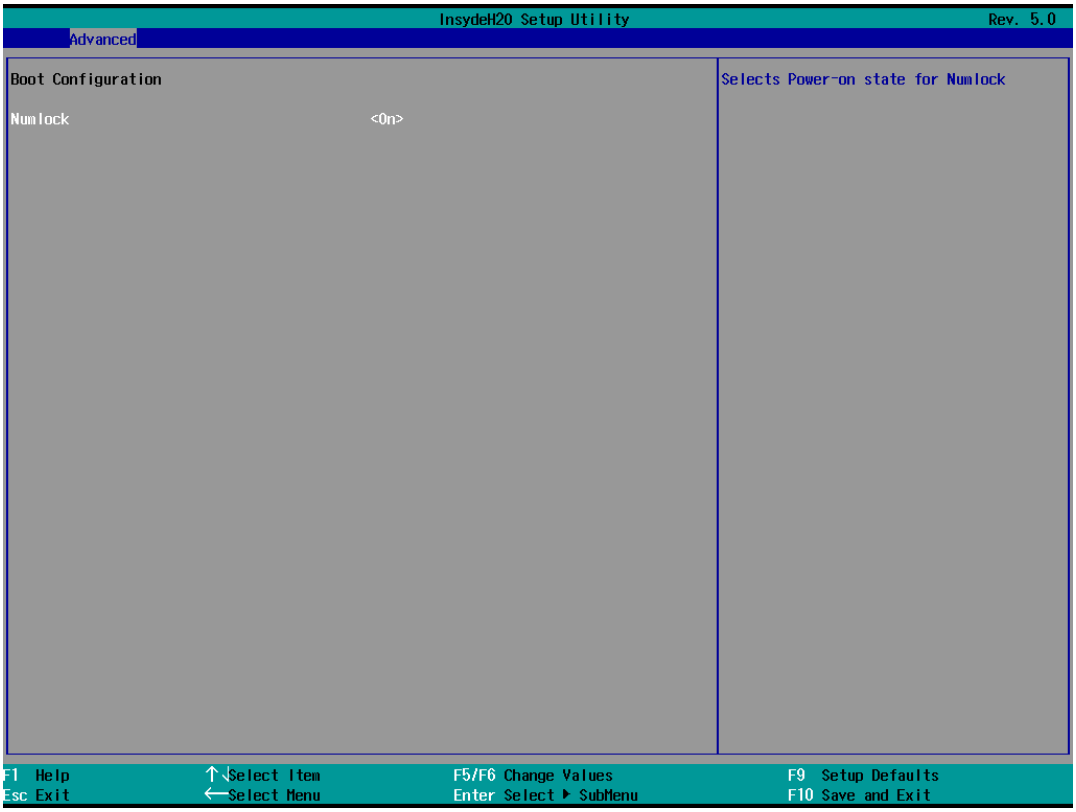
The user can bypass the date and time prompts by creating an AUTOEXEC.BAT file. For information on how to create this file, please refer to the MS-DOS manual.

Advanced Setup

Select the *Advanced* tab from the 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 Boot Configuration, 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



❑ Boot Configuration



Boot Up Num-Lock

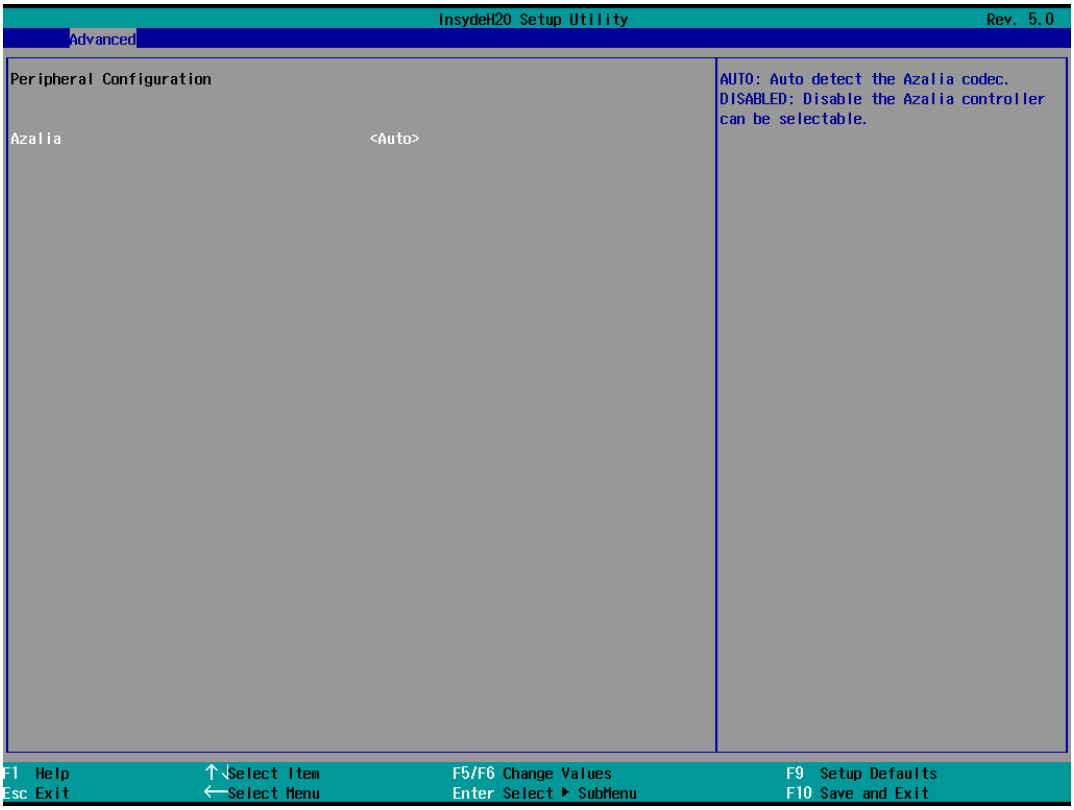
This field is used to activate the Num Lock function upon system boot. If the setting is on, after a boot, the Num Lock light is lit, and user can use the number key.

Available options: On, Off

Default setting: On

❑ Peripheral Configuration

This section describes the function of peripheral settings.



Azalia Controller

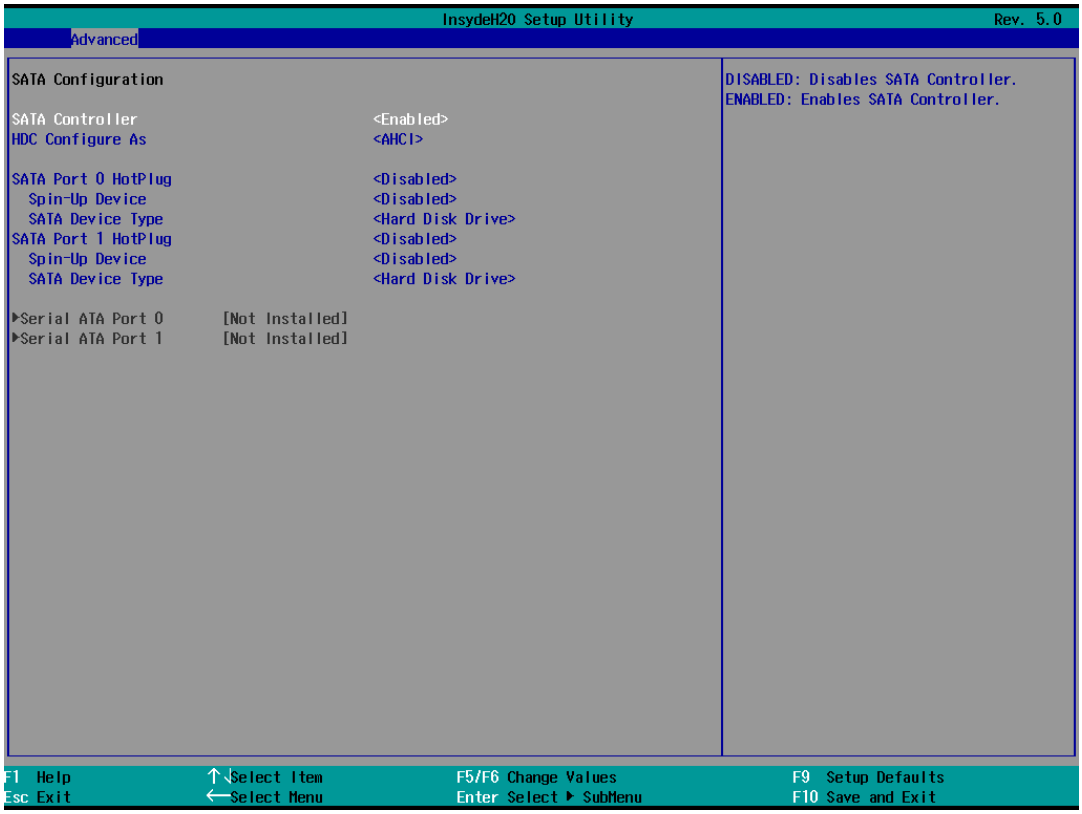
This field specifies the internal Azalia codec Control.

Available Options: Auto, Enabled and Disabled

Default setting: Auto

❑ SATA Configuration

You can use this screen to select options for the SATA Configuration Settings. Use the up and down <Arrow> keys to select an item. Use the <Plus> and <Minus> keys to change the value of the selected option. A description of the selected item appears on the right side of the screen. The settings are described on the following pages. An example of the SATA *Configuration* screen is shown below.



SATA Controller

This item allows users to enable or disable SATA Controller.

Available Options: Disabled, and Enabled

Default setting: Enabled

HDC Configure as

This field is Hard Disk controller can select IDE or AHCI mode.

Available Options: IDE, and AHCI

Default setting: AHCI

SATA Port0/1 Hot plug

The system SATA HDD corresponding SATA port 0 hot plugs, this item allows users to enable or disable SATA port 0.

Available Options: Disabled, and Enabled

Default setting: Disabled

✧ ***Spin-Up Device***

The item supports staggered Spin-Up (SSS) in AHCI Host Capability register Bit 27.

