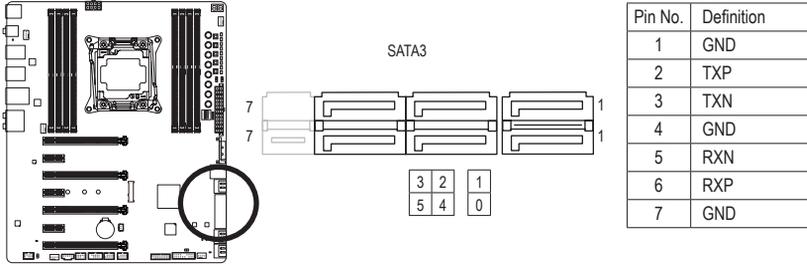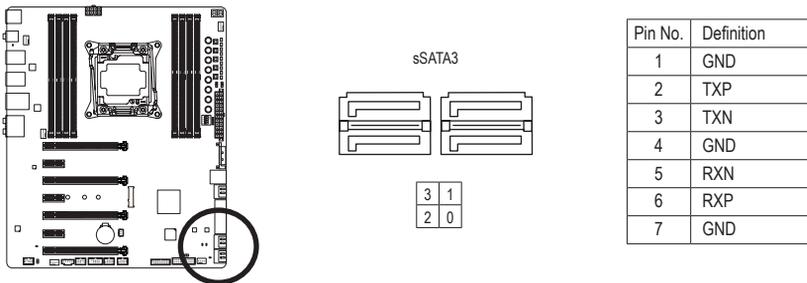**9)  SATA3 0/1/2/3/4/5 (SATA 6Gb/s Connectors)**

The SATA connectors conform to SATA 6Gb/s standard and are compatible with SATA 3Gb/s and SATA 1.5Gb/s standard. Each SATA connector supports a single SATA device. The Intel® Chipset supports RAID 0, RAID 1, RAID 5, and RAID 10. Refer to Chapter 3, "Configuring SATA Hard Drive(s)," for instructions on configuring a RAID array.

SATA3

| Pin No. | Definition |
|---------|-----------|
| 1 | GND |
| 2 | TXP |
| 3 | TXN |
| 4 | GND |
| 5 | RXN |
| 6 | RXP |
| 7 | GND |

To enable hot-plugging for the SATA ports, refer to Chapter 2, "BIOS Setup," "Chipset\PCH SATA Configuration," for more information.

**10)  sSATA3 0/1/2/3 (SATA 6Gb/s Connectors)**

The SATA connectors conform to SATA 6Gb/s standard and are compatible with SATA 3Gb/s and SATA 1.5Gb/s standards. Only AHCI and IDE modes are supported. Each SATA connector supports a single SATA device.

sSATA3

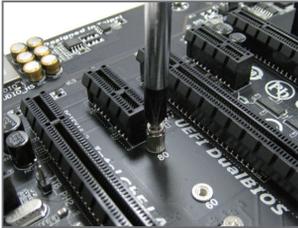| Pin No. | Definition |
|---------|-----------|
| 1 | GND |
| 2 | TXP |
| 3 | TXN |
| 4 | GND |
| 5 | RXN |
| 6 | RXP |
| 7 | GND |

To enable hot-plugging for the SATA ports, refer to Chapter 2, "BIOS Setup," "Chipset\PCH sSATA Configuration," for more information.

### 11) M2_20G (M.2 Socket 3 Connector)

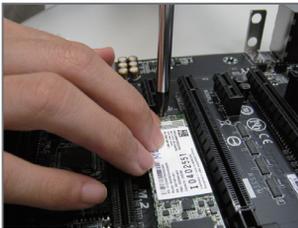You can insert an M.2 PCIe SSD into this connector.
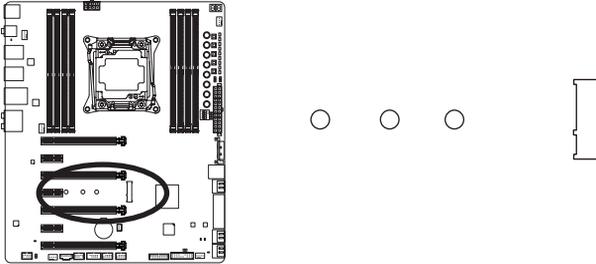


Follow the steps below to correctly install an M.2 SSD in the M.2 connector.



Step 1:
Use a screw driver to unfasten the screw and nut from the motherboard. Locate the proper mounting hole for the M.2 SSD to be installed and then screw the nut first.



Step 2:
Slide the M.2 SSD into the connector at an oblique angle.



Step 3:
Press the M.2 SSD down and then secure it with the screw.



Step 4:
The installation is completed, as shown in the picture above.


• On the motherboard there are three length adjustment holes for the M.2 SSD. Select the proper hole for the M.2 SSD to be installed and refasten the screw and nut.
• M2_20G and SATA Express connectors can only be used one at a time. The SATA Express connector becomes unavailable when an M.2 SSD is installed, but the SATA3 4/5 connectors are still functional.

## 12) F_PANEL (Front Panel Header)

Connect the power switch, reset switch, speaker, chassis intrusion switch/sensor and system status indicator on the chassis to this header according to the pin assignments below. Note the positive and negative pins before connecting the cables.
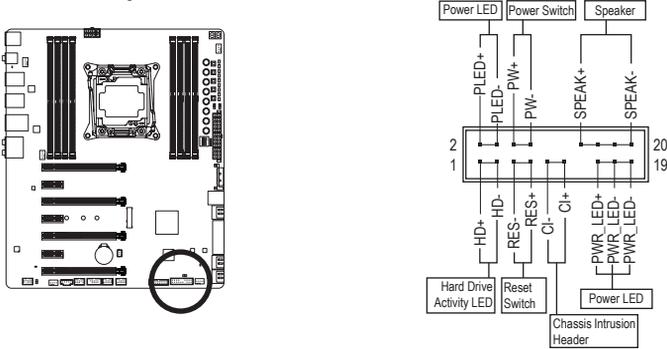


- **PLED/PWR_LED** (Power LED, Yellow/Purple):

  | System Status | LED |
  |---|---|
  | S0 | On |
  | S3/S4/S5 | Off |

  Connects to the power status indicator on the chassis front panel. The LED is on when the system is operating. The LED is off when the system is in S3/S4 sleep state or powered off (S5).

- **PW** (Power Switch, Red):
  Connects to the power switch on the chassis front panel. You may configure the way to turn off your system using the power switch (refer to Chapter 2, "BIOS Setup," "Power Management," for more information).

- **SPEAK** (Speaker, Orange):
  Connects to the speaker on the chassis front panel. The system reports system startup status by issuing a beep code. One single short beep will be heard if no problem is detected at system startup.

- **HD** (Hard Drive Activity LED, Blue):
  Connects to the hard drive activity LED on the chassis front panel. The LED is on when the hard drive is reading or writing data.

- **RES** (Reset Switch, Green):
  Connects to the reset switch on the chassis front panel. Press the reset switch to restart the computer if the computer freezes and fails to perform a normal restart.

- **CI** (Chassis Intrusion Header, Gray):
  Connects to the chassis intrusion switch/sensor on the chassis that can detect if the chassis cover has been removed. This function requires a chassis with a chassis intrusion switch/sensor.

The front panel design may differ by chassis. A front panel module mainly consists of power switch, reset switch, power LED, hard drive activity LED, speaker and etc. When connecting your chassis front panel module to this header, make sure the wire assignments and the pin assignments are matched correctly.

### 13) F_AUDIO (Front Panel Audio Header)

The front panel audio header supports Intel High Definition audio (HD) and AC'97 audio. You may connect your chassis front panel audio module to this header. Make sure the wire assignments of the module connector match the pin assignments of the motherboard header. Incorrect connection between the module connector and the motherboard header will make the device unable to work or even damage it.
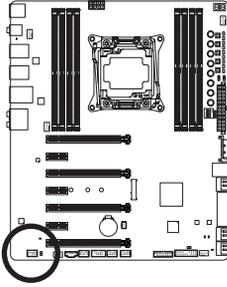


For HD Front Panel Audio:

| Pin No. | Definition |
|---------|------------|
| 1 | MIC2_L |
| 2 | GND |
| 3 | MIC2_R |
| 4 | -ACZ_DET |
| 5 | LINE2_R |
| 6 | GND |
| 7 | FAUDIO_JD |
| 8 | No Pin |
| 9 | LINE2_L |
| 10 | GND |

For AC'97 Front Panel Audio:

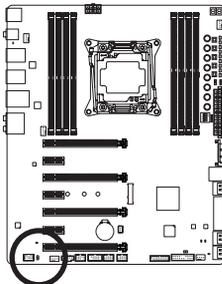| Pin No. | Definition |
|---------|------------|
| 1 | MIC |
| 2 | GND |
| 3 | MIC Power |
| 4 | NC |
| 5 | Line Out (R) |
| 6 | NC |
| 7 | NC |
| 8 | No Pin |
| 9 | Line Out (L) |
| 10 | NC |

- The front panel audio header supports HD audio by default. If your chassis provides an AC'97 front panel audio module, refer to the instructions on how to activate AC'97 functionality via the audio software in Chapter 6, "Configuring 2/4/5.1/7.1-Channel Audio."
- Audio signals will be present on both of the front and back panel audio connections simultaneously. If you want to mute the back panel audio (only supported when using an HD front panel audio module), refer to Chapter 6, "Configuring 2/4/5.1/7.1-Channel Audio."
- Some chassis provide a front panel audio module that has separated connectors on each wire instead of a single plug. For information about connecting the front panel audio module that has different wire assignments, please contact the chassis manufacturer.

### 14) SPDIF_O (S/PDIF Out Header)

This header supports digital S/PDIF Out and connects a S/PDIF digital audio cable (provided by expansion cards) for digital audio output from your motherboard to certain expansion cards like graphics cards and sound cards. For example, some graphics cards may require you to use a S/PDIF digital audio cable for digital audio output from your motherboard to your graphics card if you wish to connect an HDMI display to the graphics card and have digital audio output from the HDMI display at the same time.
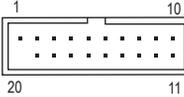
For information about connecting the S/PDIF digital audio cable, carefully read the manual for your expansion card.



| Pin No. | Definition |
|---------|------------|
| 1 | SPDIFO |
| 2 | GND |

**15) F_USB30 (USB 3.0/2.0 Header)**

The header conforms to USB 3.0/2.0 specification and can provide two USB ports. For purchasing the optional 3.5" front panel that provides two USB 3.0/2.0 ports, please contact the local dealer.
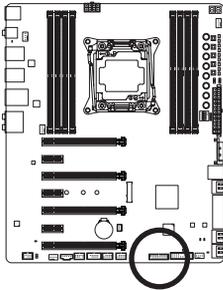
| Pin No. | Definition | Pin No. | Definition |
|---------|-----------|---------|-----------|
| 1 | VBUS | 11 | D2+ |
| 2 | SSRX1- | 12 | D2- |
| 3 | SSRX1+ | 13 | GND |
| 4 | GND | 14 | SSTX2+ |
| 5 | SSTX1- | 15 | SSTX2- |
| 6 | SSTX1+ | 16 | GND |
| 7 | GND | 17 | SSRX2+ |
| 8 | D1- | 18 | SSRX2- |
| 9 | D1+ | 19 | VBUS |
| 10 | NC | 20 | No Pin |

Prior to installing the USB front panel, be sure to turn off your computer and unplug the power cord from the power outlet to prevent damage to the USB front panel.

**16) F_USB1/F_USB2 (USB 2.0/1.1 Headers)**

The header conforms to USB 2.0/1.1 specification. Each USB header can provide two USB ports via an optional USB bracket. For purchasing the optional USB bracket, please contact the local dealer.
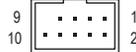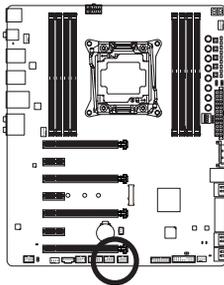
| Pin No. | Definition |
|---------|-----------|
| 1 | Power (5V) |
| 2 | Power (5V) |
| 3 | USB DX- |
| 4 | USB DY- |
| 5 | USB DX+ |
| 6 | USB DY+ |
| 7 | GND |
| 8 | GND |
| 9 | No Pin |
| 10 | NC |

- Do not plug the IEEE 1394 bracket (2x5-pin) cable into the USB 2.0/1.1 header.
- Prior to installing the USB bracket, be sure to turn off your computer and unplug the power cord from the power outlet to prevent damage to the USB bracket.

### 17) COMA (Serial Port Header)
The COM header can provide one serial port via an optional COM port cable. For purchasing the optional COM port cable, please contact the local dealer.
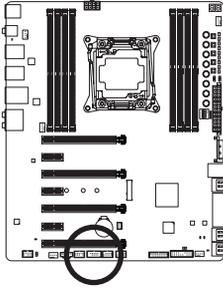
| Pin No. | Definition |
|---------|-----------|
| 1 | NDCD- |
| 2 | NSIN |
| 3 | NSOUT |
| 4 | NDTR- |
| 5 | GND |
| 6 | NDSR- |
| 7 | NRTS- |
| 8 | NCTS- |
| 9 | NRI- |
| 10 | No Pin |

### 18) THB_C (Thunderbolt Add-in Card Connector)
This connector is for a GIGABYTE Thunderbolt add-in card.
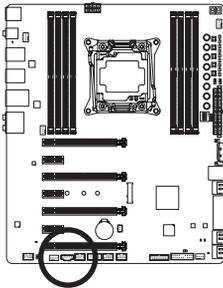
| Pin No. | Definition |
|---------|-----------|
| 1 | GPIOA |
| 2 | GPIOB |
| 3 | N_-SLP_S3 |
| 4 | N_-S4_S5 |
| 5 | GND |

THUNDERBOLT™
ready

Supports a Thunderbolt™ add-in card.

**19) SUBZ (Temp Sensor Ports)**

You can connect a K probe cable (bought separately) to the ports to measure system temperature. You can see the detected temperature in BIOS setup (refer to Chapter 2, "BIOS Setup," "M.I.T.\PC Health Status," for more information).

Temp Sensor Port 2
Temp Sensor Port 1
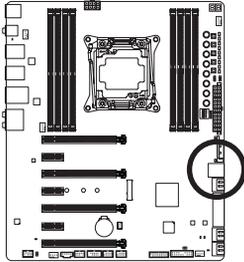
**20) CLR_CMOS (Clear CMOS Jumper)**

Use this jumper to clear the BIOS configuration and reset the CMOS values to factory defaults. To clear the CMOS values, use a metal object like a screwdriver to touch the two pins for a few seconds.
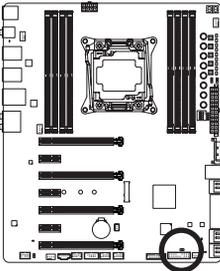
Open: Normal

Short: Clear CMOS Values

⚠️ • Always turn off your computer and unplug the power cord from the power outlet before clearing the CMOS values.
• After system restart, go to BIOS Setup to load factory defaults (select Load Optimized Defaults) or manually configure the BIOS settings (refer to Chapter 2, "BIOS Setup," for BIOS configurations).

**21) BAT (Battery)**

The battery provides power to keep the values (such as BIOS configurations, date, and time information) in the CMOS when the computer is turned off. Replace the battery when the battery voltage drops to a low level, or the CMOS values may not be accurate or may be lost.
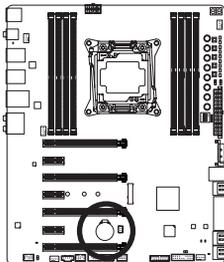
You may clear the CMOS values by removing the battery:
1. Turn off your computer and unplug the power cord.
2. Gently remove the battery from the battery holder and wait for one minute. (Or use a metal object like a screwdriver to touch the positive and negative terminals of the battery holder, making them short for 5 seconds.)
3. Replace the battery.
4. Plug in the power cord and restart your computer.

- Always turn off your computer and unplug the power cord before replacing the battery.
- Replace the battery with an equivalent one. Danger of explosion if the battery is replaced with an incorrect model.
- Contact the place of purchase or local dealer if you are not able to replace the battery by yourself or uncertain about the battery model.
- When installing the battery, note the orientation of the positive side (+) and the negative side (-) of the battery (the positive side should face up).
- Used batteries must be handled in accordance with local environmental regulations.

# Chapter 2    BIOS Setup

BIOS (Basic Input and Output System) records hardware parameters of the system in the CMOS on the motherboard. Its major functions include conducting the Power-On Self-Test (POST) during system startup, saving system parameters and loading operating system, etc. BIOS includes a BIOS Setup program that allows the user to modify basic system configuration settings or to activate certain system features.

When the power is turned off, the battery on the motherboard supplies the necessary power to the CMOS to keep the configuration values in the CMOS.

To access the BIOS Setup program, press the <Delete> key during the POST when the power is turned on.

To upgrade the BIOS, use either the GIGABYTE Q-Flash or @BIOS utility.
• Q-Flash allows the user to quickly and easily upgrade or back up BIOS without entering the operating system.
• @BIOS is a Windows-based utility that searches and downloads the latest version of BIOS from the Internet and updates the BIOS.
For instructions on using the Q-Flash and @BIOS utilities, refer to Chapter 5, "BIOS Update Utilities."

> • Because BIOS flashing is potentially risky, if you do not encounter problems using the current version of BIOS, it is recommended that you not flash the BIOS. To flash the BIOS, do it with caution. Inadequate BIOS flashing may result in system malfunction.
> • It is recommended that you not alter the default settings (unless you need to) to prevent system instability or other unexpected results. Inadequately altering the settings may result in system's failure to boot. If this occurs, try to clear the CMOS values and reset the board to default values. (Refer to the "Load Optimized Defaults" section in this chapter or introductions of the battery or the clear CMOS jumper/button in Chapter 1 for how to clear the CMOS values.)

## 2-1 Startup Screen

The following startup Logo screen will appear when the computer boots.



DEL : BIOS SETUP \ Q-FLASH    F9 : SYSTEM INFORMATION    F12 : BOOT MENU    END : Q-FLASH    — Function Keys

**Function Keys:**
**<DEL>: BIOS SETUP\Q-FLASH**
　Press the <Delete> key to enter BIOS Setup or to access the Q-Flash utility in BIOS Setup.
**<F9>: SYSTEM INFORMATION**
　Press the <F9> key to display your system information.
**<F12>: BOOT MENU**
　Boot Menu allows you to set the first boot device without entering BIOS Setup. In Boot Menu, use the up
　arrow key <↑> or the down arrow key <↓> to select the first boot device, then press <Enter> to accept.
　The system will boot from the device immediately.
　Note: The setting in Boot Menu is effective for one time only. After system restart, the device boot order
　will still be based on BIOS Setup settings.
**<END>: Q-FLASH**
　Press the <End> key to access the Q-Flash utility directly without having to enter BIOS Setup first.

## 2-2    The Main Menu

**A. Startup Guide (Default)**

The Startup Guide screen simplifies conventional complicated BIOS setup menus and presents only the most frequently used options in the easy-to-use interface. It helps first-time users to perform basic system setups more quickly and easily.



**B. ST Mode (Smart Tweak Mode)**

Differing from traditional UEFI interface, the ST Mode provides a fancy and user-friendly BIOS environment where users can easily point and click through various settings and make adjustments for optimum performance. In ST Mode, you can use your mouse to move through the option menus for quick configuration or press <F2> to switch to the traditional BIOS Setup screen.



• When the system is not stable as usual, select the **Load Optimized Defaults** item to set your system to its defaults.
• The BIOS Setup menus described in this chapter are for reference only and may differ by BIOS version.

## C. Classic Setup

Classic Setup is the conventional BIOS Setup interface where you can press the arrow keys on your keyboard to move among the items and press <Enter> to accept or enter a sub-menu. Or you can use your mouse to select the item you want.

**(Sample BIOS Version: F1u)**



Switch to ST Mode

Setup Menus
Enter Q-Flash
Select Default Language

Help

Function Keys

Configuration Items          Current Settings
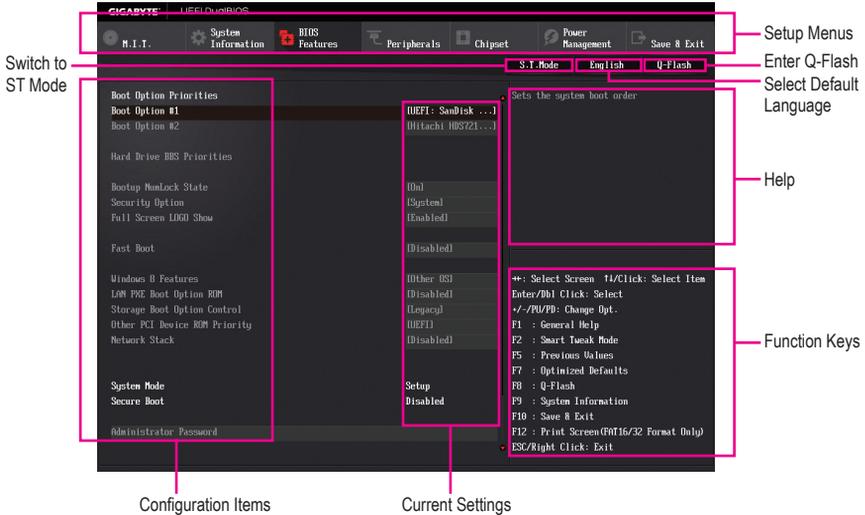
## Classic Setup Function Keys

| | |
|---|---|
| <←><→> | Move the selection bar to select a setup menu |
| <↑><↓> | Move the selection bar to select an configuration item on a menu |
| <Enter> | Execute command or enter a menu |
| <+>/<Page Up> | Increase the numeric value or make changes |
| <->/<Page Down> | Decrease the numeric value or make changes |
| <F1> | Show descriptions of the function keys |
| <F2> | Switch to ST Mode or Startup Guide screen. |
| <F5> | Restore the previous BIOS settings for the current submenus |
| <F7> | Load the Optimized BIOS default settings for the current submenus |
| <F8> | Access the Q-Flash utility |
| <F9> | Display system information |
| <F10> | Save all the changes and exit the BIOS Setup program |
| <F12> | Capture the current screen as an image and save it to your USB drive |
| <Esc> | Main Menu: Exit the BIOS Setup program |
| | Submenus: Exit current submenu |

**BIOS Setup Menus**

■ **M.I.T.**

Use this menu to configure the clock, frequency, and voltages of your CPU and memory, etc. Or check the system/CPU temperatures, voltages, and fan speeds.

