Intel® NUC
Visual BIOS Glossary
Revision 2.0 – February 2020

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Introduction

The BIOS Setup program can be used to view and change the BIOS settings for the Intel® NUC. BIOS Setup is accessed by pressing **F2** after the Power-On Self-Test (POST) memory test begins and before the operating system boot begins.

The presence of menus and BIOS settings are dependent on your Intel NUC model, hardware components installed, and the BIOS version.

If any problems occur (poor performance, intermittent issues) after making BIOS settings changes, reset the BIOS to default values:

1. Press **F2** during boot to enter the BIOS Setup.
2. Press **F9** to set defaults.
3. Press **F10** to save and exit.

If the system locks or won't boot after making BIOS settings changes, perform a BIOS Recovery.

How to Read this Glossary

Type	Indicates the type of BIOS setting. • **Action:** BIOS takes a specific action when this is selected. There may be a confirmation prompt before the action is taken. • **Checkbox:** BIOS displays a checkbox that can be set or cleared. • **Information:** BIOS displays non-selectable text. • **Numeric:** BIOS displays a number that can be incremented, decremented, manually entered, or set with a slider bar. • **One-of:** BIOS displays a list of options and allows one to be selected. • **Ordered List:** BIOS displays a list of options that can be reordered. • **Password:** BIOS displays a window for the user to enter text. Each character entered is displayed as an asterisk character (*). If an invalid character is entered, the BIOS will beep and will not display an additional asterisk.
Range	Minimum and Maximum values that can be set (for Numeric questions).
Help	Help text that appears in the standard Help section of the Setup screen.
Advanced Help	Help text that appears in the Advanced Help pop-up window.
Requires	Lists requirements for this question to appear in BIOS Setup.
Visual BIOS Page	Indicates the BIOS page or menu where the setting is found.

Setup Hotkeys

F1	Opens the Advanced Help pop-up window for the selected question.
F7	Initiates a BIOS update process.
F9	Invokes a confirmation dialog to load default settings.
F10	Invokes a confirmation dialog to Exit and Save Changes.
Ctrl + Alt + Del	Restarts the system.
Arrow Left Arrow Right Arrow Up Arrow Down Tab Shift + Tab	Moves the cursor left/right/up/down one question. Will wrap if already at first or last question on the page. When selecting an option from a drop-down list, moves the cursor up/down one option.
Space	When a Checkbox question is highlighted by the cursor, toggles Set/Clear state of Checkbox question
Esc	**When selecting an option for a One-Of/Ordered List question:** Close option selection box and cancel changes. **When selecting a value for a Numeric question:** Cancel changes. **When viewing a Setup sub-screen page**: Return to parent Setup page. **When viewing a top-level Setup page:** Invoke confirmation dialog box to Exit Discarding Changes. **When viewing a confirmation dialog box:** Close confirmation dialog box without taking action. **When entering text into a Password/Text Entry window**: Close window and cancel changes.

Home Page 1

Intel® Desktop Board *Product*

Type	Information
Visual BIOS Page	Home Page 1

- *Product* is the SMBIOS Board Product string.

BIOS Version:

Type	Information
Visual BIOS Page	Home Page 1

- Displays the current full BIOSID string.

Total Memory:

Type	Information
Visual BIOS Page	Home Page 1

- Displays the total installed system memory size in gigabytes. Example: **4 GB**

Processor:

Type	Information
Visual BIOS Page	Home Page 1

- Displays the processor brand.

System Date and Time:

- Displays the current time and date in format: MM/DD/YYYY HH:MM:SS XM

Home Page 2

System Information

Manufacturer	System Manufacturer string from SMBIOS Type 1 structure.
Product Name	System Product Name string from SMBIOS Type 1 structure.
Version	System Version string from SMBIOS Type 1 structure.
Serial Number	System Serial Number string from SMBIOS Type 1 structure.
UUID	System UUID/GUID from SMBIOS Type 1 structure.
SKU Number	System SKU Number string from SMBIOS Type 1 structure.
Family	System Family string from SMBIOS Type 1 structure.

Board Information

Manufacturer	System Manufacturer string from SMBIOS Type 2 structure.
Product Name	System Product Name string from SMBIOS Type 2 structure.
Version	System Version string from SMBIOS Type 2 structure.
Serial Number	System Serial Number string from SMBIOS Type 2 structure.
Asset Tag	Board Asset Tag string from SMBIOS Type 2 structure.

Chassis Information

Manufacturer	System Manufacturer string from SMBIOS Type 3 structure.
Product Name	System Product Name string from SMBIOS Type 3 structure.
Version	System Version string from SMBIOS Type 3 structure.
Serial Number	System Serial Number string from SMBIOS Type 3 structure.
Asset Tag	Board Asset Tag string from SMBIOS Type 3 structure.

Other Information

Intel® Integrator Toolkit has modified this BIOS	Hidden unless the flag is set that indicates that the BIOS has been modified by ITK.
Processor Signature	32-bit processor signature displayed in hexadecimal.
Processor Family x Model x Stepping X	Processor Family/Model/Stepping (including Extended Family/Model) displayed in hexadecimal.
Microcode Update Revision	32-bit processor microcode update revision in hexadecimal.
Intel® Management Engine Firmware	Displays ME Firmware Version.
EC Firmware EC2 Firmware	Displays EC or EC2 Firmware Version.
Onboard LAN MAC Address	MAC Address of onboard LAN device in hexadecimal.
Primary LAN MAC Address	MAC Address of onboard LAN device in hexadecimal.
Secondary LAN MAC Address	MAC Address of onboard LAN device in hexadecimal.

Advanced

Advanced > Main

Processor Information [Upper Left Section]

Processor Type

Type	Information
Visual BIOS Page	Advanced > Main > Processor Information

- Displays the processor brand string.

Host Clock Frequency

Type	Information
Visual BIOS Page	Advanced > Main > Processor Information

- Displays the default Host Clock Frequency.

Overridden Host Clock Frequency

Type	Information
Requires	Host Clock Frequency has been overridden to a non-default value.
Visual BIOS Page	Advanced > Main > Processor Information

- Displays the current Host Clock Frequency.

Max Processor Speed

Type	Information
Visual BIOS Page	Advanced > Main > Processor Information

- Displays the maximum processor speed at current settings. Defined as Current Host Clock Frequency x Maximum Non-Turbo Ratio, or Current Host Clock Frequency x 1-Core Active Turbo Ratio if Intel® Turbo Boost Technology is enabled.

Overridden Max Processor Speed

Type	Information
Requires	Host Clock Frequency, Turbo Ratios, or Maximum Non-Turbo Ratio have been overridden.
Visual BIOS Page	Advanced > Main > Processor Information

- Displays the maximum processor speed at current settings. Defined as Current Host Clock Frequency x Maximum Non-Turbo Ratio, or Current Host Clock Frequency x 1-Core Active Turbo Ratio if Intel® Turbo Boost Technology is enabled.

L2 Cache RAM

Type	Information
Visual BIOS Page	Advanced > Main > Processor Information

- Displays the total L2 cache memory of the installed processor in megabytes. If the installed processor is multi- core, it is displayed as number of cores x L2 cache per core.

L3 Cache RAM

Type	Information
Visual BIOS Page	Advanced > Main > Processor Information

- Displays the total L3 cache memory of the installed processor in megabytes.

Processor Signature

Type	Information
Visual BIOS Page	Advanced > Main > Processor Information

- 32-bit processor signature displayed in hexadecimal.

Processor Family *x* Model *y* Stepping *z*

Type	Information
Visual BIOS Page	Advanced > Main > Processor Information

- Processor Family/Model/Stepping (including Extended Family/Model) displayed in hexadecimal.

Microcode Update Revision

Type	Information
Visual BIOS Page	Advanced > Main > Processor Information

- 32-bit processor microcode update revision in hexadecimal.

Memory Information [Upper Right Section]

Total Memory

Type	Information
Visual BIOS Page	Advanced > Main > Memory Information

- Displays the total installed system memory size in gigabytes.

Memory Speed

Type	Information
Visual BIOS Page	Advanced > Main > Memory Information

- Displays the current memory speed. Defined as Current Host Clock Frequency x Memory Reference Multiplier x Memory Multiplier.

Overridden Memory Speed

Type	Information
Requires	Host Clock Frequency, Memory Reference Multiplier, or Memory Multiplier have been overridden.
Visual BIOS Page	Advanced > Main > Memory Information

- Displays the current memory speed. Defined as Current Host Clock Frequency x Memory Reference Multiplier x Memory Multiplier.

SODIMM *n* (Memory Channel *x*)

Type	Information
Visual BIOS Page	Advanced > Main > Memory Information

- Displays the installed system memory size in SODIMM *n* (Channel *x*) in gigabytes. One of these lines is displayed for each memory slot present on the motherboard.

System Date & Time (Center Left Section)

Allows you to set the current date and time.

Default Visual BIOS Start Page (Lower Left Section)

Allows you to choose which page opens when accessing BIOS Setup.

Event Log

Clear Event Log

Type	Checkbox
Help	Enable to clear the Event Log at next boot.
Visual BIOS Page	Advanced > Main > Event Log

Event Logging

Type	Checkbox
Help	Enables or Disables Event Logging. If Enabled, BIOS will log POST Errors in NVRAM.
Visual BIOS Page	Advanced > Main > Event Log

Event Type (Count) Time of Occurrence

Type	Information
Visual BIOS Page	Advanced > Main > Event Log

Event (Count) Timestamp

Type	Information
Visual BIOS Page	Advanced > Main > Event Log

- One of these lines is displayed for each Event Type with a non-zero occurrence value.
- *Event* is the name of the POST Error. *Count* is the number of times that event has occurred since the Event Log was last cleared.
- *Timestamp* is the time and date of the most recent occurrence of the event. It is displayed in the format MM/DD/ YYYY HH:MM:SS

Advanced > Devices > USB

USB Legacy

Type	Checkbox
Help	USB Legacy allows USB support under non-USB-aware OSes. Disabling USB Legacy will not disable USB keyboards during BIOS POST, including BIOS SETUP and Option ROMs.
Visual BIOS Page	Advanced > Devices > USB > USB Configuration

USB 3.0 Port Header Configuration

Type	One-of
Host Mode	
Device Mode	
Help	Selects the behavior of the internal USB 3.0 header. **Host Mode**: sets the port as Host (typical operation of a USB port) **Device Mode**: sets the port as Device (requires software emulation of USB device)
Visual BIOS Page	Advanced > Devices > USB

Back Panel USB3 Port (Bottom/Top) Power On/Off

Type	One-of
Enable	
Disable	
Help	Determines if USB power shall be provided by the USB port. The Power On/Off setting is applicable only when the port operates as a USB host port. Power is always disabled when the port operates as a USB device port.
Visual BIOS Page	Advanced > Devices > USB

Front Panel USB3 Port (Right/Left) Power On/Off

Type	One-of
Enable	
Disable	
Help	Determines if USB power shall be provided by the USB port. The Power On/Off setting is applicable only when the port operates as a USB host port. Power is always disabled when the port operates as a USB device port.
Visual BIOS Page	Advanced > Devices > USB

Internal USB2 Port Header Power On/Off

Type	One-of
Enable	
Disable	
Help	Determines if USB power shall be provided by the USB port. The Power On/Off setting is applicable only when the port operates as a USB host port. Power is always disabled when the port operates as a USB device port.
Visual BIOS Page	Advanced > Devices > USB

Internal USB3 (Host) Port Header Power On/Off

Type	One-of
Enable	
Disable	
Help	Determines if USB power shall be provided by the USB port. The Power On/Off setting is applicable only when the port operates as a USB host port. Power is always disabled when the port operates as a USB device port.
Visual BIOS Page	Advanced > Devices > USB

Portable Device Charging Mode

Type	One-of
Off	Normal USB operation: USB Port will not provide extra power in S3/S4/S5
Charging in S3/S4/S5	USB Port will provide extra power during S3/S4/S5
Charging Only	USB Port will always provide extra power but cannot be used to transfer data
Help	USB ports that are colored yellow support a Portable Device Charging Mode with higher maximum current.
Advanced Help	**Off:** USB Port will not provide extra power during system sleep states. **Charging in S3/S4/S5:** USB Port will provide extra power during system sleep states. **Charging Only**: USB Port will always provide extra power but cannot be used to transfer data with USB 2.0 device.
Requires	At least one USB port supports Portable Device Charging Mode
Visual BIOS Page	Advanced > Devices > USB

xHCI Mode

Type	One-of
Disabled	Forces only USB 2.0 to be supported in the OS. USB ports are always routed to the EHCI controller.
Enabled	The xHCi controller is turned on. The shareable ports are routed to the xHCI controller.
Auto	This mode uses ACPI protocol to provide an option that enables the xHCI controller and reroute USB ports via the OSC ACPI method call.
Smart Auto	This mode is similar to Auto, but it adds the capability to route the ports to xHCI or EHCI according to setting used in previous boots (for non-G3 boot) in the pre-boot environment.
Help	Configure the USB 3.0 ports routing. **Warning**: OS may need drivers/software to support USB 3.0.
Advanced Help	**Disabled:** Forces only USB 2.0 to be supported in the OS. USB ports are always routed to the EHCI controller. **Enabled:** The USB 3.0 ports are always routed to the xHCI controller. **Auto:** This mode uses ACPI protocol to provide an option that enables the xHCI controller and reroute USB ports via the _OSC ACPI method call. **Smart Auto:** This mode is similar to Auto, but it adds the capability to route the ports to xHCI or EHCI according to setting used in previous boots (for non-G3 boot) in the pre-boot environment.
Visual BIOS Page	Advanced > Devices > USB

USB Port *x*:

Back Panel USB3 Port (Bottom/Top)

Front Panel USB3 Port (Left/Right)

Internal USB2 Port Header

Internal USB3 (Host) Port Header

USB3 Rear Upper Port

USB3 Rear Lower Port

USB3 Front Port

USB3 Front Charging Port

USB2 Header Connector x

Type	One-of
Enable	Enables USB port
Disable	Disables USB port
No Detect	Disables USB port during POST only
Help	*Help is specific to each supported motherboard header/back panel port layout.*
Advanced Help	**Enable**: All devices on this port will be available to BIOS and OS. **Disable:** USB keyboard/Mouse will be available to BIOS, and all devices on this port will be unavailable to OS. **No Detect:** No devices on this port will be detected by BIOS, but all will be available to OS. Use this option to speed up BIOS boot.
Requires	Grayed out and set to **Disable** if corresponding **Portable Device Charging** question is set to **Charging Only**
Visual BIOS Page	Advanced > Devices > USB

- One of these questions is displayed for each USB port present on the motherboard.
- If a USB keyboard is attached to a USB port that has been disabled via one of these Setup questions, it will be enabled during POST and Setup, but will be disabled before OS boot.
- All non-keyboard devices will be disabled during POST, Setup, and OS. This means that drives attached to disabled USB ports will not appear in the BIOS boot order in Setup.
- If the Portable Device Charging Mode for a USB port is set to Charging Only, then a keyboard attached to that port will not be functional, even during POST.

Front Type C Port

Front USB Charging Port

Rear USB Lower Port

Rear USB Upper Port

Header USB Connector 2900

Header USB Connector 2901

Type	One-of
Enable	Enables USB port
Disable	Disables USB port
No Detect	Disables USB port during POST only
Help	*Help is specific to each supported motherboard header/back panel port layout.*

Advanced Help	**Enable**: All devices on this port will be available to BIOS and OS. **Disable:** USB keyboard/Mouse will be available to BIOS, and all devices on this port will be unavailable to OS. **No Detect:** No devices on this port will be detected by BIOS, but all will be available to OS. Use this option to speed up BIOS boot.
Requires	Grayed out and set to **Disable** if corresponding **Portable Device Charging** question is set to **Charging Only**

- One of these questions is displayed for each USB port present on the motherboard.
- If a USB keyboard is attached to a USB port that has been disabled via one of these Setup questions, it will be enabled during POST and Setup, but will be disabled before OS boot.
- All non-keyboard devices will be disabled during POST, Setup, and OS. This means that drives attached to disabled USB ports will not appear in the BIOS boot order in Setup.
- If the Portable Device Charging Mode for a USB port is set to Charging Only, then a keyboard attached to that port will not be functional, even during POST.

Advanced > Devices > SATA

Chipset SATA

Type	Checkbox
Help	The Chipset SATA controller supports the internal blue SATA port and M.2 SATA port.
Visual BIOS Page	Advanced > Devices > SATA

Chipset SATA Mode

Type	One-of
AHCI	PCH SATA controller is configured in AHCI mode.
RAID	PCH SATA controller is configured in RAID mode.
Intel RST Premium With Intel Optane System	PCH SATA controller is configured in Optane mode.
Help	Configures the Chipset SATA controller mode. Warning: OS may not boot if this setting is changed after OS install.
Advanced Help	**AHCI:** Supports advanced SATA features such as Native Command Queuing. **RAID:** Allows multiple drives to be merged into larger volumes for increased performance and/or reliability. Always enables AHCI. **Intel RST Premium With Intel Optane System Acceleration:** Fast Boot will be Grayed-out and disabled under Optane mode. **Warning:** OS may not boot if this setting is changed after OS install.
Requires	Intel RST Premium With Intel Optane System Acceleration will be Grayed-out and not able to be selected when Fast Boot is enabled.
Visual BIOS Page	Advanced > Devices > SATA

- If a USB keyboard is attached to a USB port that has been disabled via one of these Setup questions, it will be enabled during POST and Setup, but will be disabled before OS boot.
- All non-keyboard devices will be disabled during POST, Setup, and OS. This means that drives attached to disabled USB ports will not appear in the BIOS boot order in Setup.
- If the Portable Device Charging Mode for a USB port is set to Charging Only, then a keyboard attached to that port will not be functional, even during POST.