Available Options: Disabled, and Enabled

Default setting: Disabled

✧ ***SATA Device Type***

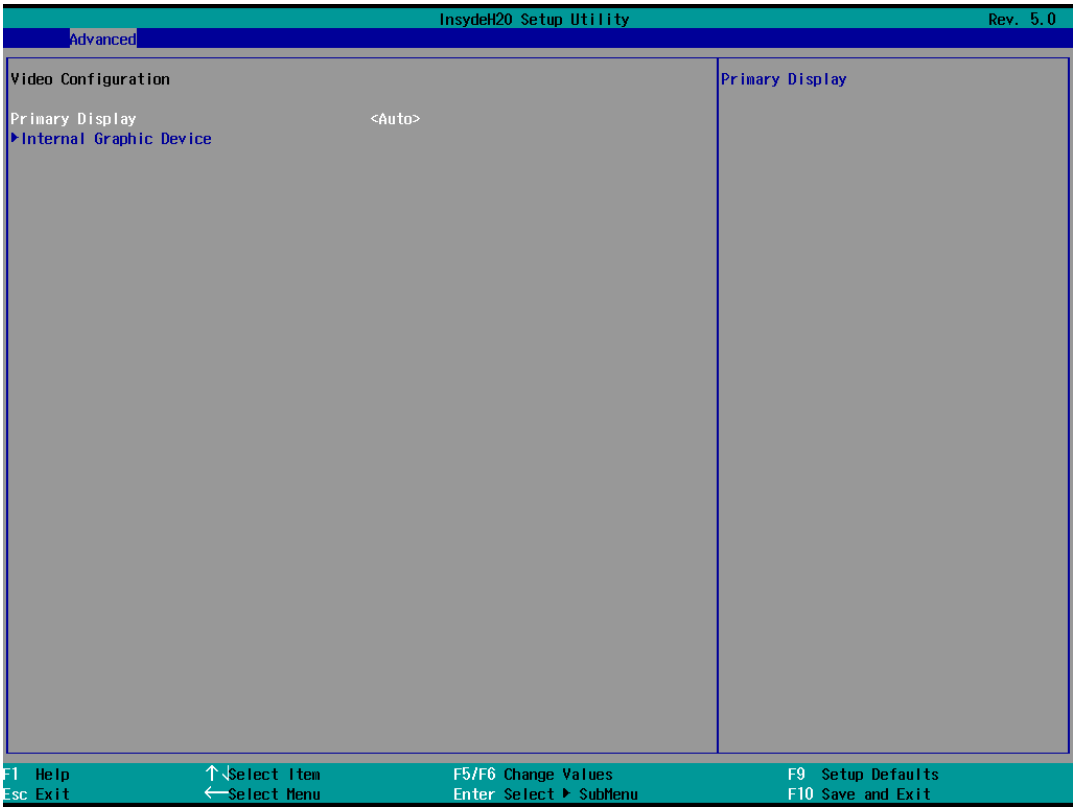
This item can select the Solid State Disk (SSD) or Hard Disk driver.

Available Options: Hard Disk Driver, and Solid State Driver

Default setting: Hard Disk Driver

❑ Video Configuration

You can use this screen to select options for the video Configuration. Use the up and down <Arrow> keys to select an item. Use the <Plus> and <Minus> keys to change the value of the selected option.



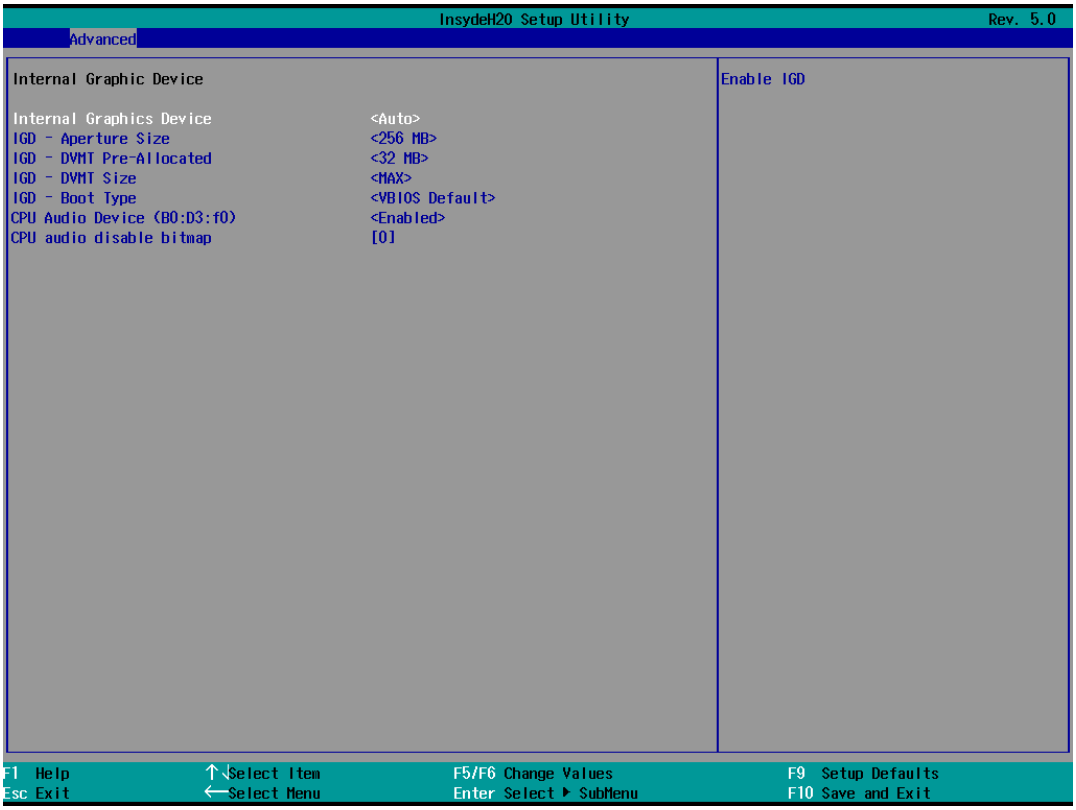
Primary Display

This field is select which graphics controller to use as the primary boot device.

Available Options: IGFX, PEG, PCI, and Auto

Default setting: Auto

Internal Graphics



✧ ***Internal Graphics Device***

This field is select internal graphics controller device to Enabled or Disabled.

Available Options: Enabled, Disabled, and Auto

Default setting: Auto

✧ ***IGD – Aperture Size***

This field specifies the system memory size that can be used by the Internal Graphics Device (IGD).

Available Options: 128MB, 256MB, and 512MB

Default setting: 128 MB

✧ ***IGD – DVMT Pre- Allocated***

The Item is select DVMT 5.0 Pre-Allocated (Fixed) graphics memory size used by the internal graphics device.

Available Options: 0MB, 32MB, 64MB, 96MB, 128MB, 160MB, 192MB, 224MB, 256MB, 288MB, 320MB, 352MB, 384MB, 416MB, 448MB, 480MB, 512MB, and 1024MB

Default setting: 32 MB

✧ ***IGD – DVMT Size***

This field specifies allows you to select the maximum amount of graphics memory of DVMT 5.0 to be shared with the system memory.

Available Options: 128MB, 256MB, and MAX

Default setting: 128 MB

✧ ***IGD – Boot Type***

This field specifies allows you to select the Video Device which will be activated during POST.

Available Options: CRT, EFP/HD (Display2), EFP2/HD1 (Display3) Port and VBIOS.

Default setting: VBIOS

✧ ***CPU Audio Device (B0:D3:F0)***

This field specifies allows you to select Enable/Disable CPU Audio Device.

Available Options: Enabled, and Disabled

Default setting: Enabled

✧ ***CPU Audio Disabled Bitmap***

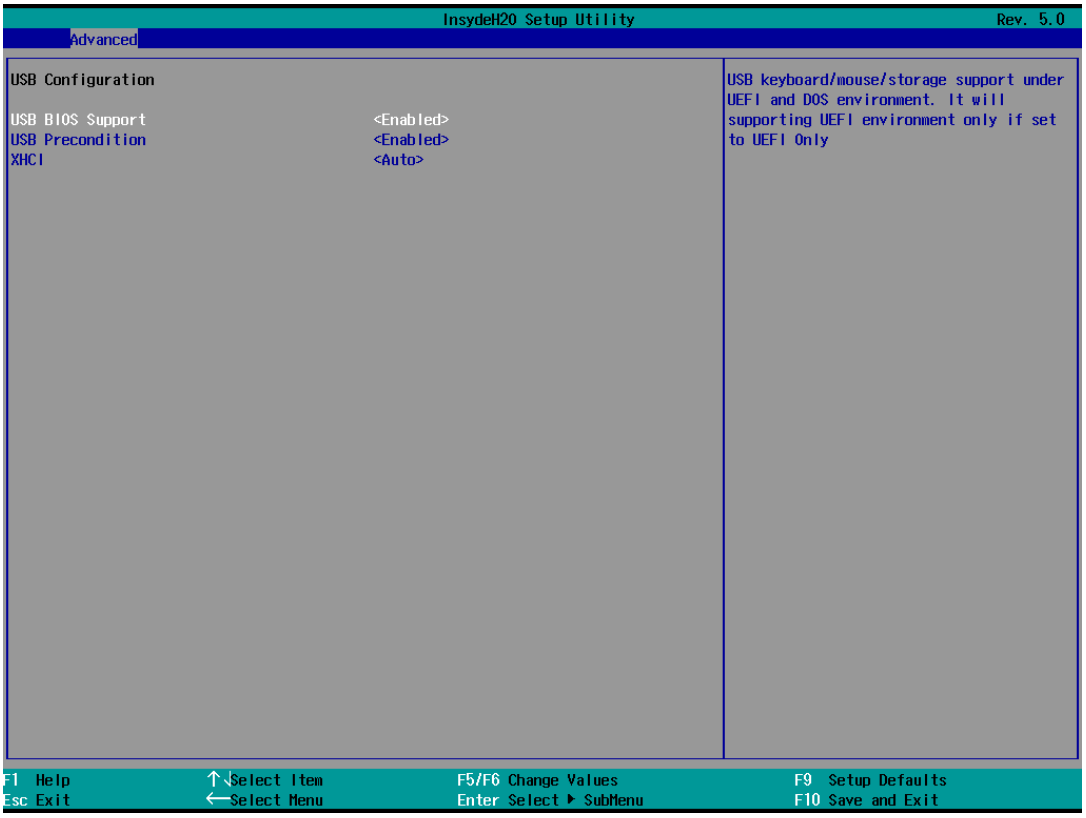
This field specifies allows you to disable codec port Bit1: Port B (Display2-HD) Bit2: Port C (Display3-HD).

Available Options: 0, 1, and 2

Default setting: 0

❑ USB Configuration

You can use this screen to select options for the USB Configuration.



USB BIOS Support

The USB BIOS Support refers to the USB mouse, USB keyboard and USB storage support. Normally if this option is not enabled; any attached USB mouse or USB keyboard will not become available until a USB compatible operating system is fully booted with all USB drivers loaded. When this option is enabled, any attached USB mouse or USB keyboard can control the system even when there is no USB drivers loaded on the system. Set this value to Enabled or UEFI only the USB device support.

Available Options: Disabled, UEFI Only, and Enabled

Default setting: Enabled

USB Precondition

This field is precondition work on USB host controller and roots ports for fast enumeration.

Available Options: Disabled, and Enabled

Default setting: Enabled

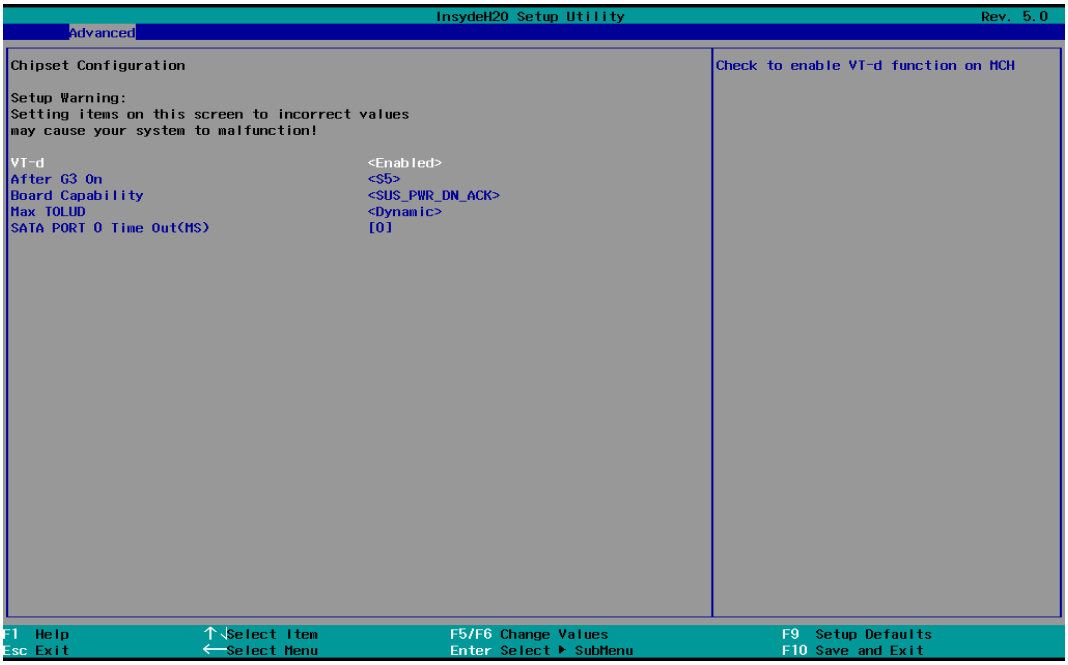
XHCI

The item XHCI (eXtensible Host Controller Interface) a workaround for specification for Universal Serial Bus 3.0 support.