■ **System Information**

Use this menu to configure the default language used by the BIOS and system time and date.

■ **BIOS Features**

Use this menu to configure the device boot order and advanced features available on the CPU.

■ **Peripherals**

Use this menu to configure all peripheral devices, such as USB, display settings, etc.

■ **Chipset**

Use this menu to configure Chipset-related options, such as SATA, onboard LAN, etc.

■ **Power Management**

Use this menu to configure all the power-saving functions.

■ **Save & Exit**

Save all the changes made in the BIOS Setup program to the CMOS and exit BIOS Setup. You can save the current BIOS settings to a profile or load optimized defaults for optimal-performance system operations.

## 2-3 M.I.T.



![warning icon] Whether the system will work stably with the overclock/overvoltage settings you made is dependent on your overall system configurations. Incorrectly doing overclock/overvoltage may result in damage to CPU, chipset, or memory and reduce the useful life of these components. This page is for advanced users only and we recommend you not to alter the default settings to prevent system instability or other unexpected results. (Inadequately altering the settings may result in system's failure to boot. If this occurs, clear the CMOS values and reset the board to default values.)
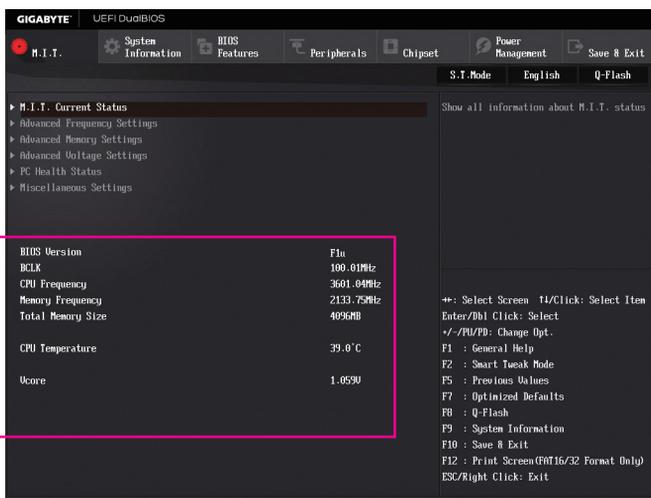


This section provides information on the BIOS version, CPU base clock, CPU frequency, memory frequency, total memory size, CPU temperature and CPU voltage, etc.

▶ **M.I.T. Current Status**
This screen provides information on CPU/memory frequencies/parameters.

▶ **Advanced Frequency Settings**



☞ **CPU Base Clock**
Allows you to manually set the CPU base clock in 0.01 MHz increments. (Default: Auto)
**Important:** It is highly recommended that the CPU frequency be set in accordance with the CPU specifications.

☞ **Host/PCIe Clock Frequency** (Note)
Allows you to manually set the host clock frequency (which controls CPU, PCIe, and memory frequencies) in 0.01 MHz increments.
This item is configurable only when **CPU Base Clock** is set to **Manual**.

☞ **Processor Base Clock (Gear Ratio)** (Note)
Allows you to configure the Processor Base Clock by multiplying the **Host/PCIe Clock Frequency** by several preset host clock multipliers. This item is configurable only when **CPU Base Clock** is set to **Manual**.

☞ **Spread Spectrum Control** (Note)
Enables or disables CPU/PCIe Spread Spectrum. (Default: Auto)
This item is configurable only when **CPU Base Clock** is set to **Manual**.

☞ **Host Clock Value**
This value is determined by multiplying the **Host/PCIe Clock Frequency** value by the **Processor Base Clock (Gear Ratio)** value.

☞ **CPU Upgrade** (Note)
Allows you to set the CPU frequency. Options may vary depending on the CPU being used. (Default: Auto)

(Note)    This item is present only when you install a CPU that supports this feature. For more information about Intel® CPUs' unique features, please visit Intel's website.

- ☞ **CPU Clock Ratio**
  Allows you to alter the clock ratio for the installed CPU. The adjustable range is dependent on the CPU being installed.
- ☞ **CPU Frequency**
  Displays the current operating CPU frequency.

▶ **Advanced CPU Core Settings**
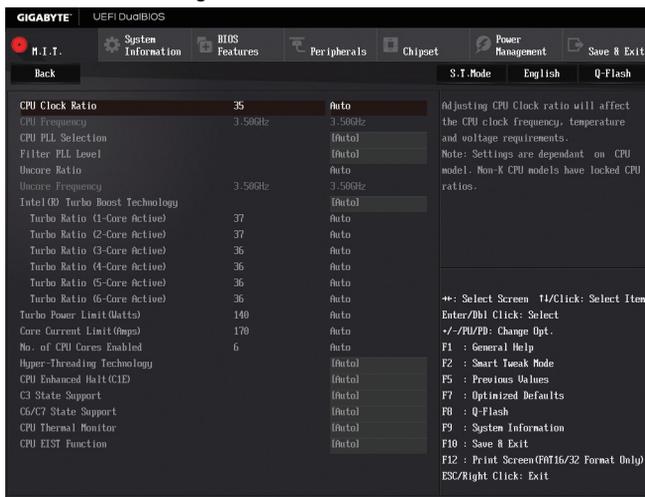


- ☞ **CPU Clock Ratio, CPU Frequency**
  The settings above are synchronous to those under the same items on the **Advanced Frequency Settings** menu.
- ☞ **CPU PLL Selection**
  Allows you to set the CPU PLL. **Auto** lets the BIOS automatically configure this setting. (Default: Auto)
- ☞ **Filter PLL Level**
  Allows you to set the Filter PLL. **Auto** lets the BIOS automatically configure this setting. (Default: Auto)
- ☞ **Uncore Ratio**
  Allows you to set the CPU Uncore ratio. The adjustable range is dependent on the CPU being used.
- ☞ **Uncore Frequency**
  Displays the current CPU Uncore frequency.
- ☞ **Intel(R) Turbo Boost Technology** (Note)
  Allows you to determine whether to enable the Intel CPU Turbo Boost technology. **Auto** lets the BIOS automatically configure this setting. (Default: Auto)
- ☞ **Turbo Ratio** (Note)
  Allows you to set the CPU Turbo ratios for different number of active cores. **Auto** sets the CPU Turbo ratios according to the CPU specifications. (Default: Auto)

(Note)     This item is present only when you install a CPU that supports this feature. For more information about Intel® CPUs' unique features, please visit Intel's website.

- **Turbo Power Limit (Watts)**

  Allows you to set a power limit for CPU Turbo mode. When the CPU power consumption exceeds the specified power limit, the CPU will automatically reduce the core frequency in order to reduce the power. **Auto** sets the power limit according to the CPU specifications. (Default: Auto)

- **Core Current Limit (Amps)**

  Allows you to set a current limit for CPU Turbo mode. When the CPU current exceeds the specified current limit, the CPU will automatically reduce the core frequency in order to reduce the current. **Auto** sets the power limit according to the CPU specifications. (Default: Auto)

- **No. of CPU Cores Enabled** (Note)

  Allows you to select the number of CPU cores to enable in an Intel® multi-core CPU (the number of CPU cores may vary by CPU). **Auto** lets the BIOS automatically configure this setting. (Default: Auto)

- **Hyper-Threading Technology** (Note)

  Allows you to determine whether to enable multi-threading technology when using an Intel® CPU that supports this function. This feature only works for operating systems that support multi-processor mode. **Auto** lets the BIOS automatically configure this setting. (Default: Auto)

- **CPU Enhanced Halt (C1E)** (Note)

  Enables or disables Intel® CPU Enhanced Halt (C1E) function, a CPU power-saving function in system halt state. When enabled, the CPU core frequency and voltage will be reduced during system halt state to decrease power consumption. **Auto** lets the BIOS automatically configure this setting. (Default: Auto)

- **C3 State Support** (Note)

  Allows you to determine whether to let the CPU enter C3 mode in system halt state. When enabled, the CPU core frequency and voltage will be reduced during system halt state to decrease power consumption. The C3 state is a more enhanced power-saving state than C1. **Auto** lets the BIOS automatically configure this setting. (Default: Auto)

- **C6/C7 State Support** (Note)

  Allows you to determine whether to let the CPU enter C6/C7 mode in system halt state. When enabled, the CPU core frequency and voltage will be reduced during system halt state to decrease power consumption. The C6/C7 state is a more enhanced power-saving state than C3. **Auto** lets the BIOS automatically configure this setting. (Default: Auto)

- **CPU Thermal Monitor** (Note)

  Enables or disables Intel® Thermal Monitor function, a CPU overheating protection function. When enabled, the CPU core frequency and voltage will be reduced when the CPU is overheated. **Auto** lets the BIOS automatically configure this setting. (Default: Auto)

- **CPU EIST Function** (Note)

  Enables or disables Enhanced Intel® Speed Step Technology (EIST). Depending on CPU loading, Intel EIST technology can dynamically and effectively lower the CPU voltage and core frequency to decrease average power consumption and heat production. **Auto** lets the BIOS automatically configure this setting. (Default: Auto)

(Note)  This item is present only when you install a CPU that supports this feature. For more information about Intel® CPUs' unique features, please visit Intel's website.

- **Extreme Memory Profile (X.M.P.)** (Note)

  Allows the BIOS to read the SPD data on XMP memory module(s) to enhance memory performance when enabled.
  - ▶▶ Disabled        Disables this function. (Default)
  - ▶▶ Profile1         Uses Profile 1 settings.
  - ▶▶ Profile2 (Note)     Uses Profile 2 settings.
- **System Memory Multiplier**

  Allows you to set the system memory multiplier. **Auto** sets memory multiplier according to memory SPD data. (Default: Auto)
- **Memory Frequency (MHz)**

  The first memory frequency value is the normal operating frequency of the memory being used; the second is the memory frequency that is automatically adjusted according to the **System Memory Multiplier** settings.

▶ **Advanced Memory Settings**
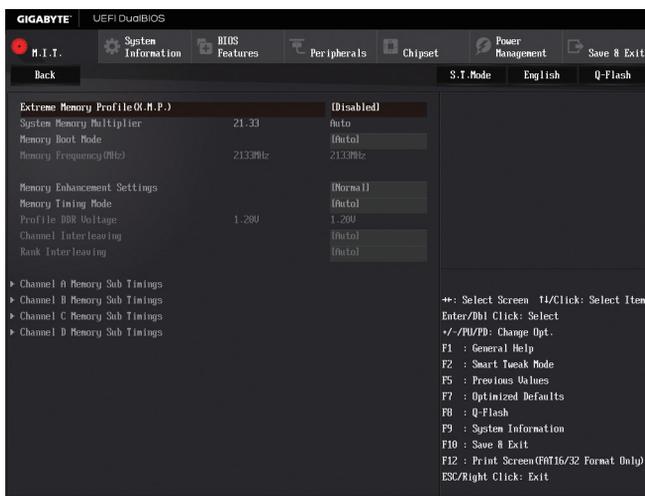


- **Extreme Memory Profile (X.M.P.)** (Note)**, System Memory Multiplier, Memory Frequency(MHz)**

  The settings above are synchronous to those under the same items on the **Advanced Frequency Settings** menu.
- **Memory Boot Mode**

  Provides memory detection and training methods.
  - ▶▶ Auto             Lets the BIOS automatically configure this setting. (Default)
  - ▶▶ Enable Fast Boot   Skip memory detection and training in some specific criteria for faster memory boot.
  - ▶▶ Disable Fast Boot   Detect and train memory at every single boot.

- **Memory Enhancement Settings**

  Provides three different memory performance enhancement settings: Normal (basic performance), Enhanced Stability, and Enhanced Performance. (Default: Normal)

(Note)     This item is present only when you install a CPU and a memory module that support this feature.

- **Memory Timing Mode**
  **Manual** and **Advanced Manual** allows the **Channel Interleaving**, **Rank Interleaving**, and memory timing settings below to be configurable. Options are: Auto (default), Manual, Advanced Manual.
- **Profile DDR Voltage**
  When using a non-XMP memory module or **Extreme Memory Profile (X.M.P.)** is set to **Disabled**, the value is displayed according to your memory specification. When Extreme Memory Profile (X.M.P.) is set to **Profile1** or **Profile2**, the value is displayed according to the SPD data on the XMP memory.
- **Channel Interleaving**
  Enables or disables memory channel interleaving. **Enabled** allows the system to simultaneously access different channels of the memory to increase memory performance and stability. **Auto** lets the BIOS automatically configure this setting. (Default: Auto)
- **Rank Interleaving**
  Enables or disables memory rank interleaving. **Enabled** allows the system to simultaneously access different ranks of the memory to increase memory performance and stability. **Auto** lets the BIOS automatically configure this setting.  (Default: Auto)

▶   **Channel A/B/C/D Memory Sub Timings**
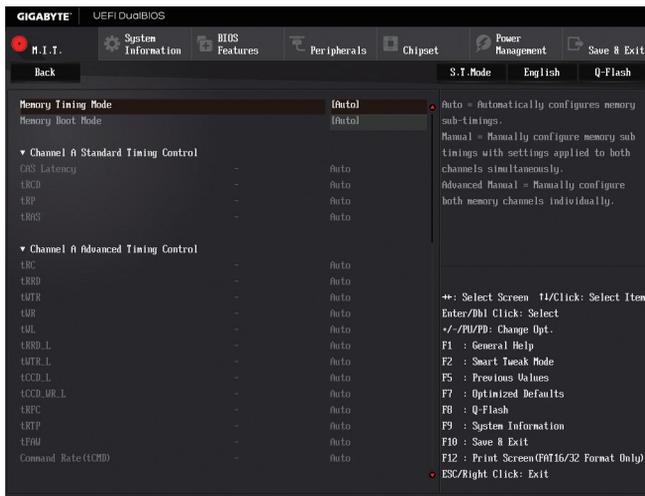


This sub-menu provides memory timing settings for each channel of memory. The respective timing setting screens are configurable only when **Memory Timing Mode** is set to **Manual** or **Advanced Manual**. Note: Your system may become unstable or fail to boot after you make changes on the memory timings. If this occurs, please reset the board to default values by loading optimized defaults or clearing the CMOS values.

▶ **Advanced Voltage Settings**
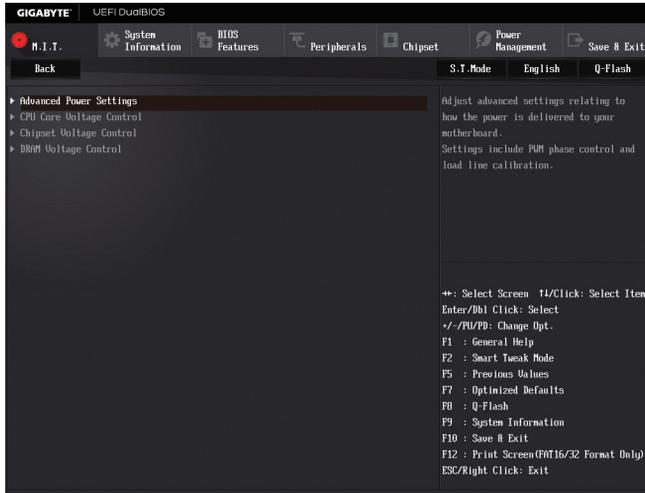


▶ **Advanced Power Settings**
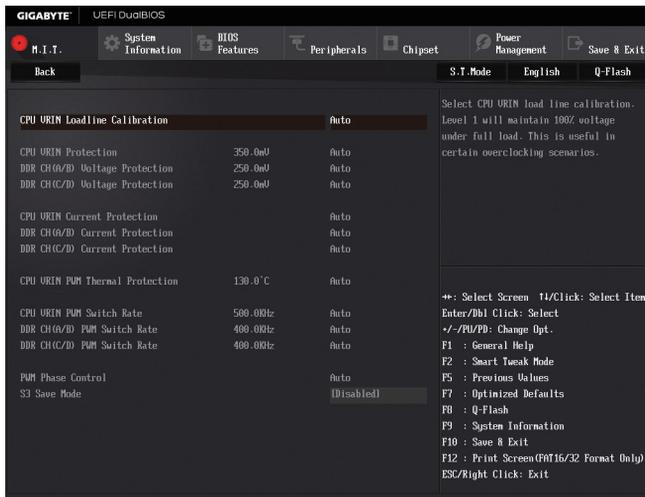


☞ **CPU VRIN Loadline Calibration**
Allows you to set the Load-Line Calibration level for the CPU VRIN. The levels are (from highest to lowest): Extreme, Turbo, High, Medium, Low, and Standard. Selecting a higher level keeps the CPU VRIN voltage more consistent with what is set in BIOS under heavy load. **Auto** lets the BIOS automatically configure this setting and sets the voltage following Intel's specifications. (Default: Auto)

☞ **CPU VRIN Protection**
Allows you to set the over-current protection level for the CPU VRIN voltage. The adjustable range is from 150.0mV to 400.0mV. **Auto** lets the BIOS automatically configure this setting. (Default: Auto)

&#9119; **DDR CH(A/B) Voltage Protection**
Allows you to set the voltage limit on Channel A and Channel B memory voltage for over-voltage protection. The adjustable range is from 150.0mV to 325.0mV. **Auto** lets the BIOS automatically configure this setting. (Default: Auto)

&#9119; **DDR CH(C/D) Voltage Protection**
Allows you to set the voltage limit on Channel C and Channel D memory voltage for over-voltage protection. The adjustable range is from 150.0mV to 325.0mV. **Auto** lets the BIOS automatically configure this setting. (Default: Auto)

&#9119; **CPU VRIN Current Protection**
Allows you to set the over-current protection level for the CPU VRIN voltage.
&#9906; Auto                    Lets the BIOS automatically configure this setting. (Default)
&#9906; Standard~Extreme    Selects Standard, Low, Medium, High, Turbo, or Extreme which represents different level of over-current protection for the CPU VRIN voltage.

&#9119; **DDR CH(A/B) Current Protection**
Allows you to set the over-current protection level for Channel A and Channel B memory voltage.
&#9906; Auto                    Lets the BIOS automatically configure this setting. (Default)
&#9906; Standard~Extreme    Selects Standard, Low, Medium, High, Turbo, or Extreme which represents different level of over-current protection for the memory voltage.

&#9119; **DDR CH(C/D) Current Protection**
Allows you to set the over-current protection level for Channel C and Channel D memory voltage.
&#9906; Auto                    Lets the BIOS automatically configure this setting. (Default)
&#9906; Standard~Extreme    Selects Standard, Low, Medium, High, Turbo, or Extreme which represents different level of over-current protection for the memory voltage.

&#9119; **CPU VRIN PWM Thermal Protection**
Allows you to set the PWM thermal protection threshold for the CPU VRIN. The adjustable range is from 120ºC~130ºC. (Default: Auto)

&#9119; **CPU VRIN PWM Switch Rate**
Allows you to set the CPU VRIN PWM frequency. The adjustable range is from 400.0KHz to 600.0KHz. (Default: Auto)

&#9119; **DDR CH(A/B) PWM Switch Rate**
Allows you to set the PWM frequency for Channel A and Channel B memory. The adjustable range is from 300.0KHz to 500.0KHz. (Default: Auto)

&#9119; **DDR CH(C/D) PWM Switch Rate**
Allows you to set the PWM frequency for Channel C and Channel D memory. The adjustable range is from 300.0KHz to 500.0KHz. (Default: Auto)

&#9119; **PWM Phase Control**
Allows you to automatically change the PWM phase according to the CPU load. The power-saving levels are (from lowest to highest): eXm Perf (Extreme Performance ), High Perf (High Performance), Perf (Performance), Balanced, Mid PWR (Mid Power), and Lite PWR (Light Power). **Auto** lets the BIOS automatically configure this setting. (Default: Auto)

&#9119; **S3 Save Mode**
Determines whether to allow memory voltage to drop to a power-saving level when the system is in S3 state. (Default: Disabled)

▶ **CPU Core Voltage Control**

This section provides CPU voltage control options.

▶ **Chipset Voltage Control**

This section provides Chipset voltage control options.

▶ **DRAM Voltage Control**

This section provides memory voltage control options.

