ROG STRIX B550-I

BIOS Manual

Motherboard

E17670
First Edition
November 2020

Contents

BIOS Setup

1. Knowing BIOS

The new ASUS UEFI BIOS is a Unified Extensible Interface that complies with UEFI architecture, offering a user-friendly interface that goes beyond the traditional keyboard-only BIOS controls to enable a more flexible and convenient mouse input. You can easily navigate the new UEFI BIOS with the same smoothness as your operating system. The term “BIOS” in this user manual refers to “UEFI BIOS” unless otherwise specified.

BIOS (Basic Input and Output System) stores system hardware settings such as storage device configuration, overclocking settings, advanced power management, and boot device configuration that are needed for system startup in the motherboard CMOS. In normal circumstances, the default BIOS settings apply to most conditions to ensure optimal performance. **DO NOT change the default BIOS settings** except in the following circumstances:

- An error message appears on the screen during the system bootup and requests you to run the BIOS Setup.
- You have installed a new system component that requires further BIOS settings or update.

Inappropriate BIOS settings may result to instability or boot failure. **We strongly recommend that you change the BIOS settings only with the help of a trained service personnel**.

- When downloading or updating the BIOS file for your motherboard, rename it as **XXXXX.CAP**. The name of the CAP file varies depending on models. Refer to the user manual that came with your motherboard for the name.
- The screenshots in this manual are for reference only, please refer to the latest BIOS version for settings and options.
- BIOS settings and options may vary due to different BIOS release versions or CPU installed. Please refer to the latest BIOS version for settings and options.

2. BIOS setup program

Use the BIOS Setup to update the BIOS or configure its parameters. The BIOS screen include navigation keys and brief onscreen help to guide you in using the BIOS Setup program.

Entering BIOS at startup

To enter BIOS Setup at startup, press <Delete> or <F2> during the Power-On Self Test (POST). If you do not press <Delete> or <F2>, POST continues with its routines.

Entering BIOS Setup after POST

To enter BIOS Setup after POST:

- Press <Ctrl>+<Alt>+<Delete> simultaneously.
- Press the reset button on the system chassis.
- Press the power button to turn the system off then back on. Do this option only if you failed to enter BIOS Setup using the first two options.

After doing either of the three options, press <Delete> key to enter BIOS.

- The BIOS setup screens shown in this section are for reference purposes only, and may not exactly match what you see on your screen.
- Ensure that a USB mouse is connected to your motherboard if you want to use the mouse to control the BIOS setup program.
- If the system becomes unstable after changing any BIOS setting, load the default settings to ensure system compatibility and stability. Select the **Load Optimized Defaults** item under the **Exit** menu or press hotkey **<F5>**. See section **Exit menu** for details.
- If the system fails to boot after changing any BIOS setting, try to clear the CMOS and reset the motherboard to the default value. See your motherboard manual for information on how to erase the RTC RAM.
- The BIOS setup program does not support Bluetooth devices.

BIOS menu screen

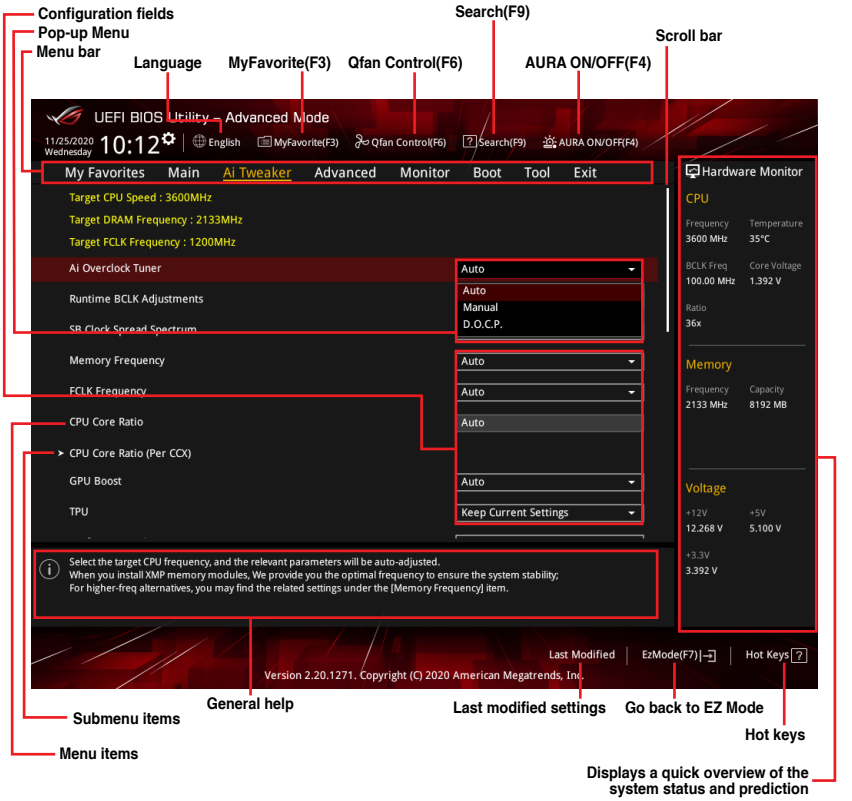
The BIOS Setup program can be used under two modes: **EZ Mode** and **Advanced Mode**. You can change modes from **Setup Mode** in **Boot menu** or by pressing the <F7> hotkey.

The BIOS settings and options for each motherboard may differ slightly with the options in this manual. Please refer to the BIOS of your motherboard for the settings and options.

2.1 Advanced Mode

The Advanced Mode provides advanced options for experienced end-users to configure the BIOS settings. The figure below shows an example of the Advanced Mode. Refer to the following sections for the detailed configurations.

The default screen for entering the BIOS setup program can be changed. Refer to the **Setup Mode** item in section **Boot menu** for details.



Menu bar

The menu bar on top of the screen has the following main items:

My Favorites	For saving the frequently-used system settings and configuration.
Main	For changing the basic system configuration
Ai Tweaker	For changing the overclocking settings
Advanced	For changing the advanced system settings
Monitor	For displaying the system temperature, power status, and changing the fan settings.
Boot	For changing the system boot configuration
Tool	For configuring options for special functions
Exit	For selecting the exit options and loading default settings

Menu items

The highlighted item on the menu bar displays the specific items for that menu. For example, selecting **Main** shows the Main menu items.

The other items (My Favorites, Extreme Tweaker, Advanced, Monitor, Boot, Tool, and Exit) on the menu bar have their respective menu items.

Submenu items

A greater than sign (>) before each item on any menu screen means that the item has a submenu. To display the submenu, select the item and press <Enter>.

Language

This button above the menu bar contains the languages that you can select for your BIOS. Click this button to select the language that you want to display in your BIOS screen.

My Favorites(F3)

This button above the menu bar shows all BIOS items in a Tree Map setup. Select frequently-used BIOS settings and save it to MyFavorites menu.

Refer to section **My Favorites** for more information.

Q-Fan Control(F6)

This button above the menu bar displays the current settings of your fans. Use this button to manually tweak the fans to your desired settings.

Refer to section **QFan Control** for more information.

Search (F9)

This button allows you to search for BIOS items by entering its name, enter the item name to find the related item listing.

AURA ON/OFF(F4)

This button allows you to turn the RGB LED lighting or functional LED on or off.

[All On]: All LEDs (Aura or Functional) will be enabled.

[Aura Only]: Aura LEDs will be enabled and functional LEDs will be disabled.

[Aura Off]: Aura LEDs will be disabled, however functional LEDs will still be enabled.

[Stealth Mode]: All LEDs (Aura and Functional) will be disabled.

Hot keys

This button above the menu bar contains the navigation keys for the BIOS setup program. Use the navigation keys to select items in the menu and change the settings.

Scroll bar

A scroll bar appears on the right side of a menu screen when there are items that do not fit on the screen. Press the Up/Down arrow keys or <Page Up> / <Page Down> keys to display the other items on the screen.

General help

At the bottom of the menu screen is a brief description of the selected item. Use <F12> key to capture the BIOS screen and save it to the removable storage device.

Configuration fields

These fields show the values for the menu items. If an item is user-configurable, you can change the value of the field opposite the item. You cannot select an item that is not user-configurable.

A configurable field is highlighted when selected. To change the value of a field, select it and press <Enter> to display a list of options.

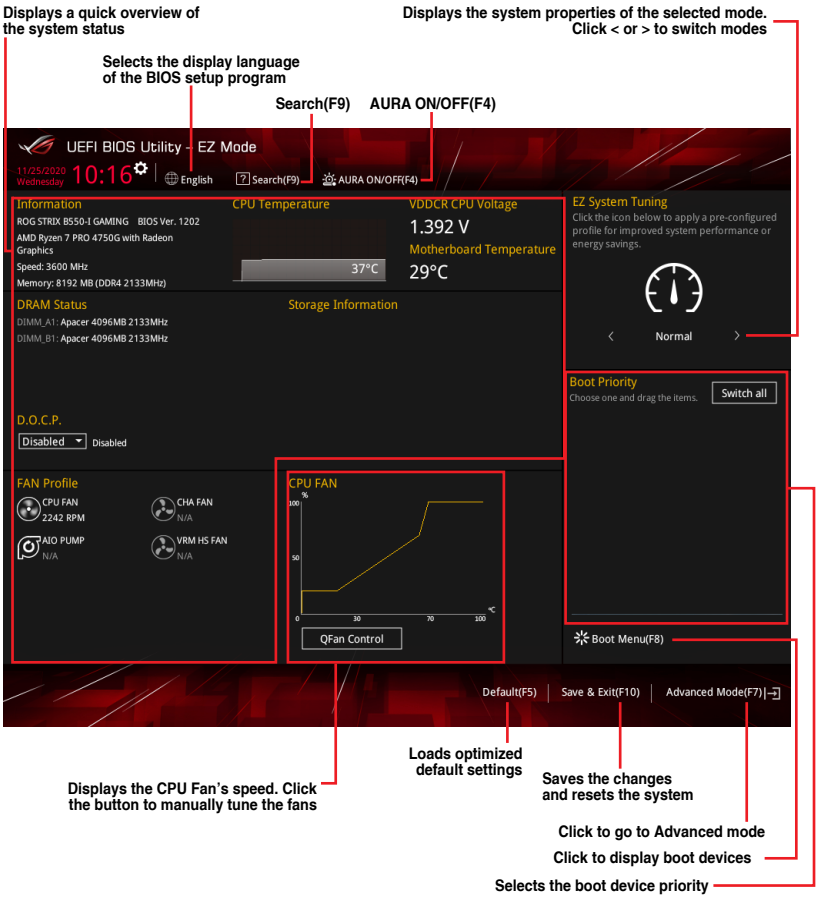
Last Modified button

This button shows the items that you last modified and saved in BIOS Setup.

2.2 EZ Mode

The EZ Mode provides you an overview of the basic system information, and allows you to select the display language, system performance, mode and boot device priority. To access the Advanced Mode, select **Advanced Mode** or press the <F7> hotkey for the advanced BIOS settings.

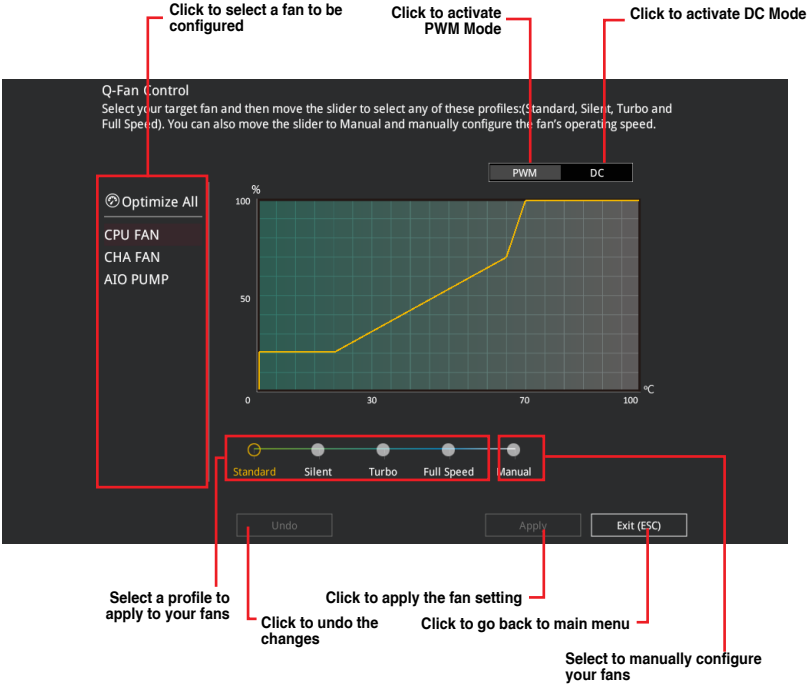
To switch from Advanced Mode to EZ Mode, click **EZ Mode(F7)** or press the <F7> hotkey.



The boot device options vary depending on the devices you installed to the system.

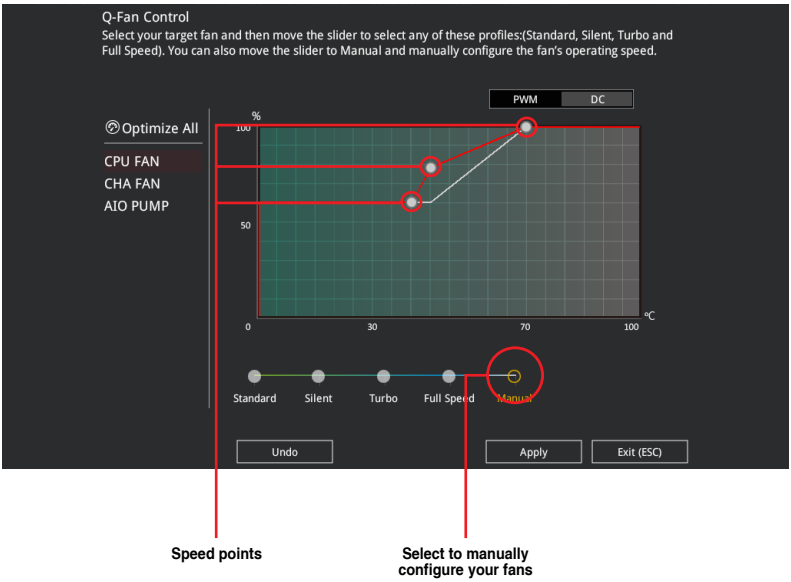
2.3 Q-Fan Control

The Q-Fan Control allows you to set a fan profile or manually configure the operating speed of your CPU and chassis fans.



Configuring fans manually

Select **Manual** from the list of profiles to manually configure your fans' operating speed.