Available Options: Disabled, Auto, Smart Auto, and Enabled

Default setting: Disabled

❑ Chipset Configuration



VT-d

The Item is Check to enable VT-d function on MCH.

Available Options: Disabled, and Enabled

Default setting: Enabled

After G3 On

This field is specify what state to go to when power is re-applied after power failure (G3 State).The states S0(G0) is working of power state, the states S5(G2) is soft off of power state.

Available Options: S0, S5, and Last State

Default setting: S5

Board Capability

This field is Board Capability - SUS_PWR_DN_ACK -> Send Disable to PCH. DeepSx -> Show DeepSx Policy.

Available Options: SUS_PWR_DN_ACK, and DeepSx

Default setting: SUS_PWR_DN_ACK

Max TOLUD

This field is Max value of TOLUD; Dynamic assignment would adjust TOLUD automatically based on largest MMIO length of installed graphic controller.

Available Options: Dynamic, 1GB, 1.25GB, 1.5GB, 1.75GB, 2GB, 2.25GB, 2.5GB, 2.75GB, 3GB, and 3.25GB

Default setting: Dynamic

SATA Port 0 Time Out (ms)

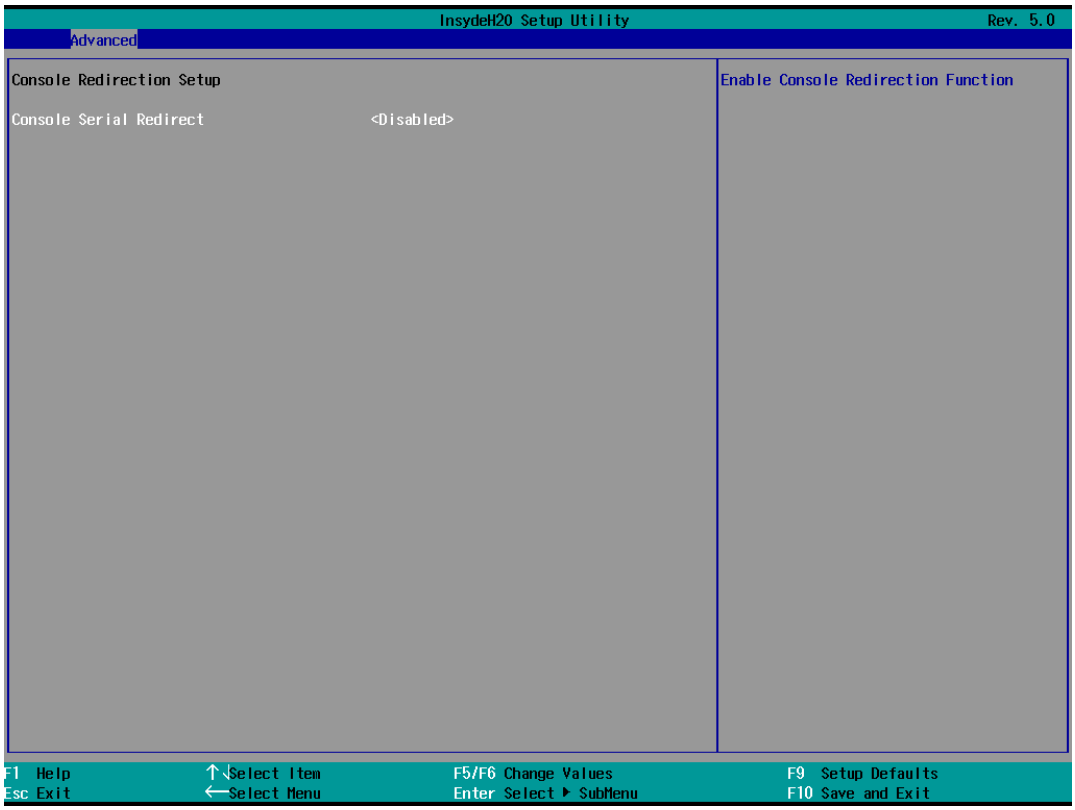
This field is Add Delay time for SATA PORT 0, Time Out 0: no delay, Time Out > 0: Max delay time equals Time out, the recommend time is: 1 to 10 MS.

Available Options: 0 ~ 10

Default setting: 0

❑ Console Redirection Setup

This option turns on Console Redirection Setup for remote access support in the BIOS and is the default setting. The console remote access feature requires the use of the serial port connector located at the back side of the system.



Console Serial Redirect

This field is select Console Serial Redirect to Enabled or Disabled.

Available Options: Enabled and Disabled

Default setting: Disabled

Information Wait Time

This field is givens the delay in seconds to display memory information.

Available Options: 0 Second, 2 Second, 5 Second, 10 Second, and 30 Second

Default setting: 5 Second

Serial Port number

This field is select Serial port for console redirection. Make sure the port is Enabled.

Available Options: COM_1, COM_2, COM_3, COM_4, PCI Device, and All Device Ports.

Default setting: COM_1

Terminal Type

This field is selecting the target terminal type.

Available Options: VT100, vt100+, VT-UTFB, and PC_ANS1

Default setting: VT100

Baud Rate

This field is select Serial ports can use baud rate. Just keep in mind that speed must match terminal setting.

Available Options: 115200 , 57600, 38400, 19200 , 9600, 4800, 2400, and 1200

Default setting: 115200

Data Bit

This field is select Serial ports can use data bit. Just keep in mind that the data bits must match terminal setting.

Available Options: 7 Bots, and 8 Bits

Default setting: 8 Bits

Parity

This field is select Serial ports can use parity mode. Just keep in mind parity must match terminal setting.

Available Options: None, Even, and Odd

Default setting: None

Stop Bit

This field is select Serial ports can use any mode. Just keep in mind that the bits per second and stop bits must match terminal setting.

Available Options: 1 Bit, and 2 Bit

Default setting: 1 Bit

Flow Control

This field is Serial ports can use flow control for console redirection.

Available Options: None, RTS/CTS, and XON/XOFF

Default setting: None

C (Console).R (Redirection) After Post

These fields is select console redirection is active during post and during boot loader or always active or off active. (Some OSS may not work if set to Always)

Available Options: Yes, and No

Default setting: Yes

Text Mode Redirection

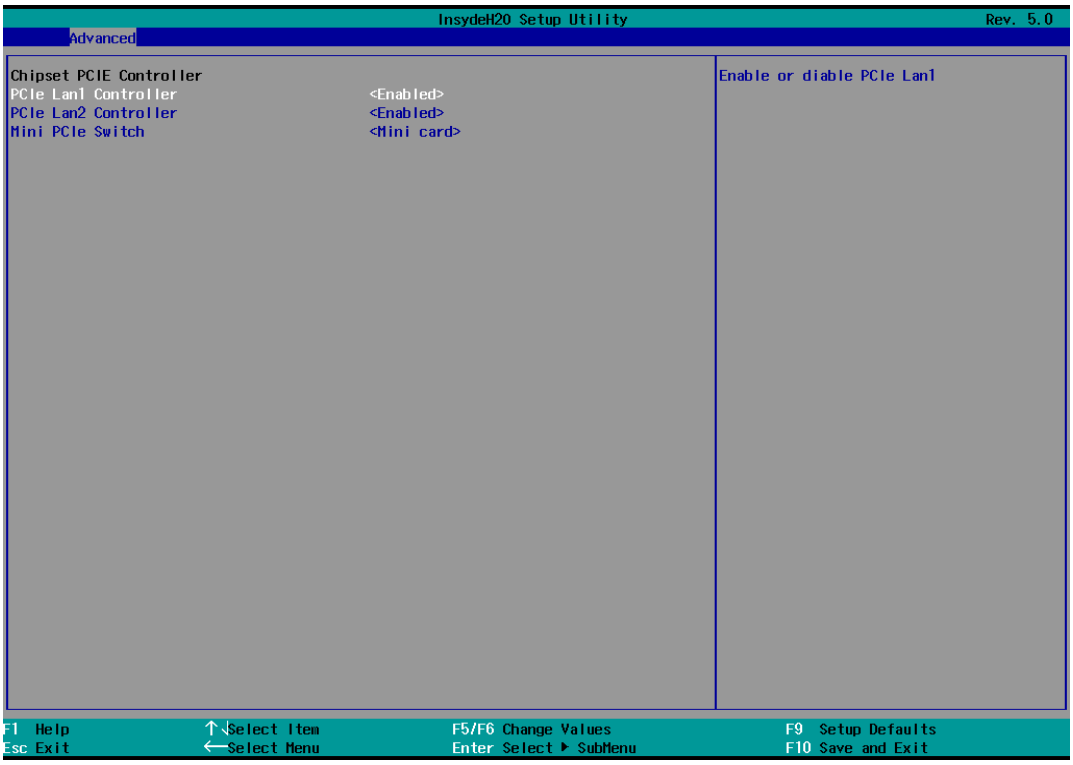
This field is select console redirection Text mode.

Available Options: Auto, Force 80X25, Force 80X24 (Del FIRST ROW), and Force 80X24 (Del LAST ROW)

Default setting: Auto

□ Chipset PCIE Controller

You can use this screen to select options for the PCIE controller Configuration.



PCIe LAN1/LAN2 Controller

This field specifies the Enabled or Disable of the onboard LAN1 and LAN2 chip.

Available Options: Disabled, Enabled

Default setting: Enabled

Mini PCIe Switch

This field specifies the select Mini PCIe of the system board or free signals for PCIE slot. When use PCIE mini card module socket, the setting will set to Mini Card, if not the PCIE will be reserved for PCIE Slot of system.

