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IPC Solution

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Small Cube System

Fanless Series

FX5206 User's Manual

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Returning Your Board for Service & Technical Support

If your board requires servicing, contact the dealer from whom you purchased the product for service information. You can help assure efficient servicing of your product by following these guidelines:

- ❑ A list of your name, address, telephone, facsimile number, or email address where you may be reached during the day
- ❑ 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.

Table of Contents

FX5206 User's Manual	i
Chapter 1 Introducing the FX5206 System	1
Overview.....	1
Series Comparison Table	2
Layout.....	3
Specifications.....	4
Packing List	5
Chapter 2 Hardware Installation	7
Before Installation	7
Removing Covers –Installing Hardware.....	8
LED Indicators & I/O Peripheral Connectors	11
Connecting the DC Power and Power Switch	14
Jumper Setting	15
Chapter 3 BIOS Setup	17
Overview.....	17
BIOS Functions	18
Keyboard Convention	19
Main Setup	20
Advanced Setup.....	21
CPU Configuration.....	22
IDE Configuration.....	23
Remote Access Configuration	26
USB Configuration	28
Boot Setup	30
Boot Setting Configuration.....	31
Boot Device	33
USB Drives	34
Security setup.....	35
Chipset Setup.....	37
Northbridge Configuration.....	38
Southbridge Configuration.....	41

Chapter 4 Software Installation	47
VGA Drivers	47
WINXP Driver	47
Audio Driver.....	48
WIN XP Driver	48
LAN Driver (RTL 8111F)	48
WIN XP Driver	48
BIOS Flash Utility.....	48
Watchdog Timer.....	49
Watchdog Timer Setting.....	49
Setup Watchdog Timer Step - WDT0 and WDT1	51
Chapter 5 Technical Reference	55
Trouble Shooting for Post Beep and Error Messages.....	55
Technical Reference.....	58
Physical and Environmental	58
Real-Time Clock and Non-Volatile RAM	58
CMOS RAM Map.....	60
I/O Port Address Map.....	61
Interrupt Request Lines (IRQ)	62
Serial Ports	63
Appendix.....	67
Dimension	67

Chapter 1 Introducing the FX5206 System

Overview

The FX5206 is an embedded system with low-power CPU module inside. This user's manual provides information on the physical features, installation, and BIOS setup of the FX5206.

Built to unleash the total potential of the Vortex™ 86DX2 Processor, Able to support 800MGz CPU, this system supports one 10/100/1000 Base -T LAN port, PCIe Mini Card connector for GPRS/GPS modules, audio, three USB 2.0 ports, and onboard 1GB DDR2 RAM, and a VGA controller.

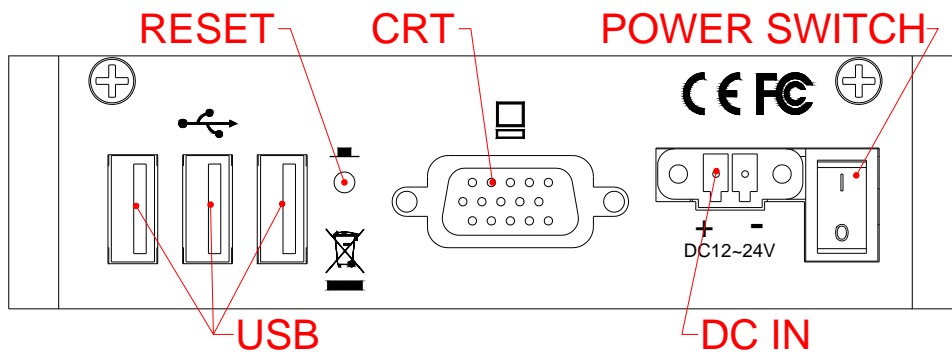
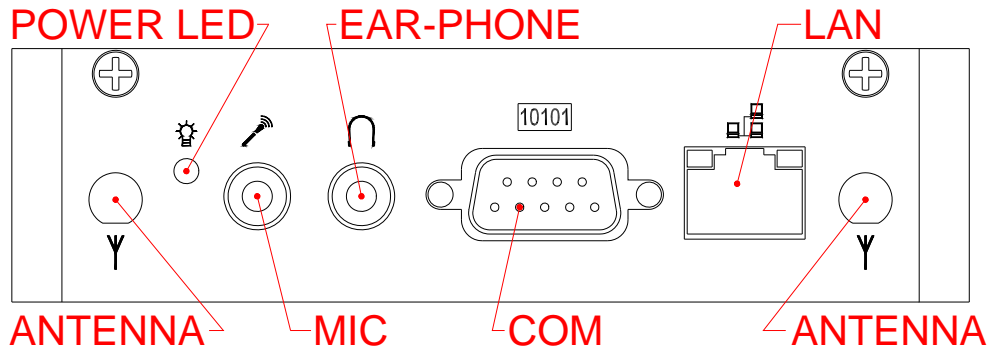
Each FX5206 has one port for I/O communications. One RS-232C port is available.

The FX5206 is perfect for ATM machines, KIOSK, point-of-sales/point-of- information, gaming and infotainment, measurement technology, lotteries, and banking and small Embedded Control. The unit is only 95.0mm (D) X115.0mm (W) X30.2mm (H).

Series Comparison Table

Model	FX5206
System Processor	Vortex™ 86DX2 800MHz
<i>Memory</i>	<i>DDR2 300/333</i>
<i>Onboard RAM</i>	<i>1GB</i>
<i>VGA</i>	<i>Yes</i>
<i>Watchdog Timer</i>	<i>Yes</i>
<i>Multi I/O</i>	<i>One RS232</i>
<i>Storage</i>	<i>One CFast and SD Card</i>
<i>USB 2.0 Port</i>	<i>Three</i>
<i>Audio</i>	<i>Ear-Phone And MIC-In</i>
<i>RJ45 LAN port</i> <i>(10/100/1000 Mbps)</i>	<i>One Realtek RTL8111F</i>
<i>PCIe Mini Card</i>	<i>One</i>
Operating Temperature	0~+ 50°C (32~113°F)
Storage Temperature	-20~+60°C (4~140°F)
Dimensions (Unit: mm)	95(D) x 115(W) X 30.2(H)

Layout



Specifications

❑ ***Processor Board –***

Vortex™ 86DX2 Low Power 800MHz CPU with 1GB DDR2-RAM.

❑ ***I/O Outlets –***

One 10/100/1000 base-TX Ethernet LAN port with RJ45.

One CRT and three USB ports (2.0) and one RS-232/422/485 serial port.

Two Audio connectors for Earphone-out and Microphone-In.

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

One DC-In terminal block with power switch.

One push button reset switch and one power LED.

❑ ***Storage Bay-***

CFast Compact Flash socket for CFast Compact Flash modules.

One SD socket supports up to 32GB SDHC (Class 6).

❑ ***Power requirement –***

+12~+24V DC, 1.12A maximum (0.77A typical) with DC 19V input.

❑ ***Dimensions -***

95.0mm (D) x 115.0mm (W) x 30.2mm (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 FX5206 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 FX5206 is not supplied from us, please make sure the specification of the cable(s) is compatible with the FX5206 system.

Note: after you install the FX5206, 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 FX5206 package. Some accessories are optional items that are only shipped upon order.

- One FX5206 embedded system.
- One 2-pin apartable terminal block.
- One compact disc includes software utility and manual.

Optional:

- One pack of half size mini PCIe module adapter kits.(P/N:0606010028G)
- FX5311K1 panel back mounting fixers and 2 screws (VESA 75*75). (P/N:0606010019G)
- Ak1009 Kit- DIN Rail mounting kit(P/N:0606010032R)

Chapter 2 Hardware Installation

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

Before Installation

Before installing the system, make sure to follow the descriptions below.

1. Before removing the cover, shut down the operation System and disconnect power switch off and unplug AC-to DC Adapter cable.
2. If installing connectors, Compact Flash, and hard disk, make sure that the power is disconnected or power switch off. Otherwise, this may damage the system.
3. The ESD (Electricity Static Discharge) created from human body may do damage to the board circuit.

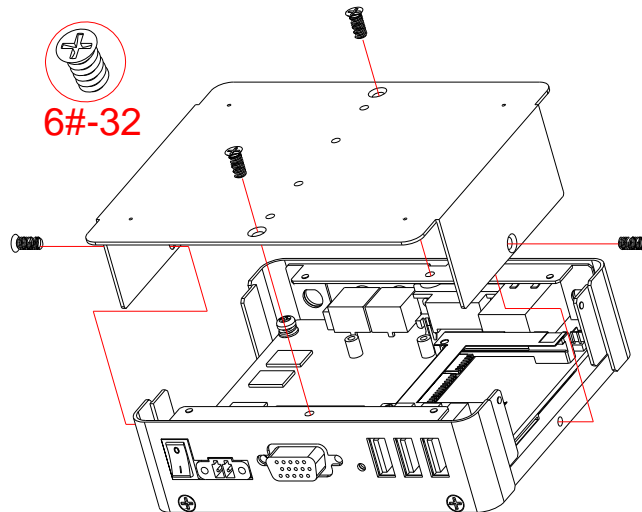
➤ **Removing Covers –Installing Hardware**

On installing optional hardware, remove the covers. The following figures are to guide how to install CFast modules, SD Card, and PCIe Mini card module to the FX5206 and how to install the FX5206 fixers. (Please see the spots circled.)

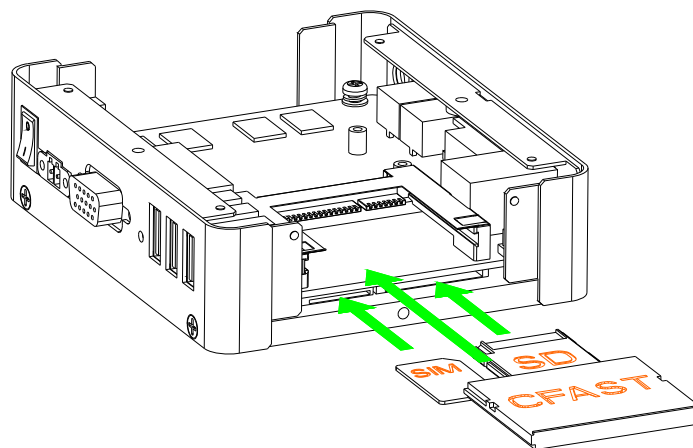
□ **a. Unscrew Bottom cover and Installing CFast, SD and SIM Card**

The following figure guide you how to install compact flash onto the FX5206.

✧ *a1. Unscrew the Bottom Cover*



✧ *a2. Insert CFast, SD and SIM Card*

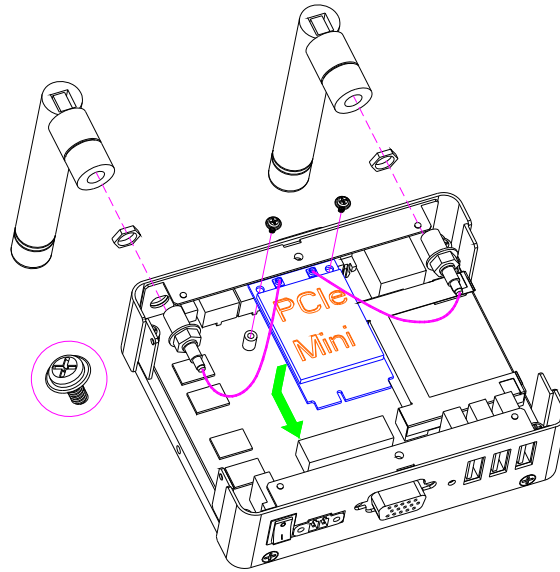


Note: The SD socket supports up to 32GB SDHC (Class 6).

□ **b. Installing PCIe Mini Card Module**

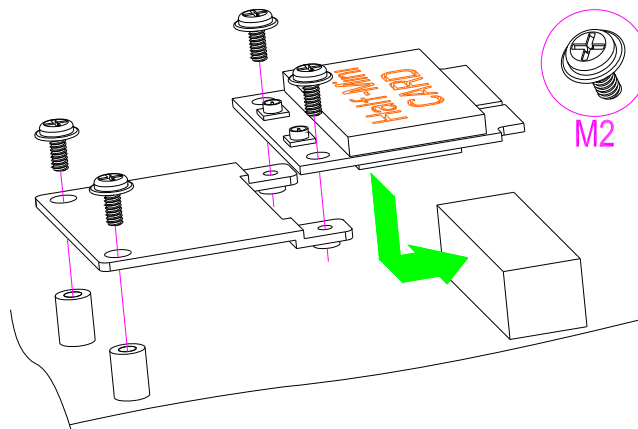
You may extend additional PCIe mini card module and SIM card to FX5206. Connect the antenna cable from backside antenna hole to GPRS module and installing the SIM card to SIM socket. See as following figure and rear pictures.

◇ **b1. Installing PCIe Mini Card and SIM card**



Note: 1. When installing PCIe GPRS Mini card on FX5206 system these is need the installing the SIM Card to SIM socket.
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.