RST PCIe Storage Remapping

Type	Checkbox
Help	Configures the PCIe storage remapping. **Warning**: OS may not boot if this setting is changed after OS install.
Requires	The Chipset SATA controller supports the PCIe storage remapping. Chipset SATA Mode is set to RAID. Remapping is enabled and grey out if Optane mode in Chipset SATA mode is set.
Visual BIOS Page	Advanced > Devices > SATA

M.2 Slot x RST PCIe Storage Remapping

Type	Checkbox
Help	Configures the PCIe storage remapping. **Warning**: OS may not boot if this setting is changed after OS install.
Requires	The Chipset SATA controller supports the PCIe storage remapping. Chipset SATA Mode is set to RAID. Board supports more than one M.2 slot.
Visual BIOS Page	Advanced > Devices > SATA

S.M.A.R.T

Type	Checkbox
Help	Enables or Disables S.M.A.R.T - Self-Monitoring, Analysis, and Reporting Technology. If supported on any attached drives, BIOS will monitor drive health.
Visual BIOS Page	Advanced > Devices > SATA

SATA Port

Type	Checkbox
Help	Enables or Disables SATA Port.
Visual BIOS Page	Advanced > Devices > SATA

SATA Controller(s)

Type	One-of
Enabled	Enables the onboard SATA controller(s)
Disabled	Disables the onboard SATA controller(s)

SATA Port *x*

Type	Information
Help	Displays the information of the device connected to internal blue SATA port.
Requires	**Chipset SATA Mode** is set to **IDE** or **AHCI**
Visual BIOS Page	Advanced > Devices > SATA

SATA port on High-Speed Custom Solutions Connector

Type	Information
Help	Displays the information of the device connected to internal blue SATA port.
Requires	**Chipset SATA Mode** is set to **IDE** or **AHCI**
Visual BIOS Page	Advanced > Devices > SATA

M.2 AHCI SSD

Type	Information
Help	Displays the information of the device connected to the M.2 slot.
Requires	M.2 PCIe (AHCI) SSD is detected.
Visual BIOS Page	Advanced > Devices > SATA

M.2 NVMe SSD

Type	Information
Help	Displays the information of the device connected to the M.2 slot.
Requires	M.2 NVMe SSD is detected.
Visual BIOS Page	Advanced > Devices > SATA

M.2 Slot x PCIe SSD

Type	Information
Help	Displays the information of the device connected to the M.2 slot.
Requires	M.2 PCIe (AHCI) SSD is detected on system with multiple M.2 slots.
Visual BIOS Page	Advanced > Devices > SATA

M.2 Slot x NVMe SSD

Type	Information
Help	Displays the information of the device connected to the M.2 slot.
Requires	M.2 NVMe SSD is detected on system with multiple M.2 slots.
Visual BIOS Page	Advanced > Devices > SATA

Detected RAID Volume

Type	Information
Requires	**Chipset SATA Mode** is set to **RAID** and at least one device is attached to a PCH SATA port
Visual BIOS Page	Advanced > Devices > SATA

- Displays the name and capacity in gigabytes for each PCH SATA RAID Volume.
- One of these lines is displayed for each RAID volume exposed by a PCH SATA controller. If no volumes are detected, this line is not displayed at all.

SATA Port *x* Hot Plug Capability

Type	Checkbox
Help	If enabled, SATA port will be reported as Hot Plug capable. It is recommended to enable this for any SATA ports routed to an external interface.
Requires	**SATA Port** is enabled. Hide and clear if **SATA Port** is set to **disabled.**
Visual BIOS Page	Advanced > Devices > SATA

- One of these is displayed for each SATA port connected to a PCH SATA controller (not including mSATA and M.2).

SATA Port (from High-Speed Custom Solutions Connector) Hot Plug Capability

Type	Checkbox
Help	If enabled, SATA port will be reported as Hot Plug capable. It is recommended to enable this for any SATA ports routed to an external interface.
Requires	SATA device is detected. Hide if no device detected. Board stuff High-Speed Custom Solutions Connector.
Visual BIOS Page	Advanced > Devices > SATA

Hard Disk Pre-Delay

Type	Numeric
Help	Delay (in seconds) before hard drives are initialized. This can be used to increase the amount of time that the BIOS Splash Screen displays.
Visual BIOS Page	Advanced > Devices > SATA

M.2 PCIe SSD LED

Type	Checkbox
Help	Allows SSD activity from PCIe-based M.2 storage card to be indicated by the chassis' HDD activity LED. PCIe-based M.2 storage card must provide SSD activity LED signal in order to support this feature, as no activity would be detected otherwise.
Requires	M.2 PCIe/NVMe SSD is detected. HDD Activity LED is set to enable. RST PCIE Storage Remapping is set to disabled.
Visual BIOS Page	Advanced > Devices > SATA

No SATA Devices Detected

Type	Information
Requires	**Secondary SATA** is set to **Enable**. No devices are detected on a Secondary SATA port.
Visual BIOS Page	Advanced > Devices > SATA

Advanced > Devices > Video

IGD Minimum Memory

Type	One-of
32 MB	
64 MB	
128 MB	Note: Kaby Lake platform does not support 128 MB option.
256 MB	Note: Kaby Lake platform does not support 256 MB option.
512 MB	Note: Kaby Lake platform does not support 512 MB option.
1 GB	Note: Broadwell and Kaby Lake platforms do not support 1GB option. Platform memory address space resource dependent. BIOS shall hide this option if memory address space is not enough.
1.5 GB	Note: Broadwell and Kaby Lake platforms do not support 1.5GB option. Platform memory address space resource dependent. BIOS shall hide this option if memory address space is not enough.
Help	Selects the minimum amount of system memory allocated to the Integrated Graphics Device (IGD). The maximum amount of memory allocated is determined by the operating system and video driver.
Visual BIOS Page	Advanced > Devices > Video

- The 64 and 128 MB options are not selectable if the system has less than 1 GB of memory installed.
- The 512 MB option is not selectable if the system has less than 1.5 GB of memory installed.
- The 1 GB option is not selectable if the system has less than 2 GB of memory installed.

IGD Aperture Size

Type	One-of
128 MB	
256 MB	
512 MB	
1024 MB	Platform memory address space resource dependent. BIOS shall hide this option if memory address space is not enough.
2048 MB	UEFI mode only. Platform memory address space resource dependent. BIOS shall hide this option if memory address space is not enough.
4096 MB	Note: Kaby Lake platform does not support 4096MB option UEFI mode only. Platform memory address space resource dependent. BIOS shall hide this option if memory address space is not enough.
Help	Selects the aperture size for the Integrated Graphics Device (IGD). Requires motherboard supports at least one video port tied to IGD.
Visual BIOS Page	Advanced > Devices > Video

IGD Primary Video Port

Type	One-of
Auto	Video BIOS will auto-detect attached monitors and output video to a maximum of two external ports (in any combination). If more than two monitors are attached, then the order of preference is: · eDP Thunderbolt DisplayPort · Mini Display Port · HDMI · Mini HDMI · DVI-DVI-I (Digital) · DVI-I (Analog) · VGA If more than one port of the same type has a monitor attached, then the preference is for the one highest on the back-panel. If more than one port of the same type and same back- panel height has a monitor attached, then the preference is for the left-most on the back- panel.
eDP	If **IGD Flat Panel** is set to **Disable**, the **eDP** option will be hidden.
VGA Analog	
DVI-I (Blue) Analog	
DVI-I (Blue) Digital	
DVI-D (White)	
HDMI	
HDMI 1	
HDMI 2	
HDMI 3	
DisplayPort	
DisplayPort 1	
DisplayPort 2	
DisplayPort 3	
Mini DisplayPort	
Mini DisplayPort 1	
Mini DisplayPort 2	
Thunderbolt	
Thunderbolt 1	
Thunderbolt 2	
Mini HDMI	
Mini HDMI 1	
Mini HDMI 2	
Help	Selects preference for Integrated Graphics Device (IGD) display interface used for environments without a graphics driver, such as POST. Auto will attempt to detect connected monitors and will display video on a maximum of two ports.
Requires	Motherboard supports at least one video port tied to IGD.
Visual BIOS Page	Advanced > Devices > Video

IGD Secondary Video Port

Type	One-of
None	
eDP	If IGD Flat Panel is set to Disable, the eDP option will be hidden.
VGA Analog	
DVI-I (Blue) Analog	
DVI-I (Blue) Digital	
DVI-D (White)	
HDMI	
HDMI 1	
HDMI 2	
HDMI 3	
DisplayPort	
DisplayPort 1	
DisplayPort 2	
DisplayPort 3	
Mini DisplayPort	
Mini DisplayPort 1	
Mini DisplayPort 2	
Thunderbolt	
Thunderbolt 1	
Thunderbolt 2	
Mini HDMI	
Mini HDMI 1	
Mini HDMI 2	
Help	Selects preference for mirrored Integrated Graphics Device (IGD) display interface used for environments without a graphics driver, such as POST.
Requires	Motherboard supports at least two video ports tied to IGD Hidden if IGD Primary Video Port is set to Auto.
Visual BIOS Page	Advanced > Devices > Video

Screen Rotation Policy

Type	One-of
Landscape (0 rotation)	
Portrait (90 rotation)	
Portrait (270 rotation)	
Landscape (180 rotation)	
Help	Controls the screen display direction.
Visual BIOS Page	Advanced > Devices > Video

Display Emulation

Type	One-of
No display emulation	
Headless display emulation	
Persistent display emulation	
Help	Headless: Allow emulation of display monitors for one or both HDMI ports when not attached to the system. Persistent: Allow emulation of display monitors for one or both HDMI ports when temporarily disconnected from the system.
Visual BIOS Page	Advanced > Devices > Video

No Video Detected Error Beeps

Type	Checkbox
Help	Enables or Disables motherboard speaker beeps when video is not detected.
Visual BIOS Page	Advanced > Devices > Video

IGD Flat Panel

Type	One-of
Disable	Disables Video BIOS eDP output. The BIOS will inform the Video BIOS that Flat Panel Display is not enabled, and deactivate the flat panel display backlight lamp. The BIOS will use “IGD Primary Video Port” for multi-monitor support configuration
eDP	The BIOS must enable the eDP port, inform the Video BIOS that Flat Panel Display is enabled, and activate the flat panel display backlight lamp.
DP	The BIOS must configure the Video BIOS/processor/chipset to enable DisplayPort output over the eDP header, including Audio
Help	Enables IGD video output to onboard eDP interfaces.
Requires	BIOS supports Flat Panel Display
Visual BIOS Page	Advanced > Devices > Video

- eDP and DP options are hidden in Setup unless eDP or DP is the current value at Setup launch.
- eDP or DP must be initially selected via ITK.

Screen Brightness

Type	One-of
Dimmest	
Dimmer	
Dim	
Neutral	
Bright	
Brighter	
Brightest	
Help	Sets the amount of panel backlight illumination.
Requires	BIOS supports Flat Panel Display. Hidden if IGD Flat Panel is not set to eDP.
Visual BIOS Page	Advanced > Devices > Video

- Controls the monitor's backlight lamp brightness through 7 dynamically-calculated values, based on resulting PWM range constrained between Min Inverter Current Limit and Max Inverter Current Limit.
  - <Dimmest> setting corresponds to Min Inverter Current Limit.
  - <Brightest> setting corresponds to Max Inverter Current Limit.
- Settings between these limits must be equally separated in 1/6th range increments for even distribution of brightness control (i.e. every step increases PWM by 1/6th of total range).

Advanced > Devices > Flat Panel Display

EDID Information

Type	Information
Visual BIOS Page	Advanced > Devices > Flat Panel Display

EDID Data Source

Type	One-of
Flat Panel Display	Activate for a support for a local flat panel with an EDID.
Custom Payload	vBIOS/GOP will use installed EDID payload binary.
Pre-Defined	vBIOS/GOP will use the built-in panel type.
Help	Flat panel display parameters (EDID) will be read from the selected source.
Visual BIOS Page	Advanced > Devices > Flat Panel Display

Pre-Defined EDID Configuration

Type	One-of
Type 01: VGA (640x480)	640x480
Type 02: SVGA (800x600)	800x600
Type 03: XGA (1024x768)	1024x768
Type 04: SXGA	1280x1024
Type 05: 1024x600	1024x600
Type 06: Reserved*	1400x1050
Type 07: UXGA	1600x1200
Type 08: 1366x768	1366x768
Type 09: Reserved*	1680x1050
Type 10: WUXGA (1920x1200)	1920x1200
Type 11: 1440x900	1440x990
Type 12: Reserved*	1600x900
Type 13: Reserved*	1024x768
Type 14: WXGA	1280x800
Type 15: 1080p	1920x1080
Type 16: Reserved*	2048x1536
Help	Select pre-defined flat-panel display parameters. * Panel types shown as Reserved may be customized upon customer request. Do not use without consulting Intel.
Requires	Hidden if **EDID Configuration** is not set to **Pre-Defined**
Visual BIOS Page	Advanced > Devices > Flat Panel Display

- Selects a pre-defined EDID configuration from a list embedded in the Video BIOS.
- When a pre-defined configuration is selected, the BIOS will load default values for each Flat Panel Display question.

Custom EDID Payload

Type	Action/Information
Help	Load Custom EDID Payload from a local file. File must be in the root directory of a supported filesystem.
Requires	Hidden if **EDID Configuration** is not set to **Custom Payload**
Visual BIOS Page	Advanced > Devices > Flat Panel Display

- When this question is selected, the user is presented with a file browser pop-up. The user may navigate to the file system containing the EDID payload file (usually **EDIDDATA.BIN**).
- Once the file is selected, the user may open the file, which will close the pop-up and attempt to write the data to NVRAM.
- A pop-up info dialog will indicate whether the operation was successful or not. If the operation was successful, the EDID payload status is updated to "**Data Installed**". Otherwise, it remains unchanged.

eDP Interface Type

Type	One-of
Single-Lane	
Dual-Lane	
Quad-Lane	
Help	Sets eDP connectivity.
Required	Hidden if **IGD Flat Panel** is not set to **eDP**
Visual BIOS Page	Advanced > Devices > Flat Panel Display

eDP Data Rate

Type	One-of
1.62 Gbps	
2.70 Gbps	
5.40 Gbps	
Help	Sets the Data Rate for the Embedded DisplayPort link. This will be used if the sink indicates that no aux handshake is required during link training.
Requires	Hidden if IGD Flat Panel is not set to eDP
Visual BIOS Page	Advanced > Devices > Flat Panel Display

Color Depth

Type	One-of
18-bpp	18-bit color depth.
24-bpp	24-bit color depth.
30-bpp	30-bit color depth.
Help	Sets flat panel display color depth in bits per pixel (bpp) and data mapping.
Visual BIOS Page	Advanced > Devices > Flat Panel Display

Inverter Frequency (Hz)

Type	Numeric
Range	200 - 40000
Help	Inverter board signal frequency. Consult inverter board and monitor specifications for proper value. **Warning:** Unsupported values may cause hardware damage.
Visual BIOS Page	Advanced > Devices > Flat Panel Display

Inverter Polarity

Type	One-of
Normal	
Inverted	
Help	Inverter board polarity. Consult inverter board specifications for proper value. **Normal**: PWM = 0% (Dim) **Inverted**: PWM = 0% (Bright)
Visual BIOS Page	Advanced > Devices > Flat Panel Display

Min Inverter Current Limit (%)

Type	Numeric
Help	Maximum backlight lamp current limit. Consult inverter board and monitor specifications for proper value. **Warning:** Unsupported values may cause hardware damage.
Range	Min Inverter Current Limit (%) – 100
Visual BIOS Page	Advanced > Devices > Flat Panel Display

Max Inverter Current Limit (%)

Type	Numeric
Help	Minimum backlight lamp current limit. Consult inverter board and monitor specifications for proper value. **Warning:** Unsupported values may cause hardware damage.
Range	0 – Max Inverter Current Limit (%)

Panel Power-On Delay Time (ms)

Type	Numeric
Range	0 - 819
Help	Specifies the delay from system power-on to panel power-on.
Requires	Hidden if IGD Flat Panel is not set to eDP
Visual BIOS Page	Advanced > Devices > Flat Panel Display

Power-On to Backlight Enable Delay Time (ms)

Type	Numeric
Range	0 - 819
Help	Specifies the delay from panel power-on to backlight enable.
Requires	Hidden if IGD Flat Panel is not set to eDP
Visual BIOS Page	Advanced > Devices > Flat Panel Display

Backlight-Off to Power-Down Delay Time (ms)

Type	Numeric
Range	0 - 819
Help	Specifies the delay from backlight-off to panel power-down.
Requires	Hidden if IGD Flat Panel is not set to eDP
Visual BIOS Page	Advanced > Devices > Flat Panel Display

Panel Power-Down Delay Time (ms)