▶ **PC Health Status**

- **Reset Case Open Status**
    - Disabled     Keeps or clears the record of previous chassis intrusion status. (Default)
    - Enabled      Clears the record of previous chassis intrusion status and the **Case Open** field will show "No" at next boot.
- **Case Open**
  Displays the detection status of the chassis intrusion detection device attached to the motherboard CI header. If the system chassis cover is removed, this field will show "Yes", otherwise it will show "No". To clear the chassis intrusion status record, set **Reset Case Open Status** to **Enabled**, save the settings to the CMOS, and then restart your system.
- **CPU Vcore/CPU VRIN/CPU VCCIO/DRAM Channel A/B Voltage/DRAM Channel C/D Voltage/DDRVPP Channel A/B Voltage/DDRVPP Channel C/D Voltage/+5V/PCH IO/PCH Core/ +12V**
  Displays the current system voltages.
- **CPU/PCH Temperature**
  Displays current CPU/Chipset temperature.
- **1st System Temperature/2nd System Temperature**
  Displays current system temperatures detected by the system temperature sensors on the motherboard.
- **1st Temp Sensor/2nd Temp Sensor**
  Displays the temperatures detected from Temp Sensor Port 1 and Temp Sensor Port 2 on the motherboard.
- **CPU/CPU OPT/System Fan Speed**
  Displays current CPU/CPU_OPT/system fan (SYS_FAN1~3) speeds.
- **CPU/System/PCH Temperature Warning**
  Sets the warning threshold for CPU/system/Chipset temperature. When temperature exceeds the threshold, BIOS will emit warning sound. Options are: Disabled (default), 60°C/140°F, 70°C/158°F, 80°C/176°F, 90°C/194°F.
- **CPU/CPU OPT/System Fan Fail Warning**
  Allows the system to emit warning sound if the fan is not connected or fails. Check the fan condition or fan connection when this occurs. (Default: Disabled)
- **CPU Fan Speed Control (CPU_FAN Connector)**
  Allows you to determine whether to enable the fan speed control function and adjust the fan speed.
    - Normal          Allows the fan to run at different speeds according to the CPU temperature. You can adjust the fan speed with System Information Viewer based on your system requirements. (Default)
    - Silent          Allows the fan to run at slow speeds.
    - Manual          Allows you to control the fan speed under the **Fan Speed Percentage** item.
    - Full Speed      Allows the fan to run at full speeds.
- **Fan Speed Percentage**
  Allows you to control the fan speed. This item is configurable only when **CPU Fan Speed Control** is set to **Manual**. Options are: 0.75 PWM value /°C ~ 2.50 PWM value /°C.
- **CPU OPT Fan Speed Control (CPU_OPT Connector)**
  Allows you to determine whether to enable the fan speed control function and adjust the fan speed.
    - Normal          Allows the fan to run at different speeds according to the CPU temperature. You can adjust the fan speed with System Information Viewer based on your system requirements. (Default)
    - Silent          Allows the fan to run at slow speeds.

    ▸▸ Manual          Allows you to control the fan speed under the **Fan Speed Percentage** item.

    ▸▸ Full Speed     Allows the fan to run at full speeds.

&#x235E; **Fan Speed Percentage**

Allows you to control the fan speed. This item is configurable only when **CPU OPT Fan Speed Control** is set to **Manual**. Options are: 0.75 PWM value /ᵒC ~ 2.50 PWM value /ᵒC.

&#x235E; **1st System Fan Speed Control (SYS_FAN1 Connector)**

Allows you to determine whether to enable the fan speed control function and adjust the fan speed.

    ▸▸ Normal          Allows the fan to run at different speeds according to the system temperature. You can adjust the fan speed with System Information Viewer based on your system requirements. (Default)

    ▸▸ Silent           Allows the fan to run at slow speeds.

    ▸▸ Manual          Allows you to control the fan speed under the **Fan Speed Percentage** item.

    ▸▸ Full Speed     Allows the fan to run at full speeds.

&#x235E; **Fan Speed Percentage**

Allows you to control the fan speed. This item is configurable only when **1st System Fan Speed Control** is set to **Manual**. Options are: 0.75 PWM value /ᵒC ~ 2.50 PWM value /ᵒC.

&#x235E; **2nd System Fan Speed Control (SYS_FAN2 Connector)**

Allows you to determine whether to enable the fan speed control function and adjust the fan speed.

    ▸▸ Normal          Allows the fan to run at different speeds according to the system temperature. You can adjust the fan speed with System Information Viewer based on your system requirements. (Default)

    ▸▸ Silent           Allows the fan to run at slow speeds.

    ▸▸ Manual          Allows you to control the fan speed under the **Fan Speed Percentage** item.

    ▸▸ Full Speed     Allows the fan to run at full speeds.

&#x235E; **Fan Speed Percentage**

Allows you to control the fan speed. This item is configurable only when **2nd System Fan Speed Control** is set to **Manual**. Options are: 0.75 PWM value /ᵒC ~ 2.50 PWM value /ᵒC.

&#x235E; **3rd System Fan Speed Control (SYS_FAN3 Connector)**

Allows you to determine whether to enable the fan speed control function and adjust the fan speed.

    ▸▸ Normal          Allows the fan to run at different speeds according to the system temperature. You can adjust the fan speed with System Information Viewer based on your system requirements. (Default)

    ▸▸ Silent           Allows the fan to run at slow speeds.

    ▸▸ Manual          Allows you to control the fan speed under the **Fan Speed Percentage** item.

    ▸▸ Full Speed     Allows the fan to run at full speeds.

&#x235E; **Fan Speed Percentage**

Allows you to control the fan speed. This item is configurable only when **3rd System Fan Speed Control** is set to **Manual**. Options are: 0.75 PWM value /ᵒC ~ 2.50 PWM value /ᵒC.

▸ **Miscellaneous Settings**
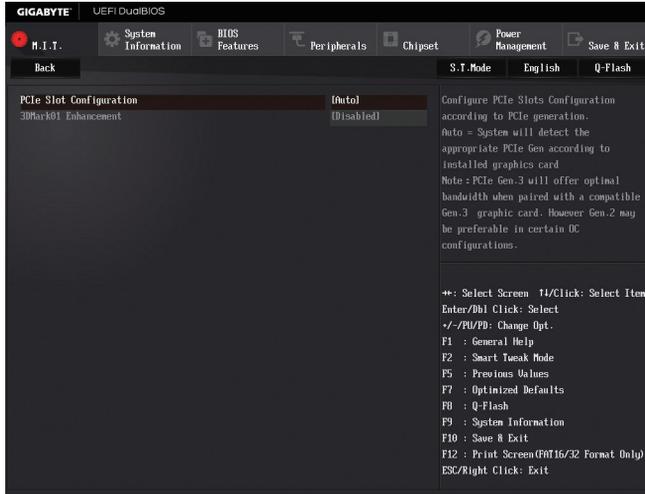


&#x261E; **PCIe Slot Configuration**
Allows you to set the operation mode of the PCI Express slots to Gen 1, Gen 2, or Gen 3. Actual operation mode is subject to the hardware specification of each slot. **Auto** lets the BIOS automatically configure this setting. (Default: Auto)

&#x261E; **3DMark01 Enhancement**
Allows you to determine whether to enhance some legacy benchmark performance. (Default: Disabled)

## 2-4    System Information
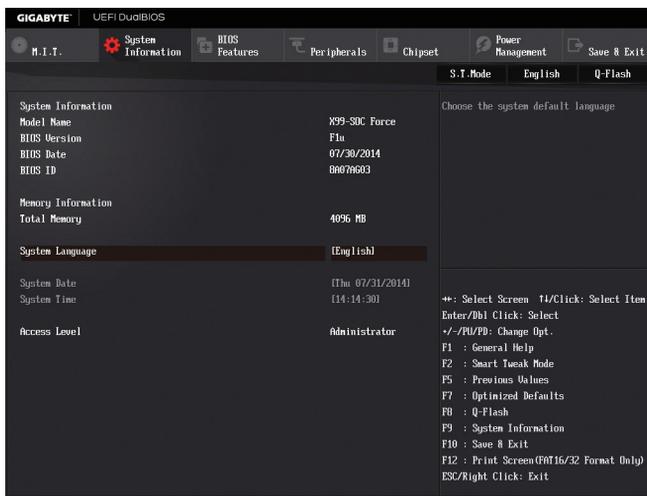


This section provides information on your motherboard model and BIOS version. You can also select the default language used by the BIOS and manually set the system time.

☞ **System Language**
Selects the default language used by the BIOS.

☞ **System Date**
Sets the system date. The date format is week (read-only), month, date, and year. Use <Enter> to switch between the Month, Date, and Year fields and use the <Page Up> or <Page Down> key to set the desired value.

☞ **Access Level**
Displays the current access level depending on the type of password protection used. (If no password is set, the default will display as **Administrator**.) The Administrator level allows you to make changes to all BIOS settings; the User level only allows you to make changes to certain BIOS settings but not all.

## 2-5    BIOS Features



&#8450; **Boot Option Priorities**

Specifies the overall boot order from the available devices. Removable storage devices that support GPT format will be prefixed with "UEFI:" string on the boot device list. To boot from an operating system that supports GPT partitioning, select the device prefixed with "UEFI:" string.

Or if you want to install an operating system that supports GPT partitioning such as Windows 7 64-bit, select the optical drive that contains the Windows 7 64-bit installation disk and is prefixed with "UEFI:" string.

&#8450; **Hard Drive/CD/DVD ROM Drive/Floppy Drive/Network Device BBS Priorities**

Specifies the boot order for a specific device type, such as hard drives, optical drives, floppy disk drives, and devices that support Boot from LAN function, etc. Press <Enter> on this item to enter the submenu that presents the devices of the same type that are connected. This item is present only if at least one device for this type is installed.

&#8450; **Bootup NumLock State**

Enables or disables Numlock feature on the numeric keypad of the keyboard after the POST. (Default: On)

&#8450; **Security Option**

Specifies whether a password is required every time the system boots, or only when you enter BIOS Setup. After configuring this item, set the password(s) under the **Administrator Password/User Password** item.

&#9658; Setup          A password is only required for entering the BIOS Setup program.

&#9658; System         A password is required for booting the system and for entering the BIOS Setup program. (Default)

&#8450; **Full Screen LOGO Show**

Allows you to determine whether to display the GIGABYTE Logo at system startup. **Disabled** skips the GIGABYTE Logo when the system starts up. (Default: Enabled)

&#8450; **Fast Boot**

Enables or disables Fast Boot to shorten the OS boot process. **Ultra Fast** provides the fastest bootup speed. (Default: Disabled)

- **SATA Support**
  - ▶▶ All Sata Devices     All SATA devices are functional in the operating system and during the POST. (Default)
  - ▶▶ Last Boot HDD Only     Except for the previous boot drive, all SATA devices are disabled before the OS boot process completes.
  
  This item is configurable only when **Fast Boot** is set to **Enabled** or **Ultra Fast**.
- **VGA Support**
  Allows you to select which type of operating system to boot.
  - ▶▶ Auto                   Enables legacy option ROM only.
  - ▶▶ EFI Driver           Enables EFI option ROM. (Default)
  
  This item is configurable only when **Fast Boot** is set to **Enabled** or **Ultra Fast**.
- **USB Support**
  - ▶▶ Disabled            All USB devices are disabled before the OS boot process completes.
  - ▶▶ Full Initial           All USB devices are functional in the operating system and during the POST.
  - ▶▶ Partial Initial       Part of the USB devices are disabled before the OS boot process completes. (Default)
  
  This item is configurable only when **Fast Boot** is set to **Enabled**. This function is disabled when **Fast Boot** is set to **Ultra Fast**.
- **PS2 Devices Support**
  - ▶▶ Disabled            All PS/2 devices are disabled before the OS boot process completes.
  - ▶▶ Enabled            All PS/2 devices are functional in the operating system and during the POST. (Default)
  
  This item is configurable only when **Fast Boot** is set to **Enabled**. This function is disabled when **Fast Boot** is set to **Ultra Fast**.
- **NetWork Stack Driver Support**
  - ▶▶ Disabled            Disables booting from the network. (Default)
  - ▶▶ Enabled            Enables booting from the network.
  
  This item is configurable only when **Fast Boot** is set to **Enabled** or **Ultra Fast**.
- **Next Boot After AC Power Loss**
  - ▶▶ Normal Boot      Enables normal bootup upon the return of the AC power. (Default)
  - ▶▶ Fast Boot         Keeps the Fast Boot settings upon the return of the AC power.
  
  This item is configurable only when **Fast Boot** is set to **Enabled** or **Ultra Fast**.

- **Windows 8 Features**
  Allows you to select the operating system to be installed. (Default: Other OS)
- **CSM Support**
  Enables or disables UEFI CSM (Compatibility Support Module) to support a legacy PC boot process.
  - ▶▶ Enabled            Enables UEFI CSM. (Default)
  - ▶▶ Disabled            Disables UEFI CSM and supports UEFI BIOS boot process only.
  
  This item is configurable only when Windows 8 Features is set to **Windows 8**.
- **LAN PXE Boot Option ROM**
  Allows you to select whether to enable the legacy option ROM for the LAN controller. (Default: Disabled)
  This item is configurable only when **CSM Support** is set to **Enabled**.
- **Storage Boot Option Control**
  Allows you to select whether to enable the UEFI or legacy option ROM for the storage device controller.
  - ▶▶ Do not launch     Disables option ROM.
  - ▶▶ Legacy            Enables legacy option ROM only. (Default)

    ▸▸ UEFI                Enables UEFI option ROM only.

    This item is configurable only when **CSM Support** is set to **Enabled**.

&#x23dd; **Other PCI Device ROM Priority**

    Allows you to select whether to enable the UEFI or Legacy option ROM for the PCI device controller other than the LAN, storage device, and graphics controllers.

    ▸▸ Legacy         Enables legacy option ROM only.

    ▸▸ UEFI            Enables UEFI option ROM only. (Default)

    This item is configurable only when **CSM Support** is set to **Enabled**.

&#x23dd; **Network stack**

    Disables or enables booting from the network to install a GPT format OS, such as installing the OS from the Windows Deployment Services server. (Default: Disabled)

&#x23dd; **Ipv4 PXE Support**

    Enables or disables IPv4 PXE Support. This item is configurable only when **Network stack** is enabled.

&#x23dd; **Ipv6 PXE Support**

    Enables or disables IPv6 PXE Support. This item is configurable only when **Network stack** is enabled.

&#x23dd; **Administrator Password**

    Allows you to configure an administrator password. Press <Enter> on this item, type the password, and then press <Enter>. You will be requested to confirm the password. Type the password again and press <Enter>. You must enter the administrator password (or user password) at system startup and when entering BIOS Setup. Differing from the user password, the administrator password allows you to make changes to all BIOS settings.

&#x23dd; **User Password**

    Allows you to configure a user password. Press <Enter> on this item, type the password, and then press <Enter>. You will be requested to confirm the password. Type the password again and press <Enter>. You must enter the administrator password (or user password) at system startup and when entering BIOS Setup. However, the user password only allows you to make changes to certain BIOS settings but not all.

    To cancel the password, press <Enter> on the password item and when requested for the password, enter the correct one first. When prompted for a new password, press <Enter> without entering any password. Press <Enter> again when prompted to confirm.

## 2-6 Peripherals



  ✆ **Initial Display Output**
    Specifies the first initiation of the monitor display from the PCI Express graphics cards.
      ▸▸ PCIe 1 Slot    Sets the graphics card on the PCIE_1 slot as the first display. (Default)
      ▸▸ PCIe 2 Slot    Sets the graphics card on the PCIE_2 slot as the first display.
      ▸▸ PCIe 3 Slot    Sets the graphics card on the PCIE_3 slot as the first display.
      ▸▸ PCIe 4 Slot    Sets the graphics card on the PCIE_4 slot as the first display.

  ✆ **Audio LED**
    Enables or disables the onboard audio LED function.
      ▸▸ Off           Disables this function.
      ▸▸ Still Mode    The LED stays constantly on. (Default)
      ▸▸ Beat Mode    The brightness of the LED changes according to the music rhythm.
      ▸▸ Pulse Mode    The brightness of the LED changes slowly and smoothly like breath.

  ✆ **Legacy USB Support**
    Allows USB keyboard/mouse to be used in MS-DOS. (Default: Enabled)

  ✆ **XHCI Hand-off**
    Determines whether to enable XHCI Hand-off feature for an operating system without XHCI Hand-off support. (Default: Enabled)

  ✆ **EHCI Hand-off**
    Determines whether to enable EHCI Hand-off feature for an operating system without EHCI Hand-off support. (Default: Disabled)

  ✆ **USB Storage Devices**
    Displays a list of connected USB mass storage devices. This item appears only when a USB storage device is installed.

  ✆ **Two Layer KVM Switch**
    Set to **Enabled** to ensure proper device functionality when chaining two KVM switches. (Default: Disabled)

▶ **Super IO Configuration**
☞ **Serial Port 1**
  Enables or disables the onboard serial port. (Default: Enabled)

▶ **Intel(R) Ethernet Network Connection**
  This sub-menu provides information on LAN configuration and related configuration options.

## 2-7 Chipset
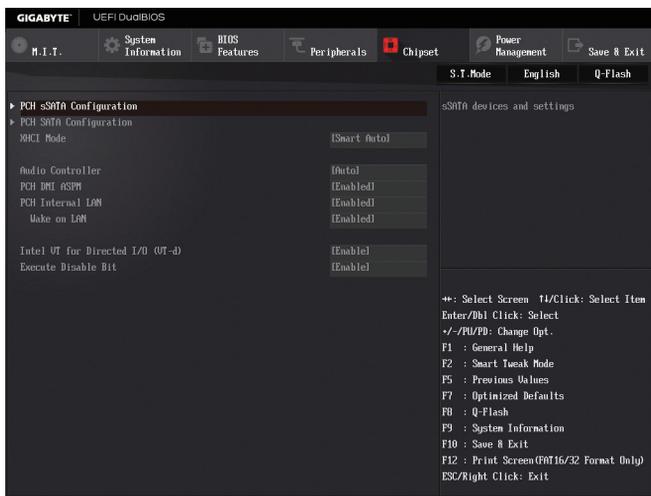


▶ **PCH sSATA Configuration (sSATA3 0~3 Connectors)**
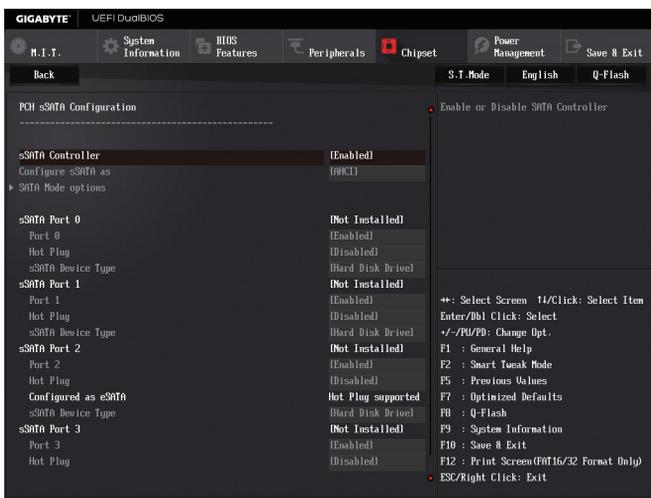


  ☞ **sSATA Controller**

Enables or disables the integrated SATA controllers that control the sSATA3 0~3 connectors. (Default: Enabled)

  ☞ **Configure sSATA as**

Allows you to decide whether to configure the SATA controllers to AHCI mode.

    ▶ IDE           Configures the SATA controllers to IDE mode.

    ▶ AHCI        Configures the SATA controllers to AHCI mode. Advanced Host Controller Interface (AHCI) is an interface specification that allows the storage driver to enable advanced Serial ATA features such as Native Command Queuing and hot plug. (Default)

▶ **SATA Mode options**

This sub-menu provides SATA-related configuration options.

☞ **sSATA Port0/1/2/3**

Enables or disables each SATA port. (Default: Enabled)

☞ **Hot plug**

Enables or disable the hot plug capability for each SATA port. (Default: Disabled)

☞ **sSATA Device Type**

Allows you to select the type of the device connected to the SATA port. (Default: Hard Disk Drive)

▶ **PCH SATA Configuration (SATA3 0~5 Connectors)**



☞ **SATA Controller**

Enables or disables the integrated SATA controllers that control the SATA3 0~5 connectors. (Default: Enabled)

☞ **Configure SATA as**

Enables or disables RAID for the SATA controllers or configures the SATA controllers to AHCI mode.

   ▶ IDE           Configures the SATA controller to IDE mode.

   ▶ RAID         Enables RAID for the SATA controller.

   ▶ AHCI         Configures the SATA controllers to AHCI mode. Advanced Host Controller Interface (AHCI) is an interface specification that allows the storage driver to enable advanced Serial ATA features such as Native Command Queuing and hot plug. (Default)

▶ **SATA Mode options**

This sub-menu provides SATA-related configuration options.

☞ **SATA Port 0/1/2/3/4/5**

Enables or disables each SATA port. (Default: Enabled)

☞ **Hot plug**

Enables or disable the hot plug capability for each SATA port. (Default: Disabled)

☞ **SATA Device Type**

Allows you to select the type of the device connected to the SATA port. (Default: Hard Disk Drive)

&#x261E; **XHCI Mode**

Allows you to determine the operating mode for the xHCI controller in OS.

&#x21A0; Smart Auto     This mode is available only when the BIOS supports the xHCI controller in the pre-boot environment. This mode is similar to **Auto**, but it adds the capability to route the ports to xHCI or EHCI according to setting used in previous boots (for non-G3 boot) in the pre-boot environment. This allows the use of USB 3.0 devices prior to OS boot. xHCI controller enabling and rerouting should follow the steps in **Auto**, when previous boot routs ports to EHCI. Note: This is the recommended mode when BIOS has xHCI pre-boot support. (Default)

&#x21A0; Auto     BIOS routes the sharable ports to EHCI controller. Then it uses ACPI protocols to provide an option to enable the xHCI controller and reroute the sharable ports. Note: This is the recommended mode when BIOS does NOT have xHCI pre-boot support.