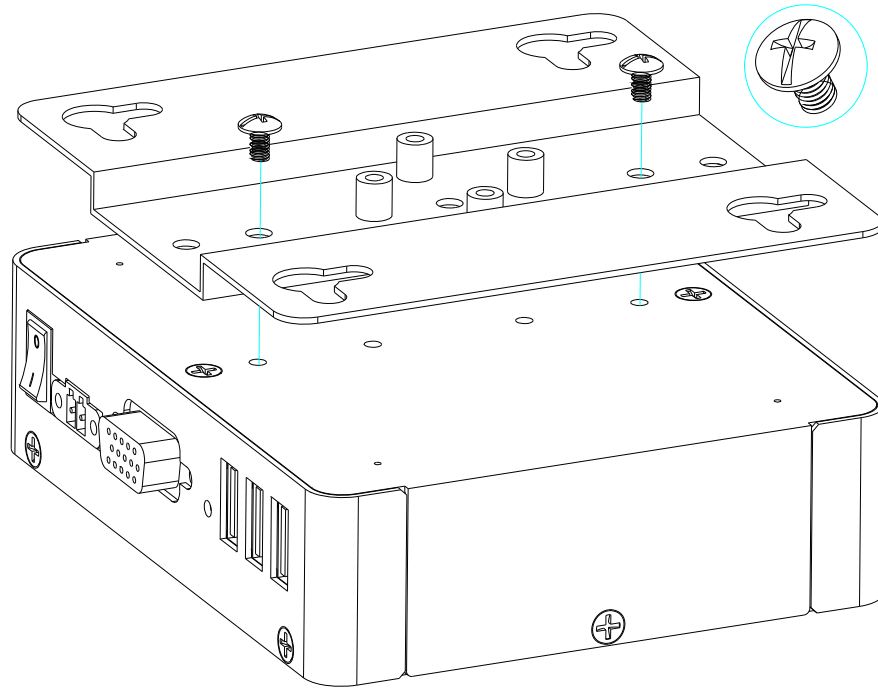
◇ **b2. Installing Half Size Mini PCIe module kit (Optional)**



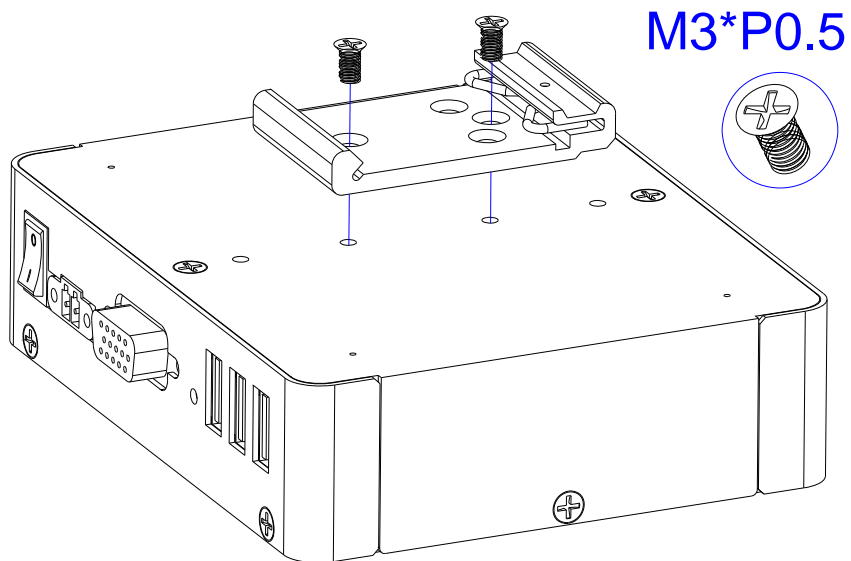
□ c. Installing the universal fixers

Please refer to the down side figure for installing the FX5206 with universal fixers.

◇ c1. FX5311K1 – Panel Back Mounting (VESA Mount 75*75)

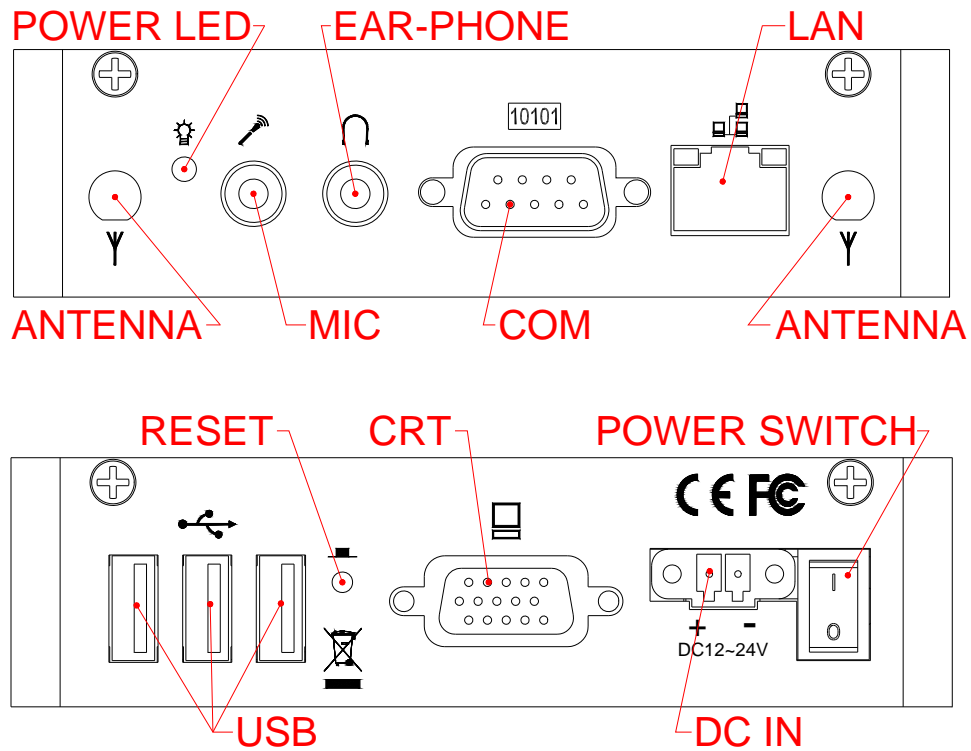


◇ c2. AK1009 Din-Rail Kit

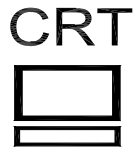
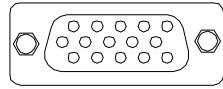


➤ **LED Indicators & I/O Peripheral Connectors**

The Power LED has two distinctive statuses: Off for inactive operation and light for activity. View from the front and back side, If you are connecting the monitor, LAN, audio, COM and USB to the FX5206. See following figure and a side pictures.



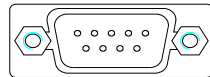
1. A VGA (CRT) connector is provided for VGA signals.



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 COM port

The COM1 (DB9) is designed for multiple proposes, It's can select RS-232/422/485 by [BIOS setting](#). The following tables show the signal connections of connector.

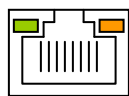


DB9	RS-232	RS-422	RS-485
1	-DCD		
6	-DSR		
2	RXD	RX-	485-
7	-RTS	TX-	
3	-TXD	RX+	485+
8	-CTS	TX+	
4	-DTR		
9	-RI/5Vor 12V		
5	Ground		
Metal	Case Ground		

3. Connecting the LAN port

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

RJ45 connector



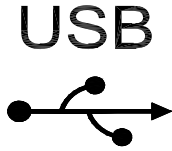
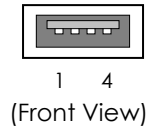
1 8
(Front View)



RJ45	LAN	RJ45	LAN
1	TPTX+	5	TPTX1-
2	TPTX -	6	TPRX -
3	TPRX+	7	TPRX1+
4	TPTX1+	8	TPRX-

4. Connecting the USB Ports

The FX5206 supports a three port USB connector. Any USB device can be attached to USB ports with plug-and-play supported.



USB#1~4	Signal
Pin 1	USBV
Pin 2	USBD-
Pin 3	USBD+
Pin 4	USBG

5. Connecting the Audio Microphone In, Earphone-out



Mic-In

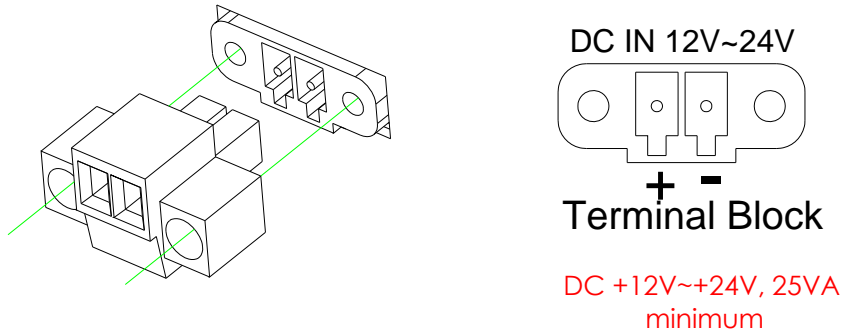


EAR-Phone

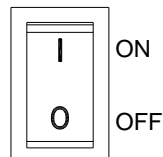
➤ **Connecting the DC Power and Power Switch**

Power is supplied through an external power DC In. See following figure and a side pictures.

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



2. Power Switch: The Power Switch controls the main power switch, plugging DC into DC power connector then turn on the Power Switch, when you final installed system hardware device.



Power Switch: On/Off

3. Reset Push Button

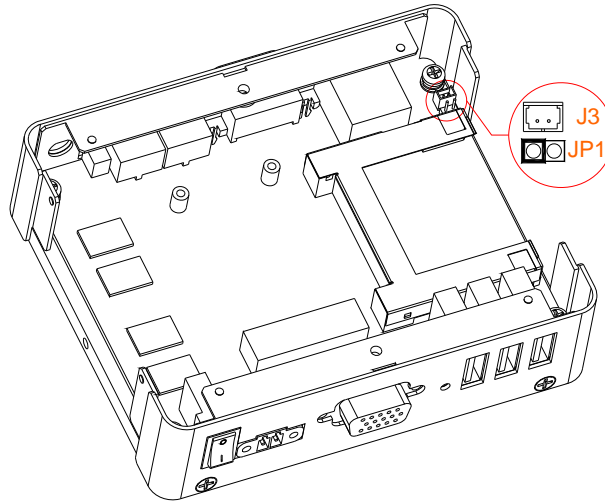
The FX5206 has a push button switcher for system reset; Push and release the button will cause hardware reset of FX5206 and restart system booting.



Reset Push Button: Restart

➤ **Jumper Setting**

The JP1 is select RS485 terminator resistor for COM1, and J3 is used to connect an external battery.



□ J3: external battery

You can pull plug external battery to clear CMOS data. The CMOS stores information like system date, time, boot up device, password, IRQ... which are set up with the BIOS. To clear the CMOS, pull the CMOS battery plug for at last 30 seconds to reset CMOS.



- +

□ JP1: RS-485 Terminator Setting

JP1



1 2

RS-485
Terminator Disabled
Factory Preset



1 2

RS-485
Terminator Enabled

Chapter 3 BIOS Setup

This chapter describes the BIOS setup.

Overview

BIOS are a 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, the ISA bus and connected devices such as the video display, diskette drive, and the keyboard. This program will not be lost when you turn off the system.

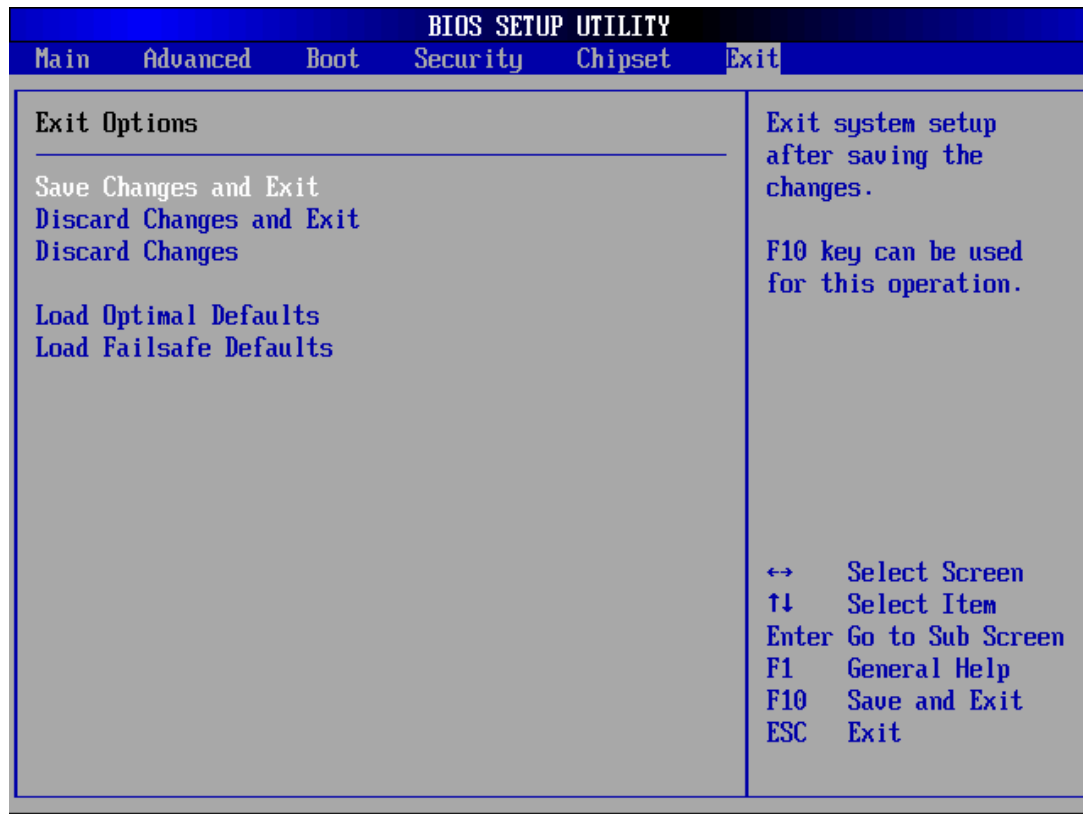
The BIOS provides a menu-driven interface to the console subsystem. The console subsystem contains special software, called firmware that interacts directly with the hardware components and facilitates interaction between the system hardware and the operating system.

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] 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.



➤ **BIOS Functions**

On the menu, you can perform the following functions

1. Main
2. Advanced
 - CPU Configuration
 - IDE Configuration
 - Remote Access Configuration
 - USB Configuration
3. Boot
 - Boot Settings Configuration
 - Boot Device Priority
 - Hard Disk Drives
 - CD/DVD Drivers
4. Security
 - Change Supervisor Password
 - Change User Password
 - Clear User Password
 - Boot Sector Virus Protection
5. Chipset
 - Northbridge Configuration
 - Southbridge Configuration
6. Exit
 - Save Changes and Exit: Exit system setup after saving the changes.F10 key can be used for this operation.

- Discard Changes and Exit: Exit system setup without saving any changes. ESC key can be used for this operation.
- Discard Changes: Discard changes down so far any of the set questions. F7 key can be used 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 Fail-Safe Default: to configure the system in fail-safe mode with predefined values.