Type	Numeric
Range	0 - 819
Help	Specifies the delay for panel power-down.
Requires	Hidden if IGD Flat Panel is not set to eDP
Visual BIOS Page	Advanced > Devices > Flat Panel Display

Panel Power Cycle Delay Time (ms)

Type	Numeric
Range	400 - 3000
Help	Specifies the delay for panel power cycling.
Requires	Hidden if IGD Flat Panel is not set to eDP
Visual BIOS Page	Advanced > Devices > Flat Panel Display

Advanced > Devices > Onboard Devices

Audio

Type	Checkbox
Help	Enables or Disables Onboard Audio.
Visual BIOS Page	Advanced > Devices > Onboard Devices

Audio DSP or HD-Audio DSP

Type	Checkbox
Help	Enables or Disables onboard audio DSP
Advanced Help	Intel Smart Sound Technology requires the Audio DSP to handle audio, voice, and speech recognition.
Requires	Board supports Intel Smart Sound Technology. Hidden if Audio is set to Disable.
Visual BIOS Page	Advanced > Devices > Onboard Devices

Digital Microphone

Type	Checkbox
Help	Enables or Disables Digital Microphone support that is part of the Custom Solutions Header
Requires	Onboard audio device and Custom Solutions header
Visual BIOS Page	Advanced > Devices > Onboard Devices

Internal Speaker

Type	Checkbox
Help	Enables or Disables Internal Speaker.
Visual BIOS Page	Advanced > Devices > Onboard Devices

HDMI/DisplayPort Audio

Type	Checkbox
Help	If enabled, HDMI/DisplayPort output includes both audio and video. If disabled, HDMI/DisplayPort output is video only.
Requires	Board has HDMI or DisplayPort output.
Visual BIOS Page	Advanced > Devices > Onboard Devices

LAN (or Primary LAN)

Type	Checkbox
Help	Enables or Disables the Onboard LAN Controller.
Visual BIOS Page	Advanced > Devices > Onboard Devices

Secondary LAN

Type	Checkbox
Help	Enables or Disables the Secondary Onboard LAN Controller.
Requires	Secondary Onboard LAN controller is present
Visual BIOS Page	Advanced > Devices > Onboard Devices

Thunderbolt™ Controller

Type	Checkbox
Help	Enables or Disables the Onboard Thunderbolt™ Controller.
Visual BIOS Page	Advanced > Devices > Onboard Devices

Trusted Platform Module 1.2 Presence

Type	Checkbox
Help	Controls exposure of the onboard Trusted Platform Module (TPM) device to the operating system.
Requires	Enabled and grayed-out if Intel® Trusted Execution Technology is set to Enable. Cleared and grayed-out if Intel Platform Trust Technology is set to Enable.
Visual BIOS Page	Advanced > Devices > Onboard Devices

Trusted Platform Module 2.0 Presence

Type	Checkbox
Help	Controls exposure of the onboard Trusted Platform Module (TPM) device to the operating system.
Requires	Enabled and grayed-out if Intel® Trusted Execution Technology is set to Enable.
Visual BIOS Page	Advanced > Devices > Onboard Devices

Trusted Platform Module 1.2

Type	Checkbox
Help	Enables or Disables the Onboard Trusted Platform Module (TPM) 1.2 state.
Requires	Hidden if Trusted Platform Module 1.2 Presence is set to Disabled. Cleared and hidden if Intel Platform Trust Technology is set to Enable. Enabled and grayed-out if Intel® Trusted Execution Technology is set to Enable.
Visual BIOS Page	Advanced > Devices > Onboard Devices

Gaussian Mixture Models and Neural Networks Accelerator (GNA)

Type	Checkbox
Help	Enables or Disables the GNA functionality.
Visual BIOS Page	Advanced > Devices > Onboard Devices

Power Button Menu Beeps

Type	Checkbox
Help	Enables or Disables the Power Button menu beeps.
Visual BIOS Page	Advanced > Devices > Onboard Devices

WLAN

Type	Checkbox
Help	Enables or Disables the onboard Wireless LAN Controller.
Visual BIOS Page	Advanced > Devices > Onboard Devices

Bluetooth

Type	Checkbox
Help	Enables or Disables the onboard Bluetooth Controller.
Visual BIOS Page	Advanced > Devices > Onboard Devices

PCIe Port in M.x Wireless Slot (for WLAN)

Type	Checkbox
Help	Enables or Disables the onboard Wireless LAN Controller.
Visual BIOS Page	Advanced > Devices > Onboard Devices

PCIe Port in M.x Wireless Slot (for Bluetooth)

Type	Checkbox
Help	Enables or Disables the onboard Bluetooth Controller.
Visual BIOS Page	Advanced > Devices > Onboard Devices

Near Field Communication (NFC)

Type	Checkbox
Help	Enables or Disables the NFC module interface to the NFC header. Note that an NFC module and its OS driver are needed if enabled.
Visual BIOS Page	Advanced > Devices > Onboard Devices

- If this question is enabled, the BIOS will disable and gray-out GPIO Lockdown to allow runtime software control GPIOs for NFC firmware update and NFC reset.

eMMC Built-in Storage

Type	Checkbox
Help	Enables or Disables the support of eMMC Built-in Storage
Default	**Set:** Enable the support of eMMC Built-in Storage for NUC6CAYS. **Clear:** Disable the support of eMMC Built-in Storage if Windows 8.x is selected in the option of OS Selection. **Set**: Enable the support of eMMC Built-in Storage if Linux is selected in the option of OS Selection.
Required	Greyed out if Windows 7 is selected in the option of OS Selection.
Visual BIOS Page	Advanced > Devices > Onboard Devices

SD Card

Type	**One-of**
Read/Write	SD card works with Read/Write
Read Only	SD card works with Read Only
Disable	SD card reader is disabled
Help	Allows users to read/write to or disable the SD card reader
Visual BIOS Page	Advanced > Devices > Onboard Devices

Serial Port

Type	Checkbox
Help	Enables or Disables the Serial Port
Visual BIOS Page	Advanced > Devices > Onboard Devices

Serial Port 2

Type	Checkbox
Help	Enables or Disables the second Serial Port
Visual BIOS Page	Advanced > Devices > Onboard Devices

HDMI CEC Control

Type	Checkbox
Help	Enables or Disables the onboard HDMI CEC control. This must be set to Disable to allow external CEC adaptor for CEC header.
Visual BIOS Page	Advanced > Devices > Onboard Devices

Auto Turn On TV

Type	One-of
Disable	TV does not turn on when Intel NUC is turned on or resumes from sleep state.
From S3/S4/S5 Boot	TV turns on when Intel NUC is powered on or resumes from S3/S4/S5 state.
From S3 Resume	TV turns on when Intel NUC resumes from S3 state.
From S4/S5 Boot	TV turns on when Intel NUC is powered on or resumes from S4/S5 state.
Help	Determines what happens to the TV when the Intel NUC goes to sleep or is shut down.
Visual BIOS Page	Advanced > Devices > Onboard Devices

Auto Turn Off TV

Type	One-of
Disable	TV stays on when Intel NUC is shut down or enters a sleep state.
When S0 to S3/S4/S5	TV turns off when Intel NUC enters S3/S4/S5 state.
When S0 to S3	TV turns off when Intel NUC enters S3 state.
When S0 to S4/S5	TV turns off when Intel NUC enters S4/S5 state.
Help	Determines what happens to the TV when the Intel NUC goes to sleep or is shut down.
Visual BIOS Page	Advanced > Devices > Onboard Devices

Wake on TV

Type	One-of
Disable	Intel NUC stays off when TV is turned on.
From S3/S4/S5	Intel NUC wakes from S3/S4/S5 power state when TV is turned on.
From S3	Intel NUC wakes from S3 power state when TV is turned on.
From S4/S5	Intel NUC wakes from S4/S5 power state when TV is turned on.
Help	Determines what happens to the Intel NUC when the TV is turned on.
Visual BIOS Page	Advanced > Devices > Onboard Devices

Standby on TV

Type	One-of
Disable	Intel NUC remains in its current state when TV is turned off (nothing happens).
Power Button Toggle	When TV is turned off, the Intel NUC action defined for the power button in Windows is triggered.
Sleep Button Toggle	When TV is turned off, the Intel NUC action defined for the sleep button in Windows is triggered.
Help	Determines what happens to the Intel NUC when TV is turned off.
Visual BIOS Page	Advanced > Devices > Onboard Devices

Enhanced Consumer IR

Type	Checkbox
Help	Enables or Disables Enhanced Consumer Infrared (CIR)
Visual BIOS Page	Advanced > Devices > Onboard Devices

CIR Remote Controller Type (for Nuvoton controllers)

Type	One-of
Generic Remote Controller	The setting is used for generic CIR remote controller.
RC6 Remote Controller	The setting is used for RC6 Remote Type.
XBOX Remote Controller	The setting is used for XBOX Remote Type.
Help	Select CIR Remote controller Type to match on-hand CIR Remote Controller.
Advanced Help	**Generic Remote Controller**: The setting of controller type is used for generic CIR remote Controller. **RC6 Remote Controller**: The setting of controller type is specific for RC6 Remote Controller. **XBOX Remote Controller:** The setting of controller type is specific for XBOX Remote Controller.
Requires	Enhanced Consumer IR is set to Enable.
Visual BIOS Page	Advanced > Devices > Onboard Devices

CIR Remote Controller Type (for ITE controllers)

Type	One-of
Generic Remote Controller	The setting is used for generic RC6, Xbox 360 CIR remote controller.
XBOX One Remote Controller	The setting is used for Xbox One Remote Type.
Help	Select CIR Remote controller Type to match on-hand CIR Remote Controller.
Advanced Help	**Generic Remote Controller**: The setting of controller type is used for RC6 and Xbox 360 CIR remote Controller. **Xbox One Remote Controller**: The setting of controller type is specific for Xbox One Remote Controller.
Requires	Enhanced Consumer IR is set to Enable.
Visual BIOS Page	Advanced > Devices > Onboard Devices

High Precision Event Timers

Type	Checkbox
Help	High Precision Event Timers are integrated into chipset hardware and are available for use by operating systems. They can be disabled if incompatible with an OS or application.
Visual BIOS Page	Advanced > Devices > Onboard Devices

Num Lock

Type	Checkbox
Help	If Num Lock is enabled, the keypad defaults to numeric functionality.
Visual BIOS Page	Advanced > Devices > Onboard Devices

Chipset Serial IO

Type	Checkbox
Help	Enables or Disables PCH Serial IO devices. The primary OS environment for the Serial IO is Windows 8.1.
Visual BIOS Page	Advanced > Devices > Onboard Devices

GPIO Lockdown

Type	Checkbox
Help	Locks PCH GPIO configuration registers for security purposes.
Advanced Help	If Enabled, BIOS will lock PCH GPIO configuration registers prior to end of POST. Use of GPIO signals from the Custom Solutions header requires this option to be disabled.
Requires	Board has the Custom Solutions Header or NFC header. Cleared and grayed-out if Near Field Communication (NFC) is set to Enable.
Visual BIOS Page	Advanced > Devices > Onboard Devices

Pin function select for Custom Solutions Header

Type	Information
Requires	Unit has the Custom Solutions header
Visual BIOS Page	Advanced > Devices > Onboard Devices

Pin 8

Type	One-of
GPIO11	Function select as generic GPIO.
SMB ALERT#	Function select as SMBus Alert Signal.
Help	Function select between generic GPIO or SMBus Alert signal.
Visual BIOS Page	Advanced > Devices > Onboard Devices

Pin 10 (GPIO 44)

Type	Information
Visual BIOS Page	Advanced > Devices > Onboard Devices

Pin 11 (GPIO 24)

Type	Information
Visual BIOS Page	Advanced > Devices > Onboard Devices

Pin 12

Type	One-of
GPIO14	Function select as generic GPIO.
DirectApp Launch	Function select as DirectApp Launch button. BIOS will configure GPIO14 to generate SCI and populate DirectApp Launch ASL code.
Help	Function select between generic GPIO or Direct Application Launch feature.
Visual BIOS Page	Advanced > Devices > Onboard Devices

Pin 13/14

Type	One-of
GPIO5/4	Function select as generic GPIO.
I2C0_SCL/I2C0_SDA	Function select as LPSS I2C0. BIOS will configure GPIO to native function and enable LPSS I2C0.
Help	Function select between generic GPIO or I2C interface.
Visual BIOS Page	Advanced > Devices > Onboard Devices

Pin 15/16

Type	One-of
GPIO7/6	Function select as generic GPIO.
I2C1_SCL/I2C1_SDA	Function select as LPSS I2C1. BIOS will configure GPIO to native function and enable LPSS I2C1.
Help	Function select between generic GPIO or I2C interface.
Visual BIOS Page	Advanced > Devices > Onboard Devices

Pin function select for High-Speed Custom Solutions connector

Type	Information
Requires	Unit has the High-Speed Custom Solutions connector
Visual BIOS Page	Advanced > Devices > Onboard Devices

Pin 8

Type	One-of
GPIO38	Function select as generic GPIO.
DEVSLP1	BIOS will configure GPIO38 as native function
Help	Function select between generic GPIO or SATA device sleep signal.
Visual BIOS Page	Advanced > Devices > Onboard Devices

Pin 12 (GPIO 58)

Type	Information
Visual BIOS Page	Advanced > Devices > Onboard Devices

Pin 13 (GPIO 57)

Type	Information
Visual BIOS Page	Advanced > Devices > Onboard Devices

Pin function select for NFC connector

Type	Information
Requires	Unit has the Near Field Communications (NFC) connector
Visual BIOS Page	Advanced > Devices > Onboard Devices

Pin 5 (GPIO 26)

Type	Information
Visual BIOS Page	Advanced > Devices > Onboard Devices

Pin 6 (GPIO 17)

Type	Information
Visual BIOS Page	Advanced > Devices > Onboard Devices

Pin 7 (GPIO 28)

Type	Information
Visual BIOS Page	Advanced > Devices > Onboard Devices

Advanced > Devices > PCI

PCI Latency Timer

Type	One-of
32	
64	
96	
128	
160	
192	
224	
248	
Help	Sets PCI Latency Timer for Bus Mastering. Limits the time in clock cycles that a PCI device can hold the PCI bus.
Visual BIOS Page	Advanced > Devices > PCI

M.2 Slot *x*

Type	Checkbox
Help	If enabled, the SATA port, PCIe and USB interface to the M.2 slot are enabled.
Visual BIOS Page	Advanced > Devices > PCI

- One of these is displayed for each M.2 slot.

Advanced > Devices > Add-In Config

Configuration forms from add-in devices are accessible here.

Advanced > Devices > LED Control

LED Color Adjustments (Left Section)

Skull LED

Type	One-of
Red	
Orange	
Yellow	
Green	
Blue	
Indigo	
White	
Manual - User Defined	
Software Controlled	
Disabled	
Help	Determines Skull LED color configuration.