&#x21A0; Enabled     All shared ports are eventually routed to the xHCI controller during the BIOS boot process. If BIOS does not have pre-boot support for the xHCI controller, it should initially route the sharable ports to the EHCI controller and then prior to OS boot it should route the ports to xHCI controller. Note: OS has to provide support for the xHCI controller in this mode. If the OS does not provide support, all sharable ports won't work.

&#x21A0; Disabled     The USB 3.0 ports are routed to the EHCI controller and the xHCI controller is turned off. All USB 3.0 devices function as High Speed devices regardless of xHCI software support/availability.

&#x21A0; Manual     Allows you to determine whether to rout the USB 3.0 ports to the xHCI or EHCI controller before booting to OS, and also provides you with options to manually rout each USB 3.0/2.0 port to xHCI or EHCI.

&#x261E; **Audio Controller**

Enables or disables the onboard audio function. (Default: Auto)

&#x261E; **PCH DMI ASPM**

Allows you to configure the ASPM mode for Chipset DMI link. (Default: Enabled)

&#x261E; **PCH Internal LAN**

Enables or disables the onboard LAN function. (Default: Enabled)

If you wish to install a 3rd party add-in network card instead of using the onboard LAN, set this item to **Disabled**.

&#x261E; **Wake on LAN**

Enables or disables the wake on LAN function. (Default: Enabled)

&#x261E; **Intel VT for Directed I/O (VT-d)**(Note)

Enables or disables Intel® Virtualization Technology for Directed I/O. (Default: Enabled)

&#x261E; **Execute Disable Bit** (Note)

Enables or disables Intel® Execute Disable Bit function. This function may enhance protection for the computer, reducing exposure to viruses and malicious buffer overflow attacks when working with its supporting software and system. (Default: Enabled)

(Note)    This item is present only when you install a CPU that supports this feature. For more information about Intel® CPUs' unique features, please visit Intel's website.

## 2-8 Power Management
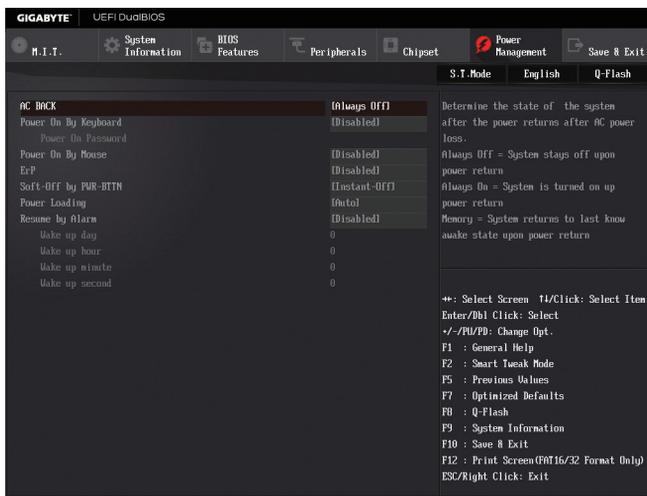


&#x261E; **AC BACK**

Determines the state of the system after the return of power from an AC power loss.

&#x25B8; Always Off   The system stays off upon the return of the AC power. (Default)
&#x25B8; Always On   The system is turned on upon the return of the AC power.
&#x25B8; Memory   The system returns to its last known awake state upon the return of the AC power.

&#x261E; **Power On By Keyboard**

Allows the system to be turned on by a PS/2 keyboard wake-up event.

Note: To use this function, you need an ATX power supply providing at least 1A on the +5VSB lead.

&#x25B8; Disabled   Disables this function. (Default)
&#x25B8; Any Key   Press any key to turn on the system.
&#x25B8; Keyboard 98   Press POWER button on the Windows 98 keyboard to turn on the system.
&#x25B8; Password   Set a password with 1~5 characters to turn on the system.

&#x261E; **Power On Password**

Set the password when **Power On By Keyboard** is set to **Password**.

Press <Enter> on this item and set a password with up to 5 characters and then press <Enter> to accept.

To turn on the system, enter the password and press <Enter>.

Note: To cancel the password, press <Enter> on this item. When prompted for the password, press <Enter> again without entering the password to clear the password settings.

&#x261E; **Power On By Mouse**

Allows the system to be turned on by a PS/2 mouse wake-up event.

Note: To use this function, you need an ATX power supply providing at least 1A on the +5VSB lead.

&#x25B8; Disabled   Disables this function. (Default)
&#x25B8; Move   Move the mouse to turn on the system.
&#x25B8; Double Click   Double click on left button on the mouse to turn on the system.

&#x27;☞ **ErP**

Determines whether to let the system consume least power in S5 (shutdown) state. (Default: Disabled)

Note: When this item is set to **Enabled**, the following functions will become unavailable: Resume by alarm, PME event wake up, power on by mouse, power on by keyboard, and wake on LAN.

&#x27;☞ **Soft-Off by PWR-BTTN**

Configures the way to turn off the computer in MS-DOS mode using the power button.

▶▶ Instant-Off      Press the power button and then the system will be turned off instantly. (Default)

▶▶ Delay 4 Sec.     Press and hold the power button for 4 seconds to turn off the system. If the power button is pressed for less than 4 seconds, the system will enter suspend mode.

&#x27;☞ **Power Loading**

Enables or disables dummy load. When the power supply is at low load, a self-protection will activate causing it to shutdown or fail. If this occurs, please set to **Enabled**. **Auto** lets the BIOS automatically configure this setting. (Default: Auto)

&#x27;☞ **Resume by Alarm**

Determines whether to power on the system at a desired time. (Default: Disabled)

If enabled, set the date and time as following:

▶▶ Wake up day: Turn on the system at a specific time on each day or on a specific day in a month.

▶▶ Wake up hour/minute/second: Set the time at which the system will be powered on automatically.

Note: When using this function, avoid inadequate shutdown from the operating system or removal of the AC power, or the settings may not be effective.

## 2-9 Save & Exit
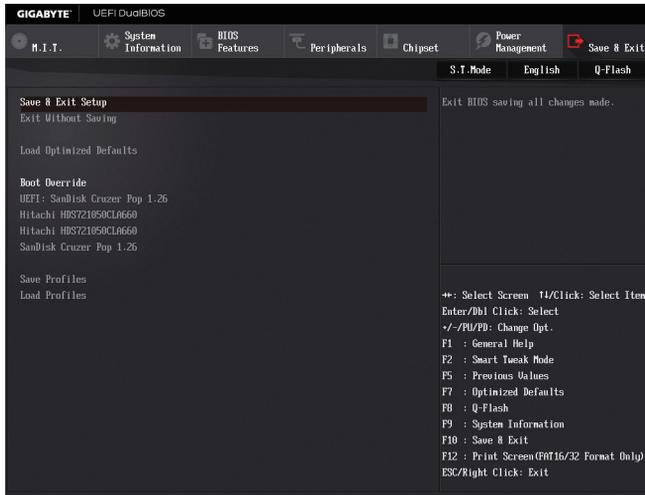


 **Save & Exit Setup**
Press <Enter> on this item and select **Yes**. This saves the changes to the CMOS and exits the BIOS Setup program. Select **No** or press <Esc> to return to the BIOS Setup Main Menu.

 **Exit Without Saving**
Press <Enter> on this item and select **Yes**. This exits the BIOS Setup without saving the changes made in BIOS Setup to the CMOS. Select **No** or press <Esc> to return to the BIOS Setup Main Menu.

 **Load Optimized Defaults**
Press <Enter> on this item and select **Yes** to load the optimal BIOS default settings. The BIOS defaults settings help the system to operate in optimum state. Always load the Optimized defaults after updating the BIOS or after clearing the CMOS values.

 **Boot Override**
Allows you to select a device to boot immediately. Press <Enter> on the device you select and select **Yes** to confirm. Your system will restart automatically and boot from that device.

 **Save Profiles**
This function allows you to save the current BIOS settings to a profile. You can create up to 8 profiles and save as Setup Profile 1~ Setup Profile 8. Or you can select **Select File in HDD/USB/FDD** to save the profile to your storage device. **Select TAG Profile** allows you to specify one of Profile 1 to Profile 8 as TAG Profile, which will be loaded when you press the OC Tag button on the motherboard.

 **Load Profiles**
If your system becomes unstable and you have loaded the BIOS default settings, you can use this function to load the BIOS settings from a profile created before, without the hassles of reconfiguring the BIOS settings. First select the profile you wish to load and then press <Enter> to complete. You can select **Select File in HDD/USB/FDD** to input the profile previously created from your storage device or load the profile automatically created by the BIOS, such as reverting the BIOS settings to the last settings that worked properly (last known good record).

# Chapter 3    Configuring SATA Hard Drive(s)

**RAID Levels**

|  | RAID 0 | RAID 1 | RAID 5 | RAID 10 |
|---|---|---|---|---|
| Minimum Number of Hard Drives | ≥2 | 2 | ≥3 | ≥4 |
| Array Capacity | Number of hard drives * Size of the smallest drive | Size of the smallest drive | (Number of hard drives -1) * Size of the smallest drive | (Number of hard drives/2) * Size of the smallest drive |
| Fault Tolerance | No | Yes | Yes | Yes |

**To configure SATA hard drive(s), follow the steps below:**
- A.   Install SATA hard drive(s) in your computer.
- B.   Configure SATA controller mode in BIOS Setup.
- C.   Configure a RAID array in RAID BIOS. [(Note 1)]
- D.   Install the SATA RAID/AHCI driver and operating system. [(Note 2)]

**Before you begin, please prepare the following items:**
- •    At least two SATA hard drives (to ensure optimal performance, it is recommended that you use two hard drives with identical model and capacity). If you do not want to create RAID, you may prepare only one hard drive.
- •    A Windows setup disk.
- •    Motherboard driver disk.
- •    A USB thumb drive.

## 3-1    Configuring SATA Controllers

**A. Installing SATA hard drive(s) in your computer**
Attach one end of the SATA signal cable to the rear of the SATA hard drive and the other end to available SATA port on the motherboard. If you want to configure a RAID set, make sure to connect the hard drives to the SATA3 0~5 ports. Then connect the power connector from your power supply to the hard drive.

(Note 1)   Skip this step if you do not want to create RAID array on the SATA controller.
(Note 2)   Required when the SATA controller is set to AHCI or RAID mode.

**B. Configuring SATA controller mode in BIOS Setup**
Make sure to configure the SATA controller mode correctly in system BIOS Setup.

Step 1:
Turn on your computer and press <Delete> to enter BIOS Setup during the POST (Power-On Self-Test). Go to **Chipset\PCH SATA Configuration**, make sure **SATA Controller** is enabled. To create RAID, set **Configure SATA as** to **RAID** (Figure 1). If you do not want to create RAID, set this item to **IDE** or **AHCI**.
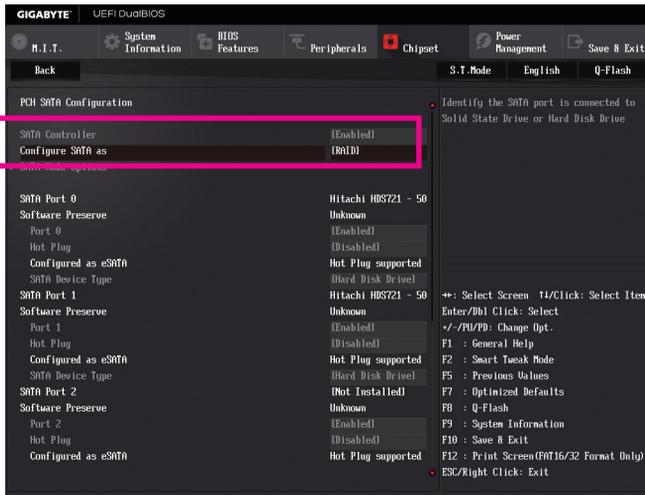


<p align="center">Figure 1</p>

Step 2:
If you want to configure UEFI RAID, follow the steps in "C-1." To enter the legacy RAID ROM, save the settings and exit BIOS Setup. Refer to "C-2" for more information.

The BIOS Setup menus described in this section may differ from the exact settings for your motherboard. The actual BIOS Setup menu options you will see shall depend on the motherboard you have and the BIOS version.

## C-1. UEFI RAID Configuration

Only Windows 8.1/8 64-bit supports UEFI RAID configuration.

Step 1:
In BIOS Setup, go to **BIOS Features** and set **Windows 8 Features** to **Windows 8** and **CSM Support** to **Disabled** (Figure 2). Save the changes and exit BIOS Setup.
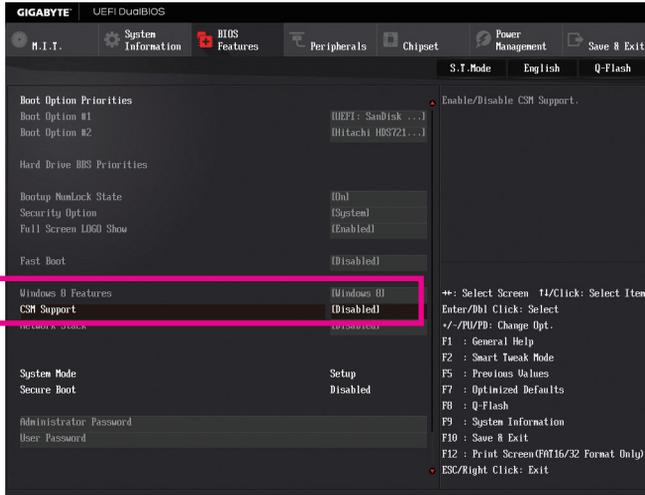


<div align="center">Figure 2</div>

Step 2:
After the system reboot, enter BIOS Setup again. Then enter the **Peripherals\Intel(R) Rapid Storage Technology** sub-menu (Figure 3).
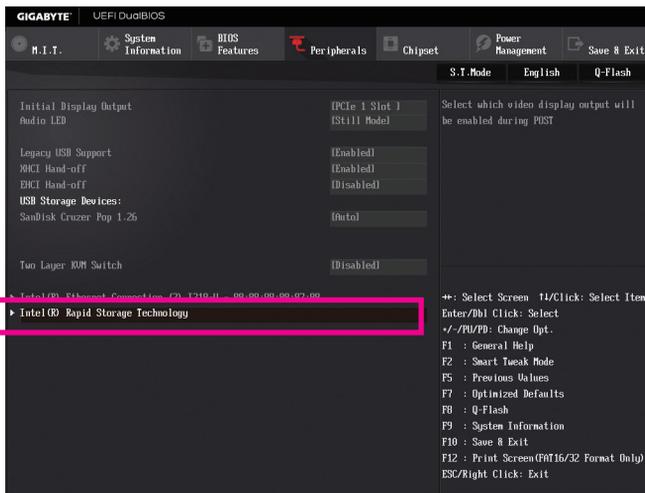


<div align="center">Figure 3</div>

Step 3:
On the **Intel(R) Rapid Storage Technology** menu, press <Enter> on **Create RAID Volume** to enter the **Create RAID Volume** screen. Enter a volume name with 1~16 letters (letters cannot be special characters) under the **Name** item and press <Enter>. Then, select a RAID level (Figure 4). RAID levels supported include RAID 0, RAID 1, RAID 10, and RAID 5 (the selections available depend on the number of the hard drives being installed). Next, use the down arrow key to move to **Select Disks**.
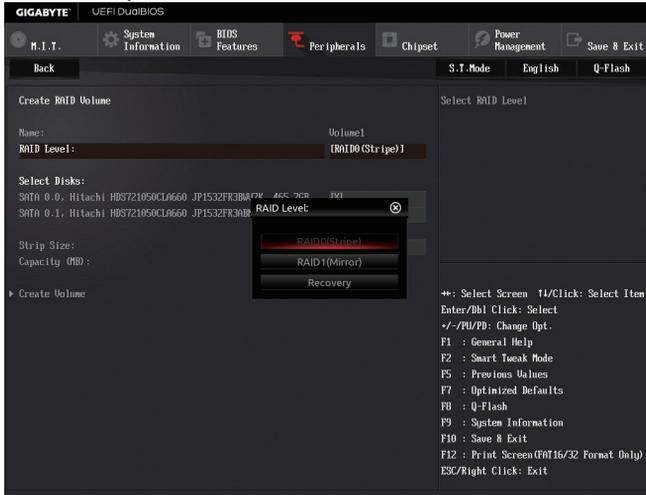


<p align="center">Figure 4</p>

Step 4:
Under **Select Disks** item, select the hard drives to be included in the RAID array. Press the <Space> key on the hard drives to be selected (selected hard drives are marked with "X"). Then set the stripe block size (Figure 5). The stripe block size can be set from 4 KB to 128 KB. Once you have selected the stripe block size, set the volume capacity.



<p align="center">Figure 5</p>

Step 5:

After setting the capacity, move to **Create Volume** and press <Enter> to begin. (Figure 6)
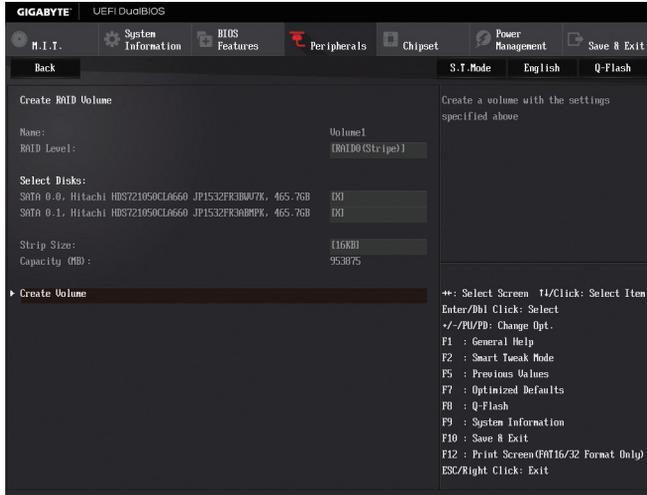


Figure 6

After completing, you'll be brought back to the **Intel(R) Rapid Storage Technology** screen. Under **RAID Volumes** you can see the new RAID volume. To see more detailed information, press <Enter> on the volume to check for information on RAID level, stripe block size, array name, and array capacity, etc. (Figure 7)
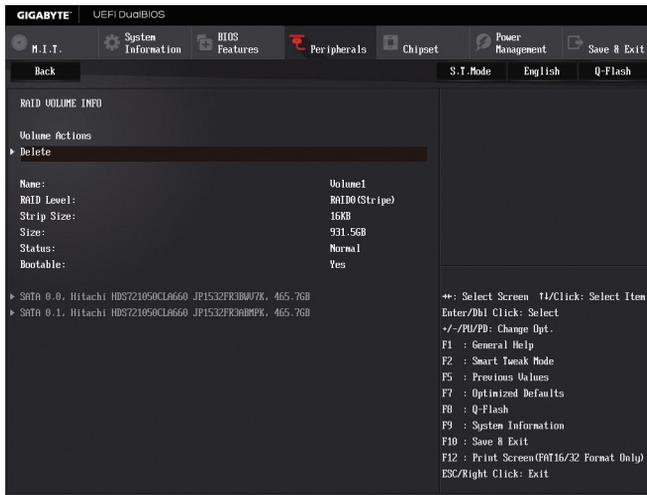


Figure 7

**Delete RAID Volume**

To delete a RAID array, press <Enter> on the volume to be deleted on the **Intel(R) Rapid Storage Technology** screen. After entering the **RAID VOLUME INFO** screen, press <Enter> on **Delete** to enter the **Delete** screen. Press <Enter> on **Yes** (Figure 8).
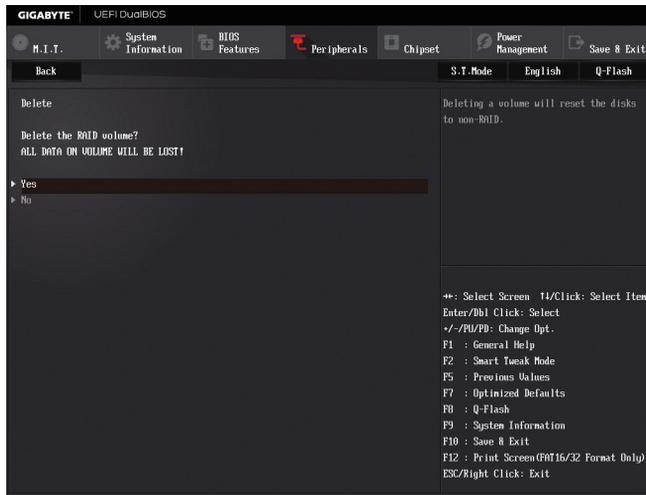


<p align="center">Figure 8</p>

## C-2. Configuring Legacy RAID ROM

Enter the Intel® legacy RAID BIOS setup utility to configure a RAID array. Skip this step and proceed with the installation of Windows operating system for a non-RAID configuration.