Available Options: Mini Card, and PCIe

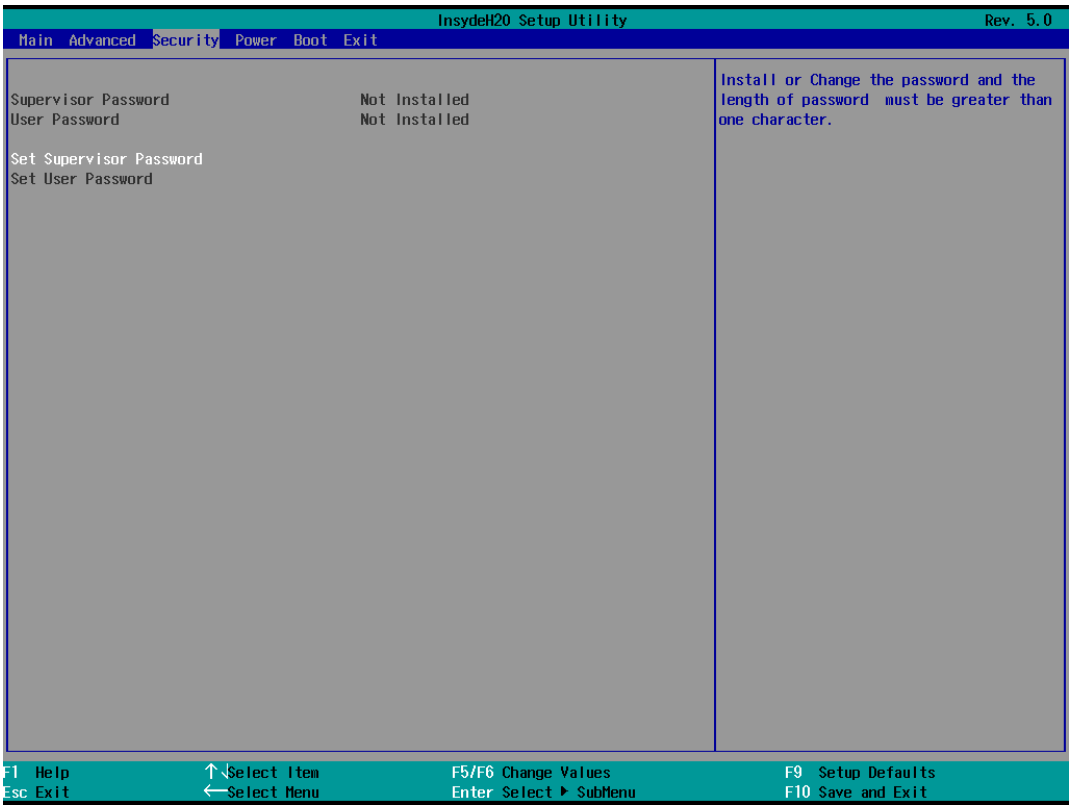
Default setting: PCIe

Security setup

There are two security passwords: Supervisor and User. Supervisor a privileged person that can change the User password from the BIOS, According to the default setting, both access passwords are not set up and are only valid after you set the password from the BIOS.

- Set Supervisor Password
- Set User Password
- Power on Password
- User Access Level

To set the password, please complete the following steps.



1. Select **Set Supervisor Password.**

2. Type the desired password (up to 6 character length) when you see the message, "**Please type in you new Password**" and "**Please confirm you new password**".

3. Then you can go on to set a "**Set User Password**" (up to 6 character length) if required. Note that you cannot configure the User password until the Supervisor password is set up.

4. Enter "**Power on Password**", when you Supervisor password are set up.

5. Select the Disabled or Enabled.

✧ **Enabled:** System will ask input password on post time.

✧ **Disabled:** System will ask input password on post time. When go to BIOS setup.

6. Point to **Save Settings and Exit** and press Enter. (or Press F10)

7. Press Y when you see the message, "Exit Saving Changes (Y/N)?"

Note: it is suggested that you write down the password in a safe place to avoid that password may be forgotten or missing.

How to Clean User Password

Select Clear User Password from the Security menu and press <Enter>.
Clear New Password > [Yes] [No] appears, select [Yes] and press <Enter>.

How to Clear Supervisor Password

Select Supervisor Password from the Security menu and press <Enter>. "Please Type in you password" >, type the password (Old password) and press <Enter>. The screen does not display the characters entered. Retype the password as prompted and press <Enter>.

Power on Password

This field enables password checking every time the computer is powered on or every time the BIOS Setup is executed. If ***Enabled*** is chosen, a user password prompt appears every time and the BIOS Setup Program executes and the computer is turned on. If ***Disabled*** are chosen, the password prompt appears if the BIOS executed.

Available options: Enabled, Disabled

Default setting: Disabled

User Access Level

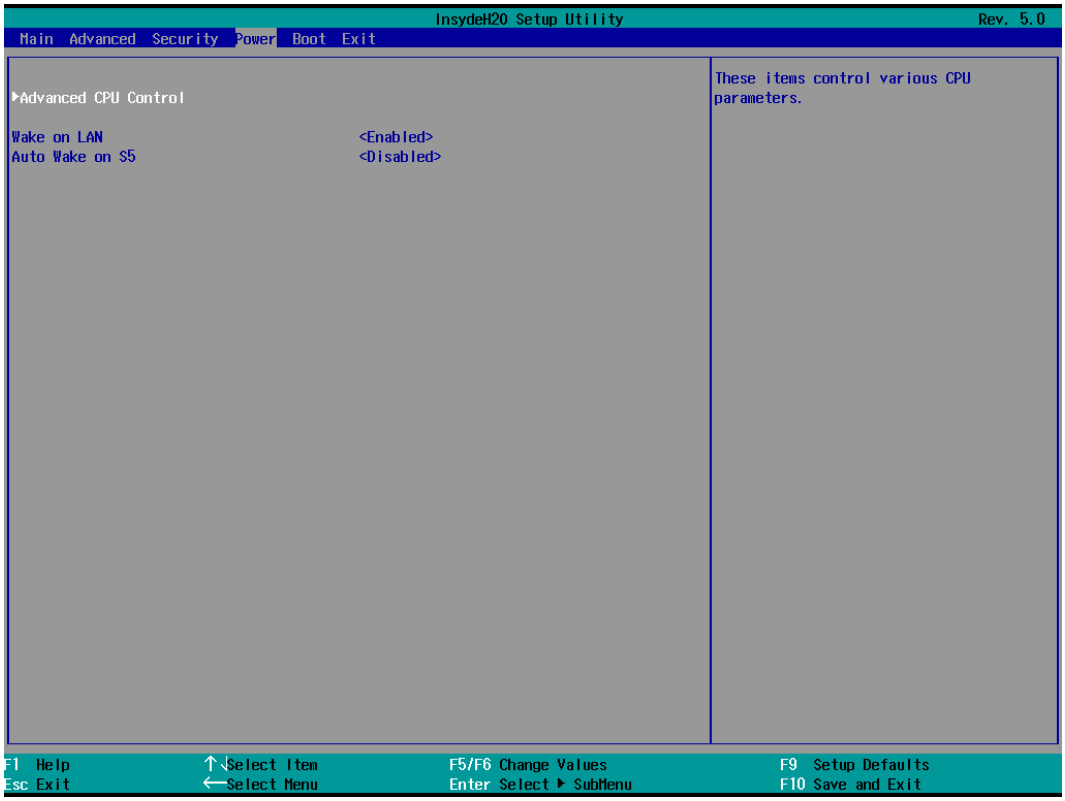
This field is Supervisor set the user can view only or full the BIOS Setup is executed. If "***View only"*** is chosen, a user only access to CMOS setup allowed buts the fields can't be change. If "***Limited"*** is chosen, only limited can be changed, if "***Full"*** is chosen, any field can be changed except the Supervisor password.

Available options: View Only, Limited, and Full

Default setting: Full

Power Setup

The Power menu allows user to set or control various parameters on power manager, and sleep states.



Wake on LAN

This item is can select Enabled to integrated LAN to wake up the system.

Available options: Enabled, Disabled

Default setting: Disabled

Auto Wake on S5

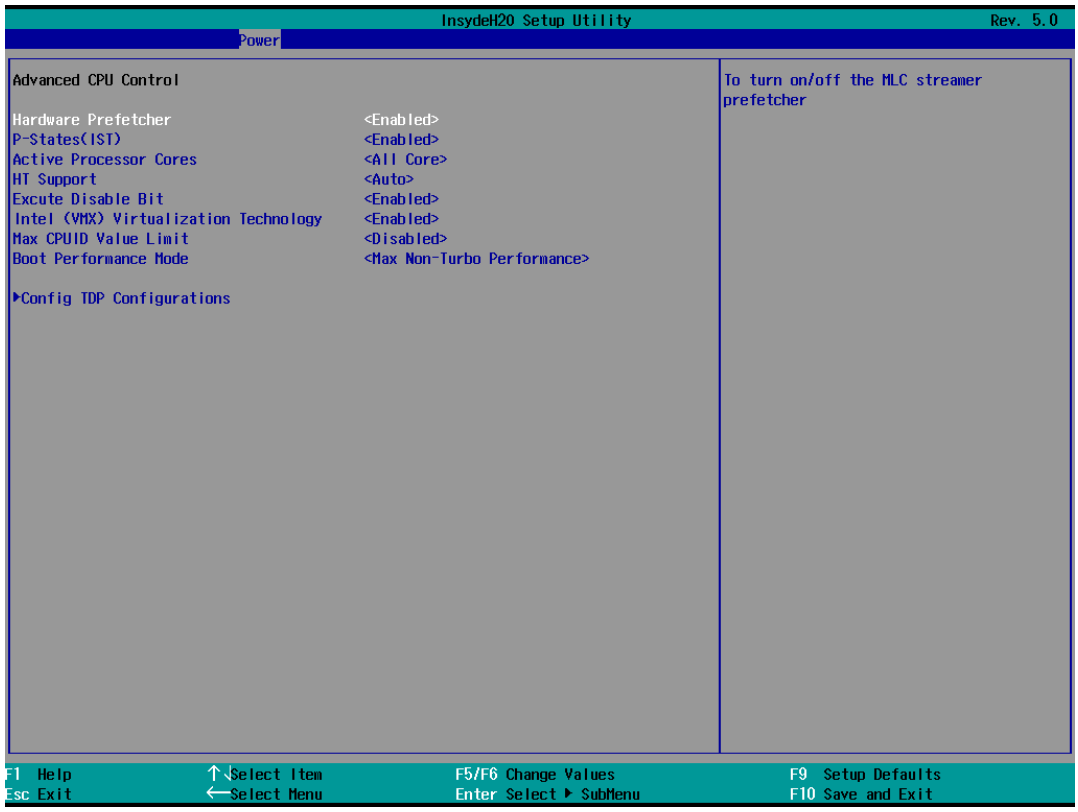
The fields are Auto wake on S5, by day of month or fixed time of every day.

Available options: Disabled, By Every Day, and By Day of Month

Default setting: Disabled

□ Advanced CPU Controller

You can use this screen to select options for the CPU controller Configuration.



Hardware Prefetcher

This field specifies the Enabled or Disable to turn on/turn off the MLC (Mid Level Cache, L2 Cache) streamer prefetcher.

Available Options: Disabled, Enabled

Default setting: Enabled

P-States (IST)

This field specifies the Enabled Processor performance states (P-States).

Available Options: Disabled, Enabled

Default setting: Enabled

Active Processor Cores

This field specifies the Number of Cores to enable in each processor package.

Available Options: 1 Core, 2 Cores, 3 Cores, and All Cores

Default setting: All Cores

HT Support

This field specifies can select Auto or Disabled of Hyper-Threading.

Available Options: Disabled, and Auto

Default setting: Auto

Excute Disable Bit

This field specifies is XD can prevent certain classes of malicious buffer overflow attacks when combined with supporting OS.

Available Options: Disabled, and Enabled

Default setting: Enabled

Intel (VMX) Virtualization Technology

This field specifies can select Enabled or Disabled of Virtualization Technology.

Available Options: Disabled, and Enabled

Default setting: Enabled

Max CPUID Value Limit

This field specifies is Limit CPUID max value to 3 (If max CPUID Value >3). The setting is useless for windows OS.