Advanced Help	Software LED Control Enabled must be unchecked to change this LED configuration. **Colors:** Select a color for the LED. **Manual – User Defined:** When enabled, you can adjust the RGB values for this LED. **Software Controlled:** When enabled, all LED Zones are controlled by the LED Manager For Intel® NUC software, available at https://downloadcenter.intel.com. **Disabled:** Disables this LED.
Visual BIOS Page	Advanced > Devices > LED Control > LED Color Adjustments

Eye LED

Type	One-of
Red	
Orange	
Yellow	
Green	
Blue	
Indigo	
White	
Manual - User Defined	
Software Controlled	
Disabled	
Help	Determines Eye LED color configuration.
Advanced Help	Software LED Control Enabled must be unchecked to change this LED configuration. **Colors:** Select a color for the LED. **Manual – User Defined:** When enabled, you can adjust the RGB values for this LED. **Software Controlled:** When enabled, all LED Zones are controlled by the LED Manager For Intel® NUC software, available at https://downloadcenter.intel.com. **Disabled:** Disables this LED.
Visual BIOS Page	Advanced > Devices > LED Control > LED Color Adjustments

HDD LED

Type	One-of
Red	
Orange	
Yellow	
Green	
Blue	
Indigo	
White	
Manual - User Defined	
Software Controlled	
Disabled	
Help	Determines Hard Drive LED color configuration.
Advanced Help	Software LED Control Enabled must be unchecked to change this LED configuration. **Colors:** Select a color for the LED. **Manual – User Defined:** When enabled, you can adjust the RGB values for this LED. **Software Controlled:** When enabled, all LED Zones are controlled by the LED Manager For Intel® NUC software, available at https://downloadcenter.intel.com. **Disabled:** Disables this LED.
Visual BIOS Page	Advanced > Devices > LED Control > LED Color Adjustments

Power Button LED

Type	One-of
Red	
Orange	
Yellow	
Green	
Blue	
Indigo	
White	
Manual - User Defined	
Software Controlled	
Disabled	
Help	Determines Skull Power Button color configuration.
Advanced Help	Software LED Control Enabled must be unchecked to change this LED configuration. **Colors:** Select a color for the LED. **Manual – User Defined:** When enabled, you can adjust the RGB values for this LED. **Software Controlled:** When enabled, all LED Zones are controlled by the LED Manager For Intel® NUC software, available at https://downloadcenter.intel.com. **Disabled:** Disables this LED.
Visual BIOS Page	Advanced > Devices > LED Control > LED Color Adjustments

Ethernet LED

Type	One-of
Red	
Orange	
Yellow	
Green	
Blue	
Indigo	
White	
Manual - User Defined	
Software Controlled	
Disabled	
Help	Determines Ethernet LED color configuration.
Advanced Help	Software LED Control Enabled must be unchecked to change this LED configuration. **Colors:** Select a color for the LED. **Manual – User Defined:** When enabled, you can adjust the RGB values for this LED. **Software Controlled:** When enabled, all LED Zones are controlled by the LED Manager For Intel® NUC software, available at https://downloadcenter.intel.com. **Disabled:** Disables this LED.
Visual BIOS Page	Advanced > Devices > LED Control > LED Color Adjustments

Programmable LED

Type	One-of
Red	
Orange	
Yellow	
Green	
Blue	
Indigo	
White	
Manual - User Defined	
Software Controlled	
Disabled	
Help	Determines Programmable LED color configuration.
Advanced Help	Software LED Control Enabled must be unchecked to change this LED configuration. **Colors:** Select a color for the LED. **Manual – User Defined:** When enabled, you can adjust the RGB values for this LED. **Software Controlled:** When enabled, all LED Zones are controlled by the LED Manager For Intel® NUC software, available at https://downloadcenter.intel.com. **Disabled:** Disables this LED.
Visual BIOS Page	Advanced > Devices > LED Control > LED Color Adjustments

Red

Type	Numeric
Range	0-255
Requires	If user defined is select, this item can be modified.
Visual BIOS Page	Advanced > Devices > LED Control > LED Color Adjustments

Green

Type	Numeric
Range	0-255
Requires	If user defined is select, this item can be modified.
Visual BIOS Page	Advanced > Devices > LED Control > LED Color Adjustments

Blue

Type	Numeric
Range	0-255
Requires	If user defined is select, this item can be modified.
Visual BIOS Page	Advanced > Devices > LED Control > LED Color Adjustments

LED Zone Controls (Upper Right Section)

All LED Zone Enable

Type	Checkbox
Help	When enabled, all LED Zones are controlled by their own options.
Advanced Help	Software LED Control Enabled must be unchecked to change this LED configuration. **Colors:** Select a color for the LED. **Manual – User Defined:** When enabled, you can adjust the RGB values for this LED. **Software Controlled:** When enabled, all LED Zones are controlled by the LED Manager For Intel® NUC software, available at https://downloadcenter.intel.com. **Disabled:** Disables this LED.
Visual BIOS Page	Advanced > Devices > LED Control > LED Zone Controls

Software LED Control Enable

Type	Checkbox
Help	When enabled, all LED Zones are set to Software Control. For more LED features and functionality, install the LED Manager For Intel® NUC software from https://downloadcenter.intel.com
Visual BIOS Page	Advanced > Devices > LED Control > LED Zone Controls

Disable (Lower Right Section)

- Individual LED zones can be disabled.

Skull LED Zone Disabled

Type	Checkbox
Help	When set, Skull LED Zone is disabled.
Visual BIOS Page	Advanced > Devices > LED Control > Disable

Eye LED Zone Disabled

Type	Checkbox
Help	When set, Eye LED Zone is disabled.
Visual BIOS Page	Advanced > Devices > LED Control > Disable

Power Button LED Zone Disabled

Type	Checkbox
Help	When set, Power Button LED Zone is disabled.
Visual BIOS Page	Advanced > Devices > LED Control > Disable

HDD LED Zone Disabled

Type	Checkbox
Help	When set, HDD LED Zone is disabled.
Visual BIOS Page	Advanced > Devices > LED Control > Disable

Ethernet LED Zone Disabled

Type	Checkbox
Help	When set, Ethernet LED Zone is disabled.
Visual BIOS Page	Advanced > Devices > LED Control > Disable

Programmable LED Zone Disabled

Type	Checkbox
Help	When set, Programmable LED Zone is disabled.
Visual BIOS Page	Advanced > Devices > LED Control > Disable

Advanced > Cooling

Fan Speeds (RPM)

- A graph displays the System Fan speed.
- To the right of the graph is an entry for the System Fan header's current fan speed. The icon to the left of the entry can be toggled to control the inclusion of the fan speed in the graph.

Temperatures (C)

- A graph displays the System Temperatures.
- To the right of the graph are entries for current CPU Core Temperature, Memory Temperature, Motherboard Ambient Temperature and PCH Temperature. The icons to the left of the entries can be toggled to control the inclusion of the temperatures in the graph.

Thresholds (V)

- A graph displays selected Voltages.
- To the right of the graph is an entry for each voltage sensor with the current voltage. The icon to the left of the entry can be toggled to control the inclusion of the voltage in the graph.

Fan Control Mode

Type	One-of
Quiet	Quiet automatic fan control profile.
Balanced	Balanced automatic fan control profile.
Cool	Cool automatic fan control profile.
Custom	Custom automatic fan control profile.
Fixed	Fixed duty cycle.
Fanless	Skip fan related warning during POST. Hide all fan control related setup items.
Help	Select how the system fan is to be controlled. **Quiet, Balanced and Cool:** used to select a preconfigured automatic fan control profile. **Custom:** selects the user-customizable automatic fan control profile. **Fixed:** selects a static duty cycle for the fan.
Visual BIOS Page	Advanced > Cooling

Fan Off Capability

Type	Checkbox
Help	Enables or Disables Fan Off Capability. If Enabled, fan control will turn off the fan if temperature falls below fan off temperature.
Visual BIOS Page	Advanced > Cooling

Primary Temperature Sensor

Type	One-of
Processor	Processor Temperature.
PCH	PCH Temperature.
Memory	Memory Temperature (diode near memory connectors).
Motherboard	Motherboard temperature near mPCIe connectors.
Help	Select the Primary Temperature Input for automatic fan control
Requires	Hidden if **Fan Control Mode** is set to **Fixed** or **Fanless**.
Visual BIOS Page	Advanced > Cooling

Fan Off Temperature (°C)

Type	Numeric
Help	Defines temperature that the fan control subsystem will turn off the fan if temperature falls below it.
Requires	Hidden if **Fan Off Capability** is set to **Disabled.**
Visual BIOS Page	Advanced > Cooling

Minimum Temperature (°C)

Type	Numeric
Range	0-127
Help	Defines temperature that the fan control subsystem attempts to maintain for this device.
Requires	Hidden if **Fan Control Mode** is set to **Fixed** or **Fanless**.
Visual BIOS Page	Advanced > Cooling

Minimum Duty Cycle (%)

Type	Numeric
Range	0-100
Help	Selects the minimum duty cycle that the fan will never go below if Fan Off Capability is disabled.
Requires	Hidden if **Fan Control Mode** is set to **Fixed** or **Fanless**.
Visual BIOS Page	Advanced > Cooling

Duty Cycle Increment (%/°C)

Type	Numeric
Range	1-20
Help	Fan control will increase fan duty cycle by this % for each degree Primary Temperature Sensor is over Minimum Temperature.
Advanced Help	If Primary Temperature Sensor's temperature exceeds the Minimum Temperature, then the fan duty cycle is set to: Minimum Duty Cycle + (Duty Cycle Increment x (Current Temperature – Minimum Temperature))
Requires	Hidden if **Fan Control Mode** is set to **Fixed** or **Fanless.**
Visual BIOS Page	Advanced > Cooling

Secondary Temperature Sensor

Type	One-of
Processor	Processor Temperature
PCH	PCH Temperature
Memory	Memory Temperature (diode near memory connectors).
Motherboard	Motherboard temperature near mPCIe connectors
None	No Secondary Temperature Sensor.
Help	Select the Primary Temperature Input for automatic fan control
Requires	Hidden if **Fan Control Mode** is set to **Fixed** or **Fanless**.
Visual BIOS Page	Advanced > Cooling

Fan Off Temperature (°C)

Type	Numeric
Help	Defines temperature that the fan control subsystem will turn off the fan if temperature falls below it.
Requires	Hidden if **Fan Off Capability** is set to **Disabled.**
Visual BIOS Page	Advanced > Cooling

Minimum Temperature (°C)

Type	Numeric
Range	0-127
Help	Defines temperature that the fan control subsystem attempts to maintain for this device.
Requires	Hidden if **Fan Control Mode** is set to **Fixed** or **Fanless**. Greyed out if Secondary Temperature Sensor is set to None.
Visual BIOS Page	Advanced > Cooling

Minimum Duty Cycle (%)

Type	Numeric
Range	0-100
Help	Selects the minimum duty cycle that the fan will never go below.
Requires	Hidden if **Fan Control Mode** is set to **Fixed** or **Fanless**.
Visual BIOS Page	Advanced > Cooling

Duty Cycle Increment (%/°C)

Type	Numeric
Range	1-7
Help	Fan control will increase fan duty cycle by this % for each degree Primary Temperature Sensor is over Minimum Temperature.
Advanced Help	If processor temperature exceeds Minimum Temperature, then the fan duty cycle is set to: Minimum Duty Cycle + (Duty Cycle Increment x (Current Temperature – Minimum Temperature))
Requires	Hidden if **Fan Control Mode** is set to **Fixed** or **Fanless.** **Greyed out if Secondary Temperature Sensor is set to None.**
Visual BIOS Page	Advanced > Cooling

Fixed Duty Cycle (%)

Type	Numeric
Range	0-100
Help	Selects the duty cycle that the fan will operate at.
Requires	Hidden if **Fan Control Mode** is set to **Quiet, Balanced, Cool, Custom** or **Fanless**.
Visual BIOS Page	Advanced > Cooling

Advanced > Performance > Processor

Processor Input Voltage Override (V)

Type	Numeric
Range	0 – 2.875
Visual BIOS Page	Advanced > Performance > Processor

Host Clock Frequency

Type	Information
Visual BIOS Page	Advanced > Performance > Processor

- Displays the default Host Clock Frequency.

Max Processor Speed

Type	Information
Requires	Host Clock Frequency and Maximum Non-Turbo Ratio have not been overridden.
Visual BIOS Page	Advanced > Performance > Processor

- Displays the maximum processor speed at current settings.
- Defined as Current Host Clock Frequency x Maximum Non-Turbo Ratio, or Current Host Clock Frequency x 1-Core Active Turbo Ratio if Intel® Turbo Boost Technology is enabled.

Overridden Max Processor Speed

Type	Information
Requires	Host Clock Frequency, Turbo Ratios, or Maximum Non-Turbo Ratio have been overridden.
Visual BIOS Page	Advanced > Performance > Processor

- Displays the maximum processor speed at current settings.
- Defined as Current Host Clock Frequency x Maximum Non-Turbo Ratio, or Current Host Clock Frequency x 1-Core Active Turbo Ratio if Intel® Turbo Boost Technology is enabled.

PEG-DMI Ratio

Type	Information
Visual BIOS Page	Advanced > Performance > Processor

- Displays the default PEG-DMI Frequency.

Intel® Hyper-Threading Technology

Type	Checkbox
Help	When disabled, only one thread per active core will be available.
Requires	Enabled and grayed-out if **Intel® Trusted Execution Technology** is set to **Enable**
Visual BIOS Page	Advanced > Performance > Processor

Intel® Turbo Boost Technology

Type	Checkbox
Help	Enable to automatically allow processor cores to run faster than the base operating frequency when running below power, current, and temperature limits.
Advanced Help	Enable to automatically allow processor cores to run faster than the base operating frequency when running below power, current, and temperature limits. Disable to limit processor speed based on Maximum Non-Turbo Ratio. Enabling Intel® Turbo Boost Technology will also Enable Enhanced Intel SpeedStep® Technology.
Requires	Hidden if processor does not support Intel® Turbo Boost Technology
Visual BIOS Page	Advanced > Performance > Processor

Active Processor Cores

Type	One-of
ALL	Enables all available Cores in the Processor.
1	Enables only 1 Core in the Processor.
2	Enables 2 Cores in a multi-core Processor.
3	Enables 3 Cores in a multi-core Processor.
4	Enables 4 Cores in a multi-core Processor.
5	Enables 5 Cores in a multi-core Processor.
6	Enables 6 Cores in a multi-core Processor.
7	Enables 7 Cores in a multi-core Processor.
Help	Number of cores to enable in each processor package
Requires	Set to **ALL** and grayed-out if **Intel® Trusted Execution Technology** is set to **Enable**
Visual BIOS Page	Advanced > Performance > Processor

Single Max Turbo Ratio

Type	Checkbox
Help	Enable to force Intel® Turbo Boost Technology to use a single maximum processor multiplier no matter how many cores are active.
Advanced Help	If Disabled, Intel® Turbo Boost Technology will use different maximum processor multipliers based on the number of active cores. If Enabled, Intel® Turbo Boost Technology will use a single maximum processor multiplier no matter how many cores are active.
Requires	Hidden if processor does not support Intel® Turbo Boost Technology. Hidden if processor does not support overriding Turbo Ratio Limits. Hidden if Intel® Turbo Boost Technology is set to Disable.
Visual BIOS Page	Advanced > Performance > Processor

Turbo Ratio

Type	Numeric
Help	Maximum processor multiplier used by Intel® Turbo Boost Technology no matter how many cores are active.
Requires	Hidden if Single Max Turbo Ratio is set to Disable. Hidden if processor does not support Intel® Turbo Boost Technology. Grayed-out if processor does not support overriding Turbo Ratio Limits. Hidden if Intel® Turbo Boost Technology is set to Disable.
Visual BIOS Page	Advanced > Performance > Processor

x-Core Turbo Ratio

Type	Numeric
Help	Maximum processor multiplier used by Intel® Turbo Boost Technology when *x* cores are active.
Requires	Hidden if Single Max Turbo Ratio is set to Disable. Hidden if processor does not support Intel® Turbo Boost Technology. Grayed-out if processor does not support overriding Turbo Ratio Limits. Hidden if Intel® Turbo Boost Technology is set to Disable.
Visual BIOS Page	Advanced > Performance > Processor

- One of these questions is displayed for each core present in the installed processor.

Maximum Non-Turbo Ratio

Type	Numeric
Help	Maximum Non-Turbo Processor Speed = Maximum Non-Turbo Ratio x Host Clock Frequency
Advanced Help	This parameter along with Host Clock Frequency determines the maximum processor speed when Intel® Turbo Boost Technology is not engaged.
Requires	Grayed-out if processor does not support Flex Ratio writes
Visual BIOS Page	Advanced > Performance > Processor

Processor Core Voltage Mode

Type	One-of
Offset Only	Hide Voltage Target question Set Voltage Target Mode (Bit 20) to 0 (Adaptive) Set Voltage Target (Bits 19:8) to 0
Interpolated + Offset	Display Voltage Target question Set Voltage Target Mode (Bit 20) to 0 (Adaptive)
Static + Offset	Display Voltage Target question Set Voltage Target Mode (Bit 20) to 1 (Static)
Visual BIOS Page	Advanced > Performance > Processor

Processor Core Voltage Target (V)

Type	Numeric (MSR Unsigned Fixed-Point w/ 2 Decimal Places)
Range	0 – 2.00
Visual BIOS Page	Advanced > Performance > Processor

Processor Core Voltage Offset (V)

Type	Numeric (MSR Signed Fixed-Point w/ 2 Decimal Places)
Range	-1.00 – 1.00
Visual BIOS Page	Advanced > Performance > Processor

Residency State Regulation

Type	Checkbox
Help	When enabled, Residency State Regulation (RSR) will limit turbo frequencies if voltage and temperature residencies are high during turbo operation.
Visual BIOS Page	Advanced > Performance > Processor

Real-Time Performance Tuning

Type	Checkbox
Help	When enabled, OS-present software can update most performance tuning features without requiring a reset to take effect. When disabled, only BIOS can update most performance tuning features. This is the more secure configuration.
Visual BIOS Page	Advanced > Performance > Processor

Silicon Debug Features

Type	Checkbox
Help	Enables or Disables IA32 silicon debug features.
Visual BIOS Page	Advanced > Performance > Processor

Processor Ring Frequency

Type	Information
Visual BIOS Page	Advanced > Performance > Processor

- This information line is constructed from the calculation of the Processor Ring Frequency (Host Clock Frequency x Processor Ring Max Multiplier).

Processor Uncore Ratio

Type	Numeric
Range	8-80 (cannot be above Processor Ring Max Multiplier)
Help	Host Clock Frequency x Ring Min Multiplier = Processor Ring Min Frequency
Visual BIOS Page	Advanced > Performance > Processor

Processor Uncore Voltage Mode

Type	One-of
Offset Only	Hide Voltage Target question Set Voltage Target Mode (Bit 20) to 0 (Adaptive) Set Voltage Target (Bits 19:8) to 0
Interpolated + Offset	Display Voltage Target question Set Voltage Target Mode (Bit 20) to 0 (Adaptive) Set Voltage Target Mode (Bit 20) to 1 (Static)
Static + Offset	Display Voltage Target question
Visual BIOS Page	Advanced > Performance > Processor

Processor Uncore Voltage Target (V)

Type	Numeric (MSR Unsigned Fixed-Point w/ 2 Decimal Places)
Range	0 – 2.00
Visual BIOS Page	Advanced > Performance > Processor

Processor Uncore Voltage Offset (V)

Type	Numeric (MSR Signed Fixed-Point w/ 2 Decimal Places)
Range	-1.00 – 1.00
Visual BIOS Page	Advanced > Performance > Processor

Advanced > Performance > Graphics

Graphics Dynamic Frequency

Type	Information
Visual BIOS Page	Advanced > Performance > Graphics

- This information line is the calculation of the Graphics Dynamic Frequency (Host Clock Frequency x 0.5 x Graphics Max Multiplier).