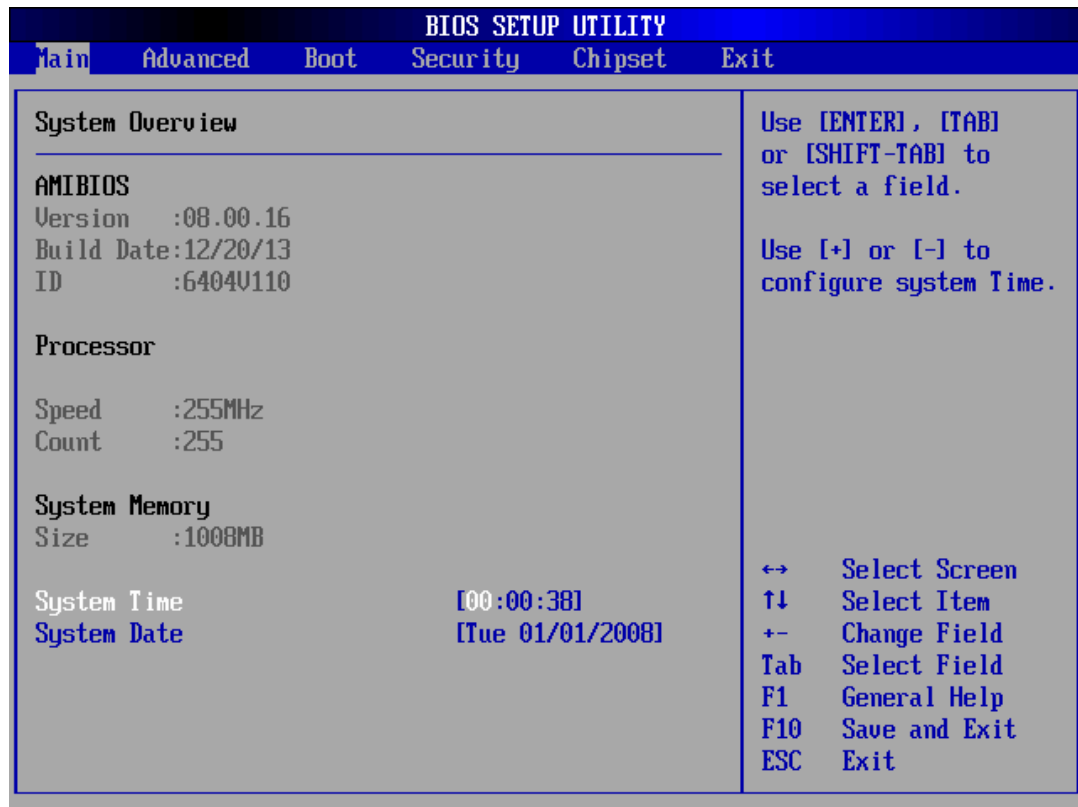
➤ **Keyboard Convention**

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

Item	Function
ESC	To exit the current menu or message
Page Up/Page Down	To select a parameter
F1	To display the help menu if you do not know the purpose or function of the item you are going to configure
F8	Fail-Safe Default
F9	Optimized Default
F10	Save and exit
UP/Down Arrow Keys	To go upward or downward to the desired item

Main Setup

This section describes basic system hardware configuration, 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

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

❑ System Date & Time Setup

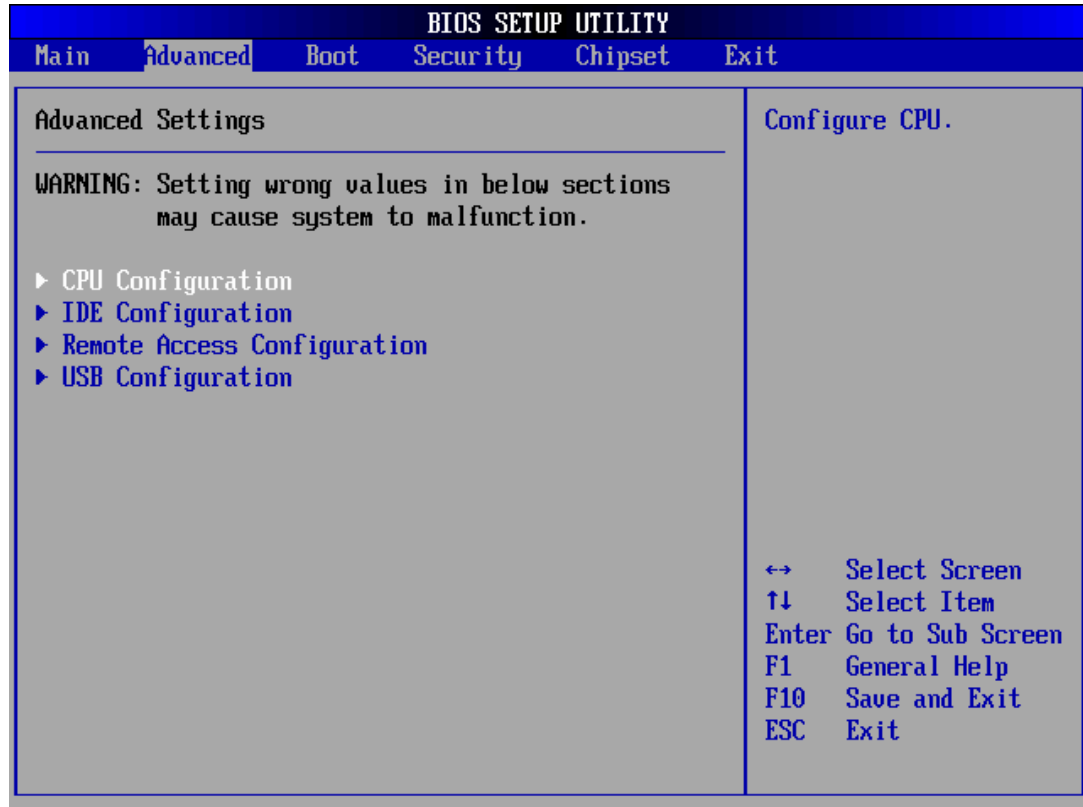
Highlight the <Date> field and then press the [Page Up] / [Page Down] or [+] / [-] keys to set the current date. Follow the month, day and year format.

Highlight the <Time> field and then press the [Page Up] / [Page Down] or [+] / [-] 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

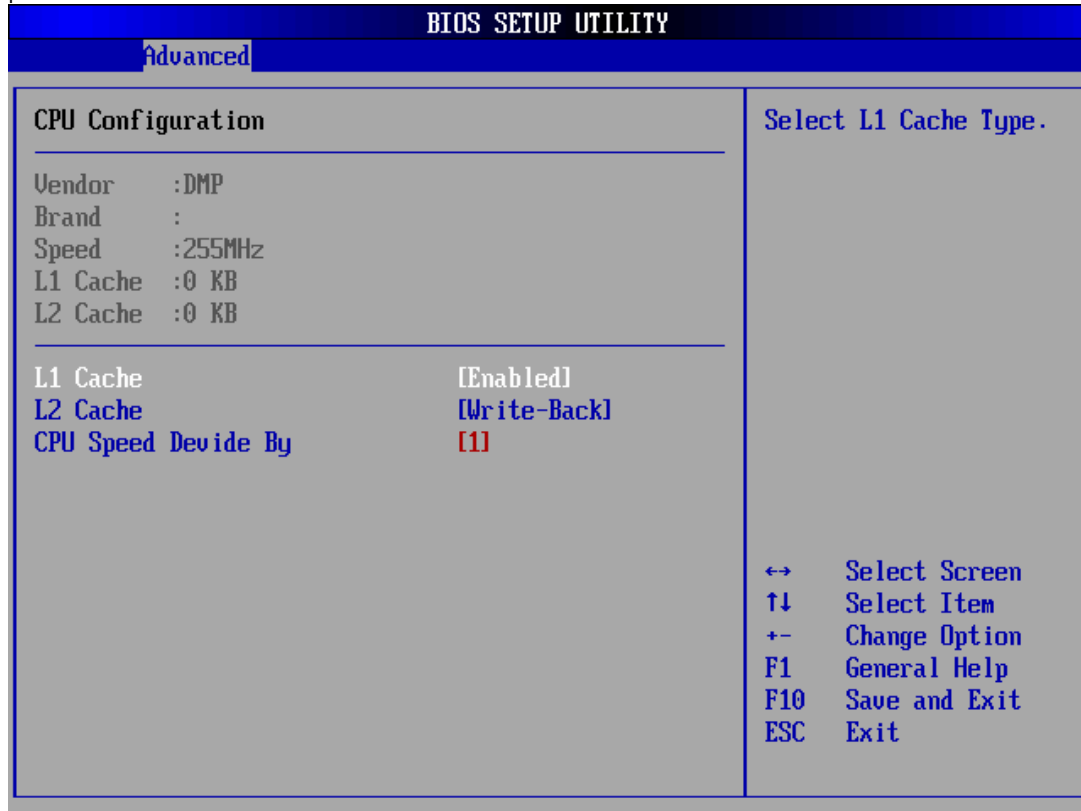
Select the *Advanced* tab from the setup screen to enter the Advanced BIOS Setup screen. You can select any of the items in the left frame of the screen, such as USB Configuration, to go to the sub menu for that item. You can display an Advanced BIOS Setup option by highlighting it using the <Arrow> 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



> **CPU Configuration**

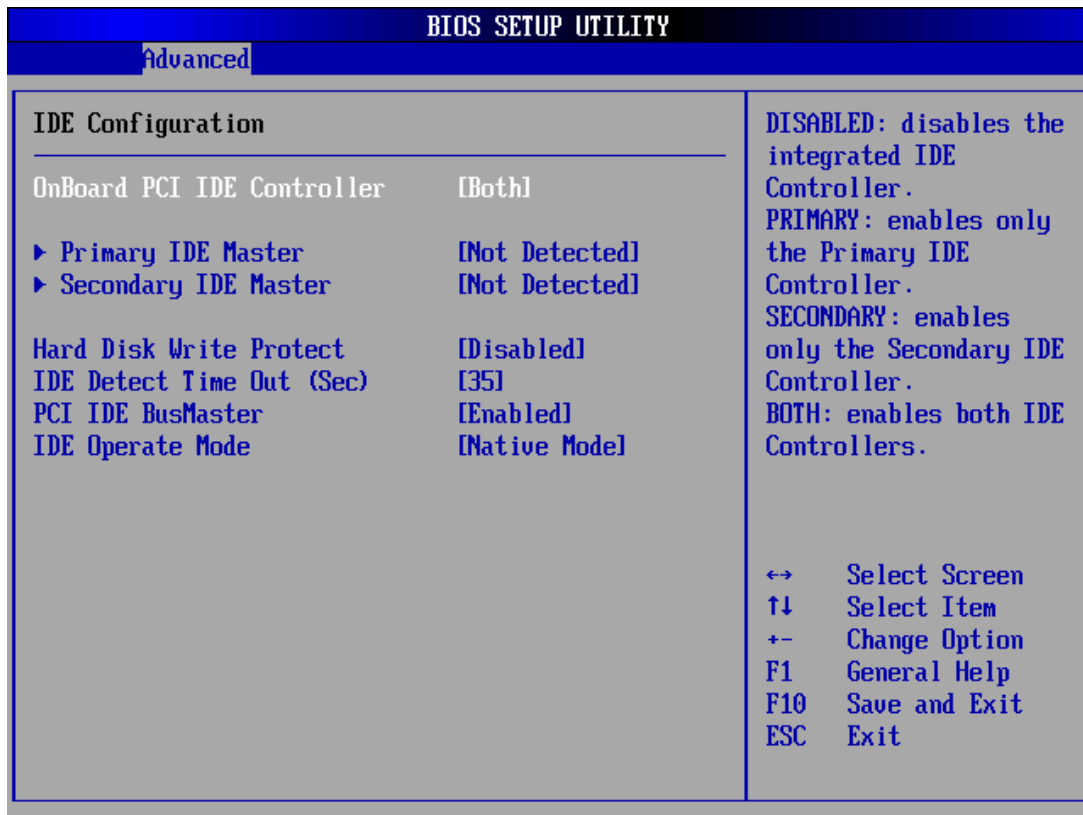
You can use this screen to select options for the CPU information.

Note: The CPU Configuration setup screen varies depending on the installed processor.



➤ **IDE Configuration**

You can use this screen to select options for the IDE 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 *IDE Configuration* screen is shown below.



□ **Onboard PCI IDE Controller**

This item specifies the IDE channels used by the onboard PCI IDE controller

Available Options: Primary, Secondary, Both and Disable

Default setting: Both

◇ **Primary/Secondary IDE Master/Slave**

IDE hard drive controllers can support up to two separate hard drives. These drives have a master/slave relationship, which is determined by the cabling configuration used to attach them to the controller.

LBA/Large Mode

LBA (Logical Block Addressing) is a method of addressing data on a disk drive. In LBA mode, the maximum drive capacity is 137 GB. The Optimal and Fail-Safe default setting is *Auto*

Hard Disk Type

The BIOS supports various types for user settings, The BIOS supports <Pri Master>, <Pri Slave>, so the user can install up to two hard disks. For the master and slave jumpers, please refer to the hard disk's installation descriptions and the hard disk jumper settings. You can select <AUTO> under the <TYPE> and <MODE> fields. This will Enabled auto detection of your IDE drives during boot up. This will allow you to change your hard drives (with the power off) and then power on without having to reconfigure your hard drive type. If you use older hard disk drives, which do not support this feature, then you must configure the hard disk drive in the standard method as described above by the <USER> option.

PIO MODE

PIO means Programmed Input/Output. Rather than have the BIOS issue a series of commands to affect a transfer to or from the disk drive, PIO allows the BIOS to tell the controller what it wants and then let the controller and the CPU perform the complete task by them. This is simpler and more efficient (and faster). Your system supports five modes, numbered from 0 to 4, which primarily differ in timing. When Auto is selected, the BIOS will select the best available mode.

BLOCK (Multi-Sector Transfer)

This option allows your hard disk controller to use the fast block mode to transfer data to and from your hard disk drive (HDD).

S.M.A.R.T

This field is used to activate the S.M.A.R.T (System Management and Reporting Technologies) function for S.M.A.R.T HDD drives. This function requires an application that can give S.M.A.R.T message.

32 Bit Data Transfer

This option sets the 32-bit data transfer option. The Optimal and Fail-Safe default setting is *enabled*.

Hard Disk Write Protect

Set this option to protect the hard disk drive from being overwritten. The Optimal and Fail-Safe default setting is *disabled*.

Available Options: Disabled, Enabled

Default setting: Disabled

IDE Detect Time Out (Sec.)

Set this option to stop the AMIBIOS from searching for IDE devices within the specified number of seconds. Basically, this allows you to fine-tune the settings to allow for faster boot times. Adjust this setting until a suitable timing that can detect all IDE disk drives attached is found.

Available Options: 0, 5, 10, 15, 20, 25, 30, and 35

Default setting: 35

PCI IDE BusMaster

This option is to specify that the IDE controller on the PCI local bus have bus-mastering capability.