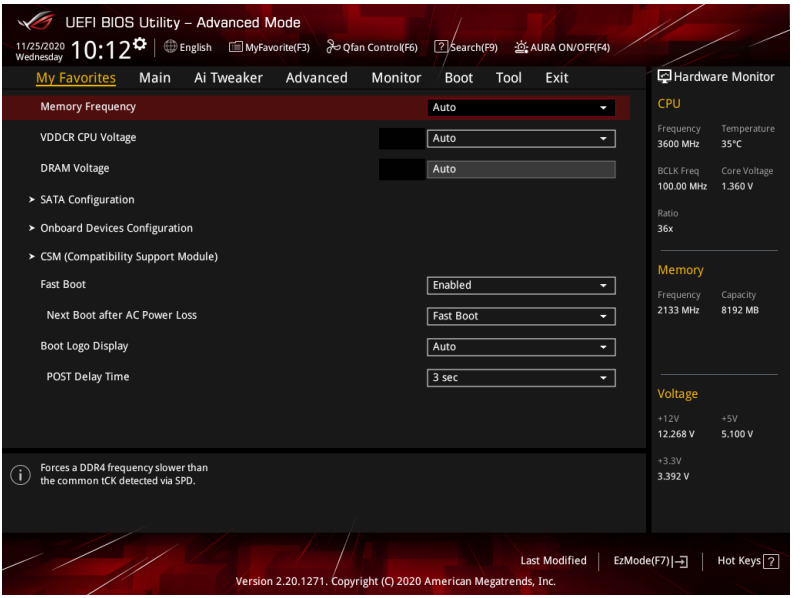


To configure your fans:

1. Select the fan that you want to configure and to view its current status.
2. Click and drag the speed points to adjust the fans' operating speed.
3. Click **Apply** to save the changes then click **Exit (ESC)**.

3. My Favorites

My Favorites is your personal space where you can easily save and access your favorite BIOS items.

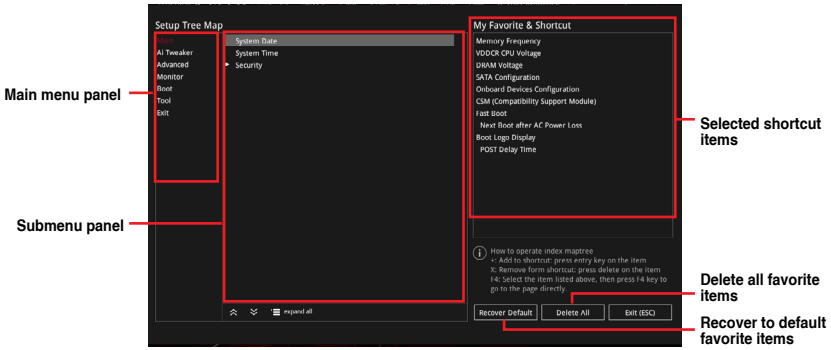


My Favorites comes with several performance, power saving, and fast boot related items by default. You can personalize this screen by adding or removing items.

Adding items to My Favorites

To add BIOS items:

1. Press <F3> on your keyboard or click **My Favorite (F3)** from the BIOS screen to open Setup Tree Map screen.
2. On the Setup Tree Map screen, select the BIOS items that you want to save in My Favorites screen.



3. Select an item from main menu panel, then click the submenu that you want to save as favorite from the submenu panel and click + or press <Enter> on your keyboard.

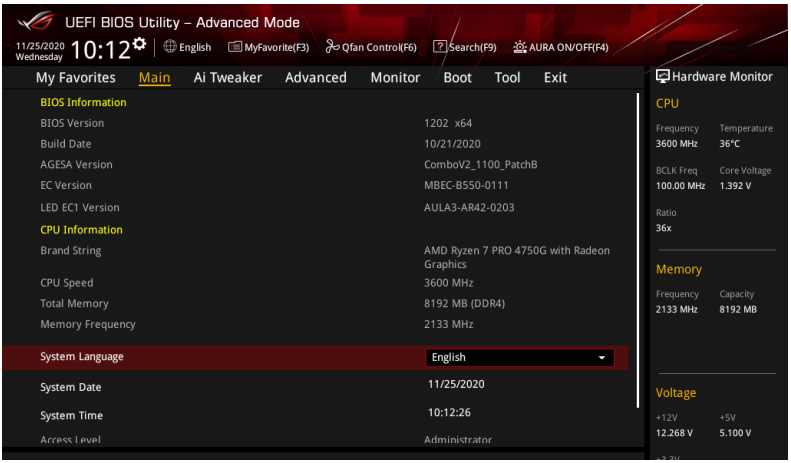
You cannot add the following items to My Favorite items:

- Items with submenu options
- User-managed items such as language and boot order
- Configuration items such as Memory SPD Information, system time and date.

4. Click **Exit (ESC)** or press <Esc> key to close Setup Tree Map screen.
5. Go to My Favorites menu to view the saved BIOS items.

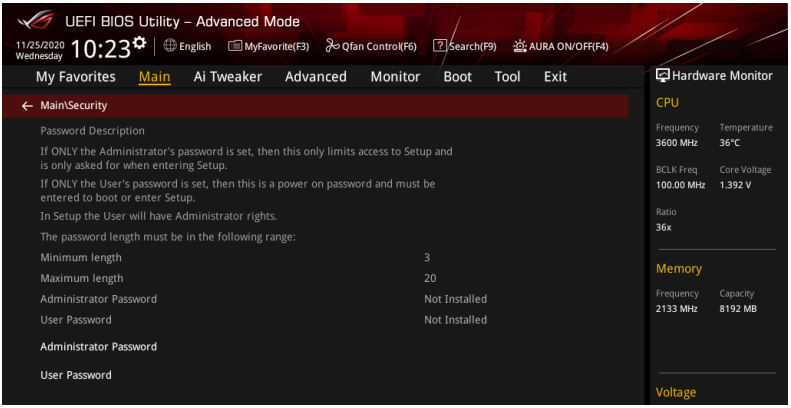
4. Main menu

The Main menu screen appears when you enter the Advanced Mode of the BIOS Setup program. The Main menu provides you an overview of the basic system information, and allows you to set the system date, time, language, and security settings.



Security

The Security menu items allow you to change the system security settings.



- If you have forgotten your BIOS password, erase the CMOS Real Time Clock (RTC) RAM to clear the BIOS password. See section **Jumpers** in your motherboard manual for information on how to erase the RTC RAM via the Clear CMOS jumper.
- The Administrator or User Password items on top of the screen show the default **[Not Installed]**. After you set a password, these items show **[Installed]**.

Administrator Password

If you have set an administrator password, we recommend that you enter the administrator password for accessing the system. Otherwise, you might be able to see or change only selected fields in the BIOS setup program.

To set an administrator password:

1. Select the **Administrator Password** item and press <Enter>.
2. From the **Create New Password** box, key in a password, then press <Enter>.
3. Re-type to confirm the password then select **OK**.

To change an administrator password:

1. Select the **Administrator Password** item and press <Enter>.
2. From the **Enter Current Password** box, key in the current password, then press <Enter>.
3. From the **Create New Password** box, key in a new password, then press <Enter>.
4. Re-type to confirm the password then select **OK**.

To clear the administrator password, follow the same steps as in changing an administrator password, but leave other fields blank then select **OK** to continue. After you clear the password, the **Administrator Password** item on top of the screen shows **[Not Installed]**.

User Password

If you have set a user password, you must enter the user password for accessing the system. The User Password item on top of the screen shows the default **[Not Installed]**. After you set a password, this item shows **[Installed]**.

To set a user password:

1. Select the **User Password** item and press <Enter>.
2. From the **Create New Password** box, key in a password, then press <Enter>.
3. Re-type to confirm the password then select **OK**.

To change a user password:

1. Select the **User Password** item and press <Enter>.
2. From the **Enter Current Password** box, key in the current password, then press <Enter>.
3. From the **Create New Password** box, key in a new password, then press <Enter>.
4. Re-type to confirm the password then select **OK**.

To clear the user password, follow the same steps as in changing a user password, but leave other fields blank then select **OK** to continue. After you clear the password, the **User Password** item on top of the screen shows **[Not Installed]**.

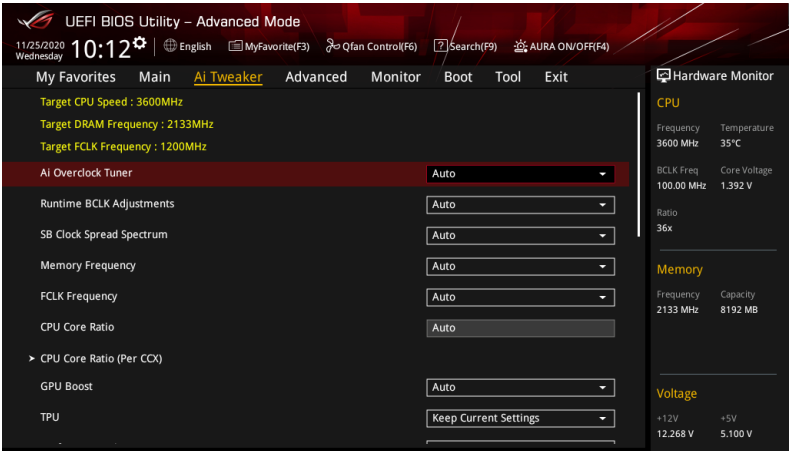
5. Ai Tweaker menu

The Ai Tweaker menu items allow you to configure overclocking-related items.

Be cautious when changing the settings of the Ai Tweaker menu items. Incorrect field values can cause the system to malfunction

The configuration options for this section vary depending on the CPU and DIMM model you installed on the motherboard.

Scroll down to display other BIOS items.



Ai Overclock Tuner

Allows you to select the CPU overclocking options to achieve the desired CPU internal frequency. Configuration options:

[Auto] Loads the optimal settings for the system.

[Manual] Allows you to individually set overclocking parameters.

[D.O.C.P.] Allows you to select a DRAM O.C. profile, and the related parameters will be adjusted automatically.

The following items appear only when **Ai Overclocking Tuner** is set to **[Manual]** or any of the **[D.O.C.P.]** options.

BCLK Frequency

This item allows you to set the BCLK frequency to enhance the system performance. Use the <+> or <-> to adjust the value.

We recommend you to set the value based on the CPU specification, as high BCLK frequencies may damage the CPU permanently.

The following item appears only when **Ai Overclocking Tuner** is set to any of the **[D.O.C.P.]** options.

D.O.C.P.

This item allows you to select your D.O.C.P. profile. Each profile has its own DRAM frequency, timing and voltage.

Runtime BCLK Adjustments

This item allows you to enable or disable runtime adjustments of BCLK.
Configuration options: [Auto] [Disabled] [Enabled]

SB Clock Spread Spectrum

This item allows you to enable or disanle the CG1_PLL Spread Spectrum.
Configuration options: [Auto] [Disabled] [Enabled]

Memory Frequency

This item allows you to set the memory operating frequency. The configurable options vary with the BCLK (base clock) frequency setting. Select the auto mode to apply the optimized setting.
Configuration options: [Auto] [DDR4-1333MHz] - [DDR4-6000MHz]

FCLK Frequency

This item allows you to specify the FCLK frequency.
Configuration options: [Auto] [666MHz] - [3000MHz]

CPU Core Ratio

This item allows you to set the CPU core ratios.
Configuration options: [Auto] [17.00] - [63.75]

CPU Core Ratio (Per CCX)

This items in this submenu allow you to adjust Core Ratios for each CCX.

Core VID

This item allows you to specify a custom CPU core VID. Power savinf features for idle cores (e.g. cc6 sleep) remain active.
Configuration options: [Auto] [0.700] - [1.550]

CCX0 Ratio

This item allows you to specify a custom Core Ratio for this CCX.
Configuration options: [Auto] [17.00] - [63.75]

CCX1 Ratio

This item allows you to specify a custom Core Ratio for this CCX.
Configuration options: [Auto] [17.00] - [63.75]

GPU Boost

This item allows you to select the GPU boost to apply.

[Auto]	System default GPU boost.
[Turbo]	Set to achieve better 3D performance.
[Extreme]	Set for excellent visual experience.
[Manual]	Select your own desired value in the frequency range.

The following item appears only when **GPU Boost** is set to **[Manual]**.

GFX clock frequency

Configuration options [Auto] [500] - [6500]

TPU

This item allows you to automatically overclock the CPU and DRAM frequencies and voltage for an enhanced system performance.

[Keep Current Settings]	Keep the current settings without changing anything.
[TPU I]	Applies air cooling overclocking conditions.
[TPU II]	Applies water cooling overclocking conditions.

Ensure to use water cooling device before selecting **[TPU II]**.

Performance Bias

This item allows you to select different values to help different Software's performance. Configuration options: [Auto] [None] [CBR15 Gentle] [Aida/Geekbench] [CBR15 Aggressive]

DRAM Timing Control

The sub-items in this menu allow you to set the DRAM timing control features. Use the <+> and <-> keys to adjust the value. To restore the default setting, type [auto] using the keyboard and press the <Enter> key.

Changing the values in this menu may cause the system to become unstable! If this happens, revert to the default settings.

DRAM CAS# Latency

Configuration options: [Auto] [5] - [33]

Trcdrd

Configuration options: [Auto] [8] - [63]

Trcdwr

Configuration options: [Auto] [8] - [63]

DRAM RAS# PRE Time

Configuration options: [Auto] [5] - [63]

DRAM RAS# ACT Time

Configuration options: [Auto] [8] - [58]

Trc

Configuration options: [Auto] [29] - [135]

TrrdS

Configuration options: [Auto] [4] - [12]

TrrdL

Configuration options: [Auto] [4] - [12]

Tfaw

Configuration options: [Auto] [6] - [54]

TwtrS

Configuration options: [Auto] [2] - [14]

TwtrL

Configuration options: [Auto] [2] - [14]

Twr

Configuration options: [Auto] [10] - [81]

Trcpage

Configuration options: [Auto] [0] - [1023]

TrdrdScl

Configuration options: [Auto] [1] - [15]

TwrwrScl

Configuration options: [Auto] [1] - [63]

Trfc

Configuration options: [Auto] [60] - [990]

Trfc2

Configuration options: [Auto] [60] - [990]

Trfc4

Configuration options: [Auto] [60] - [990]

Tcwl

Configuration options: [Auto] [9] - [22]

Trtp

Configuration options: [Auto] [1] - [14]

Trdwr

Configuration options: [Auto] [1] - [31]

Twrrd

Configuration options: [Auto] [1] - [15]

TwrwrSc

Configuration options: [Auto] [1] - [15]

TwrwrSd

Configuration options: [Auto] [1] - [15]

TwrwrDd

Configuration options: [Auto] [1] - [15]

TrdrdSc

Configuration options: [Auto] [1] - [11]

TrdrdSd

Configuration options: [Auto] [1] - [15]

TrdrdDd

Configuration options: [Auto] [1] - [15]

Tcke

Configuration options: [Auto] [1] - [31]

ProcODT

Configuration options: [Auto] [High Impeedance] [480 ohm] [240 ohm] [160 ohm] [120 ohm] [96 ohm] [80 ohm] [68.6 ohm] [60 ohm] [53.3 ohm] [48 ohm] [43.6 ohm] [40 ohm] [36.9 ohm] [34.3 ohm] [32 ohm] [30 ohm] [28.2 ohm]

Cmd2T

Configuration options: [Auto] [1T] [2T]