Graphics Turbo Ratio

Type	Numeric
Range	10-60
Help	Selects Graphics Dynamic Frequency: Host Clock Frequency x 0.5 x Graphics Max Multiplier = Graphics Dynamic Frequency
Requires	Grayed-out if installed processor IGD does not support Graphics Dynamic Frequency Override.
Visual BIOS Page	Advanced > Performance > Graphics

Graphics Voltage Mode

Type	One-of
Offset Only	Hide Voltage Target question Set Voltage Target Mode (Bit 20) to 0 (Adaptive) Set Voltage Target (Bits 19:8) to 0
Interpolated + Offset	Display Voltage Target question Set Voltage Target Mode (Bit 20) to 0 (Adaptive)
Static + Offset	Display Voltage Target question Set Voltage Target Mode (Bit 20) to 1 (Static)
Visual BIOS Page	Advanced > Performance > Graphics

Graphics Voltage Target (V)

Type	Numeric
Range	0 – 2.00
Visual BIOS Page	Advanced > Performance > Graphics

Graphics Voltage Offset (V)

Type	Numeric
Range	-1.00 – 1.00
Requires	Displayed only when Graphics Voltage Mode is set to either Interpolated+Offset or Static+Offset. Not displayed when Graphics Voltage Mode is set to Offset Only.
Visual BIOS Page	Advanced > Performance > Graphics

Advanced > Performance > Memory

Total Memory

Type	Information
Visual BIOS Page	Advanced > Performance > Memory

- Displays the total installed system memory size in gigabytes.

Memory Speed

Type	Information
Requires	Host Clock Frequency, Memory Reference Multiplier, and Memory Multiplier have not been overridden.
Visual BIOS Page	Advanced > Performance > Memory

- Displays the current memory speed. Defined as Current Host Clock Frequency x Memory Reference Multiplier x Memory Multiplier.

Overridden Memory Speed

Type	Information
Requires	Host Clock Frequency, Memory Reference Multiplier, or Memory Multiplier have been overridden.
Visual BIOS Page	Advanced > Performance > Memory

- Displays the current memory speed. Defined as Current Host Clock Frequency x Memory Reference Multiplier x Memory Multiplier.

SODIMM *n* (Memory Channel x)

Type	Information
Visual BIOS Page	Advanced > Performance > Memory

- Displays the installed system memory size in SODIMM *n* (Channel *x*) in gigabytes.
- One of these lines is displayed for each memory slot present on the motherboard.
- DIMM numbering is based on the suggested order of memory loading and should match the label on the board silkscreen.

XMP Version

Type	Information
Requires	Installed SODIMM support XMP profiles.
Visual BIOS Page	Advanced > Performance > Memory

- Display the XMP version of SODIMM XMP profile.

CAS Latency (tCL)

Type	Information
Visual BIOS Page	Advanced > Performance > Memory

- Display the current CAS Latency setting.

CAS to RAS (tRCD)

Type	Information
Visual BIOS Page	Advanced > Performance > Memory

- Display the current CAS to RAS setting.

Row Precharge (tRP)

Type	Information
Visual BIOS Page	Advanced > Performance > Memory

- Display the current Row Precharge setting.

Active to Precharge (tRAS)

Type	Information
Visual BIOS Page	Advanced > Performance > Memory

- Display the current Active to Precharge (tRSA) setting.

Memory Voltage

Type	Information
Visual BIOS Page	Advanced > Performance > Memory

- Display the current memory voltage.

System Agent Voltage

Type	Information
Visual BIOS Page	Advanced > Performance > Memory

- Display the current System Voltage Agent Voltage.

Memory Profiles

Type	One-of
Automatic	BIOS configures all memory parameters automatically
Manual – User Defined	Allows user to have full control over the memory parameters
Profile *x*: XMP- *Frequency*	BIOS configures memory parameters according to selected XMP profile
Help	Use default memory settings from DIMM SPD, manually override memory settings, or select an XMP profile (if provided by DIMM SPD).
Visual BIOS Page	Advanced > Performance > Memory

Memory Reference Multiplier

Type	One-of
1.333	
1	
Help	Selects Memory Reference Multiplier: Host Clock Frequency x Memory Reference Multiplier x Memory Multiplier = Memory Speed
Requires	Grayed-out if **Performance Memory Profiles** is not set to **Manual – User Defined** **Grayed-out if not supported by the installed processor**
Visual BIOS Page	Advanced > Performance > Memory

Memory Multiplier

Type	Numeric
Range	6-28, additionally constrained by combination of processor, PCH, and MRC
Help	Selects Memory Speed: Host Clock Frequency x Memory Reference Multiplier x Memory Multiplier = Memory Speed
Requires	Grayed-out if **Performance Memory Profiles** is not set to **Manual – User Defined**
Visual BIOS Page	Advanced > Performance > Memory

Memory Voltage

Type	One-of
1.20V	Default to 1.20V if **Performance Memory Profiles** is not set to **XMP profiles**. Derived from XMP profile If XMP profile is selected.
1.35V	
Help	Changing memory voltage may allow for overclocking.
Requires	Board supports Memory Voltage Override. Grayed-out if Performance Memory Profiles is not set to Manual – User Defined. Grayed-out if not supported by the installed processor.
Visual BIOS Page	Advanced > Performance > Memory

Memory Timing

Type	One-of
Automatic	BIOS configures all memory timing parameters automatically.
Manual – User	Allows user to have full control over the memory timing parameters
Defined	
Help	Use BIOS configured memory timing settings, or manually override memory timing settings.
Requires	Grayed-out if **Performance Memory Profiles** is not set to **Manual – User Defined.** Grayed-out if not supported by the installed processor.
Visual BIOS Page	Advanced > Performance > Memory

tCL

Type	Numeric
Range	0-31
Help	CAS Latency – Number of cycles between request for data and data read.
Requires	Grayed-out if **Performance Memory Profiles** is not set to **Manual – User Defined**
Visual BIOS Page	Advanced > Performance > Memory

tRCD

Type	Numeric
Range	0-63
Help	RAS-to-CAS Delay – Number of cycles between activating and read/write.
Range	0-63
Requires	Grayed-out if **Performance Memory Profiles** is not set to **Manual – User Defined**
Visual BIOS Page	Advanced > Performance > Memory

tRP

Type	Numeric
Range	Apr-31
Help	RAS Precharge – Number of cycles between closing one row and opening next.
Requires	Grayed-out if **Performance Memory Profiles** is not set to **Manual – User Defined**
Visual BIOS Page	Advanced > Performance > Memory

tRASmin

Type	Numeric
Range	0-64
Help	Minimum RAS Active Time – Number of cycles between precharge and activation.
Requires	Grayed-out if **Performance Memory Profiles** is not set to **Manual – User Defined**
Visual BIOS Page	Advanced > Performance > Memory

tRFC

Type	Numeric
Range	15-520 (DDR3) 1-1023 (DDR4)
Help	RAS Refresh – Number of cycles from refresh to activation of a row.
Requires	Grayed-out if **Performance Memory Profiles** is not set to **Manual – User Defined**
Visual BIOS Page	Advanced > Performance > Memory

tRRD

Type	Numeric
Range	0-63
Help	RAS to RAS Delay – Number of cycles to activate next bank in same rank.
Requires	Grayed-out if **Performance Memory Profiles** is not set to **Manual – User Defined.** DDR3 SKUs only.
Visual BIOS Page	Advanced > Performance > Memory

tRRD_L

Type	Numeric
Range	4-15
Help	RAS to RAS Delay – Number of cycles for Minimum Activate to Activate Delay Time in same bank group.
Requires	Grayed-out if **Performance Memory Profiles** is not set to **Manual – User Defined.** DDR4 SKUs only.
Visual BIOS Page	Advanced > Performance > Memory

tRRD_S

Type	Numeric
Range	4-15
Help	RAS to RAS Delay – Number of cycles for Minimum Activate to Activate Delay Time in different bank group.
Requires	Grayed-out if **Performance Memory Profiles** is not set to **Manual – User Defined.** DDR4 SKUs only.
Visual BIOS Page	Advanced > Performance > Memory

tWR

Type	Numeric
Range	0-28
Help	Write Recovery – Number of cycles between write and precharge.
Requires	Grayed-out if **Performance Memory Profiles** is not set to **Manual – User Defined**
Visual BIOS Page	Advanced > Performance > Memory

tWTR

Type	Numeric
Range	2-20
Help	Write to Read – Number of cycles between write and next read commands. Related to tCL.
Requires	Grayed-out if **Performance Memory Profiles** is not set to **Manual – User Defined**
Visual BIOS Page	Advanced > Performance > Memory

tRTP

Type	Numeric
Range	0-15
Help	Read to Precharge Delay – Number of cycles between read and precharge command to same rank.
Requires	Grayed-out if **Performance Memory Profiles** is not set to **Manual – User Defined.** DDR3 SKUs only.
Visual BIOS Page	Advanced > Performance > Memory

tCCDL

Type	Numeric
Range	4-11
Help	CAS to CAS Delay – Minimum interval between successive Active commands to the same bank.
Requires	Grayed-out if **Performance Memory Profiles** is not set to **Manual – User Defined.** DDR4 SKU only.
Visual BIOS Page	Advanced > Performance > Memory

tRC

Type	Numeric
Range	15-75
Help	Row Cycle Delay – Minimum interval between successive Active commands to the same bank.
Requires	Grayed-out if **Performance Memory Profiles** is not set to **Manual – User Defined**
Visual BIOS Page	Advanced > Performance > Memory

tFAW

Type	Numeric
Range	0-63
Help	Four Activate Window – Period of time before the fifth successive Active command to a new bank can be issued.
Requires	Grayed-out if **Performance Memory Profiles** is not set to **Manual – User Defined**
Visual BIOS Page	Advanced > Performance > Memory

tCWL

Type	Numeric
Range	0-20
Help	CAS Write Latency
Requires	Grayed-out if **Performance Memory Profiles** is not set to **Manual – User Defined**
Visual BIOS Page	Advanced > Performance > Memory

tREFI

Type	Numeric
Range	0-65535
Help	Average Periodic Refresh Interval
Requires	Grayed-out if **Performance Memory Profiles** is not set to **Manual – User Defined**
Visual BIOS Page	Advanced > Performance > Memory

Command Rate

Type	Numeric
Range	1-3 (Broadwell) 1-2 (Skylake)
Help	Command Rate – 2T is usually more stable.
Requires	Grayed-out if **Performance Memory Profiles** is not set to **Manual – User Defined**
Visual BIOS Page	Advanced > Performance > Memory

Round Trip Latency Optimization

Type	Checkbox
Help	Enable: Minimize round trip latency to improve performance.
Visual BIOS Page	Advanced > Performance > Memory

TCR

Type	One-of
Auto	Auto, follow MRC rule to configure the TCR.
Disabled	Default to disable temperature controlled refresh to improve memory compatibility.
Help	Configure temperature controlled refresh setting for memory.
Visual BIOS Page	Advanced > Performance > Memory

Additional Timing Support

Type	Checkbox
Help	**Enable**: Apply the Additional Timing override values along with the memory Manual mode configuration. **Disable**: Used MRC Values.
Visual BIOS Page	Advanced > Performance > Memory

tRRSR

Type	Numeric
Range	1-7
Help	Minimum time between Read-CAS to Read-CAS to different banks on the same ranks in DCLKs
Requires	Not displayed if **Additional Timing Support** is Disabled (un-checked). Grayed-out if **Performance Memory Profiles** is not set to **Manual – User Defined**
Visual BIOS Page	Advanced > Performance > Memory

tRRDR

Type	Numeric
Range	1-16
Help	Minimum time between Read-CAS to Read-CAS to different ranks on the same dimms in DCLKs
Requires	Not displayed if **Additional Timing Support** is Disabled (un-checked). Grayed-out if **Performance Memory Profiles** is not set to **Manual – User Defined**
Visual BIOS Page	Advanced > Performance > Memory

tRRDD

Type	Numeric
Range	1-16
Help	Minimum time between Read-CAS to Read-CAS to different dimms in DCLKs
Requires	Not displayed if **Additional Timing Support** is Disabled (un-checked). Grayed-out if **Performance Memory Profiles** is not set to **Manual – User Defined**
Visual BIOS Page	Advanced > Performance > Memory

tWRSR

Type	Numeric
Range	1-64
Help	Minimum time between Write-CAS to Read-CAS to different banks on the same ranks in DCLKs
Requires	Not displayed if **Additional Timing Support** is Disabled (un-checked). Grayed-out if **Performance Memory Profiles** is not set to **Manual – User Defined**
Visual BIOS Page	Advanced > Performance > Memory

tWRDR

Type	Numeric
Range	1-16
Help	Minimum time between WR-CAS to RD-CAS to different ranks on the same dimms in DCLKSs
Requires	Not displayed if **Additional Timing Support** is Disabled (un-checked). Grayed-out if **Performance Memory Profiles** is not set to **Manual – User Defined**
Visual BIOS Page	Advanced > Performance > Memory

tWRDD

Type	Numeric
Range	1-16
Help	Minimum time between Write-CAS to Read-CAS to different dimms in DCLKs
Requires	Not displayed if **Additional Timing Support** is Disabled (un-checked). Grayed-out if **Performance Memory Profiles** is not set to **Manual – User Defined**
Visual BIOS Page	Advanced > Performance > Memory

tWWSR

Type	Numeric
Range	1-7
Help	Minimum time between Write-CAS to Write-CAS to different banks on the same ranks in DCLKs
Requires	Not displayed if **Additional Timing Support** is Disabled (un-checked). Grayed-out if **Performance Memory Profiles** is not set to **Manual – User Defined**
Visual BIOS Page	Advanced > Performance > Memory

tWWDR

Type	Numeric
Range	1-16
Help	Minimum time between Write-CAS to Write-CAS to different ranks on the same dimms in DCLKs
Requires	Not displayed if **Additional Timing Support** is Disabled (un-checked). Grayed-out if **Performance Memory Profiles** is not set to **Manual – User Defined**
Visual BIOS Page	Advanced > Performance > Memory

tWWDD

Type	Numeric
Range	1-16
Help	Minimum time between Write-CAS to Write-CAS to different dimms in DCLKs
Requires	Not displayed if **Additional Timing Support** is Disabled (un-checked). Grayed-out if **Performance Memory Profiles** is not set to **Manual – User Defined**
Visual BIOS Page	Advanced > Performance > Memory

tRWSR

Type	Numeric
Range	1-30
Help	Minimum time between Read-CAS to Read-CAS to different banks on the same ranks in DCLKs
Requires	Not displayed if **Additional Timing Support** is Disabled (un-checked). Grayed-out if **Performance Memory Profiles** is not set to **Manual – User Defined**
Visual BIOS Page	Advanced > Performance > Memory

tRWDR

Type	Numeric
Range	1-30
Help	Minimum time between Read-CAS to Write- CAS to different ranks on the same dimms in DCLKs
Requires	Not displayed if **Additional Timing Support** is Disabled (un-checked). Grayed-out if **Performance Memory Profiles** is not set to **Manual – User Defined**
Visual BIOS Page	Advanced > Performance > Memory

tRWDD

Type	Numeric
Range	1-30
Help	Minimum time between Read-CAS to Write- CAS to different dimms in DCLKs
Requires	Not displayed if **Additional Timing Support** is Disabled (un-checked). Grayed-out if **Performance Memory Profiles** is not set to **Manual – User Defined**
Visual BIOS Page	Advanced > Performance > Memory

Dec-WRD

Type	Checkbox
Help	When this bit is set, there is a one cycle decrement of WR command to data delay, without affecting tCWL for other purposes.
Requires	Grayed-out if **Performance Memory Profiles** is not set to **Manual – User Defined**
Visual BIOS Page	Advanced > Performance > Memory

Advanced > Security

- Valid length for passwords is 2 to 20 characters.
- Valid characters for passwords are case-sensitive alpha-numeric: 0-9, A-Z, a-z.

Set Supervisor Password

Type	Password
Text Entry Prompt	Please type in your password
Text Entry Prompt	Please type in your new password
Text Entry Prompt	Please confirm your new password
Help	Passwords must be between 2 and 20 characters and are case sensitive.
Advanced Help	Fast Boot will be disabled if a User Password is installed.
Visual BIOS Page	Advanced > Security > Passwords

- The first Text Entry Prompt is only used when attempting to change a password that is already installed.
- To delete an existing Supervisor password, enter a blank password after entering the existing Supervisor password.

Set User Password

Type	Password
Text Entry Prompt	Please type in your password
Text Entry Prompt	Please type in your new password
Text Entry Prompt	Please confirm your new password
Help	Passwords must be between 2 and 20 characters and are case sensitive. If a User Password is created, it must be entered each boot before OS access.
Advanced Help	Fast Boot will be disabled if a User Password is installed.
Visual BIOS Page	Advanced > Security > Passwords

- The first Text Entry Prompt is only used when attempting to change a password that is already installed.
- To delete an existing User password, enter a blank password after entering the existing User password.