Step 1:

After the POST memory test begins and before the operating system boot begins, look for a message which says "Press <Ctrl-I> to enter Configuration Utility" (Figure 9). Press <Ctrl> + <I> to enter the RAID Configuration Utility.

```
Intel(R) Rapid Storage Technology - Option ROM - 13.1.0.2126
Copyright (C) Intel Corporation.   All Rights Reserved.

RAID Volumes :
None defined.

Physical Devices :
ID      Device Model        Serial #                          Size        Type/Status(Vol ID)
1       Hitachi HDS72105    JP1532FR3BWV7K                    465.7GB     Non-RAID Disk
2       Hitachi HDS72105    JP1532ER046M2K                    465.7GB     Non-RAID Disk

Press  <CTRL - I>  to enter Configuration Utility...
```
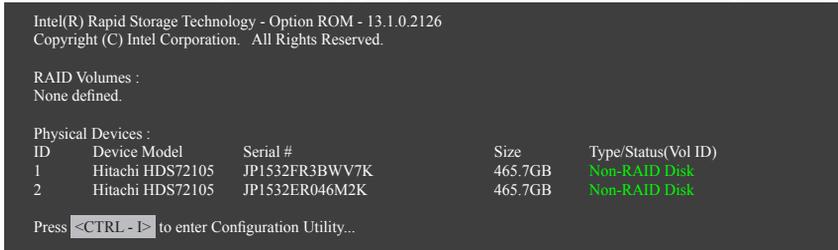
<p align="center">Figure 9</p>

Step 2:

After you press <Ctrl> + <I>, the **MAIN MENU** screen will appear (Figure 10).

**Create RAID Volume**

If you want to create a RAID array, select **Create RAID Volume** in **MAIN MENU** and press <Enter>.

```
                    Intel(R) Rapid Storage Technology - Option ROM - 13.1.0.2126
                         Copyright (C)  Intel Corporation.   All Rights Reserved.
                              ========== [ MAIN MENU ] ==========
          1.  Create RAID Volume                          4.  Recovery Volume Options
          2.  Delete RAID Volume                          5.  Acceleration Options
          3.  Reset Disks to Non-RAID                     6.  Exit

                         ========== [ DISK/VOLUME INFORMATION ] ==========
      RAID Volumes :
      None defined.

      Physical Deivces :
      ID      Device Model          Serial #              Size        Type/Status(Vol ID)
      1       Hitachi HDS72105      JP1532FR3BWV7K        465.7GB     Non-RAID Disk
      2       Hitachi HDS72105      JP1532ER046M2K        465.7GB     Non-RAID Disk

          [↑↓]-Select                    [ESC]-Exit                    [ENTER]-Select Menu
```

<p align="center">Figure 10</p>

Step 3:

After entering the **CREATE VOLUME MENU** screen, enter a volume name with 1~16 letters (letters cannot be special characters) under the **Name** item and press <Enter>. Then, select a RAID level (Figure 11). RAID levels supported include RAID 0, RAID 1, RAID 10, and RAID 5 (the selections available depend on the number of the hard drives being installed). Press <Enter> to proceed.

```
Intel(R) Rapid Storage Technology - Option ROM - Option ROM - 13.1.0.2126
              Copyright (C)  Intel Corporation.   All Rights Reserved.

========================= [ CREATE VOLUME MENU ] =========================
                            Name :    Volume0
                      RAID Level :    RAID0(Stripe)
                           Disks :    Select Disks
                      Strip Size :       16KB
                        Capacity :    931.5 GB
                            Sync :    N/A
                                      Create Volume
============================= [ HELP ] =============================



                   RAID 0: Stripes data (performance).




        [↑↓]-Change          [TAB]-Next          [ESC]-Previous Menu          [ENTER]-Select
```
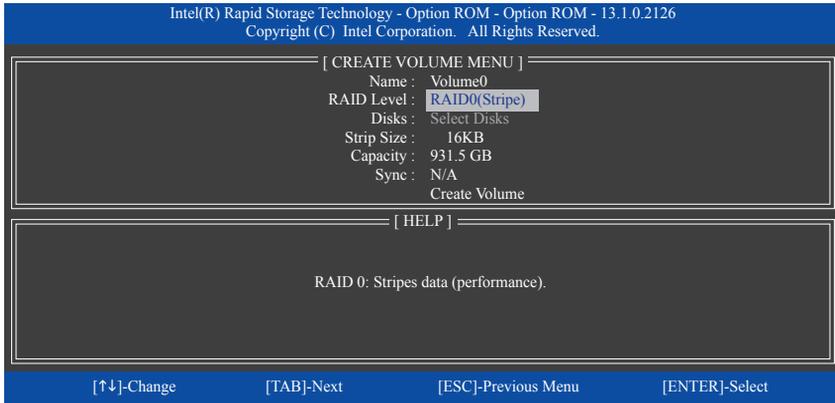
Figure 11

Step 4:

Under **Disks** item, select the hard drives to be included in the RAID array. If only two hard drives are installed, they will be automatically assigned to the array. Set the stripe block size (Figure 12) if necessary. The stripe block size can be set from 4 KB to 128 KB. Once you have selected the stripe block size, press <Enter>.

```
Intel(R) Rapid Storage Technology - Option ROM - 13.1.0.2126
              Copyright (C)  Intel Corporation.   All Rights Reserved.

========================= [ CREATE VOLUME MENU ] =========================
                            Name :    Volume0
                      RAID Level :    RAID0(Stripe)
                           Disks :    Select Disks
                      Strip Size :       16KB
                        Capacity :    931.5 GB
                            Sync :    N/A
                                      Create Volume
============================= [ HELP ] =============================
                 The following are typical values:

                       RAID0     -   128KB
                       RAID10    -   64KB
                       RAID5     -   64KB



        [↑↓]-Change          [TAB]-Next          [ESC]-Previous Menu          [ENTER]-Select
```
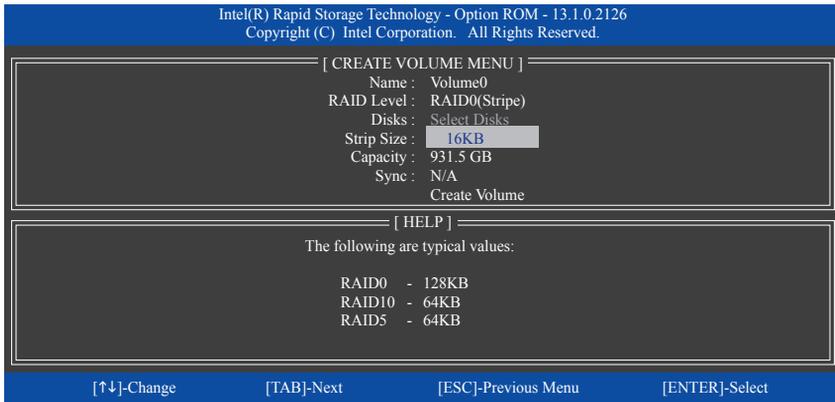
Figure 12

Step 5:

Enter the array capacity and press <Enter>. Finally press <Enter> on the **Create Volume** item to begin creating the RAID array. When prompted to confirm whether to create this volume, press <Y> to confirm or <N> to cancel (Figure 13).

```
        Intel(R) Rapid Storage Technology - Option ROM - 13.1.0.2126
                Copyright(C) Intel Corporation.  All Rights Reserved.

═══════════════════════ [ CREATE VOLUME MENU ] ═══════════════════════
                              Name :   Volume0
                        RAID Level :   RAID0(Stripe)
                             Disks :   Select Disks
                        Strip Size :   128 MB
                          Capacity :   931.5 GB

         ┌──────────────────────────────────────────────────────────┐
         │ WARNING : ALL DATA ON SELECTED DISKS WILL BE LOST.        │
         │                                                            │
         │        Are you sure you want to create this volume? (Y/N) :│
         │                                                            │
         └──────────────────────────────────────────────────────────┘

                     Press ENTER to create the specified volume.


        [↑↓]-Change        [TAB]-Next        [ESC]-Previous Menu        [ENTER]-Select
```

Figure 13

When completed, you can see detailed information about the RAID array in the **DISK/VOLUME INFORMATION** section, including the RAID level, stripe block size, array name, and array capacity, etc. (Figure 14)

```
        Intel(R) Rapid Storage Technology - Option ROM - 13.1.0.2126
                Copyright (C)  Intel Corporation.   All Rights Reserved.

═══════════════════════════ [ MAIN MENU ] ═══════════════════════════
      1.  Create RAID Volume                 4.  Recovery Volume Options
      2.  Delete RAID Volume                 5.  Acceleration Options
      3.  Reset Disks to Non-RAID            6.  Exit

═══════════════════ [ DISK/VOLUME INFORMATION ] ═══════════════════
  RAID Volumes :
  ID      Name          Level              Strip      Size      Status      Bootable
  0       Volume0       RAID0(Stripe)      128KB      931.5GB   Normal      Yes

  Physical Devices :
  ID    Device Model            Serial #              Size        Type/Status(Vol ID)
  1     Hitachi HDS72105        JP1532FR3BWV7K        465.7GB     Member Disk(0)
  2     Hitachi HDS72105        JP1532ER046M2K        465.7GB     Member Disk(0)

        [↑↓]-Select                [ESC]-Exit                [ENTER]-Select Menu
```

Figure 14

To exit the RAID BIOS utility, press <Esc> or select **6. Exit** in **MAIN MENU**.

Now, you can proceed to install the SATA RAID/AHCI driver and operating system.

**Recovery Volume Options**

Intel® Rapid Recover Technology provides data protection by allowing users to easily restore data and system operation using a designated recovery drive. With the Rapid Recovery Technology, which employs RAID 1 functionality, users can copy the data from the master drive to the recovery drive; if needed, the data on the recovery drive can be restored back to the master drive.

Before you begin:
• The recovery drive must have equal or greater capacity than the master drive.
• A recovery volume can be created with two hard drives only. A recovery volume and a RAID array cannot co-exist in the system at the same time, that is, if you have already created a recovery volume, you are unable to create a RAID array.
• By default, only the master drive can be viewed in the operating system; the recovery drive is hidden.

Step 1:
Select **Create RAID Volume** in **MAIN MENU** and press <Enter> (Figure 15).

Intel(R) Rapid Storage Technology - Option ROM - 13.1.0.2126
Copyright (C)  Intel Corporation.   All Rights Reserved.

[ MAIN MENU ]

1.  Create RAID Volume                              4.  Recovery Volume Options
2.  Delete RAID Volume                              5.  Acceleration Options
3.  Reset Disks to Non-RAID                         6.  Exit

[ DISK/VOLUME INFORMATION ]

RAID Volumes :
None defined.

Physical Disks :
| ID | Drive Model | Serial # | Size | Type/Status(Vol ID) |
|----|-------------|----------|------|---------------------|
| 1 | Hitachi HDS72105 | JP1532FR3BWV7K | 465.7GB | Non-RAID Disk |
| 2 | Hitachi HDS72105 | JP1532ER046M2K | 465.7GB | Non-RAID Disk |

[↑↓]-Select                    [ESC]-Exit                    [ENTER]-Select Menu

Figure 15

Step 2:
After entering the volume name, select **Recovery** under the **RAID Level** item and press <Enter> (Figure 16).

Intel(R) Rapid Storage Technology - Option ROM - 13.1.0.2126
Copyright (C)  Intel Corporation.   All Rights Reserved.

[ CREATE VOLUME MENU ]
Name :    Volume0
RAID Level :   Recovery
Disks :   Select Disks
Strip Size :   N/A
Capacity :   465.7 GB
Sync :   Continuous
Create Volume

[ HELP ]

Recovery: Copies data between a master and a recovery disk.

[↑↓]-Change          [TAB]-Next          [ESC]-Previous Menu          [ENTER]-Select
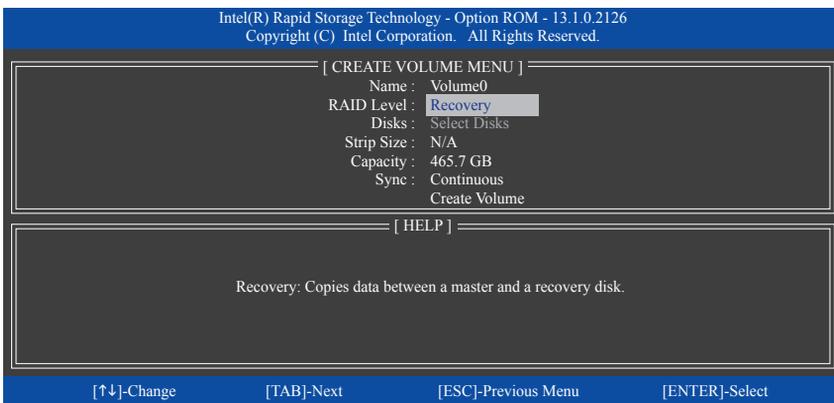
Figure 16

Step 3:

Press <Enter> under the **Select Disks** item. In the **SELECT DISKS** box, press <Tab> on the hard drive you want to use for the master drive and press <Space> on the hard drive you want to use for the recovery drive. (Make sure the recovery drive has equal or larger capacity than the master drive.) Then press <Enter> to confirm (Figure 17).

```
          Intel(R) Rapid Storage Technology - Option ROM - 13.1.0.2126
               Copyright (C)  Intel Corporation.   All Rights Reserved.
=========================[ CREATE VOLUME MENU ]=========================
                            Name :    Volume0
                      RAID Level :    Recovery
                     ==============[ SELECT DISKS ]==============

          ID      Drive Model              Serial #                Size        Status
          M1      Hitachi HDS72105         JP1532FR3BWV7K          465.7GB     Non-RAID Disk
          R2      Hitachi HDS72105         JP1532ER046M2K          465.7GB     Non-RAID Disk



                  Select 1 Master and 1 Recovery disk to create volume.

           [↑↓]-Prev/Next  [TAB]-(M)aster  [SPACE]-(R)ecovery  [ENTER]-Done

         [↑↓]-Change            [TAB]-Next              [ESC]-Previous Menu           [ENTER]-Select
```

<center>Figure 17</center>

Step 4:

Under **Sync**, select **Continuous** or **On Request** (Figure 18). When set to **Continuous**, changes made to the data on the master drive will be automatically and continuously copied to the recovery drive when both hard drives are installed in the system. **On Request** allows users to update data from the master drive to the recovery drive manually using the Intel® Rapid Storage Technology utility in the operating system. **On Request** also allows users to restore the master drive to a previous state.

```
          Intel(R) Rapid Storage Technology - Option ROM - 13.1.0.2126
               Copyright (C)  Intel Corporation.   All Rights Reserved.
=========================[ CREATE VOLUME MENU ]=========================
                      Name :    Volume0
                RAID Level :    Recovery
                     Disks :    Select Disks
                Strip Size :    N/A
                  Capacity :    0.0 GB
                      Sync :    Continuous
                               Create Volume
==============================[ HELP ]==============================

                        Select a sync option:
              On Request: volume is updated manually
             Continuous: volume is updated automatically



         [↑↓]-Change            [TAB]-Next              [ESC]-Previous Menu           [ENTER]-Select
```

<center>Figure 18</center>

Step 5:

Finally press <Enter> on the **Create Volume** item to begin creating the Recovery Volume and follow the on-screen instructions to complete.

**Delete RAID Volume**

To delete a RAID array, select **Delete RAID Volume** in **MAIN MENU** and press <Enter>. In the **DELETE VOLUME MENU** section, use the up or down arrow key to select the array to be deleted and press <Delete>. When prompted to confirm your selection (Figure 19), press <Y> to confirm or <N> to abort.



Figure 19

**Acceleration Options**

This option allows you to view the status of your accelerated drive/volume (Figure 20) created using the Intel® IRST utility. In case you are unable to run the Intel® IRST utility due to an application error or operating system issue, you will need to remove acceleration or manually enable synchronization (Maximized mode only) using this option in the RAID ROM utility.

Steps:

Select **Acceleration Options** in **MAIN MENU** and press <Enter>.

To remove the acceleration, select the accelerated drive/volume, press <R>, and press <Y> to confirm.

To synchronize data from the cache device to the accelerated drive/volume, press <S> and press <Y> to confirm.



Figure 20

## 3-2    Installing the SATA RAID/AHCI Driver and Operating System

With the correct BIOS settings, you are ready to install Windows 8.1/8/7.

**A. Installing Windows**

As some operating systems already include Intel® SATA RAID/AHCI driver, you do not need to install separate RAID/AHCI driver during the Windows installation process. After the operating system is installed, we recommend that you install all required drivers from the motherboard driver disk using "Xpress Install" to ensure system performance and compatibility. If the operating system to be installed requires that you provide additional SATA RAID/AHCI driver during the OS installation process, please refer to the steps below:

Step 1:

Copy the **IRST** folder under **BootDrv** in the driver disk to your USB thumb drive.

Step 2:

Boot from the Windows setup disk and perform standard OS installation steps. When the screen requesting you to load the driver appears, select **Browse**.

Step 3:

Insert the USB thumb drive and then browse to the location of the driver. The locations of the drivers are as follows:
Windows 32-bit: \iRST\32Bit
Windows 64-bit: \iRST\64Bit

Step 4:

When a screen as shown in Figure 1 appears, select **Intel(R) Desktop/Workstation/Server Express Chipset SATA RAID Controller** and click **Next** to load the driver and continue the OS installation.
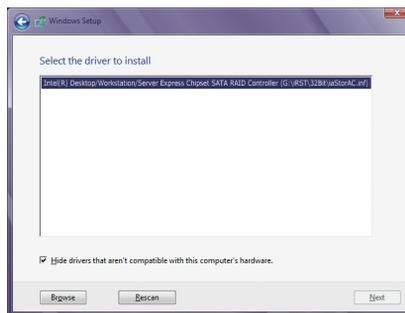

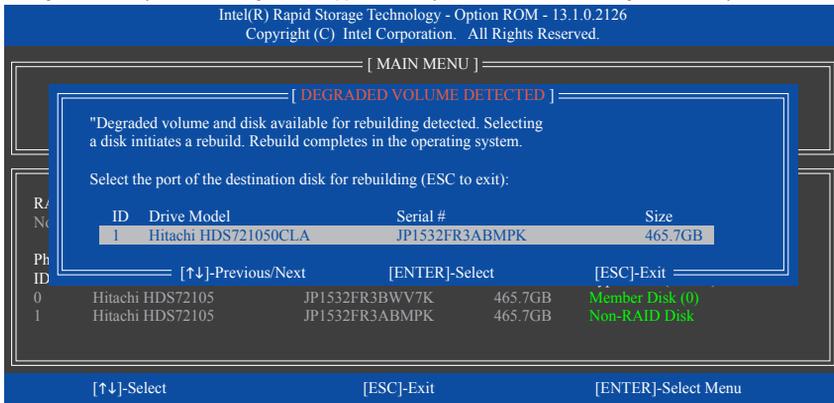Figure 1

## B. Rebuilding an Array

Rebuilding is the process of restoring data to a hard drive from other drives in the array. Rebuilding applies only to fault-tolerant arrays such as RAID 1, RAID 5 or RAID 10 arrays. The procedures below assume a new drive is added to replace a failed drive to rebuild a RAID 1 array. (Note: The new drive must have equal or greater capacity than the old one.)

Turn off your computer and replace the failed hard drive with a new one. Restart your computer.

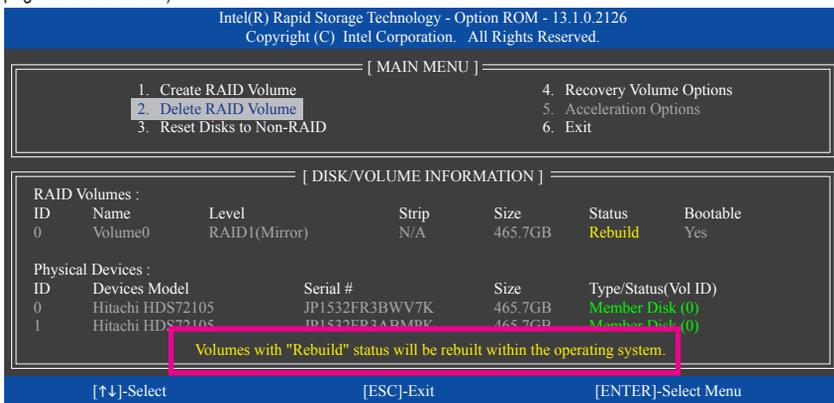• **Enabling Automatic Rebuild**

Step 1:

When the message "Press <Ctrl-I> to enter Configuration Utility" appears, press <Ctrl> + <I> to enter the RAID Configuration Utility. The following screen appears after you enter the RAID Configuration Utility.

```
                    Intel(R) Rapid Storage Technology - Option ROM - 13.1.0.2126
                         Copyright (C)  Intel Corporation.   All Rights Reserved.
                                      =[ MAIN MENU ]=

                    =[ DEGRADED VOLUME DETECTED ]=
        "Degraded volume and disk available for rebuilding detected. Selecting
        a disk initiates a rebuild. Rebuild completes in the operating system.

        Select the port of the destination disk for rebuilding (ESC to exit):

            ID    Drive Model                  Serial #                    Size
RA          1     Hitachi HDS721050CLA         JP1532FR3ABMPK              465.7GB
No

Ph          =[↑↓]-Previous/Next           [ENTER]-Select            [ESC]-Exit=
ID
0       Hitachi HDS72105           JP1532FR3BWV7K       465.7GB    Member Disk (0)
1       Hitachi HDS72105           JP1532FR3ABMPK       465.7GB    Non-RAID Disk


        [↑↓]-Select                      [ESC]-Exit                 [ENTER]-Select Menu
```
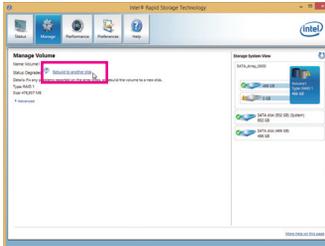
Step 2:

Select the new hard drive to add into the array to be rebuilt and press <Enter>. The following screen appears, indicating that an automatic rebuild will be performed after you enter the operating system. If you do not enable automatic rebuild on this stage, you have to manually rebuild the array in the operating system (see the next page for more details).

```
                    Intel(R) Rapid Storage Technology - Option ROM - 13.1.0.2126
                         Copyright (C)  Intel Corporation.   All Rights Reserved.
                                      =[ MAIN MENU ]=
        1.  Create RAID Volume                  4.  Recovery Volume Options
        2.  Delete RAID Volume                  5.  Acceleration Options
        3.  Reset Disks to Non-RAID             6.  Exit

                             =[ DISK/VOLUME INFORMATION ]=
  RAID Volumes :
  ID      Name           Level              Strip      Size       Status       Bootable
  0       Volume0        RAID1(Mirror)      N/A        465.7GB    Rebuild      Yes

  Physical Devices :
  ID      Devices Model              Serial #               Size       Type/Status(Vol ID)
  0       Hitachi HDS72105           JP1532FR3BWV7K         465.7GB    Member Disk (0)
  1       Hitachi HDS72105           JP1532FR3ABMPK         465.7GB    Member Disk (0)
              Volumes with "Rebuild" status will be rebuilt within the operating system.

        [↑↓]-Select                      [ESC]-Exit                 [ENTER]-Select Menu
```

•   **Performing the Rebuild in the Operating System**

While in the operating system, make sure the chipset driver has been installed from the motherboard driver disk. Then launch the Intel® Rapid Storage Technology utility from the desktop.
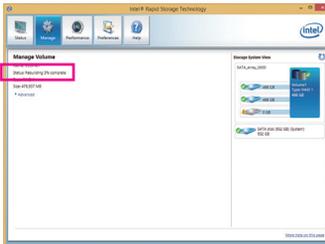


Step 1:
Go to the **Manage** menu and click **Rebuild to another disk** in **Manage Volume**.
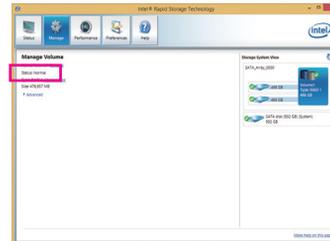


Step 2:
Select a new drive to rebuild the RAID and click **Rebuild**.