Gear Down Mode

Configuration options: [Auto] [Disabled] [Enabled]

Power Down Enable

Configuration options: [Auto] [Disabled] [Enabled]

RttNom

Configuration options: [Auto] [Rtt_Nom Disable] [RZQ/4] [RZQ/2] [RZQ/6] [RZQ/1] [RZQ/5] [RZQ/3] [RZQ/7]

RttWr

Configuration options: [Auto] [Dynamic ODT Off] [RZQ/2] [RZQ/1] [Hi-Z] [80 Ohm]

RttPark

Configuration options: [Auto] [Rtt_PARK Disable] [RZQ/4] [RZQ/2] [RZQ/6] [RZQ/1] [RZQ/5] [RZQ/3] [RZQ/7]

MemAddrCmdSetup

Configuration options: [Auto] [0] - [63]

MemCsOdtSetup

Configuration options: [Auto] [0] - [63]

MemCkeSetup

Configuration options: [Auto] [0] - [63]

MemCadBusClkDrvStren

Configuration options: [Auto] [120.0 Ohm] [60.0 Ohm] [40.0 Ohm] [30.0 Ohm] [24.0 Ohm] [20.0 Ohm]

MemCadBusAddrCmdDrvStren

Configuration options: [Auto] [120.0 Ohm] [60.0 Ohm] [40.0 Ohm] [30.0 Ohm] [24.0 Ohm] [20.0 Ohm]

MemCadBusCsOdtDrvStren

Configuration options: [Auto] [120.0 Ohm] [60.0 Ohm] [40.0 Ohm] [30.0 Ohm] [24.0 Ohm] [20.0 Ohm]

MemCadBusCkeDrvStren

Configuration options: [Auto] [120.0 Ohm] [60.0 Ohm] [40.0 Ohm] [30.0 Ohm] [24.0 Ohm] [20.0 Ohm]

Mem Over Clock Fail Count

Configuration options: [Auto] [0] - [10]

DIGI+ VRM

VDDCR CPU Load Line Calibration

Configuration options: [Auto] [Level 1] [Level 2] [Level 3] [Level 4] [Level 5] [Level 6] [Level 7] [Level 8]

VDDCR CPU Current Capability

This item allows you to set the shut off current limit for external voltage regulator. A higher setting will allow the voltage regulator to supply more current while a lower setting will cause the voltage regulator to shut off the system when the supplied current is higher than the set value.

Configuration options: [100%] [110%] [120%] [130%]

Configure higher values when overclocking or under a high loading for extra power support.

VDDCR CPU Switching Frequency

Configuration options: [200] [250] [300 [350]

DO NOT remove the thermal module. The thermal conditions should be monitored.

VDDCR CPU Power Phase Control

This item allows you to set the power phase control of the CPU.

[Optimized] Set to the ASUS optimized phase tuning profile.

[Extreme] Set to the full phase mode.

[Manual] Allows you to manually adjust the current(A) step.

DO NOT remove the thermal module when setting this item to **[Extreme]** or **[Manual]**. The thermal conditions should be monitored.

The following item appears only when **VDDCR CPU Power Phase Control** is set to **[Manual]**.

Manual Adjustment

This item allows you to set the response time, selecting **[Regular]** will result in longer reaction times.

Configuration options: [Regular] [Medium] [Fast] [Ultra Fast]

VDDCR CPU Power Duty Control

This item allows you to set the duty cycle of each VRM phase based upon current and/or temperature.

[T.Probe] Sets the buck controller to balance VRM FET temperatures.

[Extreme] Sets the buck controller to balance per phase current.

DO NOT remove the thermal module. The thermal conditions should be monitored.

VDDCR SOC Load-line Calibration

Configuration options: [Auto] [Level 1] - [Level 8]

VDDCR SOC Current Capability

Configuration options: [100%] [110%] [120%] [130%]

VDDCR SOC Switching Frequency

Configuration options: [200] [250] [300 [350]

VDDCR SOC Power Phase Control

[Optimized]	Set to the ASUS optimized phase tuning profile.
[Extreme]	Set to the full phase mode.
[Power Phase Response]	Allows you to manually adjust the current(A) step.

The following item appears only when **VDDCR SOC Power Phase Control** is set to **[Manual]**.

Manual Adjustment

This item allows you to set the response time, selecting **[Regular]** will result in longer reaction times.
Configuration options: [Regular] [Medium] [Fast] [Ultra Fast]

VDDCR CPU Voltage

Configures the mode of Voltage fed to the cores of the processor.
Configuration options: [Auto] [Manual Mode] [Offset Mode]

The following item appears only when **VDDCR CPU Voltage** is set to **[Manual Mode]**.

VDDCR CPU Voltage Override

Allows you to configure the CPU Core voltage.
Configuration options: [Auto] [0.75000] - [2.00000]

The following items appear only when **VDDCR CPU Voltage** is set to **[Offset Mode]**.

VDDCR CPU Offset Mode Sign

[+]	To offset the voltage by a positive value.
[-]	To offset the voltage by a negative value.

VDDCR CPU Offset Voltage

This item allows you to configure the CPU core voltage offset value.
Configuration options: [Auto] [-0.50000] - [+0.50000]

VDDCR SOC Voltage

Increasing the value of this item helps with Memory Frequency overclocking.
Configuration options: [Auto] [Manual Mode] [Offset Mode]

The following item appears only when **VDDCR SOC Voltage** is set to **[Manual Mode]**.

VDDCR SOC Voltage Override

Allows you to configure the CPU Core voltage.
Configuration options: [Auto] [0.75000] - [1.80000]

The following items appear only when **VDDCR SOC Voltage** is set to **[Offset Mode]**.

VDDCR SOC Offset Mode Sign

[+] To offset the voltage by a positive value.

[-] To offset the voltage by a negative value.

VDDCR SOC Voltage Offset

This item allows you to configure the VDDSOC voltage offset value.
Configuration options: [Auto] [-0.50000] - [+0.50000]

GFX core voltage

Use the <+> or <-> to adjust the value. The values increment with an interval of 0.00625V.
Configuration options: [Auto] [0.00625V] - [1.55000V]

DRAM Voltage

Use the <+> or <-> to adjust the value. The values increment with an interval of 0.005V.
Configuration options: [Auto] [1.200V] - [2.000V]

CLDO VDDP voltage

This item allows you to configure the voltage for the CLDO VDDP. Use the <+> or <-> to adjust the value.

1.05V SB Voltage

This item allows you to set the core voltage for the Southbridge. Use the <+> or <-> to adjust the value. The values increment with an interval of 0.05V.
Configuration options: [Auto] [1.05V] - [1.10V]

2.5V SB Voltage

Use the <+> or <-> to adjust the value. The values increment with an interval of 0.05V.
Configuration options: [Auto] [2.50V] - [2.55V]

VDDP voltage

Use the <+> or <-> to adjust the value. The values increment with an interval of 0.05V.
Configuration options: [Auto] [0.90V] - [1.05V]

CPU 1.80V Voltage

Use the <+> or <-> to adjust the value. The values increment with an interval of 0.005V.
Configuration options: [Auto] [1.80V] - [2.20V]

VTTDDR Voltage

This item allows you to configure voltage for the VTTDDR. Use the <+> or <-> to adjust the value. The values increment with an interval of 0.005V.
Configuration options: [Auto] [0.60V] - [0.80V]

VPP_MEM Voltage

This item allows you to configure voltage for the VPP_MEM. Use the <+> or <-> to adjust the value. The values increment with an interval of 0.005V.
Configuration options: [Auto] [2.50V] - [2.80V]

VDDP Standby Voltage

This item allows you to configure voltage for the VDDP Standby Voltage. Use the <+> or <-> to adjust the value. The values range increment with an interval of 0.005V.
Configuration options: [Auto] [0.90V] - [1.05V]

CPU Core Current Telemetry

This item allows you to offset the current read by the processor for VCore in milliAmps. May add boost frequencies if adjust downwards, but affects accurate power readings.
Configuration options: [Auto] [Manual]

The following items appear only when **CPU Core Current Telemetry** is set to **[Manual]**.

CPU Core Current Telemetry Offset sign

[+] To offset the voltage by a positive value.

[-] To offset the voltage by a negative value.

CPU Core Current Telemetry Offset

Configuration options: [Auto] [0] - [80000]

CPU SOC Current Telemetry

This item allows you to offset the current read by the processor for VSOC in milliAmps. May add boost frequencies if adjust downwards, but affects accurate power readings.
Configuration options: [Auto] [Manual]

The following items appear only when **CPU SOC Current Telemetry** is set to **[Manual]**.

CPU SOC Current Telemetry Offset sign

[+] To offset the voltage by a positive value.

[-] To offset the voltage by a negative value.

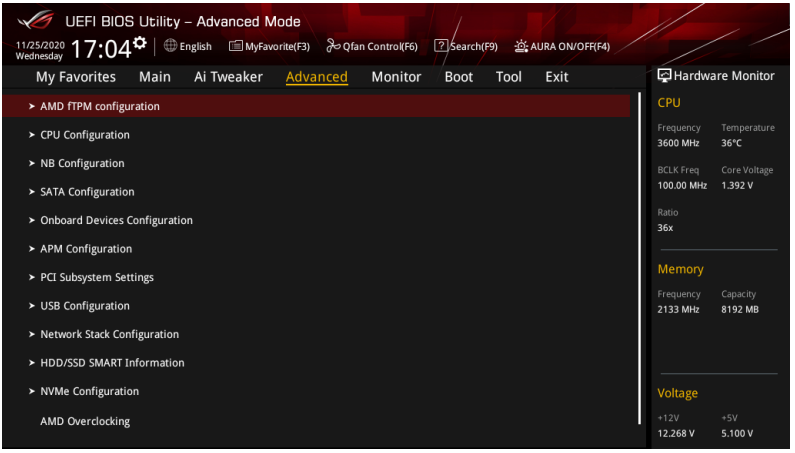
CPU SOC Current Telemetry Offset

Configuration options: [Auto] [0] - [80000]

6. Advanced menu

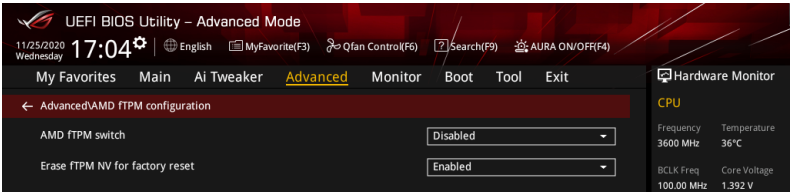
The Advanced menu items allow you to change the settings for the CPU and other system devices.

Be cautious when changing the settings of the Advanced menu items. Incorrect field values can cause the system to malfunction.



6.1 AMD fTPM configuration

The items in this menu show the AMD fTPM configuration options.



AMD fTPM switch

This item allows you to enable or disable AMD CPU Firmware TPM.

[Enabled] Enables AMD CPU fTPM.

[Disabled] Disables AMD CPU fTPM.

When Firmware TPM is set to disabled all saved data on it will be lost.

Erase fTPM NV for factory reset

This item allows you to enable or disable fTPM reset for newly installed CPUs.

[Disabled] Keep previous fTPM records and continue system boot, fTPM will not be enabled with the new CPU unless fTPM is reset (reinitialized). Swapping back to the old CPU may allow you to recover TPM related keys and data.

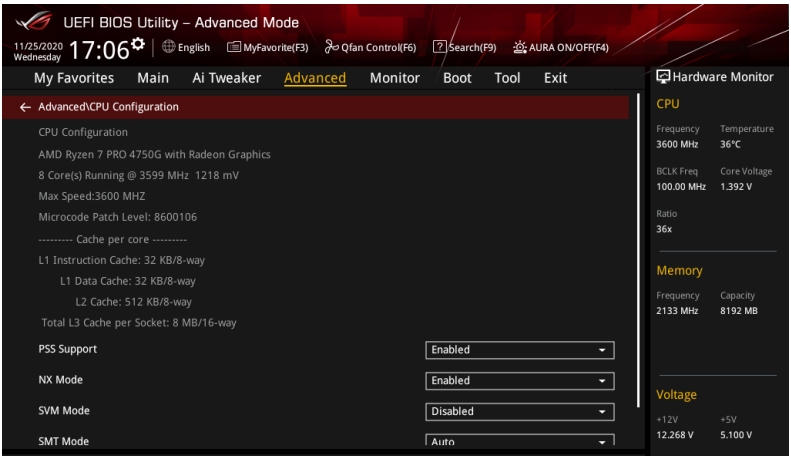
[Enabled] Reset fTPM, if you have Bitlocker or encryption-enabled system, the system will not boot without a recovery key.

6.2 CPU Configuration

The items in this menu show the CPU-related information that the BIOS automatically detects.

The items in this menu may vary based on the CPU installed.

Scroll down to display other BIOS items.



PSS Support

This item allows you enable or disable the generation of ACPI_PPC, _PSS, and _PCT objects.
Configuration options: [Disabled] [Enabled]

NX Mode

This item allows you enable or disable no-execute page protection function.
Configuration options: [Disabled] [Enabled]

SVM Mode

This item allows you enable or disable CPU Virtualization.
Configuration options: [Disabled] [Enabled]

SMT Mode

This item allows you enable or disable Simultaneous multithreading.
Configuration options: [Auto] [Disabled]

S3 is not supported on systems where cores/threads have been removed/disabled.

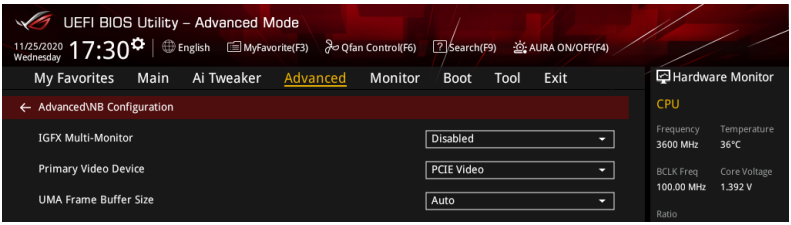
Core Leveling Mode

This item allows you to change the number of compute units in the system.
Configuration options: [Two core per processor] [Four core per processor] [Six core per processor] [Automatic mode]

S3 is not supported on systems where cores/threads have been removed/disabled.

6.3 NB Configuration

The items in this menu allows you to configure graphics related items.