Available Options: Disabled, and Enabled

Default setting: Enabled

Boot Performance Mode

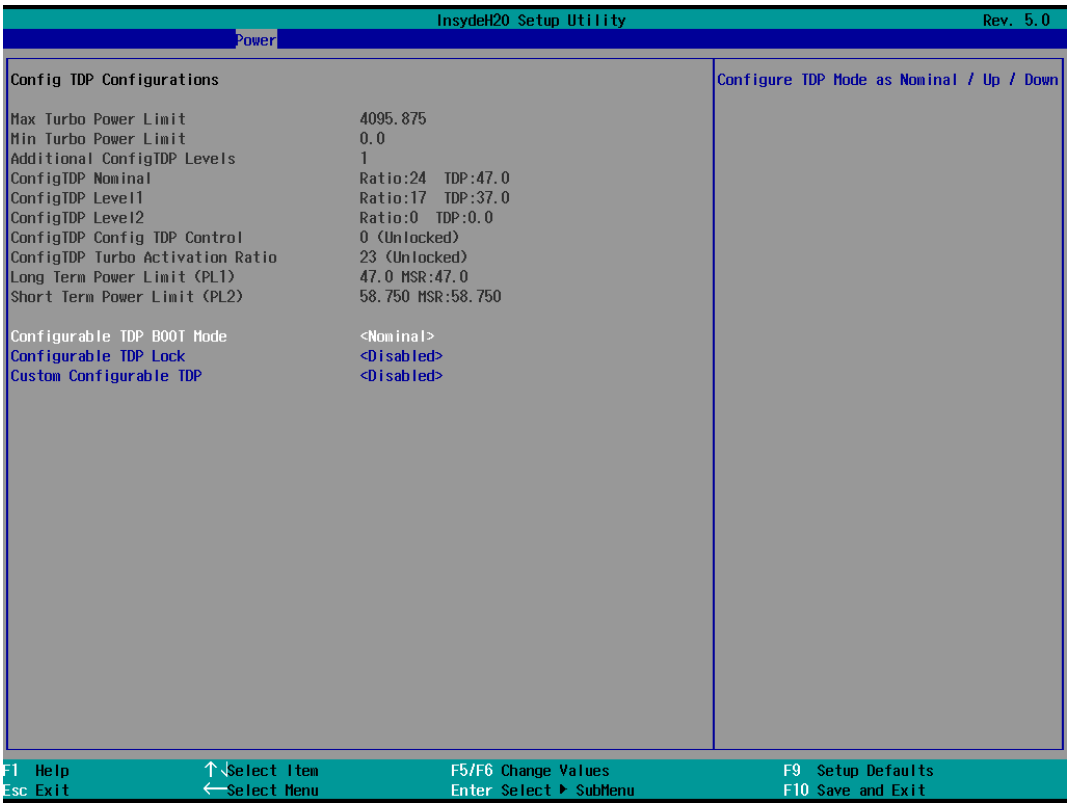
This item allows you to select Max turbo mode or not. The Max Turbo mode can run the processing cores faster than the marked frequency when at least part of the CPU is operating either under power, temperature, or other current specifications limits, as designated by the hardware.

Available Options: MAX Non-Turbo Performance, and Max Turbo Performance

Default setting: Max Non-Turbo Performance

Config TDP Configurations

You can use this screen to select options for the CPU controller Configuration.



✧ ***Configurable TDP Boot Mode***

This field specifies is Configure TDP Mode as Nominal / Up / Down for windows OS.

Available Options: Nominal, Up, and Down

Default setting: Nominal

✧ ***Configurable TDP Lock***

This field specifies is Configure TDP Mode Lock sets the Lock bits on Turbo_ Activation _Ration and Config_TDP_Control.

Available Options: Disabled, and Enabled

Default setting: Disabled

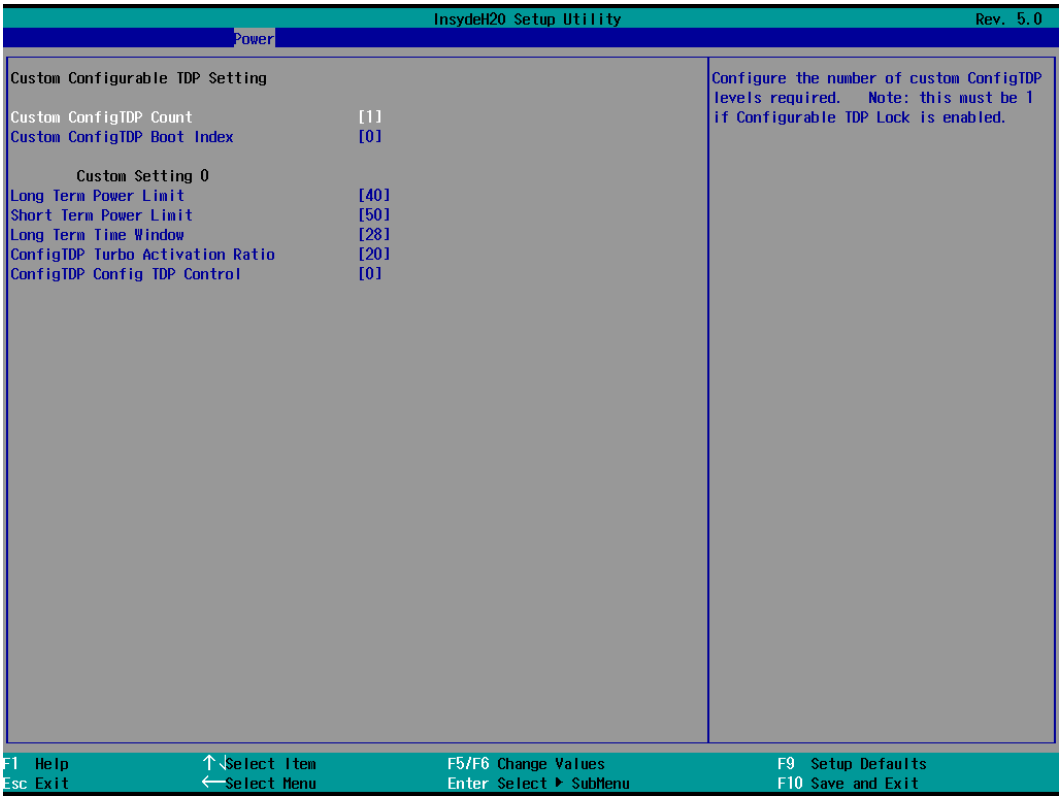
✧ ***Custom Configurable TDP***

This field specifies is Configure Custom Configurable TDP Settings

Available Options: Disabled, and Enabled

Default setting: Disabled

Custom Configurable TDP Setting



Custom ConfigTDP Count

This field specifies is Configure the number of custom ConfigTDP levels required. Note: this must be 1 if Configurable TDP Lock is enabled.

Available Options: 1, and 0

Default setting: 1

Custom Config TDP Boot Index

This field specifies is Configure the Index value of Custom ConfigTDP selected by default for boot. The setting needs to be configured with valid values from 0 to Max Custom Config TDP count. Note: this must be 0 if Configurable TDP Lock is enabled.

Available Options: 0, and 1

Default setting: 0

Custom Setting 0

Long Term Power Limit

This field specifies is Long Term Power Limit (aka Power Limit 1) value in Watts. XE SKU: any value can be programmed. Overclocking SKU: Value must be between Max and Min Power Limits. Other SKUs: This Value must be between Min Power Limit and TDP Limit. If Value is 0, BIOS will program TDP value.

Available Options: 0 ~ 9999

Default setting: 40

Short Term Power Limit

This field specifies is Short Term Power Limit (aka Power Limit 2) value in Watts. If the value is 0, BIOS will program this value as 1.25*TDP. Processor applies control policies such that the package power does not exceed this limit

Available Options: 0 ~ 9999

Default setting: 50

Long Term Time Windows

This field specifies is Long Term Time Window (aka Power Limit 1 Time) value in seconds. The value may vary from 0 to 128. If the value is 0, default values will be programmed (28 sec for Mobile and 1 sec from Desktop). Indicates the time window over which TDP value should be maintained.

Available Options: 0 ~ 128

Default setting: 28

Config TDP Turbo Activation Ratio Time

This field specifies is Custom value for Turbo Activation Ratio. The setting needs to be configured with valid values from LFM to Max Turbo.

Available Options: 0 ~ 200

Default setting: 20

ConfigTDP Config TDP Control

This field specifies is Custom value for Config TDP Control. The setting needs to be configured with valid values from 0 to 2.

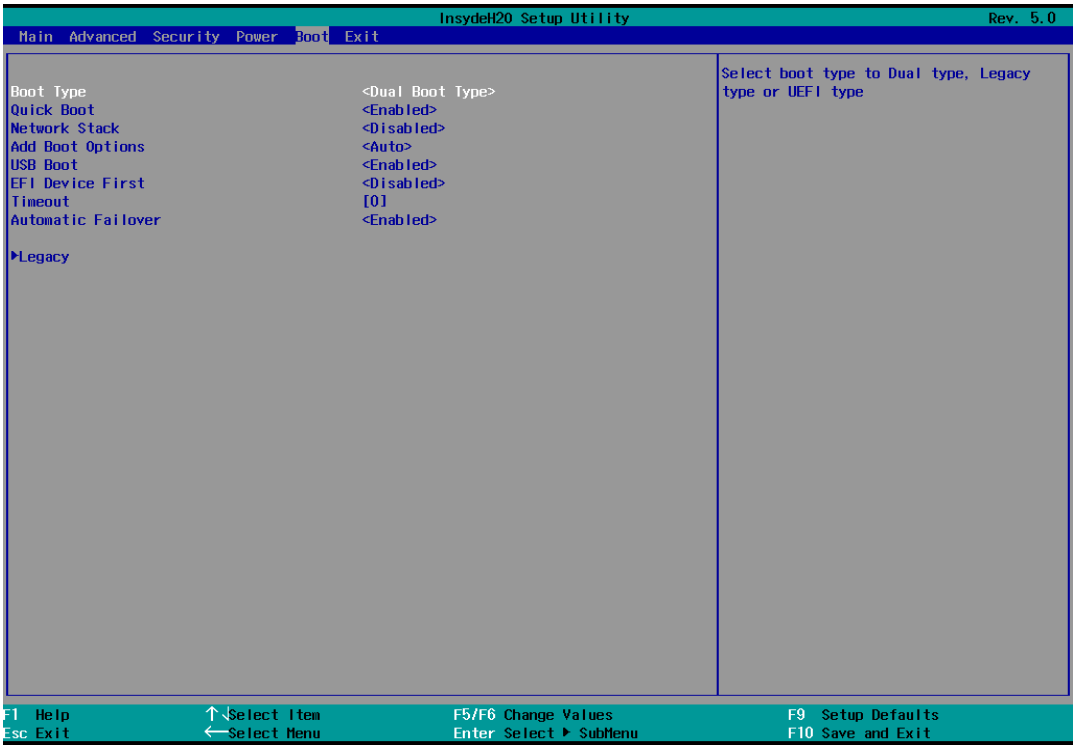
Available Options: 0 ~ 2

Default setting: 0

Boot Setup

Select the *Boot* tab from the setup screen to enter the Boot BIOS Setup screen. You can select any of the items in the left frame of the screen, such as Legacy, to go to the sub menu for that item. You can display a Boot BIOS Setup option by highlighting it using the <Arrow> keys. All Boot Setup options are described in this section. Select an item on the Boot Setup screen to access the sub menu for:

- Normal Boot Menu
- Boot Type Order
- Hard disk drives
- USB



Quick Boot

This field is used to activate the quick boot function of the system. When set to Enabled, to skip certain tests while booting. This will decrease the time needed to boot the system.