The **Status** item on the left of the screen displays the rebuild progress.
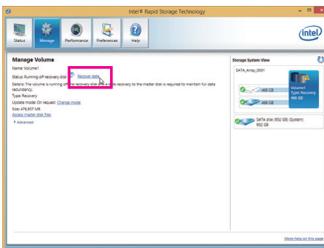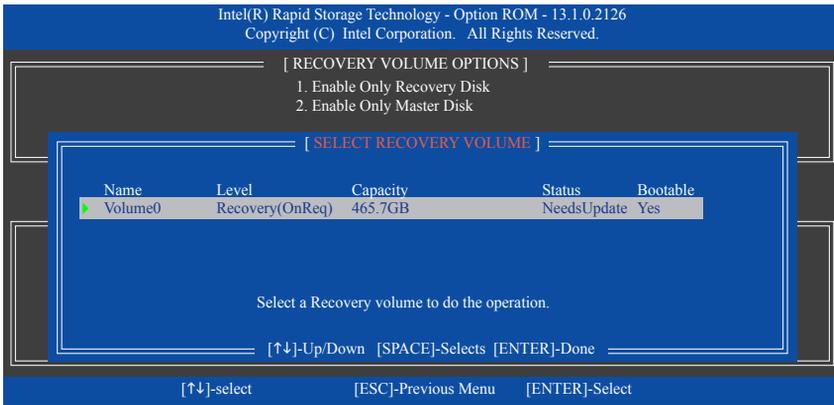


Step 3:
After the RAID 1 volume rebuilding, the **Status** will display as **Normal**.

•   **Restoring the Master Drive to a Previous State (for Recovery Volume only)**
When two hard drives are set to Recovery Volume in Update on Request mode, you can restore the master drive data to the last backup state when needed. For example, in case the master drive detects a virus, you can restore the recovery drive data to the master drive.

Step 1:
Select **4. Recovery Volume Options** in the **MAIN MENU** of the Intel® RAID Configuration Utility. On the **RECOVERY VOLUMES OPTIONS** menu, select **Enable Only Recovery Disk** to show the recovery drive in the operating system. Follow the on-screen instructions to complete and exit the RAID Configuration Utility.



Intel(R) Rapid Storage Technology - Option ROM - 13.1.0.2126
Copyright (C)  Intel Corporation.   All Rights Reserved.

[ RECOVERY VOLUME OPTIONS ]
    1. Enable Only Recovery Disk
    2. Enable Only Master Disk

[ SELECT RECOVERY VOLUME ]

| Name | Level | Capacity | Status | Bootable |
|------|-------|----------|--------|----------|
| Volume0 | Recovery(OnReq) | 465.7GB | NeedsUpdate | Yes |

Select a Recovery volume to do the operation.

[↑↓]-Up/Down   [SPACE]-Selects  [ENTER]-Done

[↑↓]-select          [ESC]-Previous Menu      [ENTER]-Select



Step 2:
Go to the **Manage** menu of the Intel® Rapid Storage Technology utility and click **Recover data** in **Manage Volume**.



The **Status** item on the left of the screen displays the rebuild progress.



Step 3:
Click **Yes** to begin the data recovery.
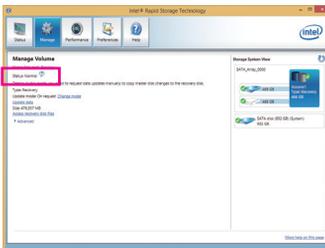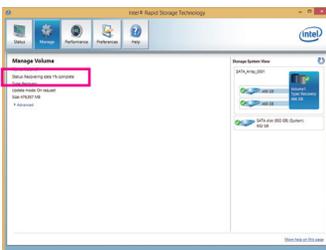


Step 4:
After the recovery volume is completed, the **Status** will display as **Normal**.

# Chapter 4     Drivers Installation

- Before installing the drivers, first install the operating system. (The following instructions use Windows 8.1 as the example operating system.)
- After installing the operating system, insert the motherboard driver disk into your optical drive. Click on the message "Tap to choose what happens with this disc" on the top-right corner of the screen and select "Run **Run**.exe." (Or go to My Computer, double-click the optical drive and execute the **Run**.exe program.)

## 4-1     Chipset Drivers

"Xpress Install" will automatically scan your system and then list all of the drivers that are recommended to install. You can click the **Xpress Install** button and "Xpress Install" will install all of the selected drivers. Or click the arrow [ ] icon to individually install the drivers you need.
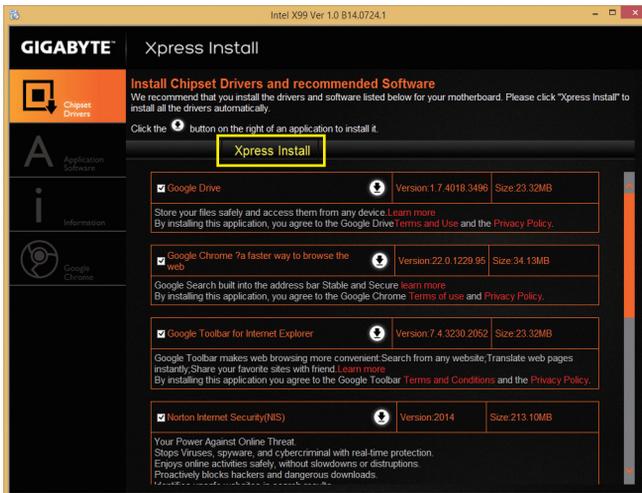


- Please ignore the popup dialog box(es) (e.g. the **Found New Hardware Wizard**) displayed when "Xpress Install" is installing the drivers. Failure to do so may affect the driver installation.
- Some device drivers will restart your system automatically during the driver installation. After the system restart, "Xpress Install" will continue to install other drivers.

## 4-2    Application Software

This page displays the apps that GIGABYTE develops and some free software. You can select the apps you want and click the **Install** ⬇ icon to begin the installation.
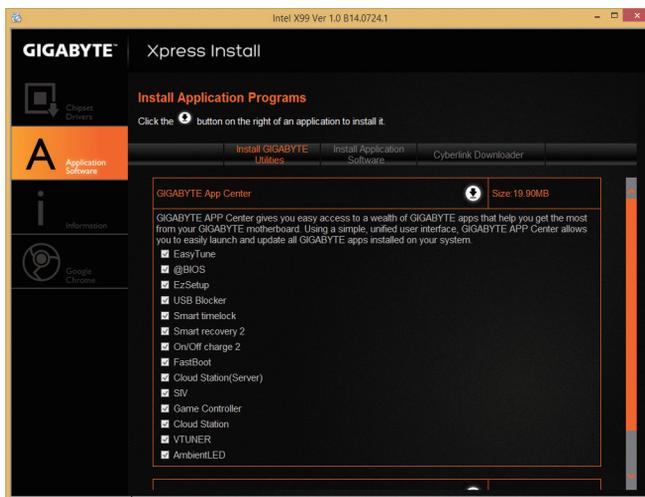


## 4-3    Information

This page provides detailed information on the drivers on the driver disk. The **Contact** page provides contact information of the GIGABYTE Taiwan headquarter. You can click the URL on this page to link to the GIGA-BYTE website to check more information on the GIGABYTE headquarter or worldwide branch offices.
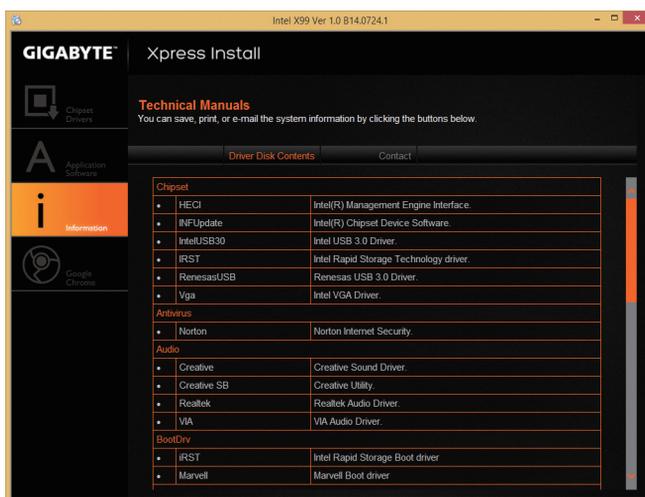
## Chapter 5    Unique Features

## 5-1    BIOS Update Utilities

GIGABYTE motherboards provide two unique BIOS update tools, Q-Flash™ and @BIOS™. GIGABYTE Q-Flash and @BIOS are easy-to-use and allow you to update the BIOS without the need to enter MS-DOS mode. Additionally, this motherboard features the DualBIOS™ design and supports Q-Flash Plus, providing multiple protection for the safety and stability of your computer.

**What is DualBIOS™?**
Motherboards that support DualBIOS have two BIOS onboard, a main BIOS and a backup BIOS. Normally, the system works on the main BIOS. However, if the main BIOS is corrupted or damaged, the backup BIOS will take over on the next system boot and copy the BIOS file to the main BIOS to ensure normal system operation. For the sake of system safety, users cannot update the backup BIOS manually.

**What is Q-Flash Plus?**
Q-Flash Plus is a new solution derived from DualBIOS™. When both the main and backup BIOS fail during system boot, Q-Flash Plus will be automatically launched and then recover BIOS data from the USB flash drive connected to a specific USB port.

**What is Q-Flash™?**
With Q-Flash you can update the system BIOS without having to enter operating systems like MS-DOS or Window first. Embedded in the BIOS, the Q-Flash tool frees you from the hassles of going through complicated BIOS flashing process.

**What is @BIOS™?**
@BIOS allows you to update the system BIOS while in the Windows environment. @BIOS will download the latest BIOS file from the nearest @BIOS server site and update the BIOS.

### 5-1-1    Updating the BIOS with the Q-Flash Utility

**A. Before You Begin**
1.  From GIGABYTE's website, download the latest compressed BIOS update file that matches your motherboard model.
2.  Extract the file and save the new BIOS file (e.g. X99SOCFORCE.F1) to your USB flash drive, or hard drive. Note: The USB flash drive or hard drive must use FAT32/16/12 file system.
3.  Restart the system. During the POST, press the <End> key to enter Q-Flash. Note: You can access Q-Flash by either pressing the <End> key during the POST or pressing the <F8> key in BIOS Setup. However, if the BIOS update file is saved to a hard drive in RAID/AHCI mode or a hard drive attached to an independent SATA controller, use the <End> key during the POST to access Q-Flash.

> ⚠️ Because BIOS flashing is potentially risky, please do it with caution. Inadequate BIOS flashing may result in system malfunction.

**B. Updating the BIOS**

In the main menu of Q-Flash, use the keyboard or mouse to select an item to execute. When updating the BIOS, choose the location where the BIOS file is saved. The following procedure assumes that you save the BIOS file to a USB flash drive.

Step 1:
1. Insert the USB flash drive containing the BIOS file into the computer. In the main menu of Q-Flash, select **Update BIOS From Drive**.

> • The **Save BIOS to Drive** option allows you to save the current BIOS file.
> • Q-Flash only supports USB flash drive or hard drives using FAT32/16/12 file system.
> • If the BIOS update file is saved to a hard drive in RAID/AHCI mode or a hard drive attached to an independent SATA controller, use the <End> key during the POST to access Q-Flash.

2. Select **USB Flash Drive**.

| Q-Flash |
|---|
| Model Name : X99-SOC Force |
| BIOS Version : F1q |
| BIOS Date : 07/25/2014 |
| Update BIOS From Drive |
| Please select drvice |
| USB Flash Drive |
| Close |

3. Select the BIOS update file.

⚠️ **Make sure the BIOS update file matches your motherboard model.**

Step 2:
The process of the system reading the BIOS file from the USB flash drive is displayed on the screen. Depending on the BIOS update file, there will be Quick Update and/or Normal Update for you to select. The update will begin after you make the selection. The monitor will display the update process.

⚠️ • **Do not turn off or restart the system when the system is reading/updating the BIOS.**
• **Do not remove the USB flash drive or hard drive when the system is updating the BIOS.**

Step 3:
The system will restart after the update process is complete.

Step 4:

During the POST, press <Delete> to enter BIOS Setup. Select **Load Optimized Defaults** on the **Save & Exit** screen and press <Enter> to load BIOS defaults. System will re-detect all peripheral devices after a BIOS update, so we recommend that you reload BIOS defaults.
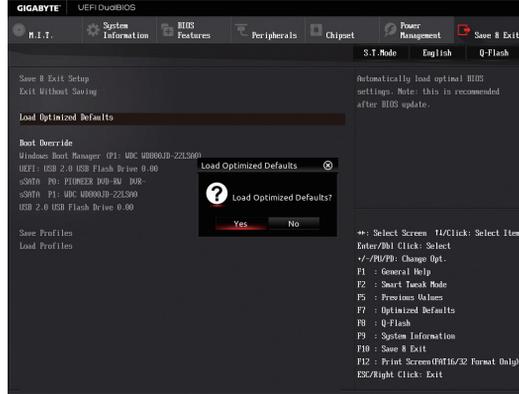


Select **Yes** to load BIOS defaults

Step 5:

Select **Save & Exit Setup** and press <Enter>. And then select **Yes** to save settings to CMOS and exit BIOS Setup. The procedure is complete after the system restarts.

## 5-1-2　Updating the BIOS with the @BIOS Utility

### A. Before You Begin
1. In Windows, close all applications and TSR (Terminate and Stay Resident) programs. This helps prevent unexpected failures when performing a BIOS update.
2. If the BIOS is being updated via the Internet, ensure the Internet connection is stable and do NOT interrupt the Internet connection (for example, avoid a power loss or switching off the Internet). Failure to do so may result in a corrupted BIOS or a system that is unable to start.
3. GIGABYTE product warranty does not cover any BIOS damage or system failure resulting from an inadequate BIOS flashing.

### B. Using @BIOS

**1.　Update the BIOS Using the Internet Update Function:**

Click **Update from Server**, select the @BIOS server site closest to your location and then download the BIOS file that matches your motherboard model. Follow the on-screen instructions to complete.
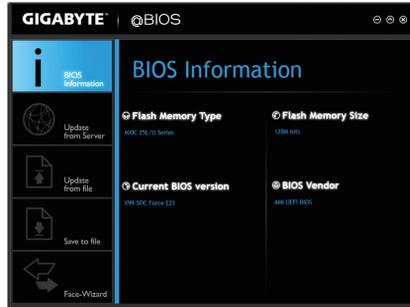
If the BIOS update file for your motherboard is not present on the @BIOS server site, please manually download the BIOS update file from GIGABYTE's website and follow the instructions in "Update the BIOS without Using the Internet Update Function" below.

**2.　Update the BIOS without Using the Internet Update Function:**

Click **Update from File**, then select the location where you save the BIOS update file obtained from the Internet or through other source. Follow the on-screen instructions to complete.

**3.　Save the Current BIOS File:**

Click **Save to File** to save the current BIOS file.

**4.　Change the Boot-up Logo:**

Click **Upload new image** in Face-Wizard and you will be able to change the boot-up logo with your own picture, creating a personalized boot-up screen. Click **Backup current image** to save the currently used boot-up logo.

Supported image formats include jpg, bmp, and gif.

### C. After Updating the BIOS
Restart your system after updating the BIOS.

- Make sure that the BIOS file to be flashed matches your motherboard model. Updating the BIOS with an incorrect BIOS file could cause your system not to boot.
- Do not turn off the system or remove the power during the BIOS update process, or the BIOS may corrupt and the system may not boot.

## 5-1-3    Using Q-Flash Plus

**A. Before You Begin**
1.  From GIGABYTE's website, download the latest compressed BIOS update file that matches your motherboard model.
2.  Uncompress the downloaded BIOS file, save it to your USB flash drive, and rename it to **GIGABYTE.bin**.
    Note: The USB flash drive must use FAT32/16/12 file system.
3.  Insert the USB flash drive into the white USB port on the back panel.

**B. Using Q-Flash Plus**
If both the main and backup BIOS fail during system boot, wait for 15-20 seconds, the system will automatically search and match the BIOS file in the USB flash drive on the white USB port. The FBIOS_LED will flash when the BIOS matching and flashing activities start.
Wait for 2-3 minutes and the FBIOS_LED will stop flashing when the main BIOS flashing is complete.

> After the main BIOS is flashed, the system will reboot automatically and then DualBIOS™ will continue to update the backup BIOS. After completion, the system will reboot again and boot from the main BIOS for normal operation.

## 5-2 APP Center

GIGABYTE App Center gives you easy access to a wealth of GIGABYTE apps that help you get the most from your GIGABYTE motherboard (Note). Using a simple, unified user interface, GIGABYTE App Center allows you to easily launch all GIGABYTE apps installed on your system, check related updates online, and download the apps, drivers, and BIOS.

**Running the APP Center**
Insert the motherboard driver disk. On the Autorun screen, go to **Application Software\Install GIGABYTE Utilities** to install GIGABYTE App Center and the selected apps. Restart your computer after the installation is complete. In Desktop mode, click the App Center icon [   ] in the notification area to launch the App Center utility (Figure 1). On the main menu, you can select an app to run or click **Live Update** to update an app online.
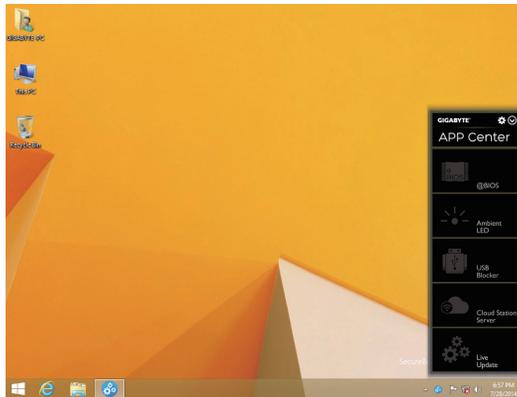


Figure 1

If the App Center is closed, you can restart it by clicking the App Center icon [   ] on the Apps menu (Figure 2).



Figure 2

(Note)      Available applications in APP Center may differ by motherboard model. Supported functions of each application may also differ depending on motherboard specifications.

## 5-2-1 EasyTune

GIGABYTE's EasyTune is a simple and easy-to-use interface that allows users to fine-tune their system settings or do overclock/overvoltage in Windows environment.

**The EasyTune Interface**
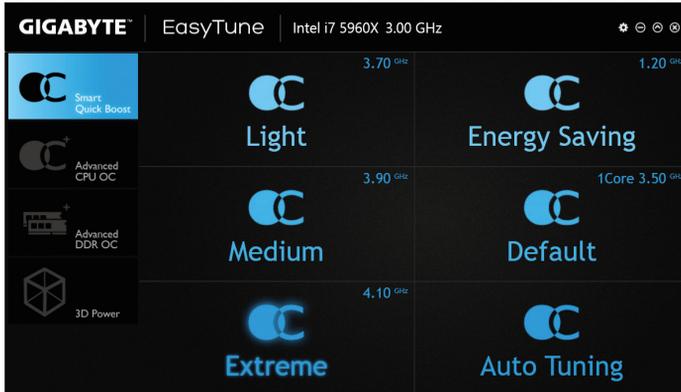


**Tabs Information**

| Tab | Description |
|-----|-------------|
|  | The **Smart Quick Boost** tab provides you with different levels of CPU frequency to choose to achieve desired system performance. After making changes, be sure to restart your system for these changes to take effect. |
|  | The **Advanced CPU OC** tab allows you to set CPU base clock, frequency, and voltages, and integrated graphics frequency. You can save the current settings to a profile. You can create up to 2 profiles. |
|  | The **Advanced DDR OC** tab allows you to set the memory clock. |
|  | The **3D Power** tab allows you to change power phase, voltage, and frequency settings. |

Available functions in EasyTune may differ by motherboard model. Grayed-out area(s) indicates that the item is not configurable or the function is not supported.