IGFX Multi-Monitor

This item allows you to enable or disable the Internal Graphics Device Multi-Monitor Support for add-on VGA devices. Memory size of Internal Graphics Device will keep memory reserved.
Configuration options: [Disabled] [Enabled]

Primary Video Device

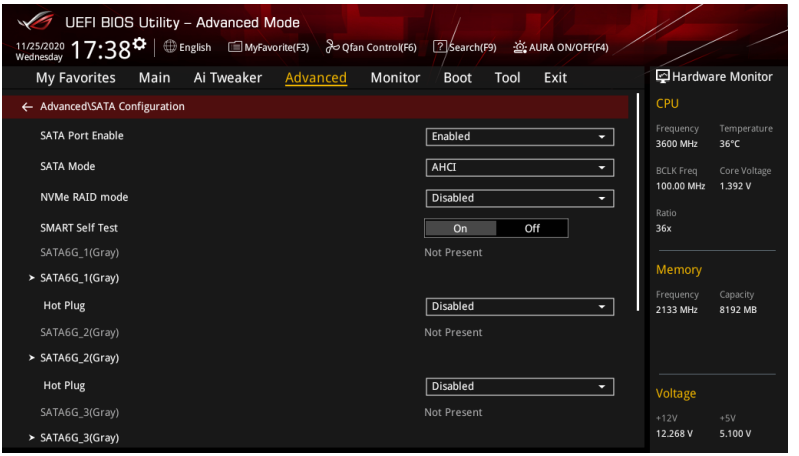
This item allows you to select the Primary Video Device which BIOS will use for output.
Configuration options: [IGFX Video] [PCIE video]

UMA Frame Buffer Size

This item allows you set the UMA FB Size.
Configuration options: [Auto] [64M] [80M] [96M] [128M] [256M] [384M] [512M] [768M] [1G] [2G] [3G] [4G]

6.4 SATA Configuration

While entering Setup, the BIOS automatically detects the presence of SATA devices. The SATA Port items show **Not Present** if no SATA device is installed to the corresponding SATA port.



SATA Port Enable

This item allows you to enable or disable the SATA Device.
Configuration options: [Disabled] [Enabled]

The following items appear only when **SATA Port Enable** is set to **[Enabled]**.

SATA Mode

This item allows you to set the SATA configuration.

[AHCI]	Set to [AHCI] when you want the SATA hard disk drives to use the AHCI (Advanced Host Controller Interface). The AHCI allows the onboard storage driver to enable advanced Serial ATA features that increases storage performance on random workloads by allowing the drive to internally optimize the order of commands.
[RAID]	Set to [RAID] when you want to create a RAID configuration from the SATA hard disk drives.

NVMe RAID Mode

This item allows you to enable or disable the NVMe RAID mode.
Configuration options: [Disabled] [Enabled]

SMART Self Test

S.M.A.R.T. (Self-Monitoring, Analysis and Reporting Technology) is a monitoring system that shows a warning message during POST (Power-on Self Test) when an error occurs in the hard disks.
Configuration options: [On] [Off]

SATA6G_1(Gray) - SATA6G_4(Gray)

SATA6G_1(Gray) - SATA6G_4(Gray)

This item allows you to enable or disable the selected SATA port.
Configuration options: [Disabled] [Enabled]

Hot Plug

These items appears only when the **SATA Mode** is set to [**AHCI**] and allows you to enable or disable SATA Hot Plug Support.
Configuration options: [Disabled] [Enabled]

M.2_1(Gray)

M.2_1(Gray)

This item allows you to rename the AMD M.2 port.

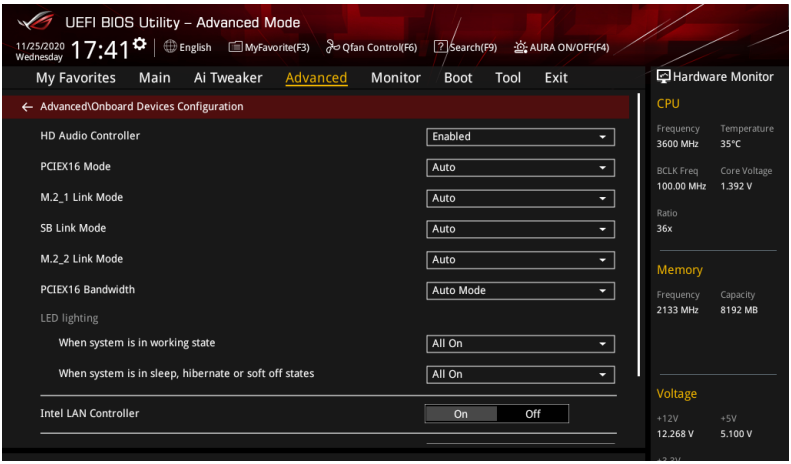
M.2_2(Gray)

M.2_2(Gray)

This item allows you to rename the AMD M.2 port.

6.5 Onboard Devices Configuration

The items in this menu allow you to switch between PCIe Lanes and configure onboard devices.



HD Audio Controller

This item allows you to use the Azalia High Definition Audio Controller.
Configuration options: [Disabled] [Enabled]

PCIEX16 Mode

This item allows you to set the PCIEX16 slot link speed.
Configuration options: [Auto] [GEN 1] [GEN 2] [GEN 3]

M.2_1 Link Mode

This item allows you to set the M.2_1 Device link speed.
Configuration options: [Auto] [GEN 1] [GEN 2] [GEN 3]

SB Link Mode

This item allows you to set the Southbridge link speed.
Configuration options: [Auto] [GEN 1] [GEN 2] [GEN 3]

M.2_2 Link Mode

This item allows you to set the M.2_2 Device link speed.
Configuration options: [Auto] [GEN 1] [GEN 2] [GEN 3]

PCIEX16 Bandwidth

[Auto Mode]	The PCIe x16 slot runs at x16 mode.
[PCIe RAID Mode]	Up to three SSDs installed onto the Hyper M.2 X16 series card can be detected. When 3 SSDs are installed, ensure to install them into the M.2_1, M.2_3, and M.2_4 slots on the card.

Use PCIe RAID Mode when installing the Hyper M.2 x16 card or other M.2 adapter cards. Installing other devices when using PCIe RAID Mode may cause your PC to fail to boot up.

LED lighting

When system is in working state

This item allows you to turn the RGB LED lighting on or off when the system is in the working state.

[All On]:	RGB LEDs and Functional LEDs will behave normally.
[Stealth Mode]:	All LEDs will be disabled.
[Aura Only]:	RGB LEDs will light up, while all functional LEDs will be disabled.
[Aura Off]:	Functional LEDs behave normally, while RGB LEDs will be disabled.

The RGB Header(s) and Addressable Header(s) will only work under the S0 (working) state.

When system is in sleep, hibernate or soft off states

This item allows you to turn the RGB LED lighting on or off when the system is in the sleep, hibernate or soft off states.

[All On]:	RGB LEDs and Functional LEDs will behave normally.
[Stealth Mode]:	All LEDs will be disabled.
[Aura Only]:	RGB LEDs will light up, while all functional LEDs will be disabled.
[Aura Off]:	Functional LEDs behave normally, while RGB LEDs will be disabled.

The RGB Header(s) and Addressable Header(s) will only work under the S0 (working) state.

Intel LAN Controller

This item allows you to enable or disable the Intel LAN controllers.
Configuration options: [On] [Off]

Wi-Fi Controller

This item allows you to enable or disable the Wi-Fi controller.
Configuration options: [Disabled] [Enabled]

Bluetooth Controller

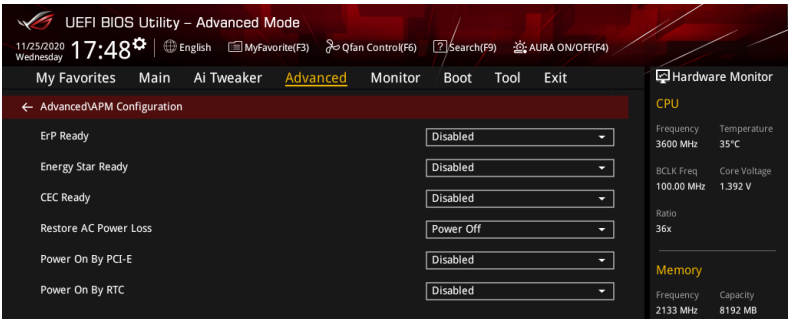
This item allows you to enable or disable the Bluetooth controller.
Configuration options: [Disabled] [Enabled]

USB power delivery in Soft Off state (S5)

This item allows you to enable or disable USB power when your PC is in S5 state.
Configuration options: [Disabled] [Enabled]

6.6 APM Configuration

The items in this menu allow you to set system wake and sleep settings.



ErP Ready

This item allows you to switch off some power at S4+S5 or S5 to get the system ready for ErP requirement. When set to **[Enabled]**, all other PME options are switched off.
Configuration options: [Disabled] [Enable(S4+S5)] [Enable(S5)]

Energy Star Ready

Configuration options: [Disabled] [Enabled]

CEC Ready

Enabling this item allows your system to comply with CEC (California Energy Commission) regulations and save more power under S0 state.
Configuration options: [Disabled] [Enabled]

Restore On AC Power Loss

This item allows your system to go to ON state, OFF state, or both states after an AC power loss. When setting your system to [Last State], it goes to the previous state before the AC power loss.
Configuration options: [Power Off] [Power On] [Last State]

Power On By PCI-E

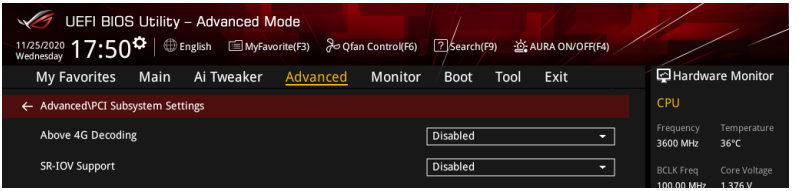
This item allows you to enable or disable the Wake-on-LAN function of the onboard LAN controller or other installed PCI-E LAN cards.
Configuration options: [Disabled] [Enabled]

Power On By RTC

This item allows you to enable or disable the RTC (Real-Time Clock) to generate a wake event and configure the RTC alarm date. When enabled, you can set the days, hours, minutes, or seconds to schedule an RTC alarm date.
Configuration options: [Disabled] [Enabled]

6.7 PCI Subsystem Settings

The items in this menu show the CPU-related information that the BIOS automatically detects.



Above 4G Decoding

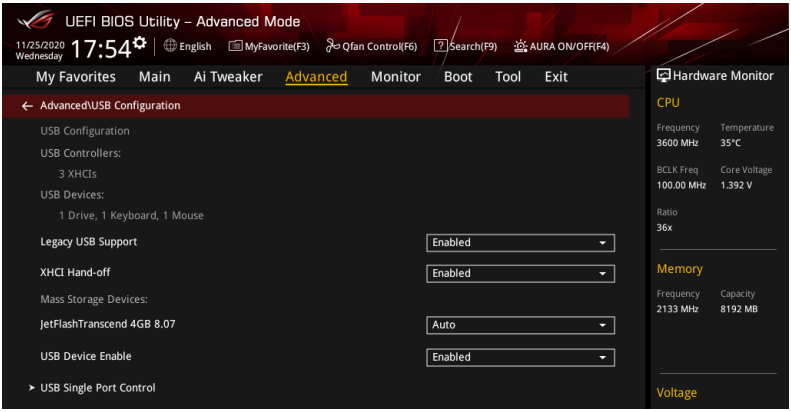
Allows you to enable or disable 64-bit capable devices to be decoded in above 4G address space. It only works if the system supports 64-bit PCI decoding.
Configuration options: [Disabled] [Enabled]

SR-IOV Support

This option enables or disables Single Root IO Virtualization Support if the system has SRIOV capable PCIe devices.
Configuration options: [Disabled] [Enabled]

6.8 USB Configuration

The items in this menu allow you to change the USB-related features.



The **Mass Storage Devices** item shows the auto-detected values. If no USB device is detected, the item shows **None**.

Legacy USB Support

[Enabled] Your system supports the USB devices in legacy operating systems.

[Disabled] Your USB devices can be used for BIOS setup only and cannot be recognized in the boot devices list.

[Auto] Your system automatically detects the presence of USB devices at startup. If any USB devices are detected, the legacy USB support is enabled.

XHCI Hand-off

[Enabled] Enables the support for operating systems without an XHCI hand-off feature.

[Disabled] Disables the XHCI Hand-off support.

Mass Storage Devices

Allows you to select the mass storage device emulation type for devices connected.
Configuration options: [Auto] [Floppy] [Forced FDD] [Hard Disk] [CD-ROM]

USB Device Enable

Configuration options: [Disabled] [Enabled]

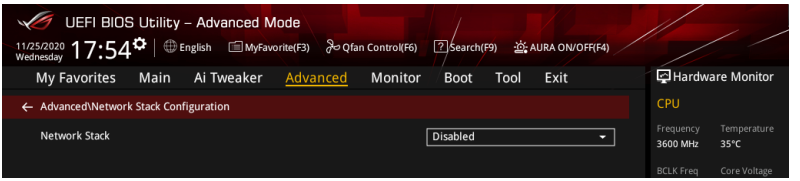
USB Single Port Control

This item allows you to enable or disable the individual USB ports.

Refer to section **Motherboard layout** in your motherboard user manual for the location of the USB ports.

6.9 Network Stack Configuration

The items in this menu allow you to enable or disable the UEFI network stack



Network stack

This item allows you to disable or enable the UEFI network stack.
Configuration options: [Disable] [Enable]

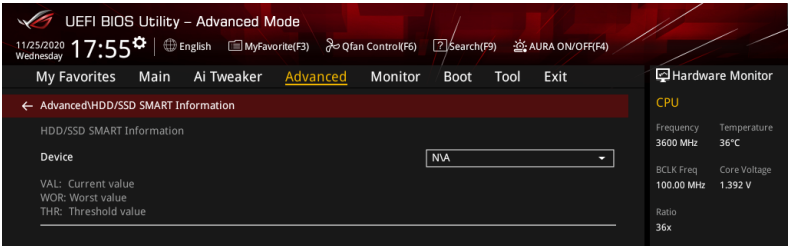
The following items appear only when **Network Stack** is set to **[Enabled]**.

Ipv4/Ipv6 PXE Support

This item allows you to enable or disable the Ipv4/Ipv6 PXE wake event.
Configuration options: [Disabled] [Enabled]

6.10 HDD/SSD SMART Information

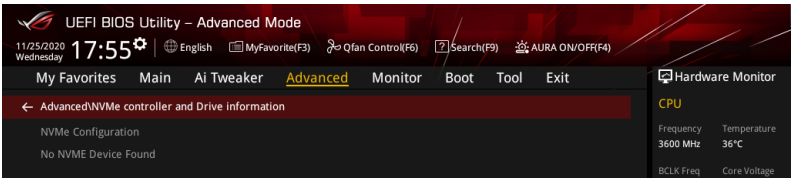
This menu displays the SMART information of the connected devices.



NVM Express devices do not support SMART information.

6.11 NVMe Configuration

This menu displays the NVMe controller and Drive information of the connected devices.

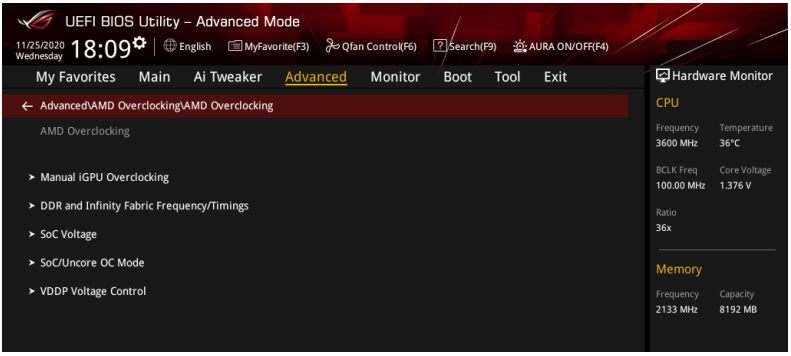


6.12 AMD Overclocking

The items in this menu shows the AMD Overclocking Setup Page.