Available Options: Enabled, Disabled

Default setting: Disabled

OnBoard IDE Operate Mode

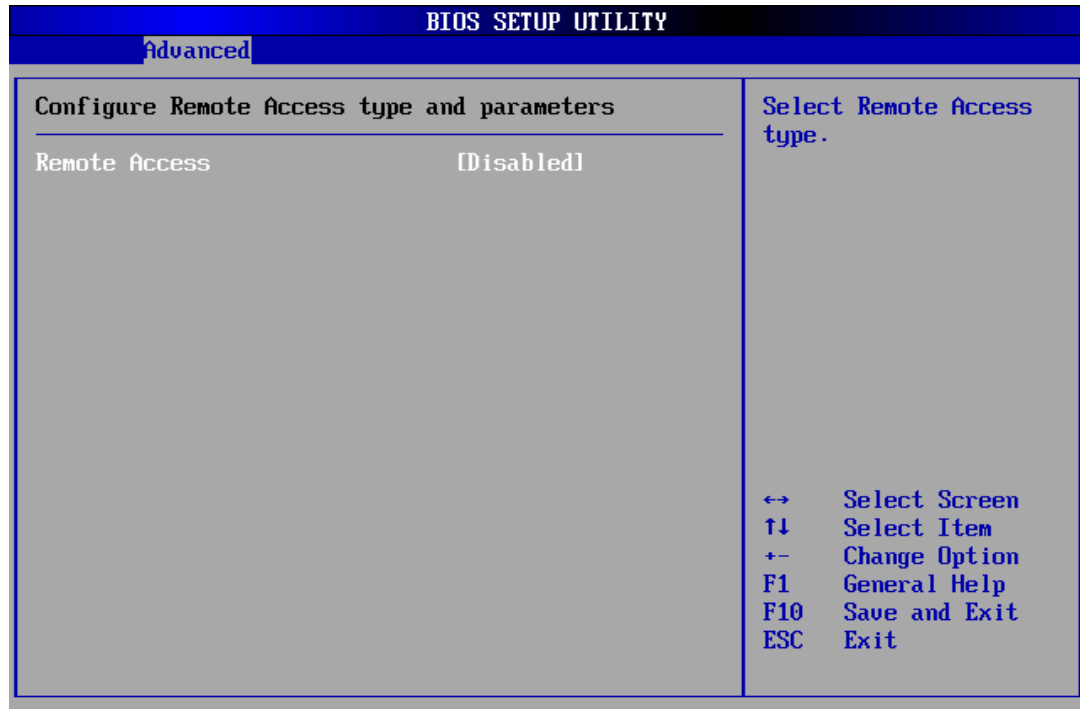
This item specifies the Native Mode ONLY for Windows(R) XP.

Available Options: Legacy, and Native mode

Default setting: Native mode

➤ **Remote Access Configuration**

This option turns on remote access support in the BIOS and is the default setting. The remote access feature requires the use of the serial port1 connector at the COM1 of system.



□ **Remote Access**

This field is select remote access type.

Available Options: Enabled and Disabled

Default setting: Disabled

✧ *Serial Port number*

This field is the Serial port1 for console redirection. Make sure the port is Enabled.

Available Options: COM1

Default setting: COM1

✧ *Base Address, IRQ*

This field is the I/O port address and Interrupt.

Available Options: 3F8, 4

Default setting: 3F8, 4

✧ *Serial Port Mode*

This field is select Serial port1 can use any mode. Just keep in mind that the bits per second, data bits, parity, and stop bits must match terminal setting.

Available Options: 115200 8,n,1/57600 8,n,1/38400,8,n,1/19200,8,n,1/9600,8,n,1

Default setting: 115200, 8, n, 1

✧ *Flow Control*

This field is Serial port1 can use flow control for console redirection.

Available Options: None, Hardware and Software

Default setting: None

✧ *Redirection After BIOS Post*

These fields is select 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: Disabled, Boot Loader and Always

Default setting: Always

✧ *Terminal Type*

This field is selecting the target terminal type.

Available Options: ANSI, VT100 and VT-UTFB

Default setting: ANSI

✧ *VT-UTF8 Combo Key Support*

This field is select VT-UTF8 combination key support for ANSI/VT100 terminals.

Available Options: Enabled and Disabled

Default setting: Enabled

✧ *Sredir Memory Display Delay*

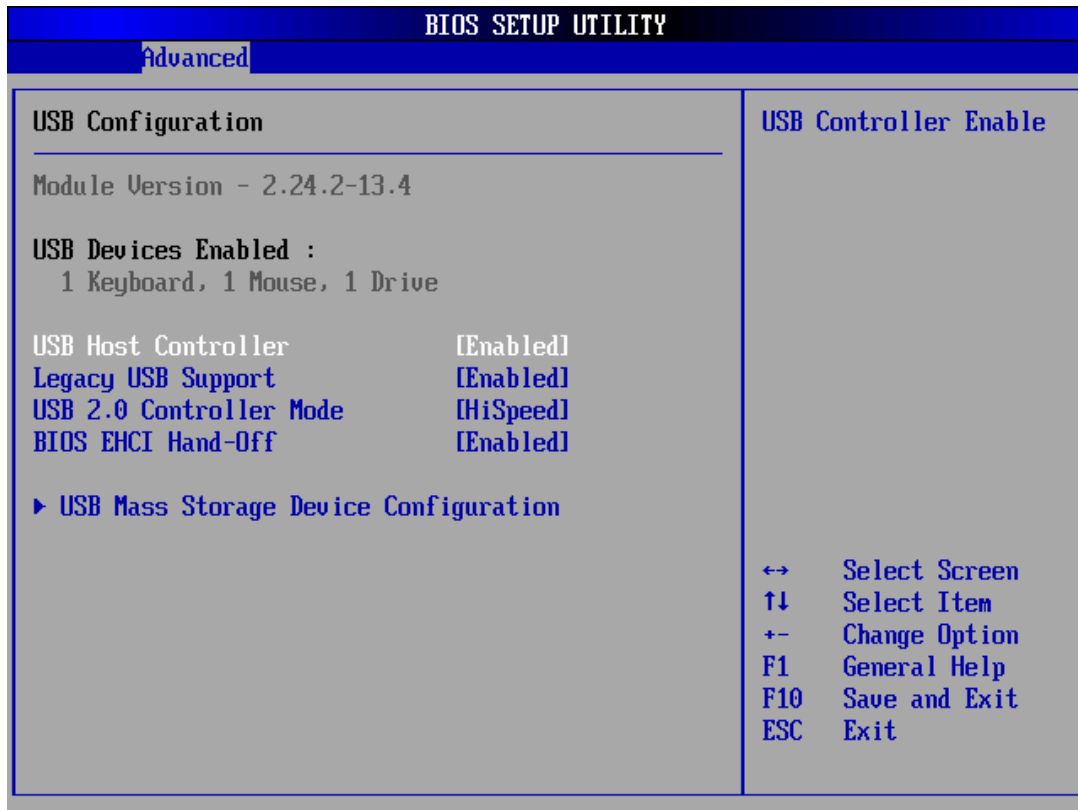
This field is gives the delay in seconds to display memory information.

Available Options: No Delay, Delay 1 Sec, Delay 2 Sec and Delay 4 Sec

Default setting: No Delay

➤ **USB Configuration**

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



❑ **USB Host Controller**

Set this value to allow system to enable and disable onboard USB ports.

Available Options: Disabled, and Enabled

Default setting: Enabled

❑ **Legacy USB Support**

Legacy USB Support refers to the USB mouse and USB keyboard 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 Disabled the Legacy USB Support.

Available Options: Disabled, Enabled and AUTO

Default setting: Auto

❑ **USB 2.0 Controller Mode**

This field is configures the USB 2.0 controllers in High speed (480Mbps) or Full speed (12Mbps).

Available Options: HiSpeed and FullSpeed

Default setting: Hispeed

❑ **BIOS ECHI Hand-Off**

This is a workaround for OS without ECHI Hand-Off support. The ECHI ownership change should claim by ECHI driver.

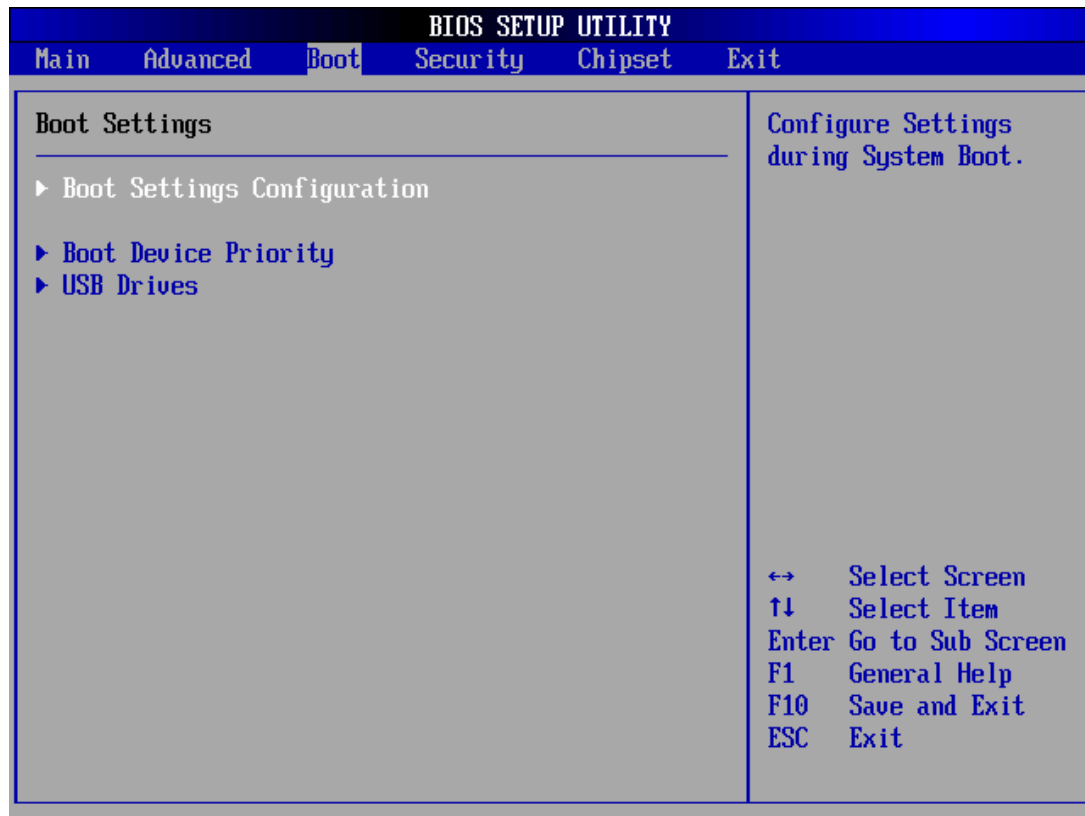
Available Options: Enabled and Disabled

Default setting: Enabled

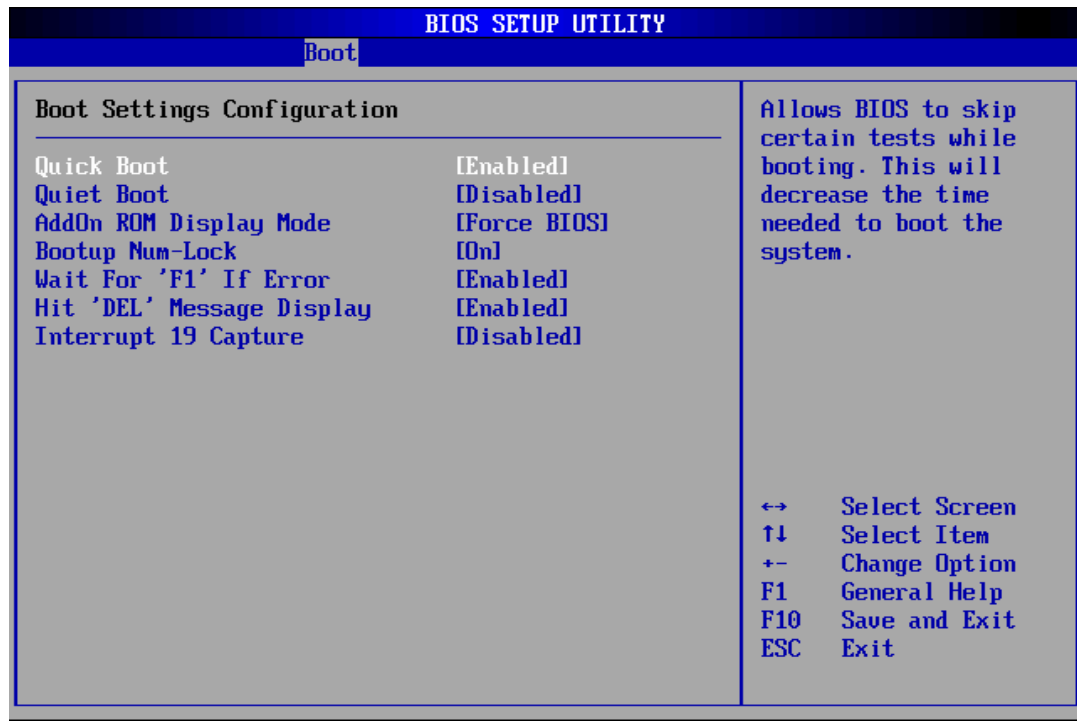
Boot Setup

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 Boot Device Priority, 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:

- Boot Setting Configuration
- Boot Device Priority
- Hard disk drives
- Removable Drivers



➤ **Boot Setting Configuration**



❑ **Quick Boot**

This field is used to activate the quick boot function of the system. When set to Enabled,

1. BIOS will not wait for up to 40 seconds if a Ready signal is not received from the IDE drive, and will not configure its drive.
2. BIOS will not wait for 0.5 seconds after sending a RESET signal to the IDE drive.
3. You cannot run BIOS Setup at system boot since there is no delay for the Hit, Del. To run Setup message.

Available Options: Disabled, Enabled

Default setting: Enabled

❑ **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

❑ **Wait for 'F1' If Error**

AMIBIOS POST error messages are followed by:

Press <F1> to continue

If this field is set to *Disabled*, the AMIBIOS does not wait for you to press the <F1> key after an error message.