Select Device to Protect with Master and User Hard Drive Passwords

Type	One-of
mSATA	Choose to set the Master and User Passwords for the mSATA device
SATA	Choose to set the Master and User Passwords for the SATA device.
Help	Select either mSATA or SATA drive to set the Master Hard Drive and User Hard Drive password for. The drive must be attached to Chipset SATA Port 0 and in either IDE or ACHI Mode.
Requires	Hidden if there is not a Hard Drive attached to Chipset SATA Port 0 or Chipset SATA Mode is not IDE or AHCI.
Visual BIOS Page	Advanced > Security > Passwords

Set Master Hard Disk Drive Password

Type	Password
Text Entry Prompt	Please type in your password
Text Entry Prompt	Please type in your new password
Text Entry Prompt	Please confirm your new password
Confirmation Prompt	Hard Drive Passwords are not recoverable and cannot be removed without an original password. The drive will remain inaccessible unless the User or Master Hard Drive
Help	Passwords must be between 2 and 19 case-sensitive alpha-numeric characters. The Master Hard Drive password is only used to unlock a drive if the User Hard Drive password is forgotten.
Advanced Help	The Master Hard Drive password does not lock a drive by itself. The drive must be attached to Chipset SATA Port 0 and in either IDE or ACHI Mode.
Requires	Hidden if there is not a Hard Drive attached to Chipset SATA Port 0 or Chipset SATA Mode is not IDE or AHCI.
Visual BIOS Page	Advanced > Security > Passwords

- The first Text Entry Prompt is only used when attempting to change a password that is already installed.
- To delete an existing Master Hard Drive password, enter a blank password after entering the existing Master Hard Drive password.

Set User Hard Disk Drive Password

Type	Password
Text Entry Prompt	Please type in your password
Text Entry Prompt	Please type in your new password
Text Entry Prompt	Please confirm your new password
Confirmation Prompt	Hard Drive Passwords are not recoverable and cannot be removed without an original password. The drive will remain inaccessible unless the User or Master Hard Drive
Help	Passwords must be between 2 and 19 case-sensitive alpha-numeric characters. If a User Hard Drive Password is created, it must be entered each boot before OS access.
Advanced Help	The drive must be attached to Chipset SATA Port 0 and in either IDE or ACHI Mode.
Requires	Hidden if there is not a Hard Drive attached to Chipset SATA Port 0 or Chipset SATA Mode is not IDE or AHCI.
Visual BIOS Page	Advanced > Security > Passwords

- The first Text Entry Prompt is only used when attempting to change a password that is already installed.
- To delete an existing Hard Drive password, enter a blank password after entering the existing Hard Drive password.

User Access Level

Type	One-of
Full Access	User Password grants access to all questions except User Access Level.
Limited	User Password grants access to Time/Date/Language/User Password questions.
View Only	User Password grants access only to Language question and changes cannot be saved.
No Access	User Password cannot be used to access Setup.
Help	User Access Level determines the level of BIOS Setup access granted when the User Password is entered.
Requires	Hidden and set to Full while a Supervisor Password is not installed. When a Supervisor Password is installed, the question is unhidden and the default value is View Only
Visual BIOS Page	Advanced > Security > Passwords

Hard Disk Drive Password Prompt

Type	Checkbox
Help	If disabled, BIOS will never prompt for an Hard Drive password unless attempting to boot to a drive with a User Hard Drive Password installed.
Advanced Help	If set to **Enable**, BIOS will always prompt for a Hard Drive password if a User Hard Drive Password is installed. If set to **Disable**, BIOS will never prompt for a Hard Drive password unless attempting to boot to a drive with a User Hard Drive Password installed.
Visual BIOS Page	Advanced > Security > Passwords

Allow UEFI 3rd Party Driver Loaded

Type	Checkbox
Help	**Enable**: Allow UEFI 3rd party driver to be loaded during Boot Device Selection (BDS) stage. **Disable**: Prohibit UEFI 3rd party driver to be loaded during BDS stage.
Visual BIOS Page	Advanced > Security > Security Features

Unattended BIOS Configuration

Type	One-of
Always Prompt	Keyboard prompt response required to configure BIOS via ITK
Lock	Cannot use ITK to configure BIOS
Temporarily	ITK BIOS customization allowed without keyboard response prompt until counter
Skip Prompt	
Never Prompt	ITK BIOS customization allowed without keyboard response prompt
Help	Configuring the BIOS via Intel® Integrator Toolkit normally requires physical presence via a keyboard response prompt. Enabling Secure Boot will set Unattended BIOS Configuration to Always Prompt.
Advanced Help	Configuring the BIOS via Intel® Integrator Toolkit normally requires physical presence via a keyboard response prompt. This prompt can disabled temporarily or permanently, or unattended BIOS configuration can be locked out entirely. If set to Lock, BIOS Setup is still accessible. Enabling Secure Boot will set Unattended BIOS Configuration to Always Prompt. Once Secure Boot is enabled, Unattended BIOS Configuration can only be set to Always Prompt, Lock or Temporarily Skip Prompt.
Requires	Never Prompt options is not selectable while Secure Boot is enabled.
Visual BIOS Page	Advanced > Security > Security Features

Execute Disable Bit

Type	Checkbox
Help	Execute Disable Bit functionality may help prevent certain classes of malicious buffer overflow attacks when combined with a supporting operating system.
Visual BIOS Page	Advanced > Security > Security Features

Intel® Virtualization Technology

Type	Checkbox
Help	Enables or Disables features that provide hardware support for virtualization. Requires power cycling and specific hardware/software installed to take effect.
Requires	Processor supports VT. Enabled and grayed-out if Intel® Trusted Execution Technology is set to Enable.
Visual BIOS Page	Advanced > Security > Security Features

Intel® Trusted Execution Technology

Type	Checkbox
Help	Intel® TXT provides hardware-based mechanisms that may help protect against software- based attacks and protect the confidentiality and integrity of data.
Advanced Help	If Intel® TXT is enabled, then Intel® VT, Intel® VT-d, Intel® HT Technology, all processor cores, and the onboard TPM will also be enabled. Once Intel® TXT is enabled, it must be disabled before disabling any of these required features.
Requires	Processor supports TXT and the board has an onboard TPM.
Visual BIOS Page	Advanced > Security > Security Features

Intel® VT for Directed I/O (VT-d)

Type	Checkbox
Help	Enables or Disables Intel® VT for Directed I/O (VT-d) which provides additional hardware support for managing I/O virtualization. If Enabled, BIOS will publish a DMA Remapping ACPI table.
Requires	Processor and chipset combination support VT-d. Enabled and grayed-out if Intel® Trusted Execution Technology is set to Enable
Visual BIOS Page	Advanced > Security > Security Features

Fixed Disk Boot Sector

Type	One-of
Normal	BIOS will allow writes to the MBR on fixed disks.
Write Protect	BIOS will block writes to the MBR on fixed disks.
Help	Write Protect provides some Master Boot Record protection. Set to Normal while installing an operating system.
Advanced Help	Only applicable to Legacy BIOS interfaces.
Visual BIOS Page	Advanced > Security > Security Features

Auto USB Provisioning of Intel® AMT

Type	Checkbox
Help	Enable/Disable of Intel® AMT USB Auto Provisioning
Requires	Platform supports Intel® AMT.
Visual BIOS Page	Advanced > Security > Security Features

Intel® Platform Trust Technology

Type	Checkbox
Help	Enables or Disables Intel® Platform Trust Technology.
Help for NUC5ixMY	Enables or Disables Intel® Platform Trust Technology. Enabling Intel Platform Trust Technology will clear and disable the discrete Trusted Platform Module.
Requires	Boards does not stuff discrete TPM 2.0. Cleared and grayed-out if Intel® Trusted Execution Technology is set to Enable
Visual BIOS Page	Advanced > Security > Security Features

Intel® Software Guard Extensions (SGX)

Type	One-of
Disabled	Hides all SGX related items: **SGX Owner EPOCH, Reset SGX Owner EPOCHs to Factory Default, and SGX Reserved Memory Size.**
Enabled	Enable SGX.
Software Controlled	Grayed-out and set **SGX Reserved Memory Size** to **<Auto>.**
Help	Enables or Disables Intel® Software Guard Extensions (SGX). Software Controlled: SGX is disabled initially. When SGX application and ME FW driver are installed, SGX will be enabled via a UEFI OS-BIOS runtime interface.
Visual BIOS Page	Advanced > Security > Security Features

SGX Owner EPOCHs

Type	One-of
Factory Default	Use factory default Owner EPOCHs. .
New Random Owner EPOCHs	Generate a new random Owner EPOCHs on next boot. Display Reset SGX Owner EPOCHs to Factory Default setup item from next boot. Display New Radom SGX Owner EPOCHs is activated if new random EPOCH is used. Hide SGX Owner EPOCHs item from next boot.
User Defined Owner EPOCHs	Extract the customer defined EPOCHs value from EPOCH variable on next boot. Display Please install 128 bit EPOCH to “EPOCH” UEFI variable. Display Reset SGX Owner EPOCHs to Factory Default item on next boot. Display User Defined SGX Owner EPOCHs is activated if user defined EPOCHs value is used. Hide SGX Owner EPOCHs item from next boot.
Help	Keep or change the SGX Owner EPOCHs value. SGX sealing key is derived from Owner EPOCHs. Warning: after change the Owner EPOCH value, previously Intel SGX sealed data cannot be accessed.
Advanced Help	Factory Default to use default Owner EPOCH value. New Random Owner EPOCHs to generate and use a new random Owner EPOCHs. User Defined Owner EPOCHs will extract customer defined EPOCHs value from EPOCH variable.
Requires	Hide if **Intel® Software Guard Extensions (SGX)** set to **<Disabled>.** Hide if new random owner EPOCHs or user defined owner EPOCHs is activated.
Visual BIOS Page	Advanced > Security > Security Features

New Random SGX Owner EPOCHs is activated

Type	Information
Requires	Hidden if **SGX Owner EPOCHS** is not from new random Owner EPOCHs.
Visual BIOS Page	Advanced > Security > Security Features

User Defined SGX Owner EPOCHs is activated

Type	Information
Requires	Hidden if **SGX Owner EPOCHS** is not from customer defined Owner EPOCHs.
Visual BIOS Page	Advanced > Security > Security Features

Reset SGX Owner EPOCHs to Factory Default

Type	Checkbox
Help	Reset Intel SGX Owner EPOCHs to factory default value. Warning: after change the Owner EPOCH value, previously Intel SGX sealed data cannot be accessed.
Requires	Platform supports SGX. Hide if Intel® Software Guard Extensions (SGX) set to <Disabled>. Hide if factory default owner EPOCHs is activated.
Visual BIOS Page	Advanced > Security > Security Features

SCE Password Check

Type	One-of
Enabled	
Bypass	
Temporarily Bypass	
Help	Configuring the BIOS Setup via Intel SCE tool requires BIOS Admin/Supervisor password for access. **Enable**: Actual BIOS Admin/Supervisor password is required. **Bypass or Temporarily Bypass**: a 'dummy' Admin password is accepted.

SGX Reserved Memory Size

Type	One-of
Auto	
32MB	
64MB	
128MB	
Help	Configure the SGX Reserved Memory Size.
Requires	Platform supports SGX. Gray-out if Intel® Software Guard Extensions (SGX) set to <Software Controlled>. Hide if Intel® Software Guard Extensions (SGX) set to <Disabled>.
Visual BIOS Page	Advanced > Security > Security Features

Thunderbolt Security Level

Type	One-of
Legacy Mode	No Security - Allow legacy Thunderbolt devices to auto connect – With at this mode the connection manager auto connects to a new device plugged in
Unique ID	User Authorization - Allow User Notification devices at minimum – With at this mode the connection manager requests connection approval from the host SW, auto approval may be given based on the Unique ID of the connecting device
One time saved key	Secure Connect - Allow One time saved key devices at minimum – With this mode the connection manager requests connection approval from the host SW, auto approval is only given if the host challenge to the device is acceptable
DP++ only	Display Port Only - Allow only DP sinks to be connected (re-driver or DP tunnel, no PCIe tunneling) – With this mode no tunneling is done for PCIe devices
Help	Configure the Thunderbolt security level.

Advanced Help	**Legacy Mode** - allow legacy Thunderbolt devices to auto connect. **Unique ID** - With this mode the connection manager requests connection approval from the host SW, auto approval may be given based on the Unique ID of the connecting device. **One time saved key** - With this mode the connection manager requests connection approval from the host SW, auto approval is only given if the host challenge to the device is acceptable. **DP++ only** - allow only DP sinks to be connected.
Requires	Hide if **Intel® Thunderbolt Technology** set to **<Disabled>**
Visual BIOS Page	Advanced > Security > Security Features

Advanced > Power

Primary Power Settings

Balanced Enabled

Type	Checkbox
Requires	Grayed-out if **Low Power Enabled** or **Max Performance Enabled** is set to **Enable**.
Visual BIOS Page	Advanced > Power > Primary Power Settings

Low Power Enabled

Type	Checkbox
Requires	Grayed-out if **Balanced Enabled** or **Max Performance Enabled** is set to **Enable**.
Visual BIOS Page	Advanced > Power > Primary Power Settings

Max Performance Enabled

Type	Checkbox
Requires	Grayed-out if **Balanced Enabled** or **Low Power Enabled** is set to **Enable**.
Visual BIOS Page	Advanced > Power > Primary Power Settings

Intel® Dynamic Power Technology

Type	One-of
Energy Efficient Performance	Hides questions: Enhanced Intel SpeedStep® Technology and OS ACPI C2 Report. Sets Enhanced Intel SpeedStep® Technology to Enable. Sets OS ACPI C2 Report to Enable. Sets PCIe ASPM Support to Enable.
Off	Hides questions: Enhanced Intel SpeedStep® Technology and OS ACPI C2 Report. Sets Enhanced Intel SpeedStep® Technology to Disable. Sets OS ACPI C2 Report to Disable. Sets PCIe ASPM Support to Disable.
Custom	Unhides questions: Enhanced Intel SpeedStep® Technology and OS ACPI C2 Report.
Help	Configures processor power management features. Setting this to Off will disable Enhanced Intel SpeedStep® Technology and Intel® Turbo Boost Technology.
Visual BIOS Page	Advanced > Power > Primary Power Settings

Enhanced Intel SpeedStep® Technology

Type	Checkbox
Help	Enhanced Intel SpeedStep® Technology allows the system to dynamically adjust processor voltage and core frequency, which can result in decreased average power consumption, decreased average heat production, and a quieter system.
Advanced Help	Disabling Enhanced Intel SpeedStep® Technology will disable Intel® Turbo Boost Technology and Processor Idle State.
Requires	Hidden if **Intel® Dynamic Power Technology** is set to **Energy Efficient Performance** or **Off**
Visual BIOS Page	Advanced > Power > Primary Power Settings

Processor Power Efficiency Policy

Type	One-of
High Performance	Set MSR 1B0h Bits 3:0 to 0h
Balanced	Set MSR 1B0h Bits 3:0 to 5h
Low Power	Set MSR 1B0h Bits 3:0 to 7h
Help	Configures processor bias for power efficiency vs. performance.
Requires	Hidden if **Enhanced Intel SpeedStep® Technology** is set to **Disable**
Visual BIOS Page	Advanced > Power > Primary Power Settings

OS ACPI C2 Report

Type	Checkbox
Help	Enables or Disables OS ACPI C2 Report. If enabled, BIOS will report ACPI C2 State (mapped to processor C2 or deeper C
Requires	Installed processor supports C2 or deeper C state. Hidden if Intel® Dynamic Power Technology is set to Energy Efficient Performance or Off
Visual BIOS Page	Advanced > Power > Primary Power Settings

Package Power Limit 1 (Sustained)

Type	Numeric
Help	Intel® Turbo Boost Technology will control processor power usage to the Sustained Mode Power Limit over a moving average time window: Sustained Mode Time (specified in seconds).
Requires	Hidden if processor does not support Intel® Turbo Boost Technology. Grayed-out if processor does not support overriding Sustained Mode Power Limit. Hidden if Intel® Turbo Boost Technology is set to Disable.
Visual BIOS Page	Advanced > Power > Primary Power Settings

Package Power Limit 2 (Burst Mode)

Type	Numeric
Help	Intel® Turbo Boost Technology will use this power limit for a very short duration. After that, the Sustained Mode Power Limit will be used.
Advanced Help	The recommended value is 1.3 x the Sustained Mode Power Limit.
Requires	Hidden if processor does not support Intel® Turbo Boost Technology. Grayed-out if processor does not support overriding Burst Mode Power Limit. Hidden if Intel® Turbo Boost Technology is set to Disable.
Visual BIOS Page	Advanced > Power > Primary Power Settings

Package Power Time Window (Tau)

Type	One-of
224	
192	
160	
128	
112	
96	
80	
64	
56	
48	
40	
32	
28	
24	
20	
16	
14	
12	
10	
8	
7	
6	
5	
4	
3.5	
3	
2.5	
2	
1.75	
1.5	
1.25	
1	
Help	Intel® Turbo Boost Technology will control processor power usage to the Sustained Mode Power Limit over a moving average time window: Sustained Mode Time (specified in seconds).