Damage caused by use of your AMD processor outside of specification or in excess of factory settings are not covered by your system manufacturers warranty.

The following items appear only when **[Accept]** is selected for **AMD Overclocking**.



Manual iGPU Overclocking

The items in this submenu allow you to configure a custom GFX frequency and voltage.

GFX Clock Frequency

This item allows you to specify a custom GFX core frequency. Must be combine with a custom GFX voltage. Power saving features (like GFX Pstates) remain active.

GFX Voltage

This item allows you to specify a custom GFX core voltage (mV). Must be combine with a custom GFX frequency. GFX voltage is derived from SOC / uncore voltage rail. Power saving features (like GFX Pstates) remain active.

DDR and Infinity Fabric Frequency/Timings

The items in this submenu allow you to adjust memory frequencies and timings, as well as Infinity Fabric frequency and dividers.

DDR Frequency and Timings

The items in this submenu allow you to adjust DDR memory frequency and timings.

DRAM Timing Configuration

Overclock

Configuration options: [Auto] [Enabled]

DRAM Controller Configuration

DRAM Power Options

Power Down Enable

This item allows you to enable or disable DDR power down mode.
Configuration options: [Auto] [Disabled] [Enabled]

Cmd2T

Select between 1T and 2T mode on ADDR/CMD.
Configuration options: [Auto] [1T] [2T]

Gear Down Mode

Configuration options: [Auto] [Disabled] [Enabled]

CAD Bus Configuration

CAD Bus Timing User Controls

This item allows you to set the CAD bus signals to Auto or Manual.
Configuration options: [Auto] [Manual]

The following items appear only when **CAD Bus Timing User Controls** is set to **[Manual]**.

AddrCmdSetup

This item allows you to setup time on CAD bus signals.
Configuration options: [0] - [39]

CsOdtSetup

This item allows you to setup time on CAD bus signals.
Configuration options: [0] - [39]

CkeSetup

This item allows you to setup time on CAD bus signals.
Configuration options: [0] - [39]

CAD Bus Drive Strength User Controls

This item allows you to set the CAD bus signals to Auto or Manual.
Configuration options: [Auto] [Manual]

The following items appear only when **CAD Bus Drive Strength User Controls** is set to **[Manual]**.

ClkDrvStren

Configuration options: [Auto] [120.0 Ohm] [60.0 Ohm] [40.0 Ohm] [30.0 Ohm] [24.0 Ohm] [20.0 Ohm]

AddrCmdDrvStren

Configuration options: [Auto] [120.0 Ohm] [60.0 Ohm] [40.0 Ohm] [30.0 Ohm] [24.0 Ohm] [20.0 Ohm]

CsOdtDrvStren

Configuration options: [Auto] [120.0 Ohm] [60.0 Ohm] [40.0 Ohm] [30.0 Ohm] [24.0 Ohm] [20.0 Ohm]

CkeDrvStren

Configuration options: [Auto] [120.0 Ohm] [60.0 Ohm] [40.0 Ohm] [30.0 Ohm] [24.0 Ohm] [20.0 Ohm]

Data Bus Configuration

Data Bus Configuration User Controls

This item allows you to specify the mode for drive strength.
Configuration options: [Auto] [Manual]

The following items appear only when **Data Bus Configuration User Controls** is set to **[Manual]**.

RttNom

Configuration options: [Rtt_Nom Disable] [RZQ/4] [RZQ/2] [RZQ/6] [RZQ/1] [RZQ/5] [RZQ/3] [RZQ/7] [Auto]

RttWr

Configuration options: [Dynamic ODT Off] [RZQ/2] [RZQ/1] [Hi-Z] [RZQ/3] [Auto]

RttPark

Configuration options: [Rtt_PARK Disable] [RZQ/4] [RZQ/2] [RZQ/6] [RZQ/1] [RZQ/5] [RZQ/3] [RZQ/7] [Auto]

Infinity Fabric Frequency and Dividers

Infinity Fabric frequemcy (FCLK) is automatically synchronized 1:1 with memory frequency (MCLK) for best performance.

Infinity Fabric Frequency and Dividers

Set Infinity Fabric frequency (FCLK) Auto: FCLK = MCLK. Manual: FCLK must be ≤ MCLK for best performance in most cases. Latency penalties are incurred if FCLK and MCLK are mismatched, but sufficiently high MCLK can negate or overcome this penalty.
Configuration options: [Auto] [667MHz] - [3000MHz]

SoC Voltage

The item in this submenu allow you to specify the SoC/uncore voltage (VDD_SOC) in mV to support memory and Infinity Fabric overclocking. VDD_SOC also determines the GPU voltage on processors with integrated graphics. 'SoC/Uncore OC Mode' needs to be enabled to force this voltage.

SoC Voltage

Configuration options: [0] - [1550]

SoC/Uncore OC Mode

Forces CPU SoC/uncore components (e.g. Infinity Fabric, memory, and integrated graphic) to run at their maximum specified frequency at all times. May improve performance at the expense of idle power savings.

SoC/Uncore OC Mode

Configuration options: [Disabled] [Enabled]

VDDP Voltage Control

VDDP is a voltage for the DDR4 bus signaling (PHY), and it is derived from your DRAM Voltage (VDDIO_Mem). As a result, VDDP voltage in mV can approach but not exceed your DRAM Voltage.

VDDP Voltage Control

Configuration options: [Auto] [Manual]

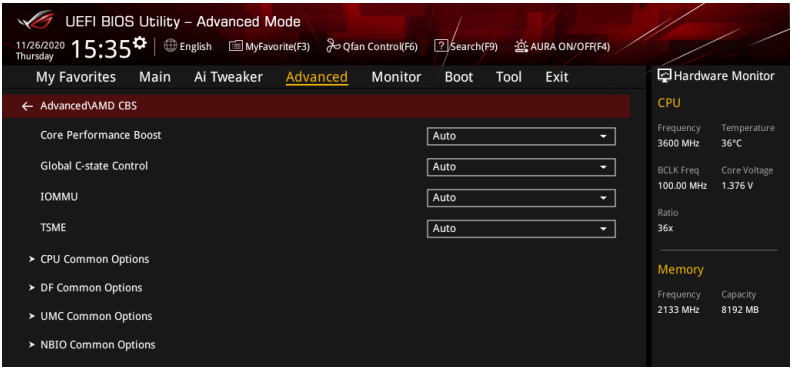
The following items appear only when **VDDP Voltage Control** is set to **[Manual]**.

VDDP Voltage Control

Configuration options: [700] - [65535]

6.13 AMD CBS

The items in this menu shows the AMD Common BIOS Specifications.



Core Performance Boost

This item allows you to Auto or disable Core Performance Boost.
Configuration options: [Auto] [Disabled]

Global C-state Control

This item allows you to control IO based C-state generation and DF C-states. There is another DF Cstate option which can be synchronized with this option if DF Cstate option is auto.
Configuration options: [Auto] [Disabled] [Enabled]

IOMMU

This item allows you to enable or disable IOMMU.
Configuration options: [Auto] [Disabled] [Enabled]

TSME

Configuration options: [Auto] [Disabled] [Enabled]

CPU Common Options

Performance

Custom Core Pstates

This item allows you to enable custom P-states and throttling.

Damage caused by use of your AMD processor outside of specification or in excess of factory settings are not covered by your system manufacturers warranty.

The following items appear only when **[Accept]** is selected for **Custom Core Pstates**.

Custom Pstate0

Configuration options: [Auto] [Custom]

The following items appear only when **Custom Pstate0** is set to **[Custom]**.

Pstate0 Freq (MHz)

Specifies the core frequency(MHz).

Pstate0 VID

Specifies the core voltage.

Prefetcher settings

L1 Stream HW Prefetcher

This item allows you to enable or disable L1 Stream HW Prefetcher.
Configuration options: [Auto] [Disabled] [Enabled]

L2 Stream HW Prefetcher

This item allows you to enable or disable L2 Stream HW Prefetcher.
Configuration options: [Auto] [Disabled] [Enabled]

Core Watchdog

Core Watchdog Timer Enable

This item allows you to enable or disable CPU Watchdog Timer.
Configuration options: [Auto] [Disabled] [Enabled]

The following items appear only when **Core Watchdog Timer Enable** is set to **[Enabled]**.

Core Watchdog Timer Interval

Configuration options: [Auto] [39.68us] [80.64us] [162.56us] [326.4us] [654.08us] [1.309ms] [2.620ms] [5.241ms] [10.484ms] [20.970ms] [40.61ms] [82.53ms] [166.37ms] [334.05ms] [669.41ms] [1.340s] [2.681s] [5.364s] [10.730s] [21.461s]

Core Watchdog Timer Severity

Configuration options: [Auto] [No Error] [Transparent] [Corrected] [Deferred] [Uncorrected] [Fatal]

RedirectForReturnDis

Configuration options: [Auto] [1] [0]

Platform First Error Handling

Enable or disable PFEH, cloack individual banks, and mask deferred error interrupts from each bank. This feature must be disabled on B1 stepping.
Configuration options: [Enabled] [Disabled] [Auto]

Opcache Control

Configuration options: [Disabled] [Enabled] [Auto]

SEV ASID Count

This field specifies the maximum valid ASID, which affects the maximum system physical address space. 16TB of physical address space is available for systems that support 253 ASIDs, while 8TB of physical address space is available for systems that support 509 ASIDs.
Configuration options: [253 ASIDs] [509 ASIDs] [Auto]

SEV-ES ASID Space Limit Control

Configuration options: [Auto] [Manual]

The following items appear only when **SEV-ES ASID Space Limit Control** is set to **[Manual]**.

SEV-ES ASID Space Limit

SEV VMs using ASIDs below the SEV-ES ASID Space Limit must enable the SEV-ES feature. The vaild values for this field are from 0x1 (1) - 0x10 (16).
Configuration options: [1] - [16]

Streaming Stores Control

This item allows you to enable or disable the streaming stores functionality.
Configuration options: [Disabled] [Enabled] [Auto]

Local APIC Mode

Configuration options: [Compatibility] [xAPIC] [x2APIC] [Auto]

ACPI _CST C1 Declaration

This item allows you to enable or disable the C1 state declaration to the OS.
Configuration options: [Disabled] [Enabled] [Auto]

MCA error thresh enable

This item allows you to enable MCA error thresholding.
Configuration options: [True] [False]

The following item appear only when **MCA error thresh enable** is set to **[True]**.

MCA error thresh count

Effective error threshold count = 4095(0xFFF) - <this value> (e.g. the default value of 0xFF5 results in a threshold of 10).

SMU and PSP Production Mode

When this option is disabled, specific uncorrected errors detected by the PSP FW or SMU FW will hang and not reset the system.
Configuration options: [Disabled] [Enabled] [Auto]

PPIN Opt-in

This option allows you to turn on the PPIN feature.
Configuration options: [Disabled] [Enabled] [Auto]

DF Common Options

Scrubber

DRAM scrub time

This item allows you to set a number of hours to scrub memory.
Configuration options: [Disabled] [1 hour] - [48 hours] [Auto]

Poison scrubber control

Configuration options: [Disabled] [Enabled] [Auto]

Redirect scrubber control

Configuration options: [Disabled] [Enabled] [Auto]

Redirect scrubber limit

Controls the number or redirect scrubs allowed at any one time.
Configuration options: [2] [4] [8] [Infinite] [Auto]

Memory Addressing

Memory interleaving

This item allows for disabling memory channel interleaving.
Configuration options: [Disabled] [Auto]

Memory interleaving size

This item controls the memory interleaving size. The valid values are AUTO, 256 bytes, 512 bytes, 1 Kbytes, or 2 Kbytes. This also determines the starting address of the interleave (bit 8, 9, 10, or 11).
Configuration options: [256 Bytes] [512 Bytes] [1 KB] [2 KB] [Auto]

DRAM map inversion

Inverting the map will cause the highest memory channels to get assigned the lowest addresses in the system.
Configuration options: [Disabled] [Enabled] [Auto]

CC6 memory region encryption

This item controls whether or not the CC6 save/restore memory is encrypted.
Configuration options: [Disabled] [Enabled] [Auto]

Memory Clear

When this item is set to **[Disabled]**, BIOS does not implement MemClear after memory training (only if non-ECC DIMMs are used).
Configuration options: [Disabled] [Enabled] [Auto]

Disable DF to external downstream IP SyncFloodPropagation

Disables Error propagation to UMC or any downstream slaves e.g. FCH. Use this to avoid reset in failure scenario.
Configuration options: [Sync flood disabled] [Sync flood enabled] [Auto]

Disable DF Sync flood propagation

Disables propagation from PIE to other DF components and eventually to SDP ports.
Configuration options: [Sync flood disabled] [Sync flood enabled] [Auto]

Freeze DF module queues on error

Enables freezing of all DF queues on error and also forces a sync flood on HWA even if MCAs are disabled.
Configuration options: [Disabled] [Enabled] [Auto]

DF Cstates

When DF Cstate feature is enabled, FW programs the registers required to enable this feature is the DF HW. If **[Auto]** is selected, this option will synchronize with Global C State.
Configuration options: [Disabled] [Enabled] [Auto]

UMC Common Options

DDR4 Common Options

DRAM Controller Configuration

DRAM Power Options

Power Down Enable

This item allows you to enable or disable DDR power down mode.
Configuration options: [Auto] [Disabled] [Enabled]

Disable Burst/Postponed Refresh

Configuration options: [Auto] [Enabled]

The following items appear only when **Disable Burst/Postponed Refresh** is set to **[Enabled]**.

SubUrgRefLowerBound

Specifies the stored refresh limit to required enter sub-urgent refresh mode. Valid value: 6 ~ 1

UrgRefLimit

Specifies the stored refresh limit to required enter urgent refresh mode. Valid value: 6 ~ 1

DRAM Maximum Activate Count

Override DIMM SPD Byte 7 [3:0] Maximum Activate Count (MAC). Auto is based on SPD setting.
Configuration options: [Untested MAC] [700 K] [600 K] [500 K] [400 K] [300 K] [200 K] [Unlimited MAC] [Auto]

Cmd2T

Select between 1T and 2T mode on ADDR/CMD.
Configuration options: [Auto] [1T] [2T]

Gear Down Mode

Configuration options: [Auto] [Disabled] [Enabled]

LPDDR4 Refresh Mode

Auto will result in all banks being enabled. Per bank enables refreshes to be sent on a per bank basis.
Configuration options: [All Banks] [Per Bank] [Auto]

CAD Bus Configuration

CAD Bus Timing User Controls

This item allows you to set the CAD bus signals to Auto or Manual.
Configuration options: [Auto] [Manual]

The following items appear only when **CAD Bus Timing User Controls** is set to **[Manual]**.