Available options: Disabled, Enabled

Default setting: Disabled

❑ **Hit 'DEL' Message Display**

Set this field to *Disabled* to prevent the message as follows:

Hit 'DEL' if you want to run setup

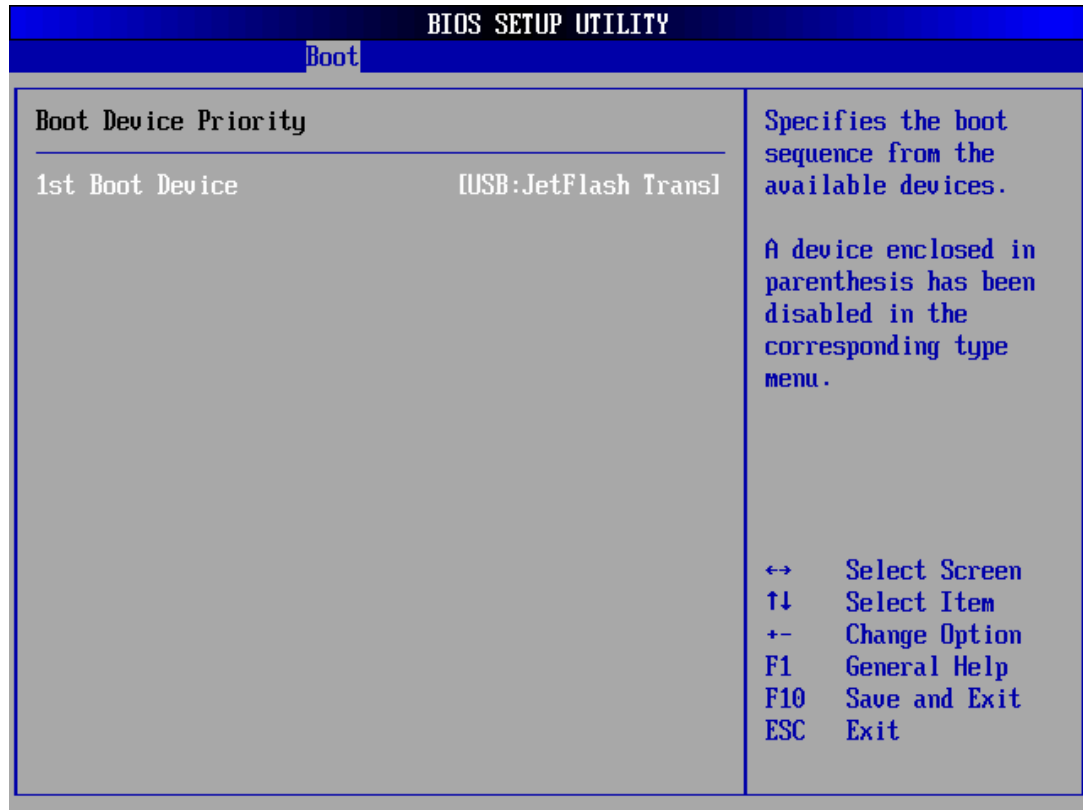
It will prevent the message from appearing on the first BIOS screen when the computer boots.

Available options: Disabled, Enabled

Default setting: Enabled

➤ **Boot Device**

Use this screen to specify the order in which the system checks for the device to boot from. To access this screen, select Boot Device Priority on the Boot Setup screen and press <Enter>.



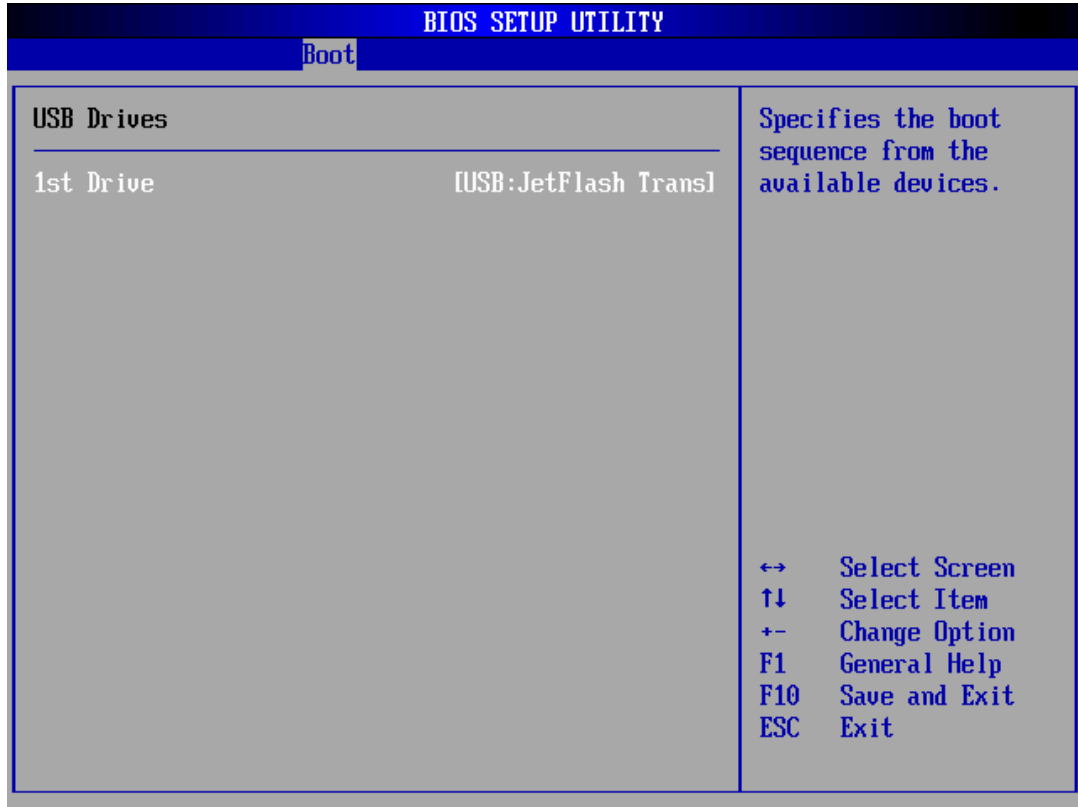
□ **First /Second Disk Boot Device**

Set the boot device options to determine the sequence in which the computer checks which device to boot from. The settings are *Removable Dev.*, *Hard Drive*, or *ATAPI CDROM*.

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 hard disk drives connected, then the list will show all three hard disk drives attached

➤ **USB Drives**

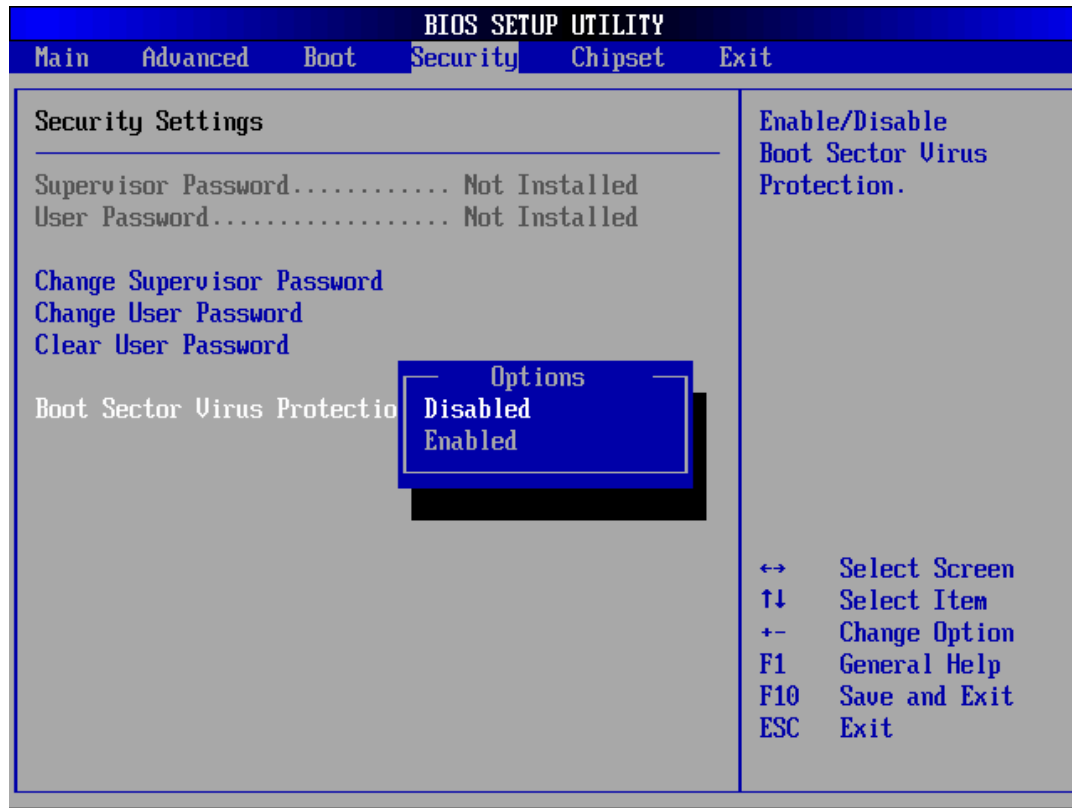
Use this screen to view the USB drives in the system. To access this screen, select USB drives on the Boot Setup screen and press <Enter>.



Security setup

There are two security passwords: Supervisor and User. Supervisor is 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.

- Change Supervisor Password
- Change User Password
- Clear User Password
- Boot Sector Virus Protection



To set the password, please complete the following steps.

1. Select **Change Supervisor Password**.
2. Type the desired password (up to 6 character length) when you see the message, "Enter New Supervisor Password."
3. Then you can go on to set a 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 Advanced BIOS Features screen and point to the Security Option field.
5. Select System or Setup.

- ✧ **Always:** a visitor who attempts to enter BIOS or operating system will be prompted for password.
 - ✧ **Setup:** a visitor who attempts to the operating system will be prompted for user password. You can enter either User password or Supervisor password.
6. Point to **Save Settings and Exit** and press Enter.
 7. Press Y when you see the message, "Save Current Settings and Exit (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.

❑ **Clear User Password**

Select Clear User Password from the Security Setup menu and press <Enter>. Clear New Password > [Ok] [Cancel] appears. Type the password and press <Enter>. The screen does not display the characters entered. Retype the password as prompted and press <Enter>.

❑ **Password Check**

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

Available options: Setup, Always

Default setting: Setup

❑ **Boot Sector Virus Protection**

This option is near the bottom of the Security Setup screen. The Optimal and Fail-Safe default setting is *disabled*

Enabled: Set this value to prevent the Boot Sector Virus Protection. This is the default setting.

Disabled: Select Enabled to enable boot sector protection, displays a warning when any program (or virus) issues a Disk Format command or attempts to write to the boot sector of the hard disk drive. If enabled, the following appears when a write is attempted to the boot sector. You may have to type N several times to prevent the boot sector write. Boot Sector Write!

Possible VIRUS: Continue (Y/N)? _

The following appears after any attempt to format any cylinder, head, or sector of any hard disk drive via the BIOS INT 13 Hard disk drive Service:

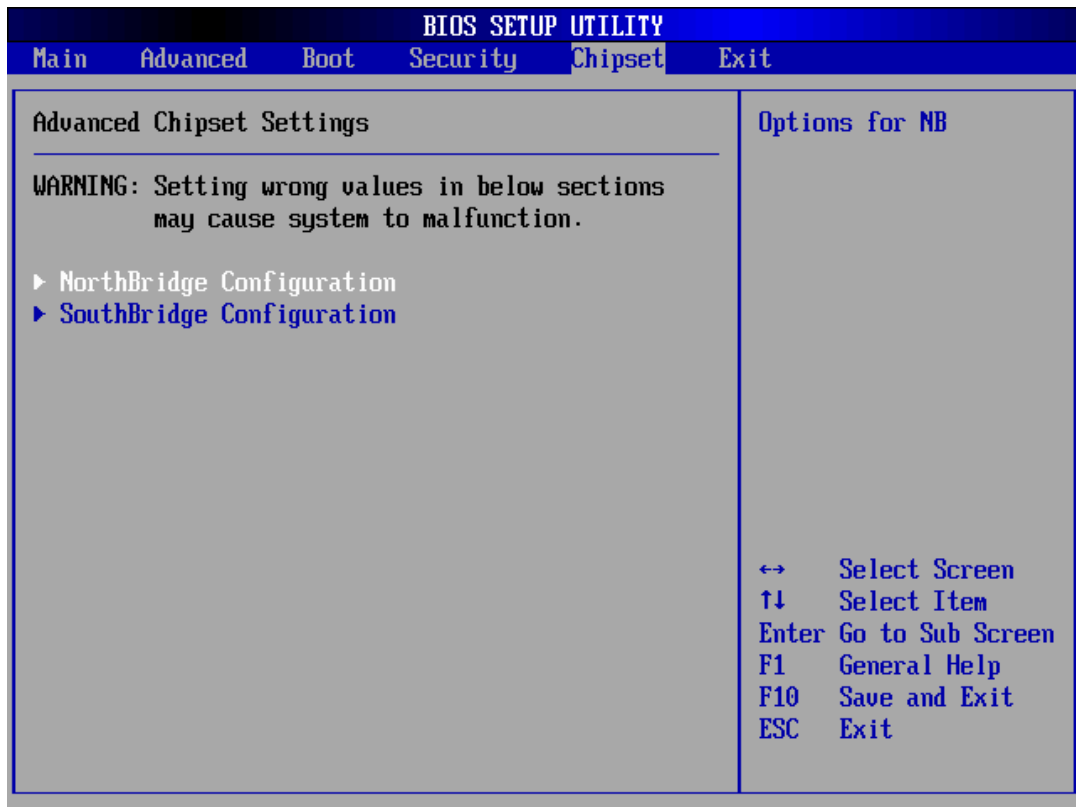
Format!!!

Possible VIRUS: Continue (Y/N)?

Chipset Setup

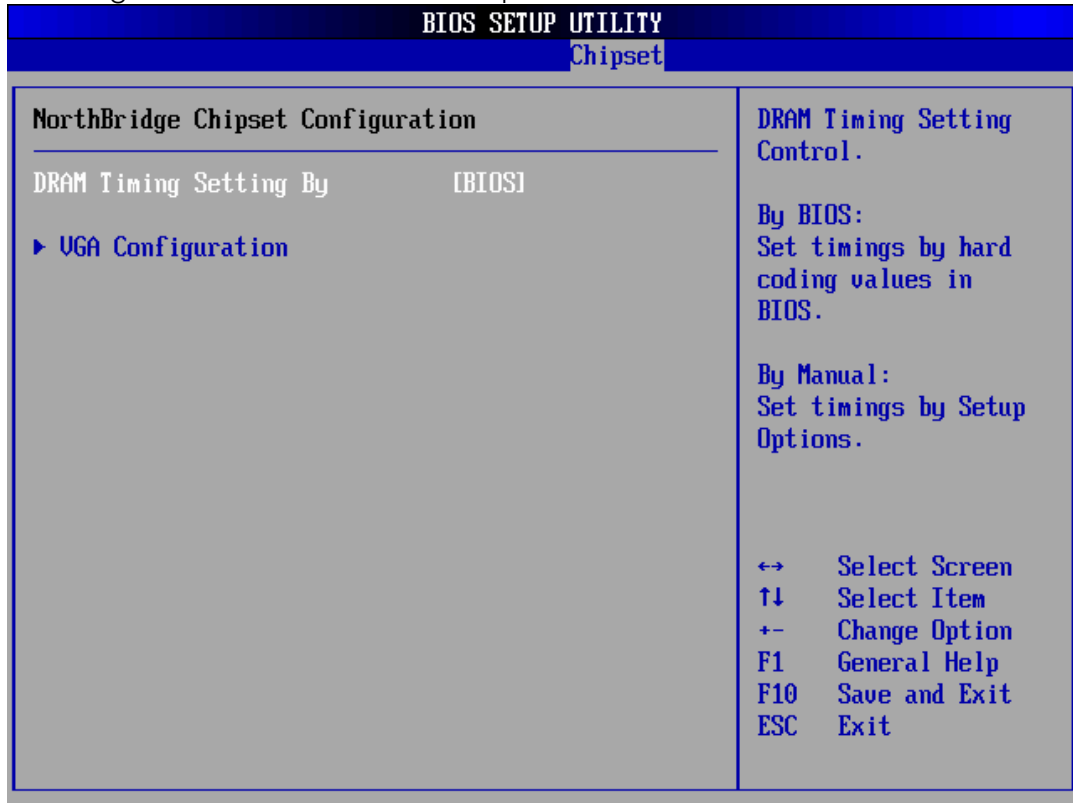
This section describes the configuration of the board's chipset features.