Available Options: Disabled, and Enabled

Default setting: Enabled

Quiet Boot

This item allows users to enable or disable Quiet boot option. If select to **Enabled**, an OEM LOGO will replace the POST messages.

Available Options: Disabled, and Enabled

Default setting: Disabled

Network Stack

This field specifies the PXE boot ROM of the onboard LAN chip.

Available Options: Disabled, Enabled

Default setting: Disabled

Add Boot Options

This field specifies the position in boot order for shell, network and removable.

Available Options: Disabled, Enabled

Default setting: Disabled

USB Boot

This item is select Enabled /Disabled for USB Booting Devices.

Available options: Disabled, and Enabled

Default setting: Enabled

EFI Device First

This field specifies the determine EFI device first or legacy device first. If enable, it is EFI device first. If disable, it is legacy device first.

Available options: Disabled, Enabled

Default setting: Disabled

Time Out

The number of second s that the firmware will wait before booting the original default boot selection.

Automatic failover

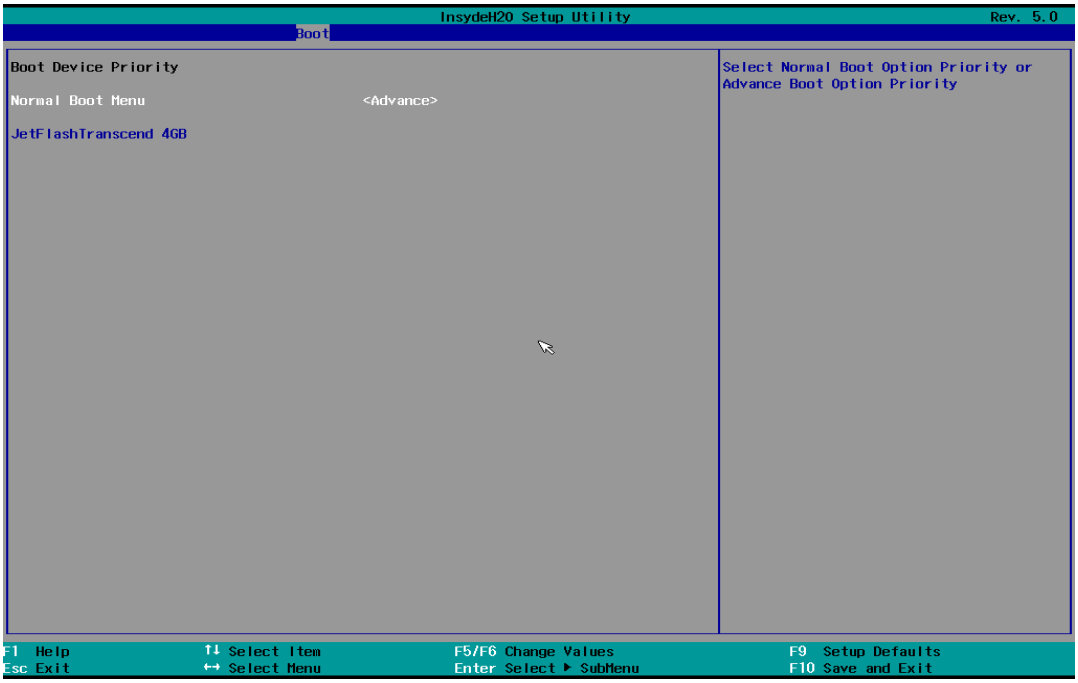
This field specifies when boot device fail, if set to enables, it will directory try to boot next device. If disabled, it will pop warning message then go into firmware UI.

Available options: Disabled, and Enabled

Default setting: Enabled

❑ Legacy > Boot Device Priority

Use this screen to specify the order in which the system checks for the device to boot from. To access this screen, select Normal or Advance of Normal Boot Menu on the Boot Setup screen.



Normal Boot Menu

Set the boot device options to determine the sequence in which the computer checks which device to boot from. It is can select Normal or Advance boot option priority.

Normal

Press F5 or F6 (Change Value) select the boot device options to determine the sequence .The settings are:

- Boot Type Order: Select boot sequence *Floppy Driver, Hard Disk Drive, CD/DVD-ROM Driver, USB or Others.*
- *Hard Disk Driver*
- *USB*

Advanced

Press F5 or F6 (Change Value) select the boot device options to determine the sequence.

Note: When you select a boot category from the boot menu, a list of devices in that category appears. For example, if the system has three storage devices hard disk drives, CFAST, USB storage are connected, then the list will show all three type device drives attached.

Chapter 4 Software Installation

The enclosed DVD diskette includes VGA, Audio, System, USB and LAN driver. To install and configure you FX5638 system, you need to perform the following steps.

System Driver

Windows 7/8/8.1 X86/X64- System Driver

Installs Intel QM87 system Chipset, the driver include the Core PCI, ISAPNP, PCIE, USB and IDE/SATA Device Drive.

Step 1: To install the QM87 system driver, insert the DVD ROM into the DVD ROM device, and enter DRIVER>SysChip>QM87>INF_10.0.14>SetupChipset.exe

Step 2: Execute SetupChipset.exe file.

Step 3: The screen shows the SETUP type. Press any key to enter the main menu.

Step 4: As the setup is completed, the system will generate the message as follows.

Yes, I want to restart my computer now. Installation is done!

No, I will restart my computer later.

System must be restart then complete the installation.

Note: In the Syschip>QM87 directory, a Readme.txt file is included to provide installation information.

VGA Driver

WIN7/8/8.1 X86/X64 Driver

Step 1: To install the VGA driver, insert the DVD ROM into the DVD ROM device, and enter DRIVER>VGA>HASWELL >WIN32 or >WIN64.

Step 2: Execute Setup.exe file.

Step 3: The screen shows the SETUP type. Press any key to enter the main menu.

Step 4: As the setup is completed, the system will generate the message as follows.

Yes, I want to restart my computer now. Installation is done!

No, I will restart my computer later.

System must be restart then complete the installation.

Step 5: In the WINDOWS, you can find the <DISPLAY> icon located in the {CONTROL PANEL} group.

Step 6: Adjust the <Refresh Rate>, <Font size> and <Resolution>.

Note: In the DRIVER> VGA> HASWELL >WIN32, or WIN64 directory, a Readme.txt file is included to provide installation information.

USB Driver

WIN7 X86/X64 Driver

Step 1: To install the AUDIO driver, insert the CD ROM into the CD ROM device, and enter DRIVER>USB>QM87>USB3.0>WIN7.

Step 2: Execute SETUP.exe file.

Step 3: The screen shows the SETUP type. Press any key to enter the main menu.

Step 4: As the setup is completed, the system will generate the message as follows.

Read License Agreement and click “Yes” to proceed.

Review Readme File Information and click “Next” to proceed.

When the “Setup Progress” is complete click “Next” to proceed.

Lastly, the “Setup Complete” screen appears so click “Finish” to restart your computer.

Note: In the DRIVER> USB> QM87 >USB3.0>WIN7 directory, a Readme.txt file is included to provide installation information.

Audio Driver

WIN7/8/8.1 X86/X64 Driver

Step 1: To install the AUDIO driver, insert the CD ROM into the CD ROM device, and enter DRIVER>AUDIO>ALC888>WIN8 > WIN32, or WIN64.

Step 2: Execute 32bit_Win7_Win8_Win81_R273.exe file.

Step 3: The screen shows the SETUP type. Press any key to enter the main menu.

Step 4: As the setup is completed, the system will generate the message as follows.

Yes, I want to restart my computer now. Installation is done!

No, I will restart my computer later.

System must be restart then complete the installation.

Note: In the DRIVER>AUDIO>ALC888>WIN8 > WIN32, or WIN64directory, a Readme.txt file is included to provide installation information.

LAN Driver (Intel I210AT)

WIN7/8 X86/X64 Driver

Step 1: To install the LAN driver, insert the DVD ROM into the CD ROM device, and enter DRIVER>LAN>I210AT.

Step 2: Execute PROWin32.exe file or PROWinx64.exe.

BIOS Flash Utility

In the <UTILITY> directory, there is the fpt.EXE file.

Step 1: Use the fpt.EXE -f xxxxxVxx.bin program to update the BIOS setting.

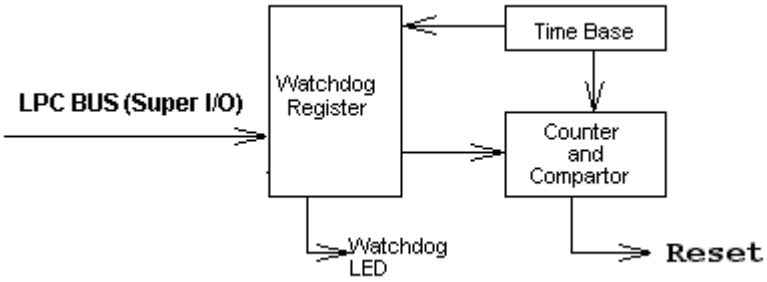
Step 2: And then refer to the chapter “BIOS Setup”, as the steps to modify BIOS.

Step 3: Now the CPU board’s BIOS loaded with are the newest program; user can use it to modify BIOS function in the future, when the BIOS add some functions.

Watchdog Timer

This section describes how to use the Watchdog Timer, including disabled, enabled, and trigger functions.

The system is equipped with a programmable time-out period watchdog timer. You can use your own program to enable the watchdog timer. Once you have enabled the watchdog timer, the program should trigger the I/O every time before the timer times out. If your program fails to trigger or disable this timer before it times out, e.g. because of a system hang-up, it will generate a reset signal to reset the system. The time-out period can be programmed to be set from 1 to 65535 seconds or minutes.



The CD includes a Watch Dog demo file. In the WATCHDOG/ ITE8712 /TURBOC: Library and Test Program written in Turbo C++

The WATCHDOG includes a demonstration program established for users who would like to configure the Watchdog timer by themselves.

Note: In the WATCHDOG/ITE8712 directory, README.TXT file is included to provide demo program information.

Watchdog Timer Setting

T The watchdog timer is a circuit that may be used from your program software to detect system crashes or hang-ups. The watchdog timer is automatically disabled after reset.

Once you have enabled the watchdog timer, your program must trigger the watchdog timer every time before it times out. After you trigger the watchdog timer, it will be set to non-zero value to watchdog counter and start to count down again. If your program fails to trigger the watchdog timer before time-out, it will generate a reset pulse to reset the system.

The factor of the watchdog timer time-out constant is approximately 1 second. The period for the watchdog timer time-out is between 1 to FFFF timer factors.

If you want to reset your system when watchdog times out, the following table listed the relation of timer factors between time-out periods.