AddrCmdSetup

This item allows you to setup time on CAD bus signals.
Configuration options: [0] - [39]

CsOdtSetup

This item allows you to setup time on CAD bus signals.
Configuration options: [0] - [39]

CkeSetup

This item allows you to setup time on CAD bus signals.
Configuration options: [0] - [39]

CAD Bus Drive Strength User Controls

This item allows you to set the CAD bus signals to Auto or Manual.
Configuration options: [Auto] [Manual]

The following items appear only when **CAD Bus Drive Strength User Controls** is set to **[Manual]**.

ClkDrvStren

Configuration options: [Auto] [120.0 Ohm] [60.0 Ohm] [40.0 Ohm] [30.0 Ohm] [24.0 Ohm] [20.0 Ohm]

AddrCmdDrvStren

Configuration options: [Auto] [120.0 Ohm] [60.0 Ohm] [40.0 Ohm] [30.0 Ohm] [24.0 Ohm] [20.0 Ohm]

CsOdtDrvStren

Configuration options: [Auto] [120.0 Ohm] [60.0 Ohm] [40.0 Ohm] [30.0 Ohm] [24.0 Ohm] [20.0 Ohm]

CkeDrvStren

Configuration options: [Auto] [120.0 Ohm] [60.0 Ohm] [40.0 Ohm] [30.0 Ohm] [24.0 Ohm] [20.0 Ohm]

Data Bus Configuration

Data Bus Configuration User Controls

This item allows you to specify the mode for drive strength.
Configuration options: [Auto] [Manual]

The following items appear only when **Data Bus Configuration User Controls** is set to **[Manual]**.

RttNom

Configuration options: [Auto] [Rtt_Nom Disable] [RZQ/4] [RZQ/2] [RZQ/6] [RZQ/1] [RZQ/5] [RZQ/3] [RZQ/7]

RttWr

Configuration options: [Auto] [Dynamic ODT Off] [RZQ/2] [RZQ/1] [Hi-Z] [80 Ohm]

RttPark

Configuration options: [Auto] [Rtt_PARK Disable] [RZQ/4] [RZQ/2] [RZQ/6] [RZQ/1] [RZQ/5] [RZQ/3] [RZQ/7]

Common RAS

Data Poisoning

Configuration options: [Enabled] [Disabled] [Auto]

DRAM Post Package Repair

Configuration options: [Enabled] [Disabled]

RCD Parity

Configuration options: [Enabled] [Disabled] [Auto]

DRAM Address Command Parity Retry

Configuration options: [Enabled] [Disabled] [Auto]

The following items appear only when **DRAM Address Command Parity Retry** is set to **[Enabled]**.

Max Parity Error Replay

Configuration options: [0] - [39]

Write CRC Enable

Configuration options: [Enabled] [Disabled] [Auto]

DRAM Write CRC Enable and Retry Limit

Configuration options: [Enabled] [Disabled] [Auto]

The following items appear only when **DRAM Write CRC Enable and Retry Limit** is set to **[Enabled]**.

Max Write CRC Error Replay

Configuration options: [0] - [39]

Disable Memory Error Injection

Configuration options: [True] [False]

ECC

DRAM ECC Symbol Size

Configuration options: [x4] [x8] [Auto]

DRAM ECC Enable

This option will allow you to enable or disable DRAM ECC. If you set **[Auto]** ECC will be enabled.
Configuration options: [Disabled] [Enabled] [Auto]

DRAM UECC Retry

This option will allow you to enable or disable DRAM UECC Retry.
Configuration options: [Disabled] [Enabled] [Auto]

Security

Data Scramble

Configuration options: [Enabled] [Disabled] [Auto]

DRAM Memory Mapping

Chipselect Interleaving

This item allows you to set interleave memory blocks across the DRAM chip selects for node 0.
Configuration options: [Disabled] [Auto]

BankGroupSwap

Configuration options: [Enabled] [Disabled] [Auto]

Address Hash Bank

This item allows you to enable or disable bank address hashing.
Configuration options: [Enabled] [Disabled] [Auto]

Address Hash CS

This item allows you to enable or disable CS address hashing.
Configuration options: [Enabled] [Disabled] [Auto]

Address Hash RM

This item allows you to enable or disable RM address hashing.
Configuration options: [Enabled] [Disabled] [Auto]

SPD Read Optimization

This item allows you to enable or disable SPD Read Optimization.
Configuration options: [Enabled] [Disabled] [Auto]

Phy Configuration

PMU Training

DFE Read Training

Perform 2D Read Training with DFE on.
Configuration options: [Disabled] [Enabled] [Auto]

FFE Training

Perform 2D Write Training with DFE on.
Configuration options: [Disabled] [Enabled] [Auto]

NVDIMM

Memory MBIST

MBIST Enable

This item allows you to enable or disable Memory MBIST.
Configuration options: [Enabled] [Disabled]

The following item appears only when **MBIST Enable** is set to **[Enabled]**.

MBIST Test Mode

This item allows you to select the MBIST Test Mode.

[Interface Mode] Tests Single and Multiple CS Transactions and Basic Connectivity.

[Data Eye Mode] Measures voltage vs. Timing.

MBIST Aggressors

This item allows you to enable or disable Memory Aggressor test.
Configuration options: [Enabled] [Disabled] [Auto]

MBIST Per Bit Slave Die Reporting

This item allows you to enable or disable MBIST per bit slave die result report.
Configuration options: [Enabled] [Disabled] [Auto]

Data Eye

Pattern Select

Configuration options: [PRBS] [SSO] [Both]

Pattern Length

This token helps to determine the pattern length.
Configuration options: [3] - [12]

Aggressor Channel

This helps read the aggressor channels. If it is set to **[Enabled]**, you can read from one or more than one aggressor channel. The default is set to disabled.
Configuration options: [1 Aggressor Channel] [3 Aggressor Channels] [7 Aggressor Channels] [Disabled]

Aggressor Static Lane Control

Configuration options: [Disabled] [Enabled]

The following items appear only when **Aggressor Static Lane Control** is set to **[Enabled]**.

Aggressor Static Lane Select Upper 32 bits

Static Lane Select for Upper 32 bits. The bit mask represents the bits to be read.

Aggressor Static Lane Select Lower 32 bits

Static Lane Select for Lower 32 bits. The bit mask represents the bits to be read.

Aggressor Static Lane Select ECC

Static Lane Select for ECC Lanes. The bit mask represents the bits to be read.

Aggressor Static Lane Value

Target Static Lane Control

Configuration options: [Enabled] [Disabled]

The following items appear only when **Target Static Lane Control** is set to **[Enabled]**.

Target Static Lane Select Upper 32 bits

Static Lane Select for Upper 32 bits. The bit mask represents the bits to be read.

Target Static Lane Select Lower 32 bits

Static Lane Select for Lower 32 bits. The bit mask represents the bits to be read.

Target Static Lane Select ECC

Target Static Lane Value

Data Eye Type

This option determines which results are expected to be captured for Data Eye. Supported options are 1D Voltage Sweep, 1D Timing Sweep, 2D Full Data Eye and Worst Case Margin only.
Configuration options: [1D Voltage Sweep] [1D Timing Sweep] [2D Full Data Eye] [Worst Case Margin Only]

Worst Case Margin Granularity

Configuration options: [Per Chip Select] [Per Nibble]

Read Voltage Sweep Step Size

This option determines the step size for Read Data Eye voltage sweep.
Configuration options: [1] [2] [4]

Read Timing Sweep Step Size

This option determines the step size for Read Data Eye.
Configuration options: [1] [2] [4]

Write Voltage Sweep Step Size

This option determines the step size for Write Data Eye voltage sweep.
Configuration options: [1] [2] [4]

Write Timing Sweep Step Size

This option determines the step size for write Data Eye.
Configuration options: [1] [2] [4]

NBIO Common Options

PCIe ARI Support

Configuration options: [Disabled] [Enabled] [Auto]

PCIe ARI Enumeration

ARI Forwarding Enable for each downstream port.
Configuration options: [Disabled] [Enabled] [Auto]

PSPP Policy

Configuration options: [Disabled] [Balanced] [Auto]

GFX Configuration

GPU Host Translation Cache

This item allows you to disable GPU Host Translation Cache.
Configuration options: [Disabled] [Enabled] [Auto]

Audio Configuration

NB Azalia

This item allows you to enable Integrate HD Audio controller.
Configuration options: [Disabled] [Enabled] [Auto]

Audio IOs

Configuration options: [Azalia] [SoundWire] [Azalia and SoundWire] [I2STDM and I2SBT] [Azalia and I2SBT] [SoundWire and I2SBT] [Azalia mHDA] [Auto]

PDM Mic Selection

Configuration options: [Use 4 Channel] [Use 6 Channel] [Auto]

XFR Enhancement

Damage caused by use of your AMD processor outside of specification or in excess of factory settings are not covered by your system manufacturers warranty.

The following items appear only when **[Accept]** is selected for **XFR Enhancement**.

Precision Boost Overdrive

This item allows you to manually set, disable, or enable the precision boost overdrive.
Configuration options: [Auto] [Disabled] [Enabled] [Manual]

The following item appears only when **Precision Boost Overdrive** is set to **[Manual]**.

PPT Limit

This item allows you to input the PPT Limit [W], Board Socket Power capability, which is adjustable up to the motherboard programmed PPT limit.
Configuration options: [0] - [9999]

TDC Limit

This item allows you to input the TDC Limit [A], Board thermally constrained current delivery capability, which is adjustable up to the motherboard programmed TDC limit.
Configuration options: [0] - [9999]

EDC Limit

This item allows you to input the EDC Limit [A], Board electrically constrained current delivery capability, which is adjustable up to the motherboard programmed EDC limit.
Configuration options: [0] - [9999]

Precision Boost Overdrive Scalar

This item allows you to manually set, or disable the part runs with a scalar of customized value.
Configuration options: [Auto] [Disabled] [Manual]

The following item appears only when **Precision Boost Overdrive Scalar** is set to **[Manual]**.

Customized Precision Boost Overdrive Scalar

The Precision Boost Overdrive Scalar increases the maximum boost voltage used (runs above parts specified maximum) and the amount of time spent at that voltage. The larger the value entered the larger the boost voltage used and the longer that voltage will be maintained.
Configuration options: [1X] - [10X]

FCLK Frequency

This item allows you to specify the FCLK frequency.
Configuration options: [Auto] [667MHz] - [3000MHz]

SOC OVERCLOCK VID

Specifies the Voltage ID (VID) value for VDDR_SOC to support overclocking.
Configuration options: [0] - [99]

UCLK DIV1 MODE

Configuration options: [Auto] [UCLK==MEMCLK] [UCLK==MEMCLK/2]

SMU Common Options

System Temperature Tracking

STT Control

Configuration options: [Auto] [Manual]

The following item appears only when **STT Control** is set to **[Manual]**.

System Temperature Tracking

Configuration options: [Disabled] [Enabled] [Auto]

The following items appear only when **System Temperature Tracking** is set to **[Enabled]**.

STT_MinLimit

Specifies the minimum sustained power that the APU power is allowed to reduce to in mWatts.
Configuration options: [0] - [65535]

STT_PCB_SENSOR_COUNT

Configuration options: [APU Only] [APU +dGPU] [Auto]

STT_M1

Configuration options: [0] - [9999]

STT_M2

Configuration options: [0] - [9999]

STT_M3

Configuration options: [0] - [9999]

STT_M4

Configuration options: [0] - [9999]

STT_M5

Configuration options: [0] - [9999]

STT_M6

Configuration options: [0] - [9999]

STT_C_APU

Configuration options: [0] - [9999]

STT_C_GPU

Configuration options: [0] - [9999]

STT_ALPHA_APU

Configuration options: [0] - [9999]

STT_ALPHA_GPU

Configuration options: [0] - [9999]

STT_SKIN_TEMPERATURE_LIMIT_APU

Configuration options: [0] - [9999]

STT_SKIN_TEMPERATURE_LIMIT_GPU

Configuration options: [0] - [9999]

STT_ERROR_COEFF

Configuration options: [0] - [9999]

STT_ERROR_RATE_COEFF_Copy

Configuration options: [0] - [9999]
STAPM Control

STAPM Control

STAPM Control

Configuration options: [Auto] [Manual]

The following item appears only when **STAPM Control** is set to **[Manual]**.

STAPM Boost

Configuration options: [Disabled] [Enabled] [Auto]

The following item appears only when **STAPM Boost** is set to **[Enabled]**.

Tskin Time Constant

This item allows you to set the Tskin time constant [seconds].

SmartShift Control

SmartShift Control

Configuration options: [Auto] [Manual]

The following item appears only when **SmartShift Control** is set to **[Manual]**.

SmartShift Enable

Configuration options: [Disabled] [Enabled] [Auto]

APU Only sPPT Limit

Configuration options: [0] - [4294967295]

Sustained PowerLimit

Configuration options: [0] - [4294967295]

Fast PPT Limit

Configuration options: [0] - [4294967295]

Slow PPT Limit

Configuration options: [0] - [4294967295]

System Configuration AM4

Configuration options: [35W COMMERCIAL and CONSUMER SYSTEM CONFIG 1] [45W COMMERCIAL and CONSUMER SYSTEM CONFIG 2] [65W COMMERCIAL - SYSTEM CONFIG 3] [65W CONSUMER - SYSTEM CONFIG 6] [Auto]

CPPC CTRL

Configuration options: [Disabled] [Enabled] [Auto]

The following item appears only when **CPPC CTRL** is set to **[Enabled]**.

Perf Limit Max Range

Configuration options: [0] - [255]

Perf Limit Min Range

Configuration options: [0] - [255]

EPP Max Range

Configuration options: [0] - [255]

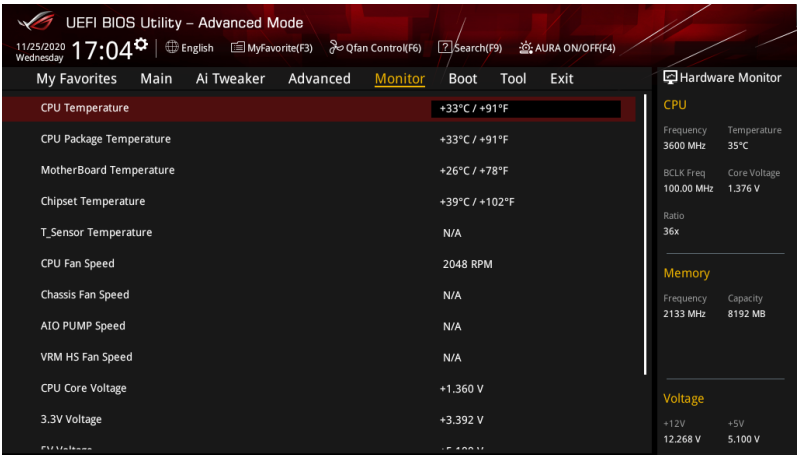
EPP Min Range

Configuration options: [0] - [255]

7. Monitor menu

The Monitor menu displays the system temperature/power status, and allows you to change the fan settings.