- Northbridge Configuration
- Southbridge Configuration



➤ **Northbridge Configuration**

You can use this screen to select options for the North Bridge 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.



□ **DRAM Timing Setting By**

This Field is SDRAM Timing Setting Control. By BIOS: Set timings by hard coding values in BIOS. By Manual: Set timings by Setup Options.

Available Options: BIOS, and Manual

Default setting: BIOS

DRAM Timing Setting By Manual

✧ *CAS Latency*

This field specifies the DDR Memory Timing: CAS Latency

Available Options: 2, 3, 4, 5, 6, and 7

Default setting: 6

✧ *tWR*

This field specifies the DDR Memory Timing: write Recovery Time.

Available Options: 0, 1, 2, 3, 4, 5, 6, and 7

Default setting: 7

✧ *tRFC*

This field specifies the DDR Memory Timing: REF/ACT to REF/ACT delay.

Available Options: 1 ~ 63.

Default setting: 38

✧ *tRP*

This field specifies the DDR Memory Timing: PRE to ACT command period.

Available Options: 0, 1, 2, 3, 4, 5, 6, and 7

Default setting: 7

✧ *tRCD*

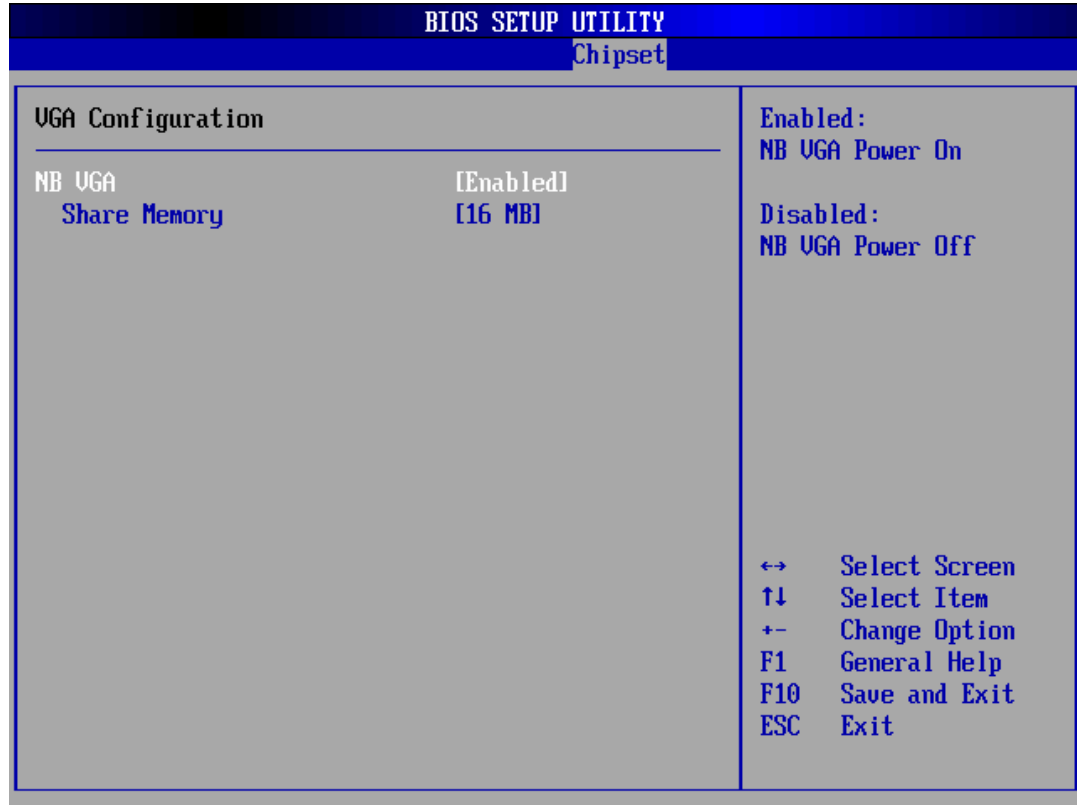
This field specifies the DDR Memory Timing: ACT to R/W command delay period.

Available Options: 0, 1, 2, 3, 4, 5, 6, 8, 9, 10, 11, 12, 13, 14, and 15

Default setting: 15

❑ **VGA Configuration**

This field item is for VGA display.



✧ **NB VGA**

This field specifies which VGA display will be used when the system is boot. Don't select Disabled the NB VGA, it's will be blinking on the VGA Display.

Available Options: Enabled and Disabled

Default setting: Enabled

Share Memory

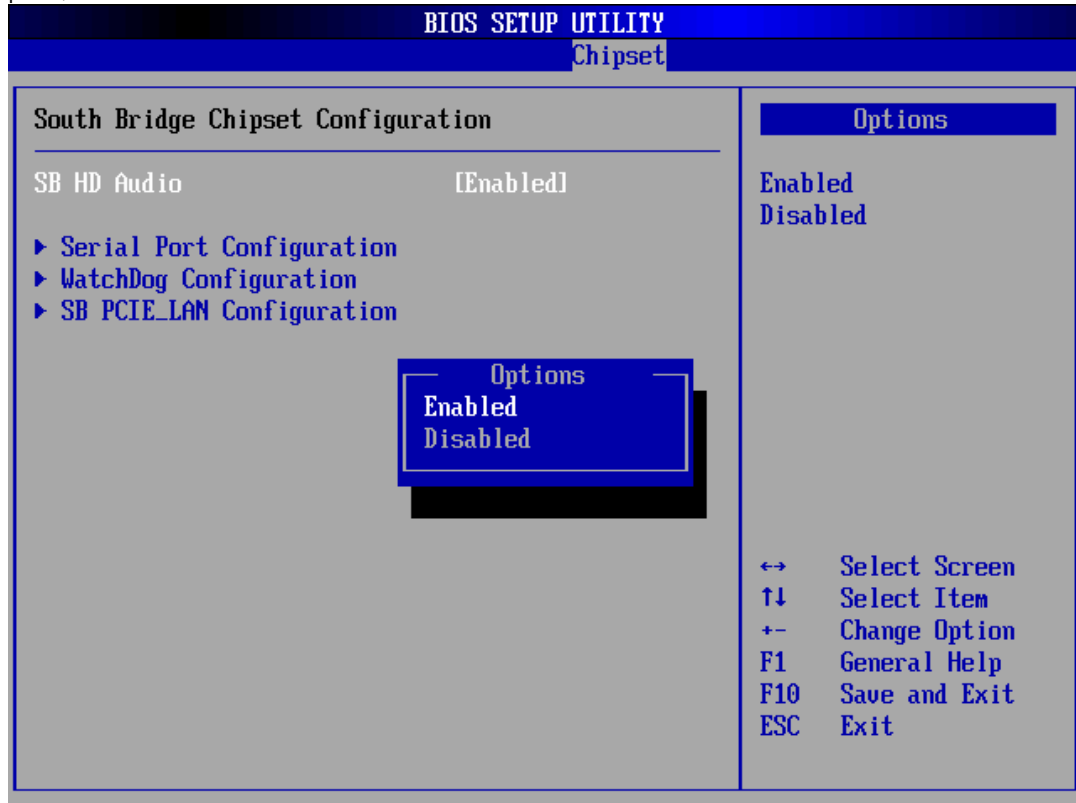
This field is share memory architecture (SMA) for frame buffer memory. SMA allows system memory to be efficiently share by the host CPU and allocated depending on user preference, application requirements, and total size of system memory.

Available Options: Disabled, 8MB, 16MB, 32MB and 64MB

Default setting: 16MB

➤ **Southbridge Configuration**

You can use this screen to select options for the South Bridge Configuration. South Bridge is a chipset on the motherboard that controls the basic I/O functions, LAN port, and audio function.



□ **SB HD Audio**

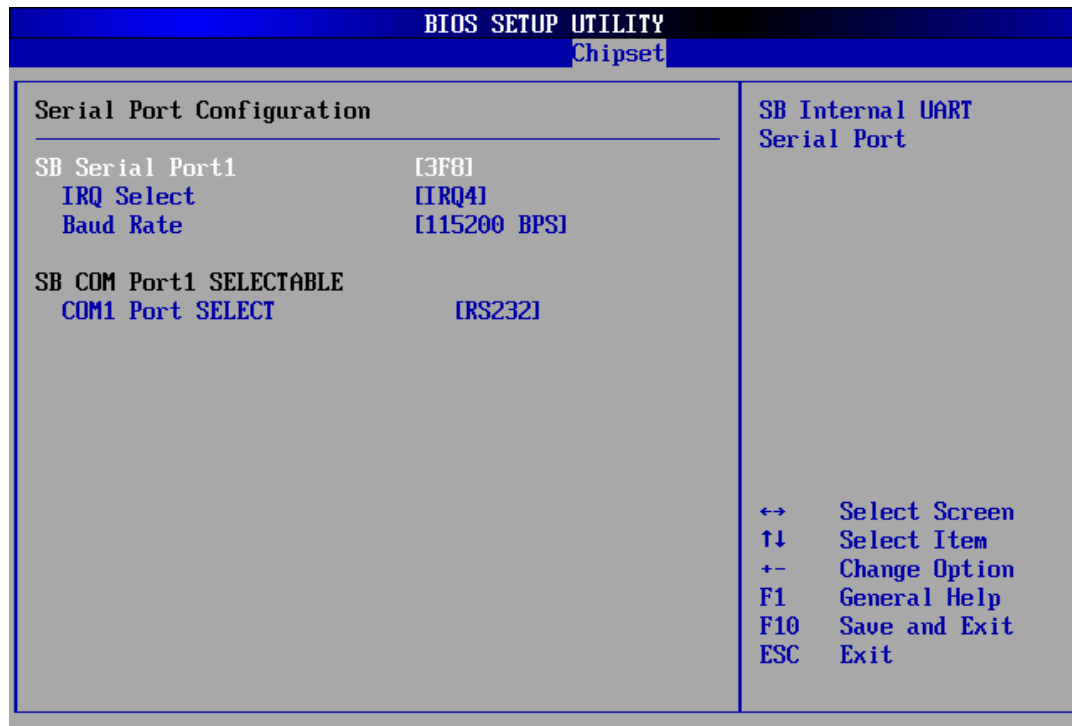
This field specifies the internal Audio Control.

Available Options: Enabled, and Disabled

Default setting: Enabled

❑ **Serial Port Configuration**

This section describes the function of Serial ports settings.



✧ **SB Serial Port 1**

These fields select the I/O port address for Serial port.

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

Default setting: 3F8H

IRQ Select

This field is the Serial port 1 Interrupt.

Available Options: 3, 4, 5, 6, 7, 9, 10, 11, 12 and 15

Default setting: 4

Baud Rate

This field is select Serial port1 can use Baud Rate any speedy.

Available Options: 748800 BPS, 499200 BPS , 249600 BPS, 124800 BPS,62400 BPS, 31200 BPS, 115200 BPS , 57600 BPS, 38400 BPS, 19200 BPS, 9600 BPS, 4800 BPS, 2400 BPS.

Default setting: 115200 BPS

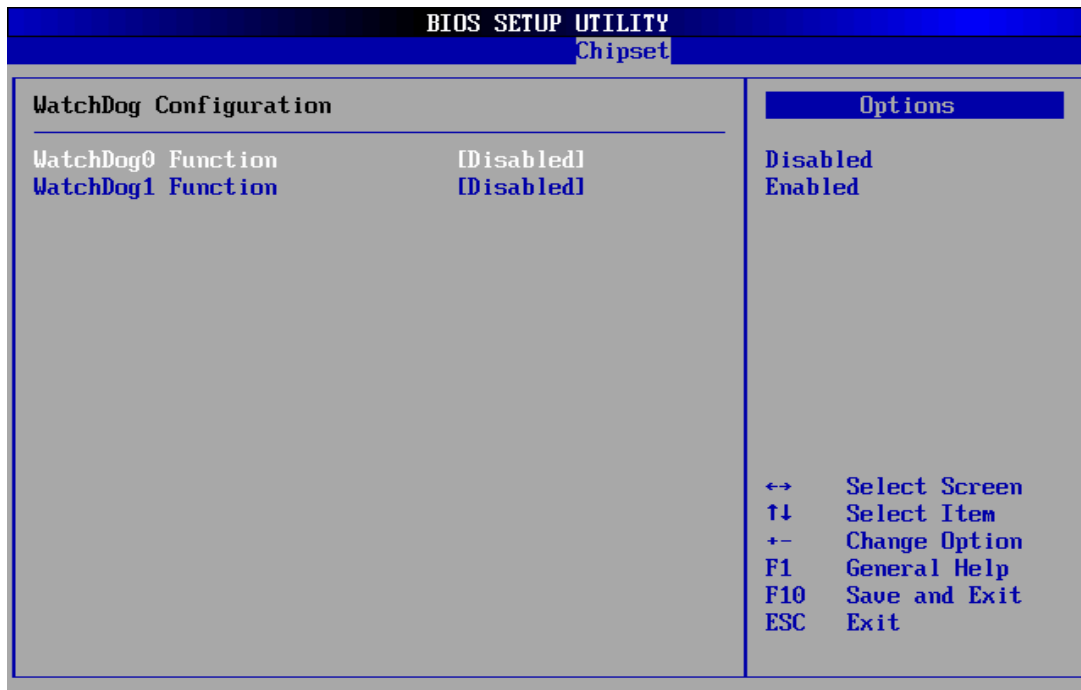
✧ *COM1 Port Select*

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

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

Default setting: RS-232

□ Watchdog Configuration



◇ *Watchdog 0/1 Function*

This field specifies the Enabled or Disabled of the Watchdog Function.