Requires	Hidden if processor does not support Intel® Turbo Boost Technology Grayed-out if processor does not support overriding Sustained Mode Time Hidden if **Intel® Turbo Boost Technology** is set to **Disable**
Visual BIOS Page	Advanced > Power > Primary Power Settings

VR Current Limits (ICCmax) (Amps)

Type	Numeric
Help	Intel® Turbo Boost Technology will be disengaged if the processor is operating beyond this current limit.
Requires	Hidden if processor does not support Intel® Turbo Boost Technology Grayed-out if processor does not support overriding Turbo Current Limit Hidden if **Intel® Turbo Boost Technology** is set to **Disable**
Visual BIOS Page	Advanced > Power > Primary Power Settings

Processor VR Efficiency Management

Type	Checkbox
Help	When disabled, processor power usage and heat will increase in exchange for improved power delivery control. This may be useful at higher Processor Base Clock frequencies.
Visual BIOS Page	Advanced > Power > Primary Power Settings

Processor VR Faults

Type	Checkbox
Help	When disabled, processor over-voltage and over-current protection is disabled. This may be useful at very high frequencies, but significantly increases the risk of processor damage.
Visual BIOS Page	Advanced > Power > Primary Power Settings

Secondary Power Settings

- Options in this section vary by Intel NUC model.

Sleep Type Support

Type	One-of
Modern Standby	
Legacy S3 Standby	
Help	For Modern Standby, the transition from the active to the low power state is a series of steps to lower power consumption. The transition into and out of a lower power state is much quicker on a Modern Standby system than on a legacy S3 system.
Advanced Help	For Modern Standby, the transition from the active to the low power state is a series of steps to lower power consumption. The transition into and out of a lower power state is much quicker on a Modern Standby system than on a legacy S3 system. Changing this BIOS setting from legacy S3 to Modern Standby will require reinstalling Windows OS.
Visual BIOS Page	Advanced > Power > Secondary Power Settings

Button LED

Type	One-of
Power State Indicator	Button LED will be used as power state indicator.
HDD Activity LED	Button LED will be used as HDD Activity LED.
SW Control	Button LED will be controlled by software through WMI interface. BIOS will turn off the LED during POST.
Help	Configures Button LED functionality.
Visual BIOS Page	Advanced > Power > Secondary Power Settings

S0 Indicator Brightness

Type	One-of
OFF	
50%	
100%	
Help	Determines Button LED brightness during S0 system power state.
Visual BIOS Page	Advanced > Power > Secondary Power Settings

S0 Indicator Blinking/Fade

Type	One-of
OFF	
50%	
100%	
Help	Determines Button LED blink pattern during S0 system power state.
Visual BIOS Page	Advanced > Power > Secondary Power Settings

S0 Indicator Color

Type	One-of
Blue	
Amber	
Help	Determines Button LED color during S0 system power state.
Requires	**Button LED** is set to **Power State Indicator**. Grayed out if 0% is selected in S0 Indicator Brightness.
Visual BIOS Page	Advanced > Power > Secondary Power Settings

S0 Indicator Brightness (%)

Type	Numeric
Range	0-100
Help	Determines Button LED brightness during S0 system power state.
Visual BIOS Page	Advanced > Power > Secondary Power Settings

S0 Indicator Blinking Behavior

Type	One-of
Solid	
Breathing	
Pulsing	
Strobing	
Help	Determines Button LED blinking behavior during S0 system power state.
Requires	**Button LED** is set to **Power State Indicator**. Grayed out if 0% is selected in S0 Indicator Brightness.
Visual BIOS Page	Advanced > Power > Secondary Power Settings

S0 Indicator Blinking Frequency (Hz)

Type	Numeric
Range	0.1-1.0
Help	Determines Button LED blinking frequency during S0 system power state.
Requires	Button LED is set to Power State Indicator. Grayed out if 0% is selected in S0 Indicator Brightness. Grayed out if Solid is selected in S0 Indicator Blinking Behavior.
Visual BIOS Page	Advanced > Power > Secondary Power Settings

S3 Indicator Brightness

Type	One-of
OFF	
50%	
100%	
Help	Determines Button LED brightness during S3 system power state.
Visual BIOS Page	Advanced > Power > Secondary Power Settings

S3 Indicator Blinking/Fade

Type	One-of
1Hz	
0.25Hz	
Slow Fade	
Always On	
Help	Determines Button LED blink pattern during S3 system power state.
Visual BIOS Page	Advanced > Power > Secondary Power Settings

S3 Indicator Color

Type	One-of
Blue	
Amber	
Help	Determines Button LED color during S3 system power state.
Visual BIOS Page	Advanced > Power > Secondary Power Settings

S3 Indicator Brightness (%)

Type	Numeric
Range	0-100
Help	Determines Button LED brightness during S3 system power state.
Requires	**Button LED** is set to **Power State Indicator**.
Visual BIOS Page	Advanced > Power > Secondary Power Settings

S3 Indicator Blinking Behavior

Type	One-of
Solid	
Breathing	
Pulsing	
Strobing	
Help	Determines Button LED blinking behavior during S3 system power state.
Requires	**Button LED** is set to **Power State Indicator**. Grayed out if 0% is selected in S3 Indicator Brightness.
Visual BIOS Page	Advanced > Power > Secondary Power Settings

S3 Indicator Blinking Frequency (Hz)

Type	Numeric
Range	0.1-1.0
Help	Determines Button LED blinking frequency during S3 system power state Determines.
Requires	**Button LED** is set to **Power State Indicator**. Grayed out if 0% is selected in S3 Indicator Brightness. Grayed out if Solid is selected in S3 Indicator Blinking Behavior.
Visual BIOS Page	Advanced > Power > Secondary Power Settings

Ready Mode Brightness

Type	One-of
OFF	
50%	
100%	
Help	Determines Button LED brightness during Intel Ready Mode.
Visual BIOS Page	Advanced > Power > Secondary Power Settings

Ready Mode Blinking/Fade

Type	One-of
1Hz	
0.25Hz	
Slow Fade	
Always On	
Help	Determines Button LED blink pattern during Intel Ready Mode.
Visual BIOS Page	Advanced > Power > Secondary Power Settings

Ready Mode Color

Type	One-of
Blue	
Amber	
Help	Determines Button LED color during Intel Ready Mode.
Visual BIOS Page	Advanced > Power > Secondary Power Settings

Brightness

Type	One-of
OFF	
50%	
100%	
Help	Determines Button LED brightness for HDD activity.
Visual BIOS Page	Advanced > Power > Secondary Power Settings

Color

Type	One-of
Blue	
Amber	
Help	Determines Button LED color for HDD activity.
Requires	**Button LED** is set to **HDD Activity LED**. Grayed out if 0% is selected in Brightness.
Visual BIOS Page	Advanced > Power > Secondary Power Settings

Brightness (%)

Type	Numeric
Range	0-100
Help	Determines Button LED brightness for HDD activity.
Requires	**Button LED** is set to **HDD Activity LED**.
Visual BIOS Page	Advanced > Power > Secondary Power Settings

Behavior

Type	One-of
Normally off, ON when	
Normally on, OFF when active	
Help	Determines Button LED Behavior for HDD activity.
Requires	**Button LED** is set to **HDD Activity LED**. Grayed out if 0% is selected in Brightness.
Visual BIOS Page	Advanced > Power > Secondary Power Settings

Ring LED

Type	One-of
Power State Indicator	Ring LED will be used as power state indicator.
HDD Activity LED	Ring LED will be used as HDD Activity LED.
SW Control	Ring LED will be controlled by software through WMI interface. BIOS will turn off the LED during POST
Help	Configures Ring LED functionality.
Requires	System implement Ring LED.
Visual BIOS Page	Advanced > Power > Secondary Power Settings

S3 Indicator Brightness

Type	One-of
OFF	
50%	
100%	
Help	Determines Ring LED brightness during S3 system power state.
Requires	**Ring LED** is set to **Power State Indicator**.
Visual BIOS Page	Advanced > Power > Secondary Power Settings

S0 Indicator Brightness

Type	One-of
OFF	
50%	
100%	
Help	Determines Ring LED brightness during S0 system power state.
Visual BIOS Page	Advanced > Power > Secondary Power Settings

S0 Indicator Blinking/Fade

Type	One-of
1Hz	
0.25Hz	
Slow Fade	
Always On	
Help	Determines Ring LED blink pattern during S0 system power state.
Requires	**Ring LED** is set to **Power State Indicator**.
Visual BIOS Page	Advanced > Power > Secondary Power Settings

S0 Indicator Color

Type	One-of
Cyan	
Red	
Green	
Blue	
Yellow	
Magenta	
White	
Help	Determines Ring LED color during S0 system power state.
Requires	**Ring LED** is set to **Power State Indicator**.
Visual BIOS Page	Advanced > Power > Secondary Power Settings

S3 Indicator Brightness

Type	One-of
OFF	
50%	
100%	
Help	Determines Ring LED brightness during S3 system power state.
Visual BIOS Page	Advanced > Power > Secondary Power Settings

S3 Indicator Blinking/Fade

Type	One-of
1Hz	
0.25Hz	
Slow Fade	
Always On	
Help	Determines Ring LED blink pattern during S3 system power state.
Requires	**Ring LED** is set to **Power State Indicator**.
Visual BIOS Page	Advanced > Power > Secondary Power Settings

S3 Indicator Color

Type	One-of
Cyan	
Red	
Green	
Blue	
Yellow	
Magenta	
White	
Help	Determines Ring LED color during S3 system power state.
Requires	**Ring LED** is set to **Power State Indicator**.
Visual BIOS Page	Advanced > Power > Secondary Power Settings

- Color choices vary, depending on SKU.

Ready Mode Brightness

Type	One-of
OFF	
50%	
100%	
Help	Determines Ring LED brightness during Intel Ready Mode.
Requires	**Ring LED** is set to **Power State Indicator**.
Visual BIOS Page	Advanced > Power > Secondary Power Settings

Ready Mode Blinking/Fade

Type	One-of
1Hz	
0.25Hz	
Slow Fade	
Always On	
Help	Determines Ring LED blink pattern during Intel Ready Mode.
Requires	**Ring LED** is set to **Power State Indicator**.
Visual BIOS Page	Advanced > Power > Secondary Power Settings

Ready Mode Color

Type	One-of
Cyan	
Red	
Green	
Blue	
Yellow	
Magenta	
White	
Help	Determines Ring LED color during Intel Ready Mode.
Requires	**Ring LED** is set to **Power State Indicator**.
Visual BIOS Page	Advanced > Power > Secondary Power Settings

Brightness

Type	One-of
OFF	
50%	
100%	
Help	Determines Ring LED brightness for HDD activity.
Requires	**Ring LED** is set to **HDD Activity LED**.
Visual BIOS Page	Advanced > Power > Secondary Power Settings

Brightness (%)

Type	Numeric
Range	0-100
Help	Determines HDD LED brightness for HDD activity.
Requires	**HDD LED** is set to **HDD Activity LED**.
Visual BIOS Page	Advanced > Power > Secondary Power Settings

Color

Type	One-of
Cyan	
Red	
Green	
Blue	
Yellow	
Magenta	
White	
Help	Determines Ring LED color for HDD activity.
Requires	**Ring LED** is set to **HDD Activity LED**.
Visual BIOS Page	Advanced > Power > Secondary Power Settings

- Color choices vary, depending on SKU.

HDD LED

Type	One-of
Power State Indicator	HDD LED will be used as power state indicator.
HDD Activity LED	HDD LED will be used as HDD Activity LED.
SW Control	HDD LED will be controlled by software through WMI interface. BIOS will turn off the LED during POST.
Help	Configures HDD LED functionality.
Visual BIOS Page	Advanced > Power > Secondary Power Settings

Behavior

Type	One-of
Normally off, ON when	
Normally on, OFF when active	
Help	Determines HDD LED Behavior for HDD activity.
Requires	**HDD LED** is set to **HDD Activity LED**. Grayed out if 0% is selected in Brightness.
Visual BIOS Page	Advanced > Power > Secondary Power Settings

S0 Indicator Brightness (%)

Type	Numeric
Range	0-100
Help	Determines HDD LED brightness during S0 system power state.
Visual BIOS Page	Advanced > Power > Secondary Power Settings

S0 Indicator Blinking Behavior

Type	One-of
Solid	
Breathing	
Pulsing	
Strobing	
Help	Determines HDD LED blinking behavior during S0 system power state.
Requires	**HDD LED** is set to **Power State Indicator**. Grayed out if 0% is selected in S0 Indicator Brightness.
Visual BIOS Page	Advanced > Power > Secondary Power Settings

S0 Indicator Blinking Frequency (Hz)

Type	Numeric
Range	0.1-1.0
Help	Determines HDD LED blinking frequency during S0 system power state.
Requires	Button HDD is set to Power State Indicator. Grayed out if 0% is selected in S0 Indicator Brightness. Grayed out if Solid is selected in S0 Indicator Blinking Behavior.
Visual BIOS Page	Advanced > Power > Secondary Power Settings

S0 Indicator Color

Type	One-of
Cyan	
Red	
Green	
Blue	
Yellow	
Magenta	
White	
Help	Determines Ring LED color during S0 system power state.
Requires	**HDD LED** is set to **Power State Indicator**.
Visual BIOS Page	Advanced > Power > Secondary Power Settings

S3 Indicator Brightness (%)

Type	Numeric
Range	0-100
Help	Determines HDD LED brightness during S3 system power state.
Requires	**HDD LED** is set to **Power State Indicator**.
Visual BIOS Page	Advanced > Power > Secondary Power Settings

S3 Indicator Blinking Behavior

Type	One-of
Solid	
Breathing	
Pulsing	
Strobing	
Help	Determines HDD LED blinking behavior during S3 system power state.
Requires	**HDD LED** is set to **Power State Indicator**. Grayed out if 0% is selected in S3 Indicator Brightness.
Visual BIOS Page	Advanced > Power > Secondary Power Settings

S3 Indicator Blinking Frequency (Hz)

Type	Numeric
Range	0.1-1.0
Help	Determines HDD LED blinking frequency during S3 system power state Determines.
Requires	**HDD LED** is set to **Power State Indicator**. Grayed out if 0% is selected in S3 Indicator Brightness. Grayed out if Solid is selected in S3 Indicator Blinking Behavior.
Visual BIOS Page	Advanced > Power > Secondary Power Settings

S3 Indicator Color

Type	One-of
Cyan	
Red	
Green	
Blue	
Yellow	
Magenta	
White	
Help	Determines HDD LED color during S3 system power state.
Requires	**HDD LED** is set to **Power State Indicator**.
Visual BIOS Page	Advanced > Power > Secondary Power Settings

Brightness

Type	Numeric
Range	0-100
Help	Determines HDD LED brightness for HDD activity.
Requires	**HDD LED** is set to HDD Activity LED.
Visual BIOS Page	Advanced > Power > Secondary Power Settings

Color

Type	One-of
Cyan	
Red	
Green	
Blue	
Yellow	
Magenta	
White	
Help	Determines HDD LED color for HDD activity.
Requires	**HDD LED** is set to HDD Activity LED.
Visual BIOS Page	Advanced > Power > Secondary Power Settings

Behavior

Type	One-of
Normally off, ON when	
Normally on, OFF when active	
Help	Determines HDD LED Behavior for HDD activity.
Requires	**HDD LED** is set to **HDD Activity LED**. Grayed out if 0% is selected in Brightness.
Visual BIOS Page	Advanced > Power > Secondary Power Settings

Front Panel Header

S0 State Indicator

Type	One-of
OFF	Front panel LED will be off during S0.
Blink (primary color @ 1 Hz)	Front panel LED will blink with a primary color at 1 Hz during S0.
Blink (alternate color @ 1 Hz)	Front panel LED will blink with an alternate color at 1 Hz during S0.
Blink (primary color @ 0.25 Hz)	Front panel LED will blink with a primary color at 0.25 Hz during S0.
Blink (alternate color @ 0.25 Hz)	Front panel LED will blink with an alternate color at 0.25 Hz during S0.
ON (solid, primary color)	Front panel LED will be on with a primary color during S0.
ON (solid, alternate color)	Front panel LED will be on with an alternate color during S0.
Help	Determines front panel power LED behavior during S0 system power state.
Visual BIOS Page	Advanced > Power > Secondary Power Settings

S3 State Indicator

Type	One-of
OFF	Front panel LED will be off during S3.
Blink (primary color @ 1 Hz)	Front panel LED will blink with a primary color at 1 Hz during S3.
Blink (alternate color @ 1 Hz)	Front panel LED will blink with an alternate color at 1 Hz during S3.
Blink (primary color @ 0.25 Hz)	Front panel LED will blink with a primary color at 0.25 Hz during S3.
Blink (alternate color @ 0.25 Hz)	Front panel LED will blink with an alternate color at 0.25 Hz during S3.
ON (solid, primary color)	Front panel LED will be on with a primary color during S3.
ON (solid, alternate color)	Front panel LED will be on with an alternate color during S3.
Help	Determines front panel power LED behavior during S3 system power state.
Visual BIOS Page	Advanced > Power > Secondary Power Settings