Scroll down to display the other BIOS items.



CPU Temperature, CPU Package Temperature, MotherBoard Temperature, Chipset Temperature, T_Sensor Temperature [xxx°C/xxx°F]

The onboard hardware monitor automatically detects and displays the CPU, CPU Package, motherboard, chipset, and T-Sensor temperatures. Select **[Ignore]** if you do not wish to display the detected temperatures.

CPU Fan Speed, CPU Optional Fan Speed, Chassis Fan Speed, AIO PUMP Speed, VRM HS Fan Speed [xxxx RPM]

The onboard hardware monitor automatically detects and displays the CPU fan, CPU optional fan, chassis fan, AIO PUMP fan, and VRM heatsink fan speed in rotations per minute (RPM). If the fan is not connected to the motherboard, the field shows N/A. Select **[Ignore]** if you do not wish to display the detected speed.

CPU Core Voltage, 3.3V Voltage, 5V Voltage, 12V Voltage [x.xxxx V]

The onboard hardware monitor automatically detects the voltage output through the onboard voltage regulators. Select **[Ignore]** if you do not want to detect this item.

Q-fan Configuration

Q-fan Tuning

Click this item to automatically detect the lowest speed and configure the minimum duty cycle for each fan.

CPU Q-Fan Control

This item allows you to set the CPU Q-Fan operating mode.

[Auto]	Detects the type of CPU fan installed and automatically switches the control modes.
[PWM Mode]	Enables the CPU Q-Fan Control feature in PWM mode for 4-pin CPU fan.
[DC Mode]	Enables the CPU Q-Fan Control feature in DC mode for 3-pin CPU fan.
[Disabled]	Disables the Q-Fan Control.

The following items appear only when you set the **CPU Q-Fan Control** to **[Auto]**, **[PWM Mode]**, and **[DC Mode]**.

CPU Fan Step Up

This item allows you to set the value of the CPU fan step up.
Configuration options: [0 sec] [2.1 sec] [2.8 sec] [3.6 sec] [4.2 sec] [5.0 sec] [6.3 sec] [8.5 sec] [12 sec] [25 sec]

CPU Fan Step Down

This item allows you to set the value of the CPU fan step down.
Configuration options: [0 sec] [2.1 sec] [2.8 sec] [3.6 sec] [4.2 sec] [5.0 sec] [6.3 sec] [8.5 sec] [12 sec] [25 sec]

CPU Fan Profile

This item allows you to set the appropriate performance level of the CPU fan.

[Standard]	Set to make the CPU fan adjust automatically depending on the CPU temperature.
[Silent]	Set to minimize the fan speed for quiet CPU fan operation.
[Turbo]	Set to achieve maximum CPU fan speed.
[Manual]	Set to assign the detailed fan speed control parameters.

The following items appear only when you set the **CPU Fan Profile** to **[Manual]**.

CPU Upper Temperature

Use the <+> or <-> keys to adjust the upper limit of the CPU temperature. The CPU fan will operate at the maximum duty cycle when the temperature source is higher than the limit.

CPU Fan Max. Duty Cycle (%)

Use the <+> or <-> keys to adjust the maximum CPU fan duty cycle. When the temperature source reaches the upper limit, the CPU fan will operate at the maximum duty cycle.

CPU Middle Temperature

Use the <+> or <-> keys to adjust the middle limit of the CPU temperature.

CPU Fan Middle. Duty Cycle (%)

Use the <+> or <-> keys to adjust the CPU fan middle duty cycle.

CPU Lower Temperature

Use the <+> or <-> keys to adjust the lower limit of the CPU temperature. The CPU fan will operate at the minimum duty cycle when the temperature source is lower than the limit.

CPU Fan Min. Duty Cycle(%)

Use the <+> or <-> keys to adjust the minimum CPU fan duty cycle. When the temperature source is under the limit, the CPU fan will operate at the minimum duty cycle.

Chassis Fan(s) Configuration

Chassis Fan Q-Fan Control

This item allows you to set the Chassis Fan operating mode.

[Auto]	Detects the type of Chassis Fan installed and automatically switches the control modes.
[PWM Mode]	Enables the Chassis Fan Q-Fan Control feature in PWM mode for 4-pin Chassis Fan.
[DC Mode]	Enables the Chassis Fan Q-Fan Control feature in DC mode for 3-pin Chassis Fan.
[Disabled]	Disables the Q-Fan control.

The following items appear only when **Chassis Fan Q-Fan Control** is set to **[Auto]**, **[PWM Mode]**, or **[DC Mode]**.

Chassis Fan Q-Fan Source

The assigned fan will be controlled according to the selected temperature source.
Configuration options: [CPU] [MotherBoard] [Chipset] [T_Sensor] [Multiple Sources]

For Multiple Sources, select up to three temperature sources and the fan will automatically change based on the highest temperature.

Chassis Fan Step Up

This item allows you to set the value of the Chassis Fan step up.
Configuration options: [0 sec] [12 sec] [25 sec] [51 sec] [76 sec] [102 sec] [127 sec] [153 sec] [178 sec] [204 sec]

Chassis Fan Step Down

This item allows you to set the value of the Chassis Fan step down.
Configuration options: [0 sec] [12 sec] [25 sec] [51 sec] [76 sec] [102 sec] [127 sec] [153 sec] [178 sec] [204 sec]

Chassis Fan Speed Low Limit

This item allows you to disable or set the Chassis Fan warning speed.
Configuration options: [Ignore] [200 RPM] [300 RPM] [400 RPM] [500 RPM] [600 RPM]

Chassis Fan Profile

This item allows you to set the appropriate performance level of the Chassis Fan.

[Standard] Sets to [Standard] to make the Chassis Fan automatically adjust depending on the chassis temperature.

[Silent] Sets to [Silent] to minimize the fan speed for quiet Chassis Fan operation.

[Turbo] Sets to [Turbo] to achieve maximum Chassis Fan speed.

[Manual] Sets to [Manual] to assign detailed fan speed control parameters.

The following items appear only when **Chassis Fan Profile** is set to **[Manual].**

Chassis Fan Upper Temperature

Use the <+> or <-> keys to adjust the upper limit of the Chassis Fan temperature. The Chassis Fan will operate at the maximum duty cycle when the temperature source is higher than the limit.

Chassis Fan Max. Duty Cycle (%)

Use the <+> or <-> keys to adjust the maximum Chassis Fan duty cycle. When the temperature source reaches the upper limit, the Chassis Fan will operate at the maximum duty cycle.

Chassis Fan 1 Middle Temperature

Use the <+> or <-> keys to adjust the middle limit of the Chassis Fan 1 temperature.

Chassis Fan 1 Middle. Duty Cycle (%)

Use the <+> or <-> keys to adjust the Chassis Fan 1 middle duty cycle.

Chassis Fan Lower Temperature

Use the <+> or <-> keys to adjust the lower limit of the Chassis Fan temperature. The Chassis Fan will operate at the minimum duty cycle when the temperature source is lower than the limit.

Chassis Fan Min. Duty Cycle(%)

Use the <+> or <-> keys to adjust the minimum Chassis Fan duty cycle. When the temperature source is under the limit, the Chassis Fan will operate at the minimum duty cycle.

AIO PUMP Control

[Disabled] Disable the AIO PUMP control feature.

[Auto] Detects the type of AIO PUMP installed and automatically switches the control modes.

[DC mode] Enable the AIO PUMP control in DC mode for 3-pin chassis fan.

[PWM mode] Enable the AIO PUMP control in PWM mode for 4-pin chassis fan.

The following items appear only when **AIO PUMP Control** is set to **[Auto]**, **[DC mode]** or **[PWM mode]**.

AIO PUMP Q-Fan Source

The assigned fan will be controlled according to the selected temperature source. Configuration options: [CPU] [MotherBoard] [Chipset] [T_Sensor] [Multiple Sources]

For Multiple Sources, select up to three temperature sources and the fan will automatically change based on the highest temperature.

AIO PUMP Upper Temperature

Use the <+> or <-> keys to adjust the upper limit of the AIO PUMP temperature.

AIO PUMP Max. Duty Cycle (%)

Use the <+> or <-> keys to adjust the maximum AIO PUMP duty cycle. When the CPU temperature reaches the upper limit, the AIO PUMP will operate at the maximum duty cycle.

AIO PUMP Middle Temperature

Use the <+> or <-> keys to adjust the middle limit of the AIO PUMP temperature.

AIO PUMP Middle. Duty Cycle (%)

Use the <+> or <-> keys to adjust the maximum AIO PUMP duty cycle. When the CPU temperature reaches the upper limit, the AIO PUMP will operate at the maximum duty cycle.

AIO PUMP Lower Temperature

Use the <+> or <-> keys to adjust the lower limit of the AIO PUMP temperature. The AIO PUMP will operate at the minimum duty cycle when the temperature is lower than the limit.

AIO PUMP Min. Duty Cycle(%)

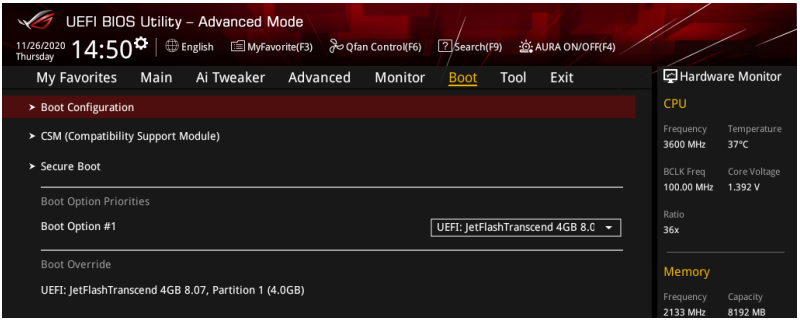
Use the <+> or <-> keys to adjust the minimum AIO PUMP duty cycle. When the CPU temperature is under the limit, the AIO PUMP will operate at the minimum duty cycle.

Active VRM HS Fan enabled

Configuration options: [Yes] [No]

8. Boot menu

The Boot menu items allow you to change the system boot options.



Boot Configuration

Fast Boot

[Disabled] Allows your system to go back to its normal boot speed.

[Enabled] Allows your system to accelerate the boot speed.

The following item appears only when you set **Fast Boot** to **[Enabled]**.

Next Boot after AC Power Loss

[Normal Boot] Returns to normal boot on the next boot after an AC power loss.

[Fast Boot] Accelerates the boot speed on the next boot after an AC power loss.

Boot Logo Display

[Auto] Sets the boot logo to display during POST.

[Full Screen] Sets the boot logo display in full screen during POST.

[Disabled] Disables the boot logo display during POST.

The following item appears only when you set **Boot Logo Display** to **[Auto]** and **[Full Screen]**.

Post Delay Time

This item allows you to select a desired additional POST waiting time to easily enter the BIOS Setup. You can only execute the POST delay time during normal boot.

Configuration options: [0 sec] - [10 sec]

This feature only works when set under normal boot.

The following item appears only when you set **Boot Logo Display** to **[Disabled]**.

Post Report

This item allows you to select a desired POST report waiting time.
Configuration options: [1 sec] - [10 sec] [Until Press ESC]

Boot up NumLock State

This item allows you to enable or disable power-on state of the NumLock.
Configuration options: [Disabled] [Enabled]

Wait For 'F1' If Error

This item allows your system to wait for the <F1> key to be pressed when error occurs.
Configuration options: [Disabled] [Enabled]

Option ROM Messages

[Force BIOS]	The Option ROM Messages will be shown during the POST.
[Keep Current]	Only the ASUS logo will be shown during the POST.

Interrupt 19 Capture

[Enabled]	Execute the trap right away.
[Disabled]	Execute the trap during legacy boot.

AMI Native NVMe Driver Support

This item allows you to enable or disable all NVMe device native OpROM.
Configuration options: [On] [Off]

Setup Mode

[Advanced Mode]	This item allows you to go to Advanced Mode of the BIOS after POST.
[EZ Mode]	This item allows you to go to EZ Mode of the BIOS after POST.

CSM (Compatibility Support Module)

This item allows you to configure the CSM (Compatibility Support Module) items to fully support the various VGA, bootable devices and add-on devices for better compatibility.

Launch CSM

[Auto]	The system automatically detects the bootable devices and the add-on devices.
[Enabled]	For better compatibility, enable the CSM to fully support the non-UEFI driver add-on devices or the Windows® UEFI mode.
[Disabled]	Disable the CSM to fully support the non-UEFI driver add-on devices or the Windows® UEFI mode.

The following items appear only when you set **Launch CSM** to **[Enabled]**.

Boot Device Control

This item allows you to select the type of devices that you want to boot.
Configuration options: [UEFI and Legacy OPROM] [Legacy OPROM only] [UEFI only]

Boot from Network Devices

This item allows you to select the type of network devices that you want to launch.
Configuration options: [Ignore] [Legacy only] [UEFI driver first]

Boot from Storage Devices

This item allows you to select the type of storage devices that you want to launch.
Configuration options: [Ignore] [Legacy only] [UEFI driver first]

Boot from PCI-E/PCI Expansion Devices

This item allows you to select the type of PCI-E/PCI expansion devices that you want to launch.
Configuration options: [Legacy only] [UEFI driver first]

Secure Boot

This item allows you to configure the Windows® Secure Boot settings and manage its keys to protect the system from unauthorized access and malwares during POST.

OS Type

[Windows UEFI Mode]	This item allows you to select your installed operating system. Execute the Microsoft® Secure Boot check. Only select this option when booting on Windows® UEFI mode or other Microsoft® Secure Boot compliant OS.
[Other OS]	Get the optimized function when booting on Windows® non-UEFI mode. Microsoft® Secure Boot only supports Windows® UEFI mode.

Key Management

Install Default Secure Boot keys

This item allows you to immediately load the default Security Boot keys, Platform key (PK), Key-exchange Key (KEK), Signature database (db), and Revoked Signatures (dbx). When the default Secure boot keys are loaded, the PK state will change from Unloaded mode to loaded mode.

Clear Secure Boot keys

This item appears only when you load the default Secure Boot keys. This item allows you to clear all default Secure Boot keys.

Key Management

Install Default Secure Boot keys

This item allows you to immediately load the default Security Boot keys, Platform key (PK), Key-exchange Key (KEK), Signature database (db), and Revoked Signatures (dbx). When the default Secure boot keys are loaded, the PK state will change from Unloaded mode to loaded mode.

Save Secure Boot Keys

This item allows you to save the PK (Platform Keys) to a USB storage device.

Platform Key(PK)

The Platform Key (PK) locks and secures the firmware from any permissible changes. The system verifies the PK before your system enters the OS.

Details

This item allows you to view the details of the PK.

Save to file

This item allows you to save the PK to a USB storage device.

Set New key

This item allows you to load the downloaded PK from a USB storage device.

Delete key

This item allows you to delete the PK from your system. Once the PK is deleted, all the system's Secure Boot keys will not be active.
Configuration options: [Yes] [No]

The PK file must be formatted as a UEFI variable structure with time-based authenticated variable.