Incorrectly doing overclock/overvoltage may result in damage to the hardware components such as CPU, chipset, and memory and reduce the useful life of these components. Before you do the overclock/overvoltage, make sure that you fully know each function of EasyTune, or system instability or other unexpected results may occur.

## 5-2-2    System Information Viewer

GIGABYTE System Information Viewer allows you to monitor and adjust the fan speed in the operating system. You can also display the hardware monitor information on the desktop to view the system status at any time.

**The System Information Viewer Interface**



**Tabs Information**

| Tab | Description |
| --- | --- |
|  | The **System Information** tab provides information on the installed CPU and motherboard and the BIOS version. |
|  | The **Smart Fan Auto** tab allows you to specify a Smart Fan mode. |
|  | The **Smart Fan Advance** tab allows you to adjust the smart fan speed. The fans will run at different speeds according to system temperatures. Using the **Smart Fan** option you can adjust the fan's workload according system temperatures or you can fix the fan speeds using the **RPM Fixed Mode** option. Click the **Calibrate** button and the fan speed will be shown in relation to overall fan workload after calibration. The **Reset** button can revert the fan settings back to the last saved values. |
|  | The **System Alerts** tab allows you to monitor hardware temperature, voltage and fan speed, and set temperature/fan speed alarm. |
|  | The **Record** tab allows you to record changes in system voltages, temperatures, and fan speeds. Please note, the recording will stop if you exit the **Record** tab during the recording process. |

 The speed control function requires the use of a fan with fan speed control design.

### 5-2-3  EZ Setup

The GIGABYTE EZ Setup utility includes the following 'EZ' setups applications that will offer greatly simplified install and configuration procedures: Disk Mode Switch, EZ Smart Response, and XHD.

**Disk Mode Switch**

Disk Mode Switch allows you to switch the operating mode for your hard drive even after it's been installed with an operating system. Supported operating modes include IDE, AHCI, and RAID. You can select a disk mode and restart your computer after the selection.

- Native UEFI mode is not supported.
- Be sure to reinstall the Intel® Rapid Storage Technology utility after you switch the disk mode.
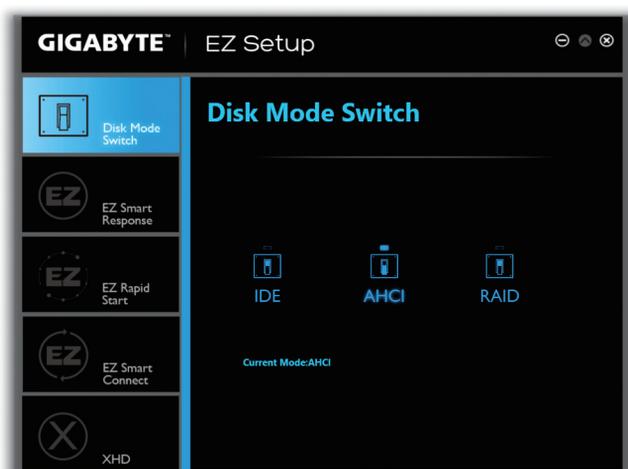
**EZ Smart Response**

**A. System Requirements**
1. An Intel® Chipset-based motherboard supporting this feature
2. Intel® Core series processor
3. Intel® SATA controllers set to RAID mode
4. Intel® Rapid Storage Technology utility installed (Note 1)
5. A conventional SATA disk and an SSD (Note 2)
6. Windows 7 with SP1/Windows 8/Windows 8.1 (Note 3)

> ⚠ If you have installed the operating system before configuring the Smart Response Technology, all original data on the SSD will be lost once you enable RAID mode (Note 4). It is recommended that you back up the hard disk before enabling the Smart Response Technology.

**B. Using EZ Smart Response**
Select **EZ Smart Response** and click **Create**.
To disable this function, click **Delete**.
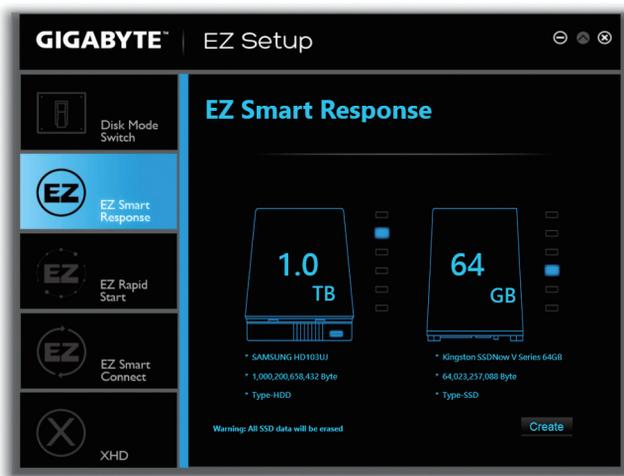


(Note 1)   Before start, make sure you have installed the Intel® Rapid Storage Technology utility (version 11.5 or above).
(Note 2)   The SSD works as a cache of the hard disk. The maximum cache memory size is 64 GB. If you use an SSD larger than 64 GB, the space beyond 64 GB can still be used for storing your data.
(Note 3)   The operating system must be installed to the SATA disk.
(Note 4)   Regardless of the BIOS settings, be it IDE or AHCI mode, the system will be forced to RAID mode.

**XHD**

With GIGABYTE XHD [(Note 1)], users can quickly configure a RAID-ready system for RAID 0 or RAID 1 when a new SATA drive is added. All with a simple click of a button, XHD helps to enhance your hard drive read/write performance without the need for complex and time-consuming configurations.

**A. System Requirements**
1. An Intel® Chipset motherboard supporting RAID
2. Intel® SATA controllers set to RAID mode
3. Intel® Rapid Storage Technology utility installed
4. Windows 7 with SP1/Windows 8/Windows 8.1
5. Intel® SATA controller driver installed

**B. Using XHD**
Select **XHD** and click **Create RAID 0** or **Create RAID 1** based on your need [(Note 2)].
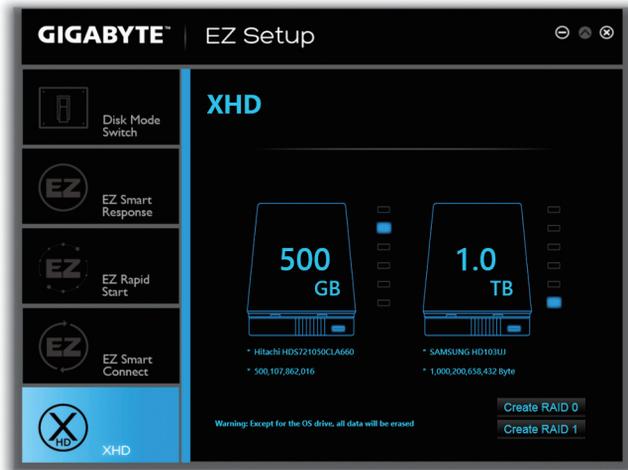
(Note 1)   The XHD utility only supports the SATA connectors controlled by the Intel® Chipset.
(Note 2)   Except for the operating system drive, all data on other hard drive will be deleted. Back up your data before using the XHD utility.

## 5-2-4 Fast Boot

Through the simple GIGABYTE Fast Boot (Note 1) interface, you can enable or change the Fast Boot or Next Boot After AC Power Loss setting right in the operating system.

**The Fast Boot Interface**



**Using Fast Boot**
• **BIOS Fast Boot:**
This option is the same as the **Fast Boot** option (Note 2) in BIOS Setup. It allows you to enable or disable the fast boot function to shorten OS boot time.
• **AC OFF Mode:**
This option is the same as the **Next Boot After AC Power Loss** option (Note 2) in BIOS Setup. It allows you to select the system bootup mode upon the return of an AC power loss. (This mode is configurable only when **BIOS Fast Boot** is set to **Fast** or **Ultra Fast**.)

After you configure the setting, click **Save** to save and click **Exit**. The settings will take effect on next boot. If you click the **Enter BIOS Setup Now** button, the system will restart and enter BIOS Setup immediately.

(Note 1)   This function is supported by Windows 8.1/8 only.
(Note 2)   For more details about this function, refer to Chapter 2, "BIOS Features."

### 5-2-5    Smart TimeLock

GIGABYTE Smart TimeLock allows you to effectively manage computer or Internet usage time with simple rules and options.

**The Smart TimeLock Interface**



**Using Smart TimeLock**

Click the lock icon [icon] on the bottom left corner and enter the password (Note). Set the time when a user can or cannot use your computer for weekdays and weekends. The **Lock Mode** on the bottom right corner allows you to choose to turn off the computer or only close the Internet connection during the specified time period. Click **Save** to save the settings and click **Exit** to exit.

An alert will appear 15 minutes and 1 minute prior to the default shutdown time. When the alert appears, you can enter the password to extend the usage time or click **Cancel** to close the alert. If you respond **Cancel**, you will be requested to enter the password to extend the usage time again when the default shutdown time arrives, or the computer will shutdown right away.

(Note)    You can set the User Password in the system BIOS Setup program to prevent the system time being changed by other users.

## 5-2-6   Smart Recovery 2

Smart Recovery 2 allows you to back up a partition as an image file every hour. You can use these images to restore your system or files when needed.

The Smart Recovery 2 main menu:

| Button | Description |
|---|---|
| Settings | Allows you to select the source and destination partition |
| Backup Now | Allows you to perform the backup immediately |
| File Recovery... | Allows you to recover your files from the backup image |
| System Recovery... | Allows you to recover your system from the backup image |

- Smart Recovery 2 only supports NTFS file system.
- You need to select the destination partition in **Settings** the first time you use Smart Recovery 2.
- The Backup Now button will be available only after you log in Windows for ten minutes.
- Select the **Always run on next reboot** checkbox to automatically enable Smart Recovery2 after system reboot.

**Creating a backup:**
Click the **Settings** button on the main menu. In the **Settings** dialog box, select the source partition and destination partition and click **OK**. The initial backup will start after 10 minutes and regular backup will be performed hourly. Note: By default, all partitions on the system drive are selected as the backup source. The backup destination cannot be on the same partition as the backup source.

**Saving the backup to a network location:**
If you want to save the backup to a network location, select **Browse network location**. Make sure your computer and the computer where you want to save the backup are in the same domain. Choose the network location where you want to store the backup and enter the user name and password. Follow the on-screen instructions to complete.
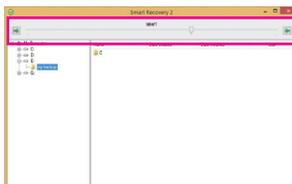
**Recovering a file:**
Click the **File Recovery** button on the main menu. Use the time slider on the top of the popped out window to select a previous backup time. The right pane will display the backed-up partitions in the backup destination (in the **My Backup** folder). Browse to the file you want and copy it.

**Recovering your system with Smart Recovery 2:**

Steps:
1. Click the **System Recovery** button on the main menu.
2. Select the location where your backup is saved.
3. Use the time slider to select a time point.
4. Select a partition backup created on the selected time point and click **Restore**.
5. Confirm whether to restart your system to proceed with the restore immediately or later. Once you respond "Yes" the system will restart to the Windows recovery environment. Follow the onscreen instructions to restore your system.

⚠ All of your files and programs will be deleted and replaced with those on the selected backup. If needed, be sure to make a copy of your data before the restore.

### 5-2-7    USB Blocker

GIGABYTE USB Blocker provides you with an easy-to-use interface that allows you to block certain USB device types on your PC. Devices classes that are blocked will be ignored by the operating system.

**The USB Blocker Interface**



**Using USB Blocker**
Select the class of USB device that you would like to block or unblocked. Double left-click to change the **Blocked** or **Unblocked** status and click **OK**. Then enter your password and click **OK** to complete.

## 5-2-8    Ambient LED

GIGABYTE Ambient LED allows you to enable or change the display mode for the onboard audio LED and rear panel I/O shield LED [(Note)] while in the Windows environment.

**The Ambient LED Interface**
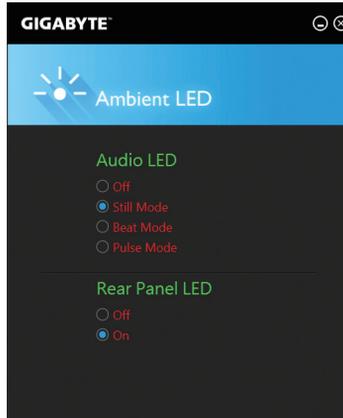


**Using Ambient LED**
*   **Audio LED (display mode of the onboard audio LED):**
    **Off** -- Disables this function.
    **Still Mode** -- The LED stays constantly on.
    **Beat Mode** -- The brightness of the LED changes according to music rhythm.
    **Pulse Mode** -- The brightness of the LED changes slowly and smoothly like breath.

*   **Rear panel LED (display mode of the rear panel I/O shield LED)** [(Note)]**:**
    **Off** -- Disables this function.
    **On** -- The LED will light and follow the behavior of the onboard audio LED.

(Note)    This function only works for motherboards with an I/O shield that has audio LED.

### 5-2-9 V-Tuner

GIGABYTE V-Tuner [(Note 1)] allows you to easily fine-tune your graphics card in the Windows environment. You can manually overclock the GPU and memory [(Note 2)] or adjust the fan speed and power settings. It also allows you to monitor your graphic card status at any time.

**The V-Tuner Interface**



**Using V-Tuner**

You can manually select the values of each item or use the sliders for adjustment and then click **Apply**. To set the fan speed you need to select **Manual** first. You can save the current settings to a profile and create up to 4 profiles. To check the graphics card status, you can click the icon on the top right corner.

(Note 1) Before using V-Tuner, be sure to install the graphics card driver first.
(Note 2) Adjustable items may vary by graphics cards.

## 5-2-10 Smart Switch

GIGABYTE Smart Switch provides you with the conventional Windows start menu, allowing you to easily access to the apps that you frequently use. You can also select the default screen displayed after you enter Windows.

**The Smart Switch Interface**
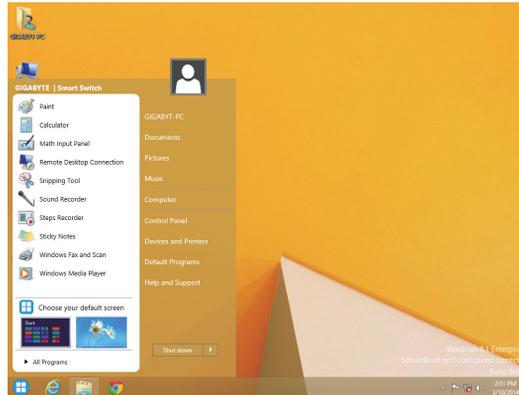


**Using Smart Switch**

The Smart Switch icon [icon] will appear on the bottom left corner of the traditional Windows desktop screen after Smart Switch is installed. Left-click the icon to see the screen as that shown above and you can set the default screen displayed after you enter Windows.

### 5-2-11 Cloud Station Server

GIGABYTE Cloud Station Server is composed of several GIGABYTE's unique apps that allow your smart phone/ tablet device to communicate, share resources, and control desktop PCs via wireless connection.

**Before You Begin:**
• To use the HomeCloud, GIGABYTE Remote, and Remote OC functions, you must install GIGABYTE Cloud Station on your smart phone/tablet device as well. (For Android system, please download the app from Google Play; for iOS system, please download it from App Store.) (Note 1)
• Your smart phone/tablet device must have Android 4.0/iOS 6.0 or above version.
• The first time you use HomeCloud, GIGABYTE Remote, and Remote OC, you must click **Login with Google** or **Login with Facebook** to sign in with your Google or Facebook account. Be sure to use the same account to sign in to the three apps on your smart phone/tablet device as well.

**HomeCloud**
HomeCloud allows you to share the files (Note 2) between your smart phone/tablet device and computer or back up the files from the device to the computer.



**The HomeCloud Interface:**
**Using HomeCloud**
Step 1:
Launch HomeCloud on your computer and click **Login with Google** or **Login with Facebook** to sign in with your Google or Facebook account or select the account on the **Account List**. Then enable **HomeCloud Function**. To automatically enable this function after system reboot, enable **Always run on next reboot**.
Step 2:
Run GIGABYTE Cloud Station on your smart phone/tablet device, sign in with the same account you use for HomeCloud on your computer. Tap on **HomeCloud** to perform the following functions:

(Note 1) You can use your smart phone/tablet device to scan the QR code on the HomeCloud UI to link to the download page of the GIGABYTE Cloud Station on App Store or Google Play.
(Note 2) For iOS systems, the file types are limited to image/video files.

**On the Computer:**

| Option | Function |
|---|---|
| Account List | Displays currently signed in account(s). |
| Remove | Remove the selected account. |
| Share Folder | Displays the shared folder directory of the currently signed in account. |
| Open Folder | Access the shared folder of the currently signed in account. |

**On the Smart Phone/Tablet Device:**

| Option | Function |
|---|---|
| All Picture Files | File Upload: Tap on the folder, browse and select the files inside. Tap on the menu icon and select **Upload selected Files** to upload the files to your computer. To open a file, tap on it for about 1 second (for iOS systems only). File Download: Tap on the folder and then tap on the menu icon, select **Download Files**. You can browse the files and select the files that you want to download to your smart phone/tablet device. |
| All Music Files | |
| All Video Files | |
| All Files | |
| User Contacts | Tap on the folder and then tap on the menu icon to use the options including **Backup to remote**, **Restore From remote**, **View Remote Contact**, and **Reselect Computers**. |
| Call Log | |

**GIGABYTE Remote**

GIGABYTE Remote allows you to use your smart phone/tablet device to remotely control the mouse/keyboard/ Windows Media Player on your computer.

**The GIGABYTE Remote Interface**



**Using GIGABYTE Remote**

Step 1:

Launch GIGABYTE Remote on your computer and enable **GIGABYTE Remote Function**. To automatically enable this function after system reboot, enable **Always run on next reboot**.

Step 2:

Run GIGABYTE Cloud Station on your smart phone/tablet device, sign in with the same account you use for HomeCloud on your computer. Tap on **Remote Control** to perform the following remote controls:

**On the Smart Phone/Tablet Device:**

| Option | Function |
|---|---|
| Mouse | Remotely perform mouse functionalities including dragging, right/left-clicking, and holding the mouse left button. |
| Keyboard | Remotely control your keyboard such as text input (tap on Real-Time Mode to type texts) or deletion. |
| Media | Remotely configure and control the currently running Windows Media Player application on your computer. |

**Remote OC**

Remote OC provides you with remote control options including overclocking and system tweaking, system monitoring plus the ability to also remotely power down/reset the PC when needed.

**The Remote OC Interface**



**Using Remote OC**

Step 1:

Launch Remote OC on your computer and enable **Remote OC Function**. To automatically enable this function after system reboot, enable **Always run on next reboot**.

Step 2:

Run GIGABYTE Cloud Station on your smart phone/tablet device, sign in with the same account you use for HomeCloud on your computer. Tap on **Remote OC** to perform the following functions:

**On the Smart Phone/Tablet Device:**

| Option | Function |
|---|---|
| Tuner | Allows you to change CPU/memory frequency and voltage settings. |
| INFO | Displays the system information, including the CPU, motherboard, and memory. |
| HW MONIT | Allows you to monitor system temperatures, voltages, and fan speeds. |
| QUICK BOOST | Provides you with three preset overclocking configurations. |
| CONTROL | Allows you to remotely reboot or shut down your computer. |

**AutoGreen**

AutoGreen is an easy-to-use tool that provides users with simple options to enable system power savings via a Bluetooth-enabled smart phone/tablet device. When the device is out of the range of the computer's Bluetooth receiver, the system will enter the specified power saving mode. Before using this app, you need to turn on Bluetooth on both your computer and smart phone/tablet device.

**The AutoGreen Interface**



**Bluetooth Devices Tab:**

The **Bluetooth** tab allows you to pair your smart phone/tablet device with the Bluetooth receiver on your computer. Press **Refresh** to let AutoGreen search for the Bluetooth devices around you. From the displayed list, select your smart phone/tablet device and a message which says "Tap to set up your.." will appear. Click to confirm. A message will appear on both your computer and smart phone/tablet device prompting you to compare the passcodes on the two devices. Confirm to complete the pairing.process.

• **Device Scan Time:**
  Set the length of time that AutoGreen will search for your smart phone/tablet device, ranging from 2 to 30 seconds.
• **Rescan Times:**
  Set how many times AutoGreen will search for your smart phone/tablet device if it does not detect it, ranging from 2 to 10 times. If the device is still not detected, the system will enter the selected power saving mode.

**Control Tab:**

The **Control** tab allows you to select a system power saving mode.

| Button | Description |
|---|---|
| Standby | Enters Power on Suspend mode |
| Suspend | Enters Suspend to RAM mode |
| Hibernate | Enters Suspend to Disk mode |
| Disable | Disables this function |

**User Account Tab:**

On the **User Account** tab, you can enter your Windows user account password and confirm. Later, when you awaken your system from Suspend/Hibernate mode you can enter Windows directly without entering the user account password.