Time Factor	Time-Out Period (Seconds)	Time-Out Period (Minutes)
1	1	1
2	2	2
3	3	3
4	4	4
5	5	5
“	“	“
“	“	“
“	“	“
FFFF	FFFF	FFFF

Watchdog Timer Enabled

To enable the watchdog timer, you have to output a byte of timer factor to the watchdog register whose address is 2eh and data port is 2fH. The following is an Assemble program, which demonstrates how to enable the watchdog timer and set the time-out period at 28 seconds.

```
;-----------------------------------------------------------------------------------------
; Enter the extended function mode
;-----------------------------------------------------------------------------------------
Mov     dx, 2eh         ; Enter to extended function mode
Mov     al, 87h
Out     dx,al
Nop
Nop
Mov     al,01h
Out     dx,al
Nop
Nop
Mov     al,55h
Out     dx,al
Nop
Nop
Mov     al,55h
Out     dx,al
Mov     al,22
Out     dx,al
Mov     dx,2fh
Mov     al,00h
Out     dx,al
;-----------------------------------------------------------------------------------------------------------
; Logical device 7, configuration registers Index 72h-Bit 7, 73H (LSB)/74H (MSB)
;-----------------------------------------------------------------------------------------------------------
Mov     dx,2fh
Mov     al,07h          ; Select Logical Device 7 of watchdog timer
Out     dx,al
Mov     dx,2eh
Mov     al,72h          ;Index 72h- Time-Out Value and Watchdog Register
Out     dx,al
Mov     dx,2fh
Or      al,C0h          ;Set Bit 7 is 1: Second and Bit6: Enabled Watchdog.
;Or     al,40h          ;Set Bit 7 is 0: Minute.
Out     dx,al
Mov     dx,2eh
Mov     al,74h          ; Set Timer counter 0100~FF00 (MSB)
Out     dx,al
Mov     dx,2fh
Mov     al,00h
Out     dx,al
Mov     dx,2eh
Mov     al,73h          ; Set Timer counter 0001~00FF (LSB)
Mov     dx,2fh
```

```
Mov     al,28h          ; Set timeout interval as 28seconds and start counting
Out     dx,al
;----------------------------------------
; Exit extended function mode
;----------------------------------------
Mov     dx,2eh
Mov     al,01h
Out     dx,al
```

Watchdog Timer Trigger

After you enable the watchdog timer, your program must write the same factor as enabling to the watchdog register at least once every time-out period to its previous setting. You can change the time-out period by writing another timer factor to the watchdog register at any time, and you must trigger the watchdog before the new time-out period in next trigger.

Watchdog Timer Disabled

To disable the watchdog timer, simply write a 00H to the watchdog register.

```
;-----------------------------------------------------------------------------------------------
; Logical device 7, configuration registers Index 72h Bit 4
;-----------------------------------------------------------------------------------------------
Mov     dx,2fh
Mov     al,07h          ; Select Logical Device 7 of watchdog timer
Out     dx,al
Mov     dx,2eh
Mov     al,72h          ;Index 72h- Time-Out Value and Watchdog Register
Out     dx,al
Mov     dx,2fh
And     al,00h          ;Set Bit4 to '0': Disabled Watchdog.
Out     dx,al
```

Chapter 5 Technical Reference

This section provider description the hardware that may occur when you operate the system, and also gives you the suggestions on solving the problems.

Topic include:

- Technical Reference
- FX5638X Dimension

Technical Reference

Physical and Environmental

Temperature: Operating -20°C ~ 50°C

Relative humidity 5 % to 95 % non-condensing

DC-AC adapter

Input AC Voltage Range: 100V~240V/1A, 50Hz ~60Hz

Output DC Voltage: 19V/4.74A Maximal

Surface Temperature of Chassis：

5°C to 45°C (W/HDD)/-20°C to 50°C (W/CFAST CF card or SSD only)

I/O Port Address Map

Each peripheral device in the system is assigned a set of I/O port addresses, which also becomes the identity of the device. There is a total of 1K-port address space available. The following table lists the I/O port addresses used on the Industrial CPU Card.

Address	Device Description
000h - 01Fh	DMA Controller #1
020h - 03Fh	Interrupt Controller #1
040h - 05Fh	Timer
060h - 06Fh	Keyboard Controller
070h – 07Fh	Real Time Clock, NMI
080h	BIOS Post Code
081h-09Fh	DMA Controller #1
0A0h - 0BFh	Interrupt Controller #2
0C0h - 0DFh	DMA Controller #2
0F0h - 0FFh	Math Coprocessor
2E8h – 2EFh	Serial Port #4(COM4)
2F8h – 2FFh	Serial Port #2(COM2)
3B0h – 3DFh	VGA Controller
3E8h – 3EFh	Serial Port #3(COM3)
3F8h – 3FFh	Serial Port #1(COM1)
4D0h – 4D1h	System Board Resource
CF8h – CFFh	System Board Resource

Interrupt Request Lines (IRQ)

There are a total of 15 IRQ lines available on the Industrial CPU Card. Peripheral devices use interrupt request lines to notify CPU for the service required. The following table shows the IRQ used by the devices on the Industrial CPU Card.

Level	Function
IRQ0	System Timer Output
IRQ1	Keyboard
IRQ2	Interrupt Cascade
IRQ3	Serial Port #2
IRQ4	Serial Port #1
IRQ5	Serial Port #3
IRQ6	HAD/USB/LAN#1
IRQ7	Serial Port #4
IRQ8	Real Time Clock
IRQ9	ACPI
IRQ10	LAN#2
IRQ11	System Resource
IRQ13	FPU
IRQ14	ATA- Chanel 0
IRQ15	USB/SMBUS/SATA

Serial Ports

The ACEs (Asynchronous Communication Elements ACE1 to ACE2) are used to convert parallel data to a serial format on the transmit side and convert serial data to parallel on the receiver side. The serial format, in order of transmission and reception, is a start bit, followed by five to eight data bits, a parity bit (if programmed) and one, one and half (five-bit format only) or two stop bits. The ACEs are capable of handling divisors of 1 to 65535, and produce a 16x clock for driving the internal transmitter logic.

Provisions are also included to use this 16x clock to drive the receiver logic. That's Also included in the ACE a completed MODEM control capability, and a processor interrupt system that may be software tailored to the computing time required to handle the communications link.

The following table is a summary of each ACE accessible register

DLAB	Port Address	Register
0	Base + 0	Receiver buffer (read)
		Transmitter holding register (write)
0	Base + 1	Interrupt enable
X	Base + 2	Interrupt identification (read only)
X	Base + 3	Line control
X	Base + 4	MODEM control
X	Base + 5	Line status
X	Base + 6	MODEM status
X	Base + 7	Scratched register
1	Base + 0	Divisor latch (least significant byte)
1	Base + 1	Divisor latch (most significant byte)

Receiver Buffer Register (RBR)

Bit 0-7: Received data byte (Read Only)

Transmitter Holding Register (THR)

Bit 0-7: Transmitter holding data byte (Write Only)

Interrupt Enable Register (IER)

Bit 0: Enable Received Data Available Interrupt (ERBFI)

Bit 1: Enable Transmitter Holding Empty Interrupt (ETBEI)

Bit 2: Enable Receiver Line Status Interrupt (ELSI)

Bit 3: Enable MODEM Status Interrupt (EDSSI)

Bit 4: Must be 0

Bit 5: Must be 0

Bit 6: Must be 0

Bit 7: Must be 0

Interrupt Identification Register (IIR)

Bit 0: “0” if Interrupt Pending

Bit 1: Interrupt ID Bit 0

Bit 2: Interrupt ID Bit 1

Bit 3: Must be 0

Bit 4: Must be 0

Bit 5: Must be 0

Bit 6: Must be 0

Bit 7: Must be 0

Line Control Register (LCR)

Bit 0: Word Length Select Bit 0 (WLS0)

Bit 1: Word Length Select Bit 1 (WLS1)

WLS1	WLS0	Word Length
0	0	5 Bits
0	1	6 Bits
1	0	7 Bits
1	1	8 Bits

Bit 2: Number of Stop Bit (STB)

Bit 3: Parity Enable (PEN)

Bit 4: Even Parity Select (EPS)

Bit 5: Stick Parity

Bit 6: Set Break

Bit 7: Divisor Latch Access Bit (DLAB)

MODEM Control Register (MCR)

Bit 0: Data Terminal Ready (DTR)

Bit 1: Request to Send (RTS)

Bit 2: Out 1 (OUT 1)

Bit 3: Out 2 (OUT 2)

Bit 4: Loop

Bit 5: Must be 0

Bit 6: Must be 0

Bit 7: Must be 0

Line Status Register (LSR)

Bit 0: Data Ready (DR)

Bit 1: Overrun Error (OR)

Bit 2: Parity Error (PE)

Bit 3: Framing Error (FE)

Bit 4: Break Interrupt (BI)

Bit 5: Transmitter Holding Register Empty (THRE)

Bit 6: Transmitter Shift Register Empty (TSRE)

Bit 7: Must be 0

MODEM Status Register (MSR)

Bit 0: Delta Clear to Send (DCTS)

Bit 1: Delta Data Set Ready (DDSR)

Bit 2: Training Edge Ring Indicator (TERI)

Bit 3: Delta Receive Line Signal Detect (DSLSD)

Bit 4: Clear to Send (CTS)

Bit 5: Data Set Ready (DSR)

Bit 6: Ring Indicator (RI)

Bit 7: Received Line Signal Detect (RSLD)

Divisor Latch (LS, MS)

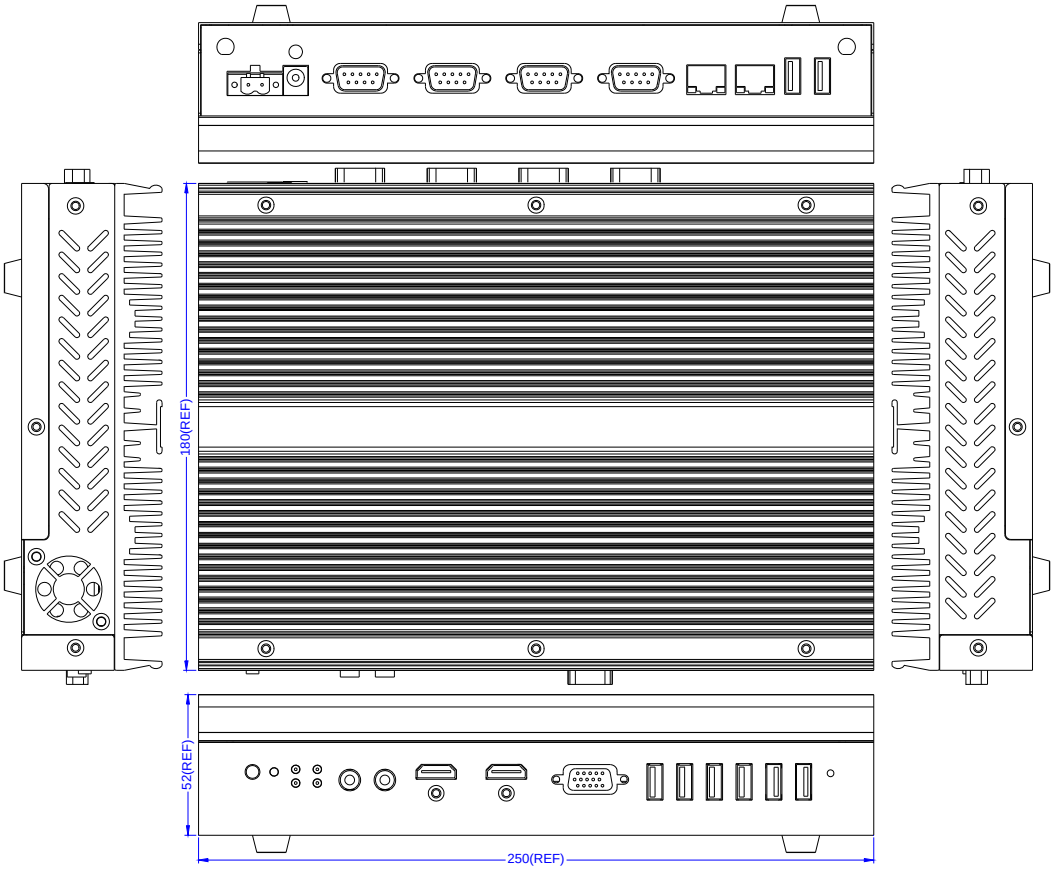
	LS	MS
Bit 0:	Bit 0	Bit 8
Bit 1:	Bit 1	Bit 9
Bit 2:	Bit 2	Bit 10
Bit 3:	Bit 3	Bit 11
Bit 4:	Bit 4	Bit 12
Bit 5:	Bit 5	Bit 13
Bit 6:	Bit 6	Bit 14
Bit 7:	Bit 7	Bit 15