Available Options: Disabled and Enabled

Default setting: Disabled

Watchdog 0/1 Signal Select

This field is the Select IRQ, NMI or Reset signal trigger of onboard watchdog.

Available Options: IRQ 3 ~ IRQ12, IRQ14, IRQ15, NMI, and Reset

Default setting: Reset

Watchdog 0/1 Timer

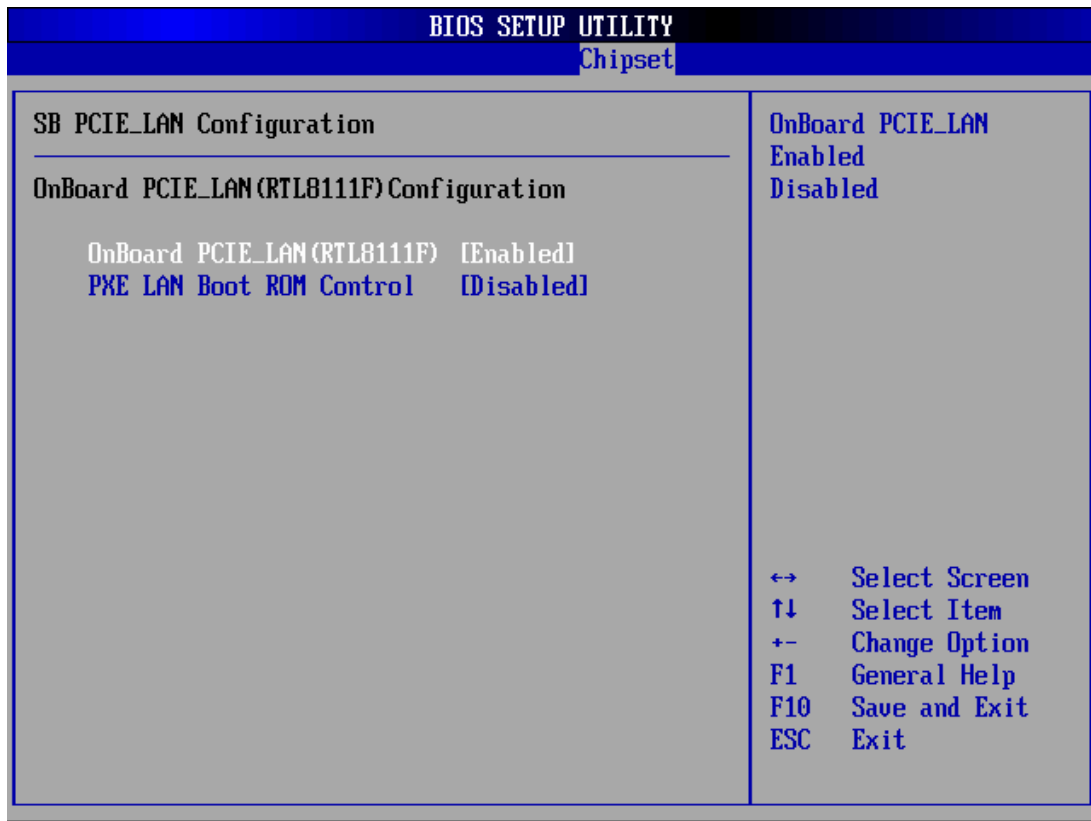
This field is the Select when IRQ, NMI or Reset signal trigger timer of onboard watchdog.

Available Options: 2 Sec ~ 512 Sec

Default setting: 64 Sec

Note: Please refer to the section of the "[Watchdog Timer](#)" in the Chapter 5 "Driver and Utility" for the detail description of the Watchdog ports register.

❑ SB PCIE_LAN Configuration



✧ *OnBoard PCIE_LAN(RTL8111F)*

The onboard LAN corresponding PCI Express, this item allows users to enable or disable on board LAN.

Available Options: Disabled, and Enabled

Default setting: Enabled

✧ *PXE LAN Boot ROM Controller*

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

Available Options: Disabled, and Enabled

Default setting: Disabled

Chapter 4 Software Installation

The enclosed diskette includes FX5206 VGA, Audio, and LAN driver. To install and configure you FX5206 system, you need to perform the following steps.

VGA Drivers

➤ **WINXP Driver**

Step 1: To install the VGA driver, insert the CD ROM into the CD ROM device, and enter DRIVER>VGA> Vortex86DX2> WINXP. If your system is not equipped with a CD ROM device, copy the VGA driver from the CD ROM to CF.

Step 2: Execute M2012_R6.MSI 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 XP, you can find the <DISPLAYL> icon located in the {CONTROL PANEL} group.

Step 6: Adjust the <Color>, and <Resolution>.

Audio Driver

➤ WIN XP Driver

Step 1: To install the AUDIO driver, insert the CD ROM into the CD ROM device, and enter DRIVER>AUDIO>ALC888>WIN2K&XP.

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.

LAN Driver (RTL 8111F)

➤ WIN XP Driver

Step 1: To install the LAN driver, insert the CD ROM into the CD ROM device, and enter DRIVER>LAN>RTL8111F\XP. If your system is not equipped with a CD ROM device, copy the LAN driver from the CD ROM to CF.

Step 2: Execute setup.exe file.

BIOS Flash Utility

In the <UTILITY> directory, there is the jflash.exe file.

Step 1: Use the ANYBIOS.EXE program to update the BIOS setting.

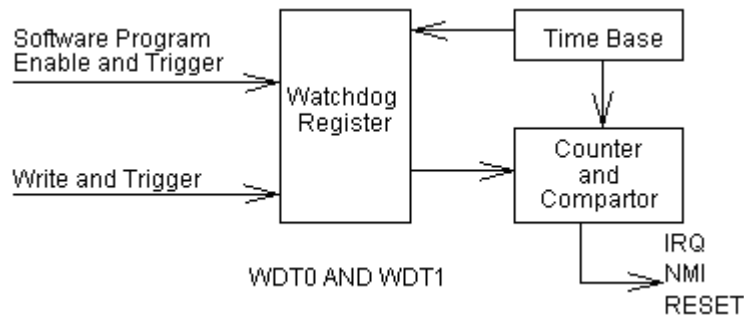
Step 2: And then refer to the chapter "BIOS Setup", as the steps to modify BIOS.

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 0 and Watchdog Timer 1, including disabled, enabled, and triggers functions.

The FX5206 is equipped with a programmable time-out period watchdog timer. User can use the program to enable the watchdog timer. Once you have enabled the watchdog timer, the program should trigger it every time before it times out. If your program fails to trigger or disable this timer before it times out because of system hang-up, it will generate a reset signal to reset the system or trigger an IRQ signal. The time-out period can be programmed to be 30.5 μ seconds to 512 seconds.



> Watchdog Timer Setting

The watchdog timer (WDT0 and WDT1) is a circuit that may be used from your program software to detect 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 zero and start to count again. If your program fails to trigger the watchdog timer before time-out, it will generate a reset pulse to reset the system or trigger an IRQ signal and NMI to tell your program that the watchdog is times out. To access WDT0 registers the software programmer use the index port 22hh data port 23h and access WDT1 registers, its use IO ports 68h ~ 6Dh.

□ Watchdog timer – WDT0 and WDT1

WDT 0	3Bh	3Ah	39h
WDT 1	6Ah	6Bh	6Ch
	D7...D0	D7...D0	D7...D0
	Counter [MSB ...LSB]		

For example:

WDT 0	3Bh	3Ah	39h	
WDT 1	6Ah	6Bh	6Ch	
	00h	00h	01h	30.5 μsec
	--	--	02h	61.0μsec
	00h	01h	00h	7.8 m sec
	00h	02h	00h	15.6 m sec
	01h	00h	00h	2 sec
	02h	00h	00h	4 sec
	FFh	FFh	FFh	512 sec

□ Select Watchdog Report Signal - WDT0 and WDT1

WDT 0	38h	
WDT 1	69h	
Bit 7-4	Watchdog timer time out report signal select	
	0000	Reserved
	0001	IRQ3 selected
	0010	IRQ4 selected
	0011	IRQ5 selected
	0100	IRQ6 selected
	0101	IRQ7 selected
	0110	IRQ9 selected
	0111	IRQ10 selected
	1000	IRQ11 selected
	1001	IRQ12 selected
	1010	IRQ14 selected
	1011	IRQ15 selected
	1100	NMI selected
	1101	System reset selected
	1110	Reserved
	1111	Reserved
Bit 3-0	Other function. Please do not modify these bits.	

□ Watchdog Enabled/Disabled - WDT0 and WDT1

WDT 0	37h	
WDT 1	68h	
Bit 7	Reserved.	
Bit 6	0	Disable watchdog timer
	1	Enable watchdog timer
Bit 5-0	Other function. Please do not modify these bits.	

NOTE: 1. If you program the watchdog to generate IRQ15 signal when it times out, you should initial IRQ15 interrupt vector and enable the second interrupt controller (8259 PIC) in order to enable CPU to process this interrupt. An interrupt service routine is required too. Before you configure the IRQ signals, make sure they are not conflicted with other devices, like Floppy, printer, serial ports, LAN, and PS/2 mouse, etc. Refer to Table 2-2 Interrupt Controller for IRQ reference.

2. Before you initialize the interrupt vector of IRQ15 and enable the PIC, please enable the watchdog timer previously; otherwise the watchdog timer will generate an interrupt at the time watchdog timer is enabled. If you want to generate IRQ15 signal to warn your program when watchdog times out, the following table listed the relation of timer factors between time-out periods. And if you use the IRQ15 signal to warn your program when watchdog timer out, please enter the BIOS Setup the <Peripheral Setup> menu, the <OnBoard PCI IDE> and <IDE Prefetch> these two items must set to **Primary**.

□ **Timeout Status – WDT0 and WDT1**

WDT 0	3Ch	
WDT 1	6Dh	
Bit 7	0	Timer timeout not happened - Read only.
	1	Timer timeout happened - Read only.
Bit 6	Write this bit "1" to reset watchdog timer (Only for WDT 0.)	
Bit 5-0	Other function. Please do not modify these bits.	

□ **Reload Register - WDT1**

WDT 1	67h	
Bit 7-0	Writer this port to reload Watchdog Timer Counter. The read date is unknown.	

➤ **Setup Watchdog Timer Step - WDT0 and WDT1**

□ **WDT0 setup Step:**

1. Unlock Registers by Index 22h and data port 23h.
2. Index 37h Set Bit 6 = 0 to disable the watchdog timer 0 (WDT0).
3. Write the desired counter value to index 3Bh, 3Ah, and 39h.
4. Index 37h Set Bit 6 = 1 to enable the timer, the counter will begin to count up.
5. When counter reaches the setting value, the time out will generate signal setting by index 38h bit [7:4].
6. BIOS can read index 3Ch Bit 7 to decide whether the Watchdog timeout event will happen or not.

To clear the watchdog timer counter:

1. Index 3Ch set Bit 6 = 0 to disable timer. This will also clear counter at the same time.

✧ **Watchdog Timer Enabled**

To enable the watchdog timer 0 (WDT 0), you have to output a byte of timer factor to the watchdog register whose index address is 22h and data port is 23H. The following is an Assemble program, which demonstrates how to enable the watchdog timer and set the time-out period at 4 seconds.

```
-----  
; Unlock Configuration Register  
-----  
Mov    dx,22h          ; Enter to extended function mode  
Mov    al,13h  
Out    dx,al  
Mov    dx,23h  
Mov    al,c5h  
Out    dx,al  
-----  
; Enabled Watch dog  
-----  
Mov    al,37h  
Mov    dx,22h  
Out    dx,al  
Mov    al,40h          ;Index 37 Bit 6 set 1  
Mov    dx,23h  
Out    dx,al  
-----  
; Lock Configuration Register  
-----  
Mov    dx,22h          ;Exit the extended function mode  
Mov    al,13h  
Out    dx,al  
Mov    dx,23h  
Mov    al,00h  
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.

```
-----  
; Timer Counter  
-----  
Mov    al,02h  
Mov    dx,3bh          ;Index 3bh set 02h =4 sec  
Out    dx,al  
-----  
; System Reset or Interrupt  
-----  
Mov    al,38h  
Mov    dx,22h  
Out    dx,al  
;Mov   al,50h          ;Trigger IRQ7  
Mov    al,d0h          ;System Reset  
Mov    dx,23h  
Out    dx,al  
-----  
; Trigger (Reset) Watchdog Timer  
-----  
Mov    al,3ch  
Mov    dx,22h  
In     dx,al  
Or     al,40h          ;Trigger Watchdog  
Mov    dx,23h  
Out    dx,al
```

✧ *Watchdog Timer Disabled*

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

```
-----  
; Disabled Watchdog  
-----  
Mov    al,37h  
Mov    dx,22h  
Out    dx,al  
Mov    al,00h          ;Index 37 Bit 6 set 0  
Mov    dx,23h  
Out    dx,al
```

❑ WDT1 setup Step:

1. Write time into register 6Ah-6Ch.
2. Select signal from register 69h.
3. Set register 68h bit 8 to enable WDT1.

To clear the watchdog timer counter:

1. Write any value to register 67H

❖ Watchdog Timer Enabled

To enable the watchdog timer 1 (WDT 1), you have to output a byte of timer factor to the watchdog ports address is 68h. The following is an Assemble program, which demonstrates how to enable the watchdog timer 1 and set the time-out period at 4 seconds.