(Note)   Once your smart phone/tablet device has been paired with your AutoGreen-enabled computer, you'll not be able to use it to connect to other Bluetooth device(s).

**HotSpot**

HotSpot turns your computer into a virtual wireless access point and allows you to share your connection with your other wireless devices. Make sure your computer has been connected to a network and Wi-Fi is enabled.

**The HotSpot Interface**



**Using HotSpot:**

Configuring your computer:

The options are as follows. Make sure to click **Start** to complete.

• **Shared Connection:**

Select a currently running network connection you want to share.

• **HOTSPOT Connection:**

Select a network virtual adapter. If there are more than one Wi-Fi card on your computer, you need to select the one you want to use from the list.

• **HotSpot SSID:**

The hotspot SSID name. You can keep the default name or create your own one.

• **HotSpot Password:**

The password is required when other wireless devices want to access the Internet through the virtual wireless access point. You can keep the default name or create your own one. The password must have at least 8 characters and cannot be empty.

**Sharing your connection with other wireless devices:**

First make sure Wi-Fi is enabled on the wireless devices. Then browse to the network configuration screen, search for available Wi-Fi networks, and tap the name of your virtual wireless access point, enter the password, and confirm.

## Chapter 6    Appendix

## 6-1    Configuring Audio Input and Output

### 6-1-1    Configuring 2/4/5.1/7.1-Channel Audio

The motherboard provides five audio jacks on the back panel which support 2/4/5.1/7.1-channel (Note) audio. The picture to the right shows the default audio jack assignments.

The integrated HD (High Definition) audio provides jack retasking capability that allows the user to change the function for each jack through the audio driver. (Supported functions for each jack may vary based on hardware specification.)

Center/Subwoofer Speaker Out
Line In
Rear Speaker Out
Front Speaker Out
Mic In

• To install a microphone, connect your microphone to the Mic in jack and manually configure the jack for microphone functionality.
• To configure 4/5.1/7.1-channel audio, you have to retask one of the audio jacks to be Side speaker out through the audio driver.
• Audio signals will be present on both of the front and back panel audio connections simultaneously. If you want to mute the back panel audio (only supported when using an HD front panel audio module), refer to instructions on the next page.

**High Definition Audio (HD Audio)**
HD Audio includes multiple high quality digital-to-analog converters (DACs) and features multistreaming capabilities that allow multiple audio streams (in and out) to be simultaneously processed. For example, users can listen to MP3 music, have an Internet chat, make a telephone call over the Internet, and etc. all at the same time.

**A. Configuring Speakers**
(The following instructions use Windows 8.1 as the example operating system.)

Step 1:
After installing the audio driver, restart your computer. Then switch to Windows desktop mode. The **HD Audio Manager** icon  will appear in the notification area. Double-click the icon to access the **HD Audio Manager**.

4:31 PM
5/22/2014
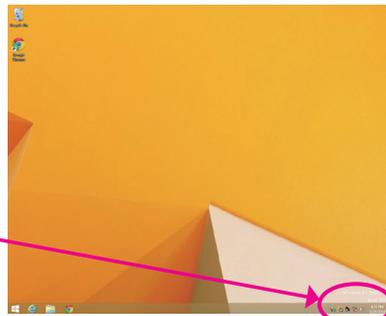
(Note)    2/4/5.1/7.1-Channel Audio Configurations:
Refer to the following for multi-channel speaker configurations.
• 2-channel audio: Headphone or Line out.
• 4-channel audio: Front speaker out and Rear speaker out.
• 5.1-channel audio: Front speaker out, Rear speaker out, and Center/Subwoofer speaker out.
• 7.1-channel audio: Front speaker out, Rear speaker out, Center/Subwoofer speaker out, and Side speaker out.

Step 2:

Connect an audio device to an audio jack. The **The current connected device is** dialog box appears. Select the device according to the type of device you connect. Then click **OK**.



Step 3:

On the **Speakers** screen, click the **Speaker Configuration** tab. In the **Speaker Configuration** list, select **Stereo**, **Quadraphonic**, **5.1 Speaker**, or **7.1 Speaker** according to the type of speaker configuration you wish to set up. Then the speaker setup is completed.



## B. Configuring Sound Effect

You may configure an audio environment on the **Sound Effects** tab.

## C. Activating an AC'97 Front Panel Audio Module

If your chassis provides an AC'97 front panel audio module, to activate the AC'97 functionality, click the **Tool** icon 🔘 on the right bottom of the screen . On the **Connector Settings** dialog box, select the **Disable front panel jack detection** check box. Click **OK** to complete.



## D. Muting the Back Panel Audio (For HD Audio Only)

Click **Device advanced settings** icon ⚙ on the right bottom of the screen to open the **Device advanced settings** dialog box. Select the **Mute the rear output device, when a front headphone plugged in** check box. Click **OK** to complete.

## 6-1-2    Configuring S/PDIF Out

The S/PDIF Out jack can transmit audio signals to an external decoder for decoding to get the best audio quality.

**1. Connecting a S/PDIF Out Cable:**
Connect a S/PDIF optical cable to an external decoder for transmitting the S/PDIF digital audio signals.



Connects to a S/PDIF optical cable

**2. Configuring S/PDIF Out:**
On the **Digital Output(Optical)** screen (Note), click the **Default Format** tab and then select the sample rate and bit depth. Click **OK** to complete.



(Note)    Enter the **Digital Output(Optical)** screen to configure further settings if you use the S/PDIF Out connector(s) on the back panel for digital audio output or enter the **Digital Output** screen if you use the internal S/PDIF Out connector (SPDIF_O) for digital audio output.

## 6-1-3 Configuring Microphone Recording

Step 1:
Switch to Windows desktop mode. The **HD Audio Manager** icon  will appear in the notification area. Double-click the icon to access the **HD Audio Manager**.
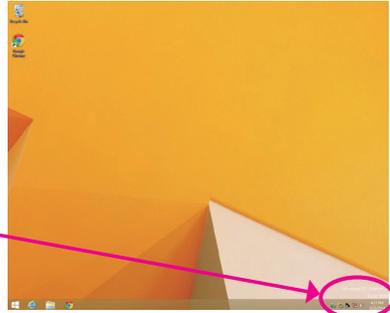
Step 2:
Connect your microphone to the Mic in jack (pink) on the back panel or the Mic in jack (pink) on the front panel. Then configure the jack for microphone functionality.
Note: The microphone functions on the front panel and back panel cannot be used at the same time.

Step 3:
Go to the **Microphone** screen. Do not mute the recording volume, or you'll not be able to record the sound. To hear the sound being recorded during the recording process, do not mute the playback volume. It is recommended that you set the volumes at a middle level.

Step 4:
To raise the recording and playback volume for the microphone, you can set the Microphone Boost level on the right of the **Recording Volume** slider.

Step 5:

To open the **Sounder Recorder,** move the mouse cursor to the bottom left corner of the screen, click the **Start** [icon] icon to switch to the **Start** screen (or press the Windows button on the keyboard). Click the [icon] icon on the bottom left corner of the screen to access the **Apps** screen.

Step 6:

On this screen, click **Sound Recorder** for audio recording.
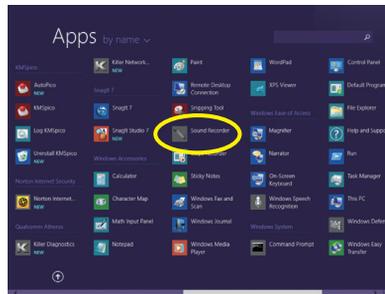
**\* Enabling Stereo Mix**

If the HD Audio Manager does not display the recording device you wish to use, refer to the steps below. The following steps explain how to enable Stereo Mix (which may be needed when you want to record sound from your computer).

Step 1:

Switch to Windows desktop mode. Locate the [icon] icon in the notification area and right-click on this icon. Select **Recording Devices**.
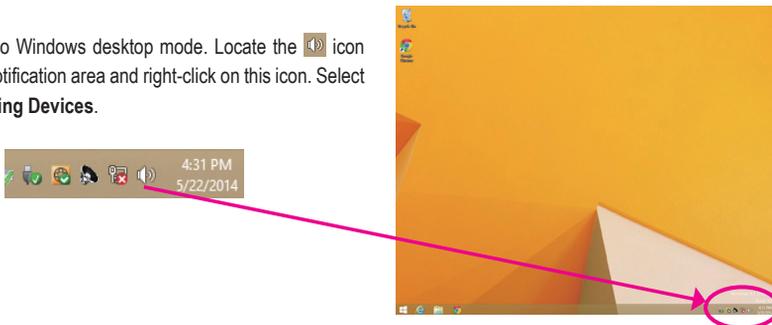
Step 2:
On the **Recording** tab, right-click on an empty space and select **Show Disabled Devices**.
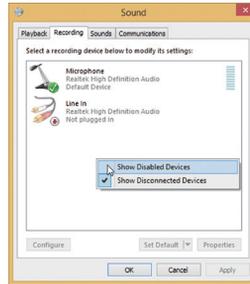
Step 3:
When the **Stereo Mix** item appears, right-click on this item and select **Enable**. Then set it as the default device.

Step 4:
Now you can access the **HD Audio Manager** to configure **Stereo Mix** and use **Sound Recorder** to record the sound.

## 6-1-4    Using the Sound Recorder

### A. Recording Sound
1.  Make sure you have connected the sound input device (e.g. microphone) to the computer.
2.  To record the audio, click the **Start Recording** button ● Start Recording .
3.  To stop recording audio, click the **Stop Recording** button ■ Stop Recording .
Be sure to save the recorded audio file upon completion.

### B. Playing the Recorded Sound
You can play your recording in a digital media player program that supports your audio file format.

## 6-2    Troubleshooting

### 6-2-1    Frequently Asked Questions
To read more FAQs for your motherboard, please go to the **Support & Downloads\FAQ** page on GIGABYTE's website.

Q:  Why is the light of my keyboard/optical mouse still on after the computer shuts down?
A:  Some motherboards provide a small amount of standby power after the computer shuts down and that's why the light is still on.

Q:  How do I clear the CMOS values?
A:  For motherboards that have a Clear CMOS button, press this button to clear the CMOS values (before doing this, please turn off the computer and unplug the power cord). For motherboards that have a Clear CMOS jumper, refer to the instructions in Chapter 1 to short the jumper to clear the CMOS values. If your board doesn't have this jumper/button, refer to the instructions on the motherboard battery in Chapter 1. You can temporarily remove the battery from the battery holder to stop supplying power to the CMOS, which will clear the CMOS values after about one minute.

Q:  Why do I still get a weak sound even though I have turned my speaker to the maximum volume?
A:  Make sure your speaker is equipped with an internal amplifier. If not, try a speaker with power/amplifier.

## 6-2-2    Troubleshooting Procedure

If you encounter any troubles during system startup, follow the troubleshooting procedure below to solve the problem.

```
                              ( START )
                                  │
                                  ▼
        ┌──────────────────────────────────────────────────┐
        │ Turn off the power. Remove all peripherals,       │
        │ connecting cables, and power cord etc.            │
        └──────────────────────────────────────────────────┘
                                  │
                                  ▼
        ╱──────────────────────────────────────────╲        ┌────────────────────────┐
        ╲ Make sure the motherboard does not short- ╱  Yes   │ Isolate the short      │
        ╱ circuit with the chassis or other metal   ╲ ─────▶ │ circuit.               │
        ╲ objects.                                   ╱        └────────────────────────┘
                                  │  No
                                  ▼                    The problem is verified and solved.
        ╱──────────────────────────────────────────╲        ┌────────────────────────┐
        ╲ Check if the CPU cooler is attached to    ╱        │ Secure the CPU cooler  │
        ╱ the CPU securely. Is the power connector   ╲  No    │ on the CPU. Connect the│
        ╲ of the CPU cooler connected to the         ╱ ─────▶ │ CPU cooler power cable │
        ╱ CPU_FAN header properly?                   ╲        │ to the motherboard.    │
                                  │  Yes                      └────────────────────────┘
                                  ▼                    The problem is verified and solved.
        ╱──────────────────────────────────────────╲        ┌────────────────────────┐
        ╲ Check if the memory is installed properly  ╱  No    │ Correctly insert the   │
        ╱ on the memory slot.                        ╲ ─────▶ │ memory into the memory │
        ╲                                            ╱        │ socket.                │
                                  │  Yes                      └────────────────────────┘
                                  ▼                    The problem is verified and solved.
        ┌──────────────────────────────────────────────────┐
        │ Insert the graphics card. Connect the ATX main    │
        │ power cable and the 12V power cable. Turn on the   │
        │ power to start the computer.                       │
        └──────────────────────────────────────────────────┘
                                  │     Make sure the graphics card is securely seated
                                  │     in the expansion slot and power connectors are
                                  ▼     firmly attached.
                                ( A )

                            (Continued...)
```

```
                                    ┌─────┐
                                    │  A  │
                                    └──┬──┘
                                       │
                                       ▼
┌───────────────────────────────────────────────────┐  No  ┌──────────────────────┐
│  When the computer is turned on, is the CPU cooler │─────▶│ The power supply, CPU or│
│  running?                                          │      │ CPU socket might fail. │
└───────────────────────────────────────────────────┘      └──────────────────────┘
                       Yes ◀────────────────────────────
                        │         The problem is verified and solved.
                        ▼
┌───────────────────────────────────────────────────┐  No  ┌──────────────────────┐
│  Check if there is display on your monitor.        │─────▶│ The graphics card,    │
│                                                    │      │ expansion slot, or monitor│
│                                                    │      │ might fail.           │
└───────────────────────────────────────────────────┘      └──────────────────────┘
                       Yes ◀────────────────────────────
                        │         The problem is verified and solved.
                        ▼
┌───────────────────────────────────────────────────┐
│  Turn off the computer. Plug in the keyboard and   │
│  mouse and restart the computer.                   │
└───────────────────────────────────────────────────┘
                        │
                        ▼
┌───────────────────────────────────────────────────┐  No  ┌──────────────────────┐
│  Check if the keyboard is working properly.        │─────▶│ The keyboard or keyboard│
│                                                    │      │ connector might fail.  │
└───────────────────────────────────────────────────┘      └──────────────────────┘
                       Yes ◀────────────────────────────
                        │         The problem is verified and solved.
                        ▼
┌───────────────────────────────────────────────────┐
│  Press <Delete> to enter BIOS Setup. Select "Load  │
│  Optimized Defaults." Select "Save & Exit Setup" to│
│  save changes and exit BIOS Setup.                 │
└───────────────────────────────────────────────────┘
                        │
                        ▼
┌───────────────────────────────────────────────────┐  No  ┌──────────────────────┐
│  Turn off the computer and connect the hard        │─────▶│ The hard drive, connector,│
│  drive(s). Check if the system can boot            │      │ or cable might fail.   │
│  successfully.                                     │      │                        │
└───────────────────────────────────────────────────┘      └──────────────────────┘
                       Yes ◀────────────────────────────
                        │         The problem is verified and solved.
                        ▼
┌───────────────────────────────────────────────────┐
│  Reinstall the operating system. Reinstall other   │
│  devices one by one (install one device at one     │
│  time and then boot the system to see if the       │
│  device works successfully).                       │
└───────────────────────────────────────────────────┘
                        │
                        ▼
                    ┌───────┐
                    │  END  │
                    └───────┘
```

If the procedure above is unable to solve your problem, contact the place of purchase or local dealer for help. Or go to the **Support & Downloads\Technical Support** page to submit your question. Our customer service staff will reply you as soon as possible.

## 6-3   Debug LED Codes

**Regular Boot**

| Code | Description |
|------|-------------|
| 10 | PEI Core is started. |
| 11 | Pre-memory CPU initialization is started. |
| 12~14 | Reserved. |
| 15 | Pre-memory North-Bridge initialization is started. |
| 16~18 | Reserved. |
| 19 | Pre-memory South-Bridge initialization is started. |
| 1A~2A | Reserved. |
| 2B~2F | Memory initialization. |
| 31 | Memory installed. |
| 32~36 | CPU PEI initialization. |
| 37~3A | IOH PEI initialization. |
| 3B~3E | PCH PEI initialization. |
| 3F~4F | Reserved. |
| 60 | DXE Core is started. |
| 61 | NVRAM initialization. |
| 62 | Installation of the PCH runtime services. |
| 63~67 | CPU DXE initialization is started. |
| 68 | PCI host bridge initialization is started. |
| 69 | IOH DXE initialization. |
| 6A | IOH SMM initialization. |
| 6B~6F | Reserved. |
| 70 | PCH DXE initialization. |
| 71 | PCH SMM initialization. |
| 72 | PCH devices initialization. |
| 73~77 | PCH DXE initialization (PCH module specific). |
| 78 | ACPI Core initialization. |
| 79 | CSM initialization is started. |
| 7A~7F | Reserved for AMI use. |
| 80~8F | Reserved for OEM use (OEM DXE initialization codes). |
| 90 | Phase transfer to BDS (Boot Device Selection) from DXE. |
| 91 | Issue event to connect drivers. |

| Code | Description |
|------|-------------|
| 92 | PCI Bus initialization is started. |
| 93 | PCI Bus hot plug initialization. |
| 94 | PCI Bus enumeration for detecting how many resources are requested. |
| 95 | Check PCI device requested resources. |
| 96 | Assign PCI device resources. |
| 97 | Console Output devices connect (ex. Monitor is lighted). |
| 98 | Console input devices connect (ex. PS2/USB keyboard/mouse are activated). |
| 99 | Super IO initialization. |
| 9A | USB initialization is started. |
| 9B | Issue reset during USB initialization process. |
| 9C | Detect and install all currently connected USB devices. |
| 9D | Activated all currently connected USB devices. |
| 9E~9F | Reserved. |
| A0 | IDE initialization is started. |
| A1 | Issue reset during IDE initialization process. |
| A2 | Detect and install all currently connected IDE devices. |
| A3 | Activated all currently connected IDE devices. |
| A4 | SCSI initialization is started. |
| A5 | Issue reset during SCSI initialization process. |
| A6 | Detect and install all currently connected SCSI devices. |
| A7 | Activated all currently connected SCSI devices. |
| A8 | Verify password if needed. |
| A9 | BIOS Setup is started. |
| AA | Reserved. |
| AB | Wait user command in BIOS Setup. |
| AC | Reserved. |
| AD | Issue Ready To Boot event for OS Boot. |
| AE | Boot to Legacy OS. |
| AF | Exit Boot Services. |
| B0 | Runtime AP installation begins. |
| B1 | Runtime AP installation ends. |
| B2 | Legacy Option ROM initialization. |
| B3 | System reset if needed. |

| Code | Description |
|------|-------------|
| B4 | USB device hot plug-in. |
| B5 | PCI device hot plug. |
| B6 | Clean-up of NVRAM. |
| B7 | Reconfigure NVRAM settings. |
| B8~BF | Reserved. |
| C0~CF | Reserved. |

### S3 Resume

| Code | Description |
|------|-------------|
| E0 | S3 Resume is started (called from DXE IPL). |
| E1 | Fill boot script data for S3 resume. |
| E2 | Initializes VGA for S3 resume. |
| E3 | OS S3 wake vector call. |

### Recovery

| Code | Description |
|------|-------------|
| F0 | Recovery mode will be triggered due to invalid firmware volume detection. |
| F1 | Recovery mode will be triggered by user decision. |
| F2 | Recovery is started. |
| F3 | Recovery firmware image is found. |
| F4 | Recovery firmware image is loaded. |
| F5~F7 | Reserved for future AMI progress codes. |

### Error

| Code | Description |
|------|-------------|
| 50~55 | Memory initialization error occurs. |
| 56 | Invalid CPU type or speed. |
| 57 | CPU mismatch. |
| 58 | CPU self test failed or possible CPU cache error. |
| 59 | CPU micro-code is not found or micro-code update is failed. |
| 5A | Internal CPU error. |
| 5B | Reset PPI is failed. |
| 5C~5F | Reserved. |
| D0 | CPU initialization error. |
| D1 | IOH initialization error. |

| Code | Description |
|------|-------------|
| D2 | PCH initialization error. |
| D3 | Some of the Architectural Protocols are not available. |
| D4 | PCI resource allocation error. Out of Resources. |
| D5 | No Space for Legacy Option ROM initialization. |
| D6 | No Console Output Devices are found. |
| D7 | No Console Input Devices are found. |
| D8 | It is an invalid password. |
| D9~DA | Can't load Boot Option. |
| DB | Flash update is failed. |
| DC | Reset protocol is failed. |
| DE~DF | Reserved. |
| E8 | S3 resume is failed. |
| E9 | S3 Resume PPI is not found. |
| EA | S3 Resume Boot Script is invalid. |
| EB | S3 OS Wake call is failed. |
| EC~EF | Reserved. |
| F8 | Recovery PPI is invalid. |
| F9 | Recovery capsule is not found. |
| FA | Invalid recovery capsule. |
| FB~FF | Reserved. |

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### Regulatory Notices
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This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult a dealer or experienced TV/radio technician for help.

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- This Class B digital apparatus complies with Canadian ICES-003 and RSS-210.
- Operation is subject to the following two conditions: (1) this device may not cause interference, and (2) this device must accept any interference, including interference that may cause undesired operation of the device.
- Cet appareil numérique de classe B est conforme aux normes canadiennes ICES-003 et RSS-210.
- Son fonctionnement est soumis aux deux conditions suivantes : (1) cet appareil ne doit pas causer d'interférence et (2) cet appareil doit accepter toute interférence, notamment les interférences qui peuvent affecter son fonctionnement.

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