Desired Baud Rate	Divisor Used to Generate 16x Clock
300	384
600	192
1200	96
1800	64
2400	48
3600	32
4800	24
9600	12
14400	8
19200	6
28800	4
38400	3
57600	2
115200	1

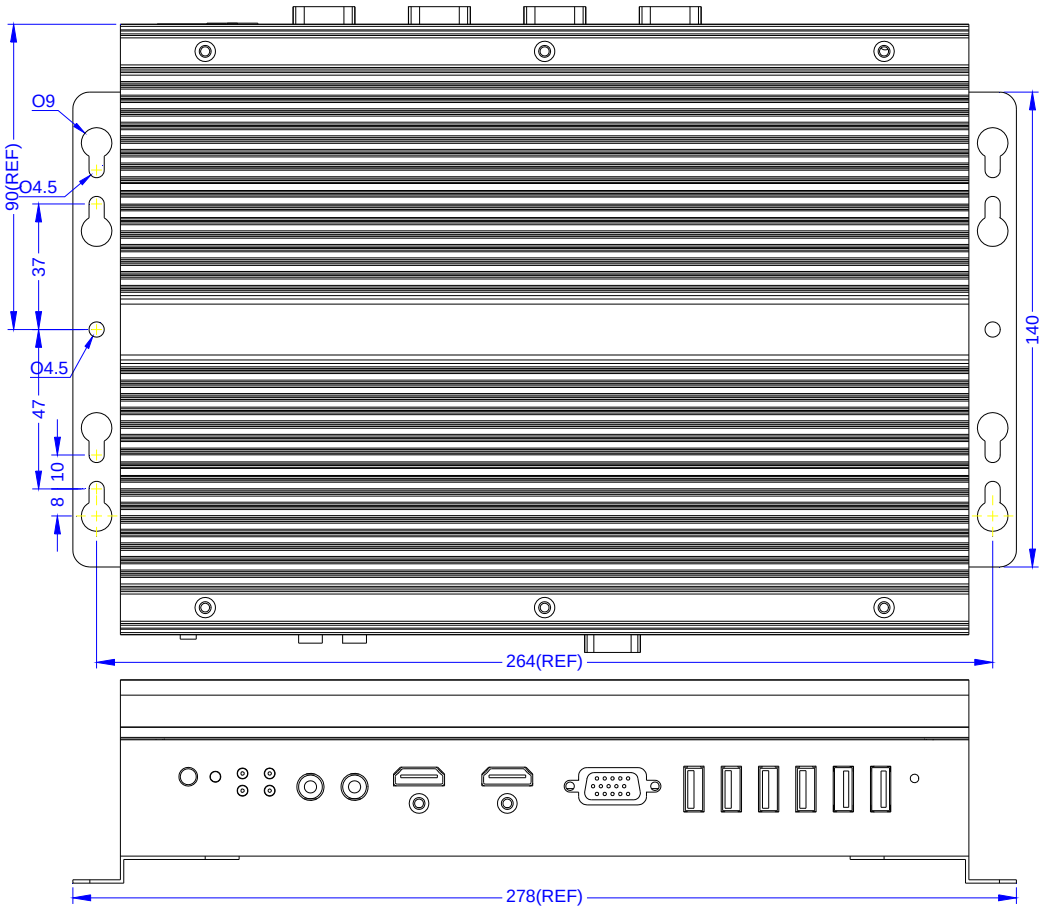
Appendix

Dimension

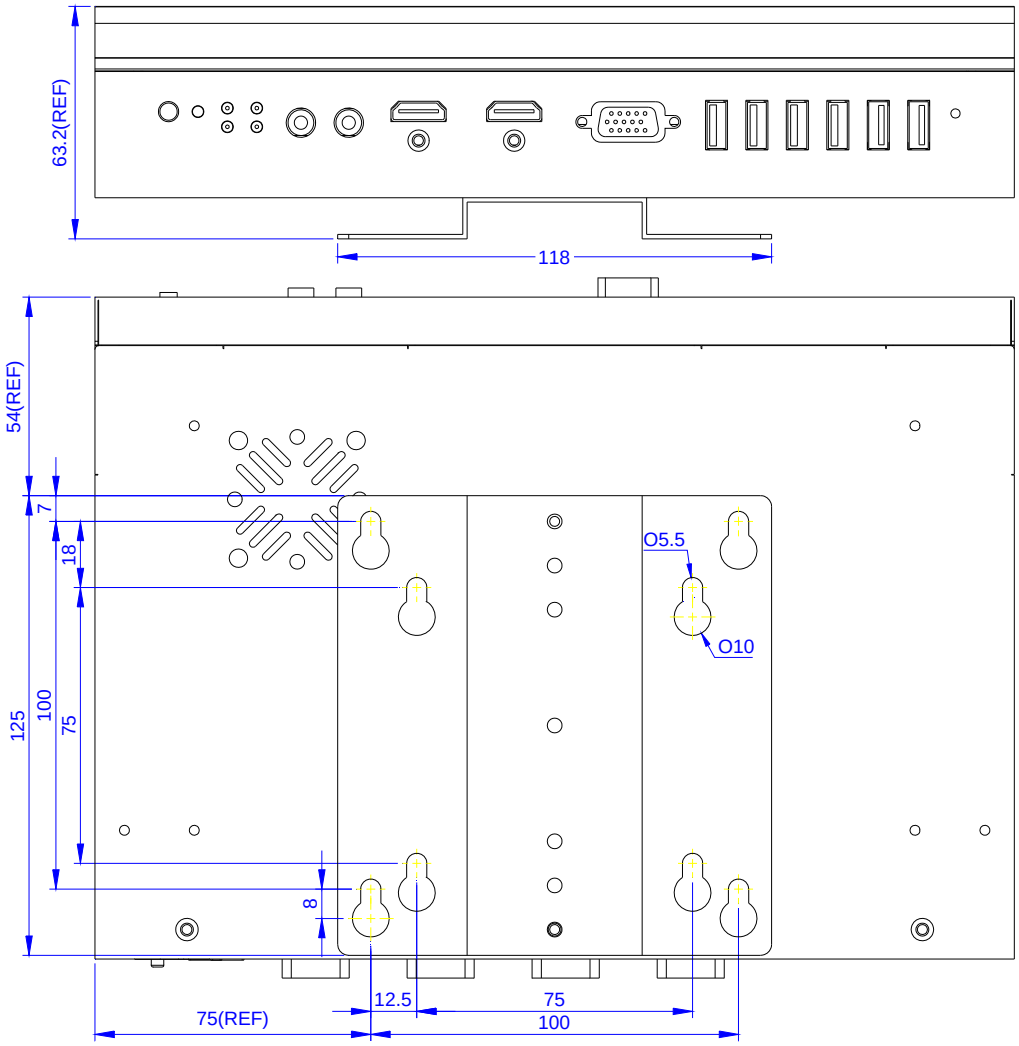
a. FX5638



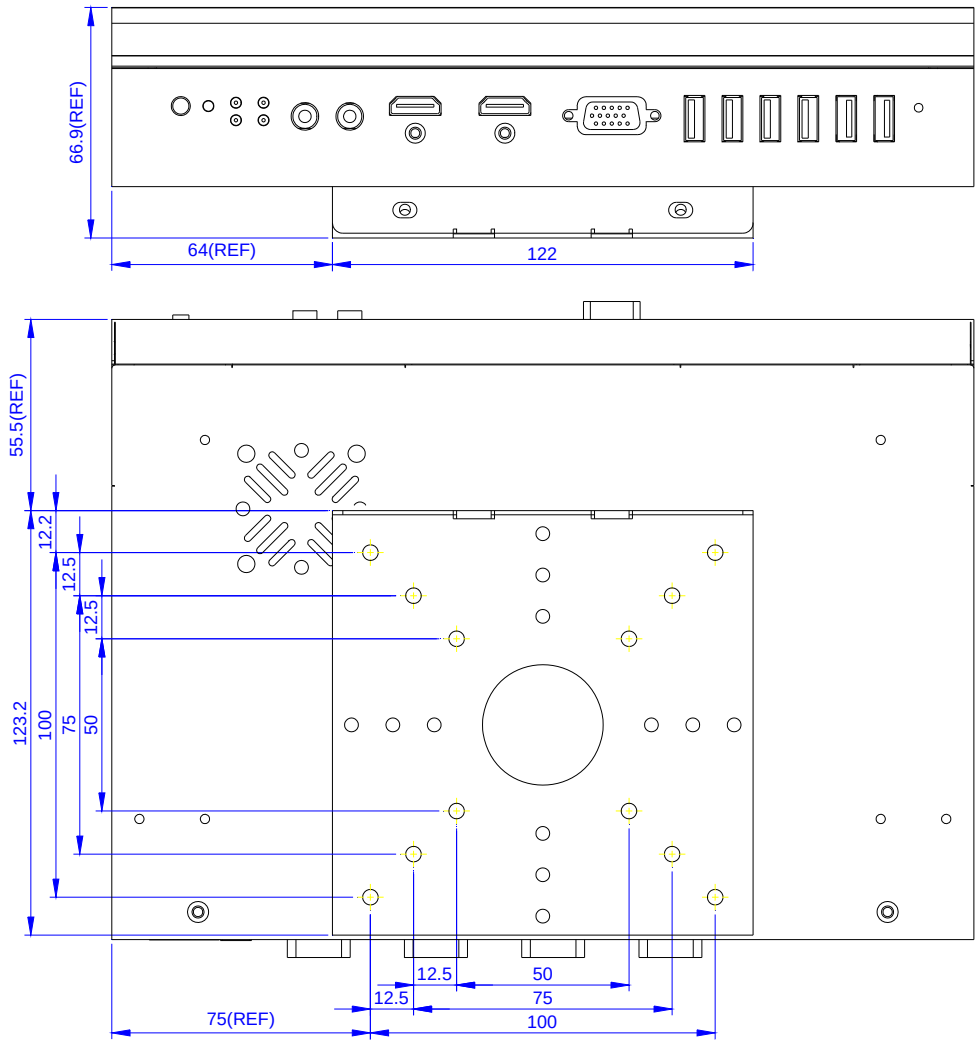
b. FX5501K1- Wall Mount



c. FX5504K1- Pane Mount #1



d. FX5407K3- Pane Mount Kit #2



e. FX5622K1- 1U Rack-Mount