```
;-----  
; Enabled Watch dog  
;-----  
Mov    al,40h  
Mov    dx,68h      ;IO port 68h Bit 6 set 1  
Out    dx,al
```

❖ Watchdog Timer Trigger

```
;-----  
; Timer Counter  
;-----  
Mov    al,02h  
Mov    dx,6ah      ; IO port 68h set 02h = 4 sec  
Out    dx,al  
;-----  
; Interrupt or System Reset  
;-----  
Mov    al,50h      ;Trigger IRQ7  
;Mov   al,d0h      ;System Reset  
Mov    dx,69h      ; IO port 69h Select Int, Reset, NMI signal  
Out    dx,al  
;-----  
; Trigger (Reset) Watchdog Timer  
;-----  
Or     al,40h  
Mov    dx,67h      ; IO port 67h Trigger Watchdog  
Out    dx,al
```

❖ Watchdog Timer Disabled

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

```
;-----  
; Disabled Watchdog  
;-----  
Mov    al,40h      ; IO port 68h disabled Watchdog  
Mov    dx,68h  
Out    dx,al
```

Chapter 5 Technical Reference

This section outlines the errors that may occur when you operate the system, and also gives you the suggestions on solving the problems.

Topic include:

- ❑ Trouble Shooting for Post Beep & Error Messages
- ❑ Technical Reference

Trouble Shooting for Post Beep and Error Messages

The following information informs the Post Beep & error messages. Please adjust your systems according to the messages below. Make sure all the components and connectors are in proper position and firmly attached. If the errors still exist, please contact with your distributor for maintenance.

❑ POST BEEP

Currently there are two kinds of beep codes in BIOS setup.

- One indicates that a video error has occurred and the BIOS cannot initialize the video screen to display any additional information. This beep code consists of a single long beep followed by three short beeps.
- The other indicates that an error has occurred in your DRAM. This beep code consists of a constant single long beep.

❑ CMOS BATTERY FAILURE

When the CMOS battery is out of work or has run out, the user has to replace it with a new battery.

❑ **CMOS CHECKSUM ERROR**

This error informs that the CMOS has corrupted. When the battery runs weak, this situation might happen. Please check the battery and change a new one when necessary.

❑ **DISK BOOT FAILURE**

When you can't find the boot device, insert a system disk into Drive A and press < Enter >. Make sure both the controller and cables are all in proper positions, and also make sure the disk is formatted. Then reboot the system.

❑ **DISKETTE DRIVES OR TYPES MISMATCH ERROR**

When the diskette drive type is different from CMOS, please run setup or configure the drive again.

❑ **ERROR ENCOUNTERED INITIALIZING HARD DRIVE**

When you can't initialize the hard drive, ensure the following things:

1. The adapter is installed correctly
2. All cables are correctly and firmly attached
3. The correct hard drive type is selected in BIOS Setup

❑ **ERROR INITIALIZING HARD DISK CONTROLLER**

When this error occurs, ensure the following things:

1. The cord is exactly installed in the bus.
2. The correct hard drive type is selected in BIOS Setup
3. Whether all of the jumpers are set correctly in the hard drive

❑ **FLOPPY DISK CONTROLLER ERROR OR NO CONTROLLER PRESENT**

When you cannot find or initialize the floppy drive controller, please ensure the controller is in proper BIOS Setup. If there is no floppy drive installed, ensure the Diskette Drive selection in Setup is set to NONE.

❑ **KEYBOARD ERROR OR NO KEYBOARD PRESENT**

When this situation happens, please check keyboard attachment and no keys being pressed during the boot. If you are purposely configuring the system without a keyboard, set the error halt condition in BIOS Setup to HALT ON ALL, BUT KEYBOARD. This will cause the BIOS to ignore the missing keyboard and continue the boot procedure.

❑ **MEMORY ADDRESS ERROR**

When the memory address indicates error, you can use this location along with the memory map for your system to find and replace the bad memory chips.

❑ **MEMORY SIZE HAS CHANGED**

Memory has been added or removed since last boot. In EISA mode, use Configuration Utility to re-configure the memory configuration. In ISA mode enter BIOS Setup and enter the new memory size in the memory fields.

❑ **MEMORY VERIFYING ERROR**

It indicates an error verifying a value is already written to memory. Use the location along with your system's memory map to locate the bad chip.

❑ **OFFENDING ADDRESS MISSING**

This message is used in connection with the I/O CHANNEL CHECK and RAM PARITY ERROR messages when the segment that has caused the problem cannot be isolated.

❑ **REBOOT ERROR**

When this error occurs that requires you to reboot. Press any key and the system will reboot.

❑ **SYSTEM HALTED**

Indicates the present boot attempt has been aborted and the system must be rebooted. Press and hold down the CTRL and ALT keys and press DEL.

Technical Reference

➤ Physical and Environmental

Temperature: Operating 0°C ~ 50°C

Relative humidity 5 % to 95 % non-condensing

➤ Real-Time Clock and Non-Volatile RAM

The FX5206 contains a real-time clock compartment that maintains the date and time in addition to storing configuration information about the computer system. It contains 14 bytes of clock and control registers and 114 bytes of general purpose RAM. Because of the use of CMOS technology, it consumes very little power and can be maintained for long periods of time using an internal Lithium battery. The contents of each byte in the CMOS RAM are listed below:

Address	Description
00	Seconds
01	Second alarm
02	Minutes
03	Minute alarm
04	Hours
05	Hour alarm
06	Day of week
07	Date of month
08	Month
09	Year
0A	Status register A
0B	Status register B
0C	Status register C
0D	Status register D
0E	Diagnostic status byte
0F	Shutdown status byte
10	Diskette drive type byte, drive A and B
11	Fixed disk type byte, drive C

Address	Description
12	Fixed disk type byte, drive D
13	Reserved
14	Equipment byte
15	Low base memory byte
16	High base memory byte
17	Low expansion memory byte
18	High expansion memory byte
19-2D	Reserved
2E-2F	2-byte CMOS checksum
30	Low actual expansion memory byte
31	High actual expansion memory byte
32	Date century byte
33	Information flags (set during power on)
34-7F	Reserved for system BIOS

➤ **CMOS RAM Map**

Register	Description
00h -10h	Standard AT-compatible RTC and Status and Status Register data definitions
11h – 13h	Varies
14h	Equipment Bits 7-6 Number of Floppy Drives 00 1 Drive 01 2 Drives Bits 5-4 Monitor Type 00 Not CGA or MDA 01 40x25 CGA 01 2 Drives 80x25 CGA Bits 3 Display Enabled 0 Disabled 1 Enabled Bit 2 Keyboard Enabled 00 Not CGA or MDA 01 40x25 CGA 01 2 Drives 80x25 CGA Bit 1 Math Coprocessor Installed 0 Absent 1 Present Bit 0 Floppy Drive Installed 0 Disabled 1 Enabled
15h	Base Memory (in 1KB increments), Low Byte
16h	Base Memory (in 1KB increments), High Byte
17h	IBM-compatible memory (in 1KB increments), Low Byte
18h	IBM-compatible memory (in 1KB increments), High Byte (max 15 MB)
19h-2Dh	Varies
2Eh	Standard CMOS RAM checksum, high byte
2Fh	Standard CMOS RAM checksum, low byte
30h	IBM-compatible Extended Memory, Low Byte (POST) in KB
31h	IBM-compatible Extended Memory, High Byte (POST) in KB
32h	Century Byte
33h	Reserved. Do not use
34h	Reserved. Do not use
35h	Low byte of extended memory (POST) in 64 KB
36h	High byte of extended memory (POST) in 64 KB
37h-3Dh	Varies
3Eh	Extended CMOS Checksum, Low Byte (including 34h-3Dh)
3Fh	Extended CMOS Checksum, High Byte (including 34h-3Dh)

➤ **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 - 021h	Interrupt Controller #1
022h - 023h	WDT 0 Control Register
040h - 05Fh	Timer Controller
060h - 064h	Keyboard Controller
066h - 06fh	WTD1 Control Ports
070h - 073h	Real Time Clock, NMI
080h - 09Fh	DMA Page Register
0A0h - 0BFh	Interrupt Controller #2
0C0h - 0DFh	DMA Controller #2
0F0h	Clear Math Coprocessor Busy Signal
0F1h	Reset Math Coprocessor
1F0h - 1F7h	IDE Interface
290h - 297h	System Chipset
2F8h - 2FFh	Serial Port #2(COM2)
2B0 - 2DF	Graphics adapter Controller
3C0 - 3CF	EGA adapter
3D0 - 3DF	CGA adapter
3F8h - 3FFh	Serial Port #1(COM1)

➤ **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	Reserved
IRQ4	Serial Port #1
IRQ5	USB#0/1
IRQ6	Reserved
IRQ7	Audio
IRQ8	Real Time Clock
IRQ9	IDE
IRQ10	VGA LAN
IRQ11	PCI Bridge
IRQ12	Reserved
IRQ13	FPU
IRQ14	PCI Bridge/LAN
IRQ15	USB#2

Note: BIOS Default (IDE: Native Mode)

➤ 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, 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)**

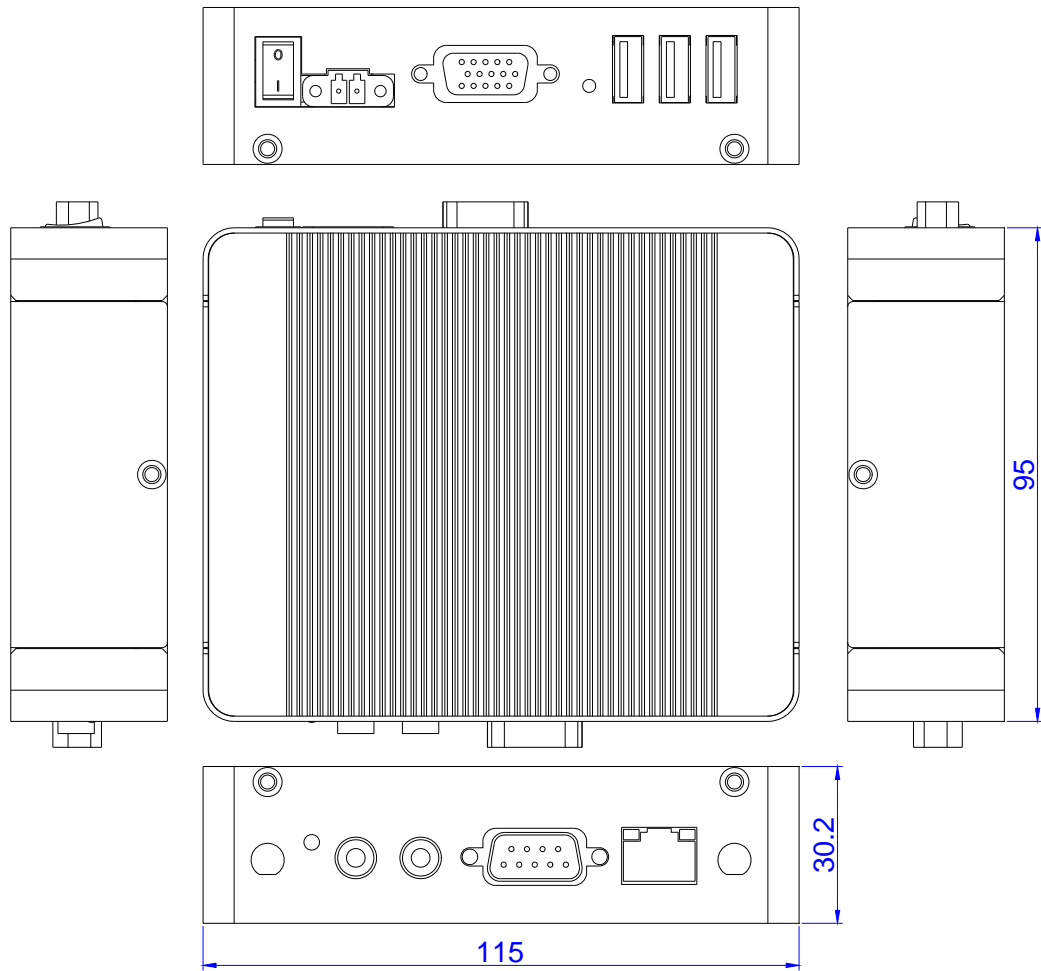
	LS	MS
Bit 0:	Bit 0	Bit 8
Bit 1:	Bit 1	Bit 9
Bit 2:	Bit 2	Bit 10
Bit 3:	Bit 3	Bit 11
Bit 4:	Bit 4	Bit 12
Bit 5:	Bit 5	Bit 13
Bit 6:	Bit 6	Bit 14
Bit 7:	Bit 7	Bit 15

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

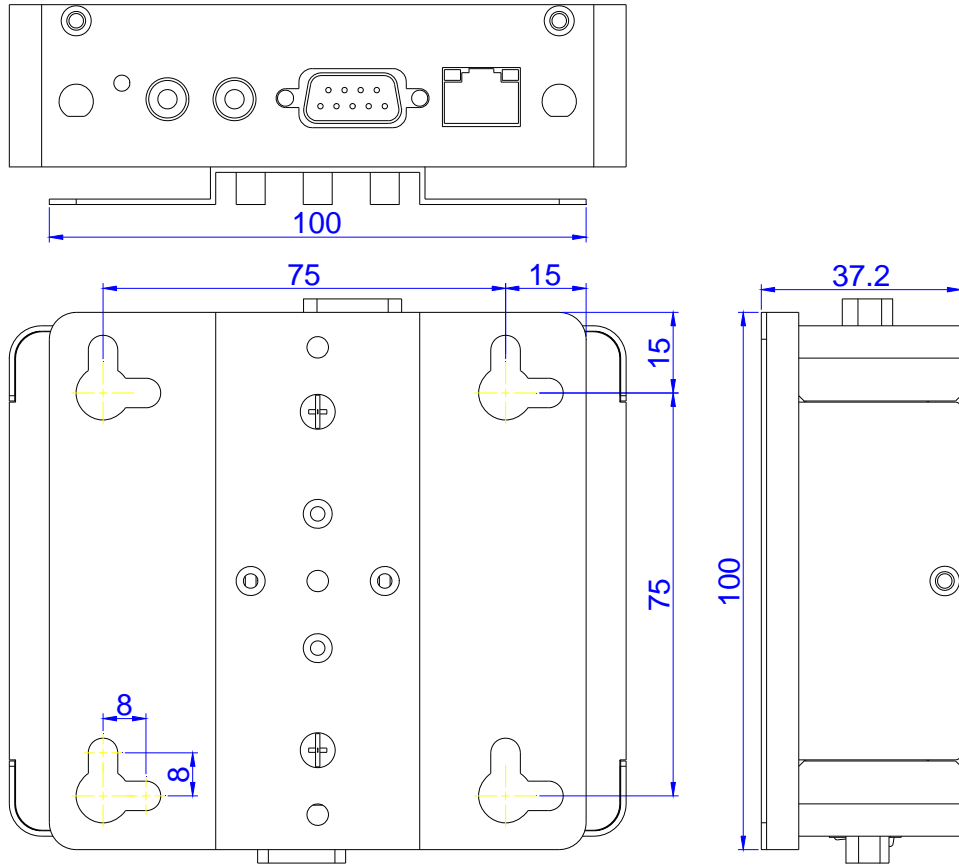
Appendix

Dimension

a. FX5206



b. FX5311K1



c. AK1009- DIN-Rail