Key Exchange Keys

The Key Exchange Keys (KEK) manages the Signature database (db) and Forbidden Signature database (dbx).

Key Exchange Keys (KEK) refers to Microsoft® Secure Boot Key-Enrollment Key (KEK).

Details

This item allows you to view the details of the KEK.

Save to file

This item allows you to save the KEK to a USB storage device.

Set New key

This item allows you to load the downloaded KEK from a USB storage device.

Append Key

This item allows you to load the additional KEK from a storage device for an additional db and dbx loaded management.

Delete key

This item allows you to delete the KEK from your system.
Configuration options: [Yes] [No]

The KEK file must be formatted as a UEFI variable structure with time-based authenticated variable.

DB Management

The db (Authorized Signature database) lists the signers or images of UEFI applications, operating system loaders, and UEFI drivers that you can load on the single computer.

Save to file

This item allows you to save the db to a USB storage device.

Set New key

This item allows you to load the downloaded db from a USB storage device.

Forbidden Signatures

The Forbidden Signature database (dbx) lists the forbidden images of db items that are no longer trusted and cannot be loaded.

Details

This item allows you to view the details of the dbx.

Save to file

This item allows you to save the dbx to a USB storage device.

Set New key

This item allows you to load the downloaded dbx from a USB storage device.

Append Key

This item allows you to load the additional dbx from a storage device for an additional db and dbx loaded management.

Delete key

This item allows you to delete the dbx file from your system.
Configuration options: [Yes] [No]

The dbx file must be formatted as a UEFI variable structure with time-based authenticated variable.

Boot Option Priorities

These items specify the boot device priority sequence from the available devices. The number of device items that appears on the screen depends on the number of devices installed in the system.

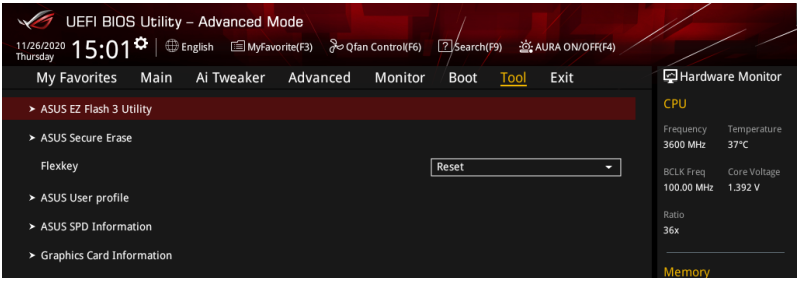
- To access Windows® OS in Safe Mode, press <F8 > after POST (Windows® 8 not supported).
- To select the boot device during system startup, press <F8> when ASUS Logo appears.

Boot Override

These item displays the available devices. The number of device items that appear on the screen depends on the number of devices installed in the system. Click an item to start booting from the selected device.

9. Tool menu

The Tool menu items allow you to configure options for special functions. Select an item then press <Enter> to display the submenu.



Flexkey

[Reset]	Reboots the system.
[Aura On/Off]	Enable or Disable Aura LEDs. This setting does not sync with the BIOS/ software option.
[DirectKey]	Boot directly into the BIOS.

9.1 ASUS EZ Flash 3 Utility

This item allows you to run ASUS EZ Flash 3. When you press <Enter>, a confirmation message appears. Use the left/right arrow key to select between [Yes] or [No], then press <Enter> to confirm your choice.

For more details, refer to section **ASUS EZ Flash 3**.

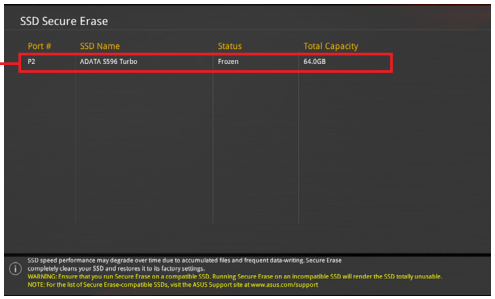
9.2 Secure Erase

SSD speeds may lower over time as with any storage medium due to data processing. Secure Erase completely and safely cleans your SSD, restoring it to factory performance levels.

To launch Secure Erase, click **Tool > Secure Erase** on the Advanced mode menu.

- The time to erase the contents of your SSD may take a while depending on its size. Do not turn off the system during the process.
- Secure Erase is only supported on Intel SATA port. For more information about Intel SATA ports, refer to section **Motherboard layout** in your user manual.

Displays the available SSDs

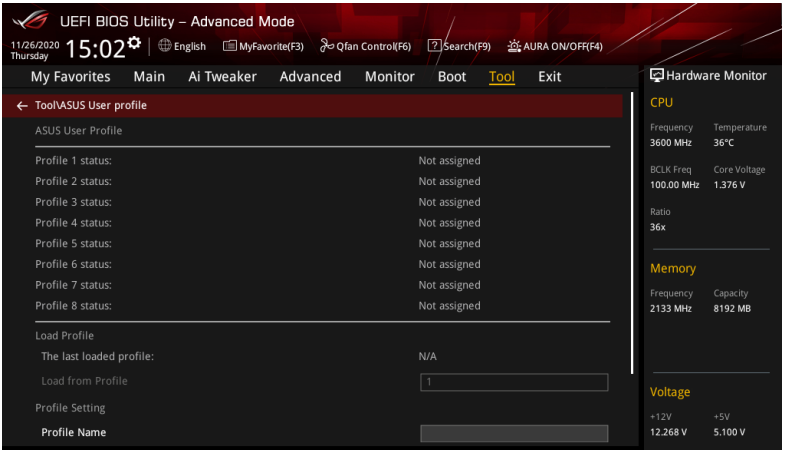


Status definition:

- **Frozen.** The frozen state is the result of a BIOS protective measure. The BIOS guards drives that do not have password protection by freezing them prior to booting. If the drive is frozen, a power off or hard reset of your PC must be performed to proceed with the Secure Erase.
- **Locked.** SSDs might be locked if the Secure Erase process is either incomplete or was stopped. This may be due to a third party software that uses a different password defined by ASUS. You have to unlock the SSD in the software before proceeding with Secure Erase.

9.3 ASUS User Profile

This item allows you to store or load multiple BIOS settings.



Load from Profile

This item allows you to load the previous BIOS settings saved in the BIOS Flash. Key in the profile number that saved your BIOS settings, press <Enter>, and then select **Yes**.

- DO NOT shut down or reset the system while updating the BIOS to prevent the system boot failure!
- We recommend that you update the BIOS file only coming from the same memory/ CPU configuration and BIOS version.

Profile Name

This item allows you to key in a profile name.

Save to Profile

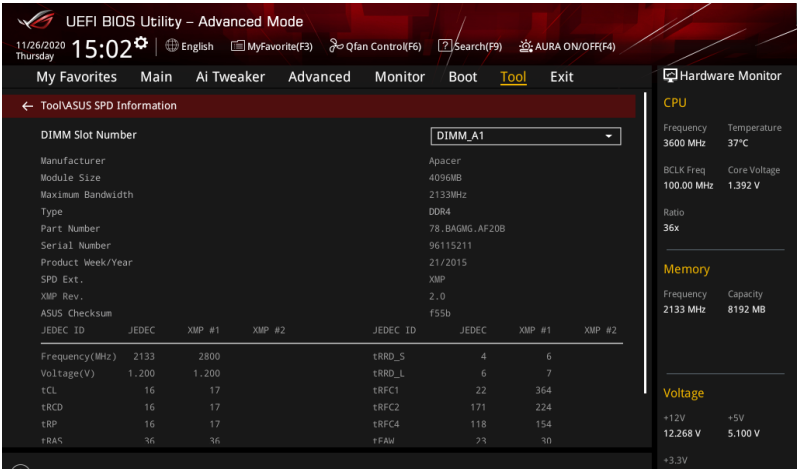
This item allows you to save the current BIOS settings to the BIOS Flash, and create a profile. Key in a profile number from one to eight, press <Enter>, and then select **Yes**.

Load/Save Profile from/to USB Drive

This item allows you to load or save profile from your USB drive, load and save profile to your USB drive.

9.4 ASUS SPD Information

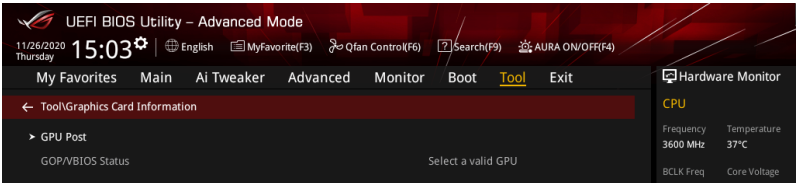
This item allows you to view the DRAM SPD information.



9.5 Graphics Card Information

This item displays the information and recommended configuration for the PCIE slots that the graphics card is installed in your system.

This feature is only supported on selected ASUS graphics cards.

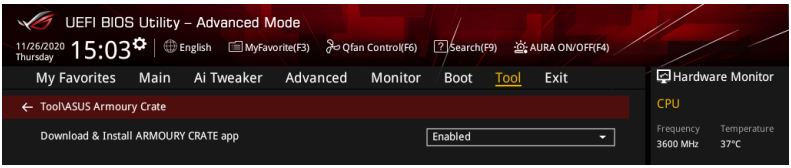


GPU Post

This item displays the information and recommended configuration for the PCIE slots that the graphics card is installed in your system.

9.6 ASUS Armoury Crate

This item allows you to enable or disable downloading and installing of the Armoury Crate app in the Windows® OS. The Armoury Crate app can help you manage and download the latest ROG drivers and utilities for your motherboard.

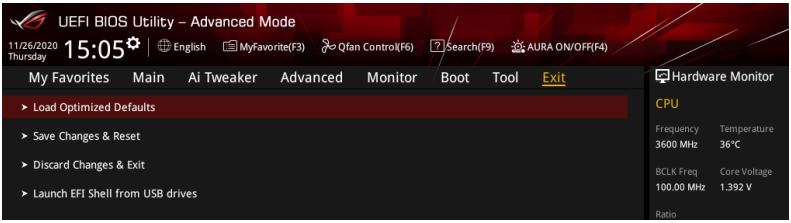


Download & Install ARMOURY CRATE app

Configuration options: [Disabled] [Enabled]

10. Exit menu

The Exit menu items allow you to load the optimal default values for the BIOS items, and save or discard your changes to the BIOS items. You can access the EZ Mode from the Exit menu.



Load Optimized Defaults

This option allows you to load the default values for each of the parameters on the Setup menus. When you select this option or if you press <F5>, a confirmation window appears. Select **OK** to load the default values.

Save Changes & Reset

Once you are finished making your selections, choose this option from the Exit menu to ensure the values you selected are saved. When you select this option or if you press <F10>, a confirmation window appears. Select **OK** to save changes and exit.

Discard Changes & Exit

This option allows you to exit the Setup program without saving your changes. When you select this option or if you press <Esc>, a confirmation window appears. Select **Yes** to discard changes and exit.

Launch EFI Shell from USB drives

This option allows you to attempt to launch the EFI Shell application (shellx64.efi) from one of the available filesystem devices.

11. Updating BIOS

The ASUS website publishes the latest BIOS versions to provide enhancements on system stability, compatibility,and performance. However, BIOS updating is potentially risky. If there is no problem using the current version of BIOS, DO NOT manually update the BIOS. Inappropriate BIOS updating may result to system's failure to boot. Carefully follow the instructions in this chapter to update your BIOS when necessary.

Visit http://www.asus.com to download the latest BIOS file for this motherboard.

The following utilities allow you to manage and update the motherboard BIOS setup program.

1. EZ Update: Updates the BIOS in Windows® environment.
2. ASUS EZ Flash 3: Updates the BIOS using a USB flash drive.
3. ASUS CrashFree BIOS 3: Restores the BIOS using the motherboard support DVD or a USB flash drive when the BIOS file fails or gets corrupted.

11.1 EZ Update

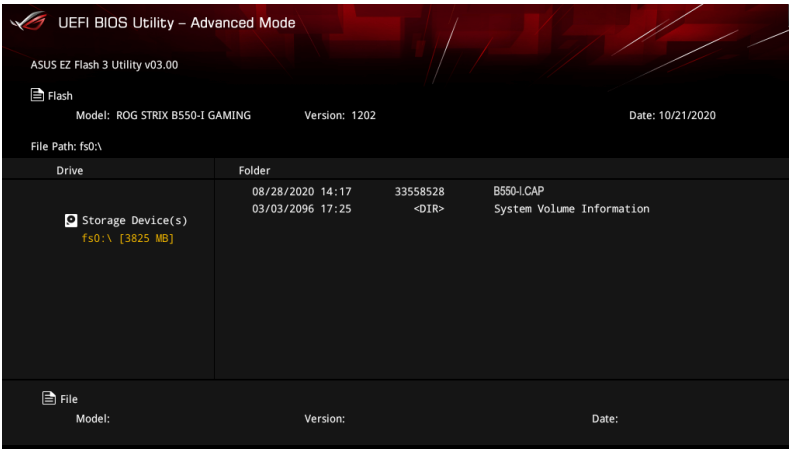
The EZ Update is a utility that allows you to update the motherboard BIOS in Windows® environment.

- EZ Update requires an Internet connection either through a network or an ISP (Internet Service Provider).
- This utility is available in the support DVD that comes with the motherboard package

11.2 Updating BIOS

ASUS EZ Flash 3 allows you to download and update to the latest BIOS using a USB drive.

1. Insert the USB flash drive that contains the latest BIOS file to a USB port.
2. Enter the Advanced Mode of the BIOS setup program. Go to the **Tool** menu to select **ASUS EZ Flash 3 Utility** and press <Enter>.
3. Press <Tab> to switch to the **Drive** field.
4. Press the Up/Down arrow keys to find the USB flash drive that contains the latest BIOS, and then press <Enter>.
5. Press <Tab> to switch to the **Folder** Info field.
6. Press the Up/Down arrow keys to find the BIOS file, and then press <Enter> to perform the BIOS update process. Reboot the system when the update process is done.



11.3 ASUS CrashFree BIOS 3

The ASUS CrashFree BIOS 3 utility is an auto recovery tool that allows you to restore the BIOS file when it fails or gets corrupted during the updating process. You can restore a corrupted BIOS file using the motherboard support DVD or a USB flash drive that contains the BIOS file.

The BIOS file in the motherboard support DVD may be older than the BIOS file published on the ASUS official website. If you want to use the newer BIOS file, download the file at https://www.asus.com/support/ and save it to a USB flash drive.

Recovering the BIOS

To recover the BIOS:

1. Turn on the system.
2. Insert the motherboard support DVD to the optical drive, or the USB flash drive containing the BIOS file to the USB port.
3. The utility automatically checks the devices for the BIOS file. When found, the utility reads the BIOS file and enters ASUS EZ Flash 3 automatically.
4. The system requires you to enter BIOS Setup to recover the BIOS setting. To ensure system compatibility and stability, we recommend that you press <F5> to load default BIOS values.

DO NOT shut down or reset the system while updating the BIOS! Doing so can cause system boot failure!