Intel Ready Mode Indicator

Type	One-of
OFF	Front panel LED will be off during S3.
Blink (primary color @ 1 Hz)	Front panel LED will blink with a primary color at 1 Hz during Intel Ready Mode.
Blink (alternate color @ 1 Hz)	Front panel LED will blink with an alternate color at 1 Hz during Intel Ready Mode.
Blink (primary color @ 0.25 Hz)	Front panel LED will blink with a primary color at 0.25 Hz during Intel Ready Mode.
Blink (alternate color @ 0.25 Hz)	Front panel LED will blink with an alternate color at 0.25 Hz during Intel Ready Mode.
ON (solid, primary color)	Front panel LED will be on with a primary color during Intel Ready Mode.
ON (solid, alternate color)	Front panel LED will be on with an alternate color during Intel Ready Mode.
Help	Determines front panel power LED behavior during Intel Ready Mode.
Visual BIOS Page	Advanced > Power > Secondary Power Settings

Intel® Ready Mode Technology

Type	Checkbox
Help	If enabled, Intel® Ready Mode Technology software can be configured to optimize the system power plan in Intel® Ready Mode. Windows menu options transition into Intel® Ready mode instead of S3 sleep.
Requires	Requires Intel® Ready Mode Technology software installed and configured
Visual BIOS Page	Advanced > Power > Secondary Power Settings

Intel Ready Mode Indicator

Type	One-of
OFF	Front panel LED will be off during S3.
Blink (primary color @ 1 Hz)	Front panel LED will blink with a primary color at 1 Hz during Intel Ready Mode.
Blink (alternate color @ 1 Hz)	Front panel LED will blink with an alternate color at 1 Hz during Intel Ready Mode.
Blink (primary color @ 0.25 Hz)	Front panel LED will blink with a primary color at 0.25 Hz during Intel Ready Mode.
Blink (alternate color @ 0.25 Hz)	Front panel LED will blink with an alternate color at 0.25 Hz during Intel Ready Mode.
ON (solid, primary color)	Front panel LED will be on with a primary color during Intel Ready Mode.
ON (solid, alternate color)	Front panel LED will be on with an alternate color during Intel Ready Mode.
Help	Determines front panel power LED behavior during Intel Ready Mode.
Requires	**Intel Ready Mode Technology** is set to **Enable**
Visual BIOS Page	Advanced > Power > Secondary Power Settings

Power Sense

Type	Checkbox
Help	When enabled, the power sense will monitor the input power from the power supply and will assert PROCHOT# to the CPU if the power is high enough that it risks causing the power adaptor to shut down.
Visual BIOS Page	Advanced > Power > Secondary Power Settings

Intel® Smart Connect Technology

Type	Checkbox
Help	If enabled, Intel® Smart Connect Technology software can be configured to periodically wake up the system briefly to retrieve data from the network (email, etc.)
Visual BIOS Page	Advanced > Power > Secondary Power Settings

After Power Failure

Type	One-of
Stay Off	System will stay in power-off state after AC power restore.
Last State	System will return to last power state before AC power lost.
Power On	System will automatically power-on after AC power is restored.
Help	Configures system behavior after AC power is lost.
Advanced Help	If set to Stay Off, the System will stay in a power-off state after AC power is restored. If set to Last State, the System will return to the last power state before AC power was lost. If set to Power On, the System will automatically power-on after AC power is restored.
Visual BIOS Page	Advanced > Power > Secondary Power Settings

S0 State Indicator

Type	One-of
OFF	Front panel LED will be off during S0.
Blink (primary color @ 1	Front panel LED will blink with a primary color at 1 Hz during S0.
Blink (alternate color @ 1 Hz)	Front panel LED will blink with an alternate color at 1 Hz during S0.
Blink (primary color @ 0.25 Hz)	Front panel LED will blink with a primary color at 0.25 Hz during S0.
Blink (alternate color @ 0.25 Hz)	Front panel LED will blink with an alternate color at 0.25 Hz during S0.
ON (solid, primary color)	Front panel LED will be on with a primary color during S0.
ON (solid, alternate color)	Front panel LED will be on with an alternate color during S0.
Help	Determines front panel power LED behavior during S0 system power state.
Visual BIOS Page	Advanced > Power > Secondary Power Settings

S3 State Indicator

Type	One-of
OFF	Front panel LED will be off during S3.
Blink (primary color @ 1	Front panel LED will blink with a primary color at 1 Hz during S3.
Blink (alternate color @ 1 Hz)	Front panel LED will blink with an alternate color at 1 Hz during S3.
Blink (primary color @ 0.25 Hz)	Front panel LED will blink with a primary color at 0.25 Hz during S3.
Blink (alternate color @ 0.25 Hz)	Front panel LED will blink with an alternate color at 0.25 Hz during S3.
ON (solid, primary color)	Front panel LED will be on with a primary color during S3.
ON (solid, alternate color)	Front panel LED will be on with an alternate color during S3.
Help	Determines front panel power LED behavior during S3 system power state.
Visual BIOS Page	Advanced > Power > Secondary Power Settings

Deep S4/S5

Type	Checkbox
Help	If Enabled, the system will use less power while turned off but still plugged into AC power (the wall power outlet). The system can only be turned on by power button. Other wake methods are disabled.
Requires	Board hardware supports Deep S4/S5
Visual BIOS Page	Advanced > Power > Secondary Power Settings

Wake on LAN from S4/S5

Type	One-of
Stay Off	System will not wake from S4/S5 power state if Wake on LAN packet is received.
Power On – Normal Boot	System will wake from S4/S5 power state if Wake on LAN packet is received. BIOS will follow normal boot order.
Power On – PXE Boot	System will wake from S4/S5 power state if Wake on LAN packet is received. BIOS will attempt to boot to PXE. If PXE boot fails, BIOS will attempt to boot to other devices according to normal boot order.
Help	Configures behavior when Wake on LAN packet is received during S4/S5. Wake on LAN must also be enabled in OS LAN driver.
Advanced Help	**Stay Off -** System will not wake. **Power On - Normal Boot:** System will wake and use normal boot order. **Power On - PXE Boot**: System will wake and attempt boot to PXE.
Visual BIOS Page	**Advanced > Power > Secondary Power Settings**

Wake System from S5

Type	Checkbox
Help	Enables or Disables Wake System from S5. If Enabled, system will wake at the selected date/time via RTC alarm.
Requires	Grayed-out and disabled if **Intel® Rapid Start Technology** is enabled.
Visual BIOS Page	Advanced > Power > Secondary Power Settings

Recurrence

Type	One-of
Monthly	System will wake at the selected date/time via RTC alarm monthly.
Weekly	System will wake at the selected week day/time via RTC alarm weekly.
Daily	System will wake at the selected time daily.
Help	Select Daily/Weekly/Monthly to wake the system.
Requires	**Wake System from S5** is set to **Enable**
Visual BIOS Page	Advanced > Power > Secondary Power Settings

Sunday
Monday
Tuesday
Wednesday
Thursday
Friday
Saturday

Type	Checkbox
Help	If enabled, system will wake at the selected time via RTC alarm on the day selected.
Requires	**Wake System from S5** is set to **Enable.** **Recurrence is set to Weekly.**
Visual BIOS Page	Advanced > Power > Secondary Power Settings

Wakeup Date

Type	Numeric
Range	0-31
Help	Select day of each month to wake the system. Select 0 for daily wakeup.
Requires	**Wake System from S5** is set to **Enable.** Recurrence is set to Monthly.
Visual BIOS Page	Advanced > Power > Secondary Power Settings

Wakeup Hour

Type	Numeric
Range	0-23
Help	Select wakeup hour in 24-hour format. For example, 15 means 3 PM.
Requires	**Wake System from S5** is set to **Enable**
Visual BIOS Page	Advanced > Power > Secondary Power Settings

Wakeup Minute

Type	Numeric
Range	0-59
Help	Select wakeup minute.
Requires	**Wake System from S5** is set to **Enable**
Visual BIOS Page	Advanced > Power > Secondary Power Settings

Wakeup Second

Type	Numeric
Range	0-59
Help	Select wakeup second.
Requires	**Wake System from S5** is set to **Enable**
Visual BIOS Page	Advanced > Power > Secondary Power Settings

Wake from S3 via CIR

Type	Checkbox
Help	Enable or Disables Wake on Enhanced Consumer Infrared (CIR) from S3 sleep state.
Requires	Board hardware supports CIR. Enhanced Consumer IR is set to Enable.
Visual BIOS Page	Advanced > Power > Secondary Power Settings

Wake from S4 and S5 via CIR

Type	Checkbox
Help	Enable or Disables Wake on Enhanced Consumer Infrared (CIR) from (S4 and S5) system off state.
Requires	Board hardware supports CIR. Enhanced Consumer IR is set to Enable.
Visual BIOS Page	Advanced > Power > Secondary Power Settings

USB S4/S5 Power

Type	Checkbox
Help	Enables or Disables the USB Port power in S4/S5 state. This does not affect USB charging ports.
Requires	Board hardware support USB power in S4/S5 state. Hidden and Disabled if **Deep S4/S5** is set to **Enabled**
Visual BIOS Page	Advanced > Power > Secondary Power Settings

Wake on USB from S5

Type	Checkbox
Help	Enables or Disables Wake on USB from S5 state
Requires	Board hardware supports USB power in S4/S5 state. USB S4/S5 Power is set to Enable.
Visual BIOS Page	Advanced > Power > Secondary Power Settings

Wake from Thunderbolt Device

Type	Checkbox
Help	Enable or disable system wake from Thunderbolt devices
Requires	Onboard Thunderbolt Controller. Hide if Intel® Thunderbolt Technology set to <Disabled>
Visual BIOS Page	Advanced > Power > Secondary Power Settings

PCIe ASPM Support

Type	Checkbox
Help	Configures PCI Express (PCIe) Active State Power Management (ASPM). Tradeoffs involve power usage, performance, and device/driver compatibility.
Advanced Help	If set to Disable, ASPM support is disabled for all PCIe devices. If set to Enable, ASPM support is enabled for all PCIe devices.
Visual BIOS Page	Advanced > Power > Secondary Power Settings

Native ACPI OS PCIe Support

Type	Checkbox
Help	Enable for power savings and performance improvements. Note: Not all PCIe devices are compatible with this feature.
Visual BIOS Page	Advanced > Power > Secondary Power Settings

Flash Update Sleep Delay

Type	Checkbox
Help	If set to Enable, the system will sleep for 20 seconds during the flash update power cycle. Enabling this feature may increase compatibility with power supplies.
Visual BIOS Page	Advanced > Power > Secondary Power Settings

Advanced > Boot > Boot Priority

UEFI Boot

Type	Checkbox
Help	If Enabled, BIOS will attempt to boot via UEFI before using the legacy boot sequence. UEFI Boot must be enabled in order to boot to a drive larger than 2 TB (terabytes).
Advanced Help	If both UEFI Boot and Legacy Boot are enabled, BIOS will attempt to boot via UEFI before using the legacy boot sequence. Enabling Secure Boot will also enable UEFI Boot and disable Legacy Boot.
Requires	Enabled if **Legacy Boot** is Disabled. Enabled if Secure Boot is Enabled.
Visual BIOS Page	Advanced > Boot > Boot Priority

Boot Drive Order

Boot Option

Type	Ordered List
Help	Select the boot order for all detected bootable devices.
Requires	Hidden if **UEFI Boot** is Disabled
Visual BIOS Page	Advanced > Boot > Boot Priority

- All detected UEFI boot options will be included in the list.
- The user can change the order of boot options within the list.
- The BIOS will attempt to boot to each option in the order of this list.

Legacy Boot

Type	Checkbox
Help	If Enabled, BIOS can attempt to boot via the legacy (non-UEFI) boot sequence.
Advanced Help	If both UEFI Boot and Legacy Boot are enabled, BIOS will attempt to boot via UEFI before using the legacy boot sequence. Enabling Secure Boot will also enable UEFI Boot and disable Legacy Boot.
Requires	Enabled if UEFI Boot is Disabled. Disabled if Secure Boot is Enabled. Disabled and gray out if Optane mode in Chipset SATA mode and RST PCIe Storage Remapping are set for Optane support.
Visual BIOS Page	Advanced > Boot > Boot Priority

Boot Drive Order

Type	Ordered List
Help	Select the boot order for all detected bootable devices.
Requires	Hidden if **Legacy Boot** is Disabled
Visual BIOS Page	Advanced > Boot > Boot Priority

All detected Legacy boot options will be included in the list.
The user can change the order of boot options within the list.
The BIOS will attempt to boot to each option in the order of this list.

Advanced > Boot > Boot Configuration

UEFI Boot Pane (Upper Left Section)

OS Selector

Type	One-of
Windows 10	Set for Windows 10
Linux	Set for Linux
Help	Windows 10: It is recommended to be set if installing Windows 10. Linux: It is recommended to be set if installing Linux.
Requires	Apollo Lake platforms.
Visual BIOS Page	Advanced > Boot > Boot Configuration

OR

Type	One-of
Windows 8.x	Set for Windows 8 or Windows 8.1
Windows 7	Set for Windows 7
Linux	Set for Linux
Android	Set for Android
Help	Windows 8.x: It is recommended to be set if installing Windows 8 and Windows 8.1. Windows 7: It is recommended to be set if installing Windows 7. Linux: It is recommended to be set if installing Linux. Android: It is recommended to be set if installing Android.
Requires	Braswell platforms
Visual BIOS Page	Advanced > Boot > Boot Configuration

Fast Boot

Type	Checkbox
Help	If Enabled, Boot from Network/Optical/Removable Devices and RAID configuration will be disabled. In addition, Video and USB devices (keyboards and drives) will not be available until after OS boot.
Advanced Help	This feature cannot be enabled while a User Password or Hard Disk Drive Password is installed, and when Chipset SATA Mode set to Intel RST Premium With Intel Optane System Acceleration. This feature does not affect USB and video capabilities after OS boot. In order to disable Fast Boot without entering BIOS Setup: Power down the system, then hold down the power button until the system beeps.
Requires	Fast Boot will be Grayed-out and Disabled if Chipset SATA Mode set to Intel RST Premium With Intel Optane System Acceleration.
Visual BIOS Page	Advanced > Boot > Boot Configuration

Boot USB Devices First

Type	Checkbox
Help	If Enabled, the BIOS will attempt to boot to supported USB devices before any other devices. If Disabled, the normal boot order will be used.
Requires	Grayed-out and set to **Disable** if **Fast Boot** is set to **Enable**
Visual BIOS Page	Advanced > Boot > Boot Configuration

Boot Network Devices Last

Type	Checkbox
Help	If Enabled, Network devices will always be placed after non-Network devices in the boot priority. If Disabled, Network devices can be placed at any position in the boot priority, but will default to last.
Visual BIOS Page	Advanced > Boot > Boot Configuration

Unlimited Boot to Network Attempts

Type	Checkbox
Help	If Enabled, network devices will receive unlimited boot attempts after the normal boot order has been exhausted. If Disabled, each boot device will only receive a single boot attempt.
Visual BIOS Page	Advanced > Boot > Boot Configuration

BIOS Setup Auto-Entry

Type	Checkbox
Help	If set to Enable, BIOS will halt and prompt to boot normally or enter Setup. This must be set to Disable to allow OS boot without user intervention.
Advanced Help	This feature is not available while Fast Boot USB Optimization is set to Enable.
Requires	Grayed-out and set to **Disable** if **Fast Boot** is set to **Enable**.
Visual BIOS Page	Advanced > Boot > Boot Configuration

Startup Sound

Type	Checkbox
Help	If enabled, BIOS will play the Intel® sound mark (about 3 seconds long) via onboard audio during each boot. BIOS may extend boot time slightly if necessary to finish playing the sound.
Requires	Onboard Audio is supported. Grayed-out and set to Disable if Audio is set to Disable.
Visual BIOS Page	Advanced > Boot > Boot Configuration

Boot Devices [Lower Left Section]

Internal UEFI Shell

Type	Checkbox
Help	Enables or Disables the Internal UEFI Shell.
Requires	Grayed-out and Disabled if **Secure Boot** is **Enabled**
Visual BIOS Page	Advanced > Boot > Boot Configuration

USB

Type	Checkbox
Help	Enables or Disables the ability to boot from supported USB Devices.
Requires	Grayed-out and Disabled if **Fast Boot** is **Enabled**
Visual BIOS Page	Advanced > Boot > Boot Configuration

Thunderbolt USB Boot

Type	Checkbox
Help	Enables or Disables the ability to boot from USB Devices which are present behind
Requires	Grayed-out and Disabled if Fast Boot is Enabled. Grayed-out and Disabled if USB is Disabled. Hide if Intel® Thunderbolt Technology set to <Disabled>.
Visual BIOS Page	Advanced > Boot > Boot Configuration

Thunderbolt Boot

Type	Checkbox
Help	Enables or Disables the ability to boot from Thunderbolt Devices which are present behind Thunderbolt
Requires	Grayed-out and Disabled if Fast Boot is Enabled. Grayed-out and Disabled if USB is Disabled. Hide if Intel® Thunderbolt Technology set to <Disabled>.
Visual BIOS Page	Advanced > Boot > Boot Configuration

Ignore Thunderbolt Option ROM

Type	Checkbox
Help	Determine if BIOS runs the Option ROM on the device (SAT card, etc.) behind the Thunderbolt
Requires	Grayed-out and Disabled if Fast Boot is Enabled. Hide if Intel® Thunderbolt Technology set to <Disabled>
Visual BIOS Page	Advanced > Boot > Boot Configuration

Optical

Type	Checkbox
Help	Enables or Disables the ability to boot to Optical Devices.
Requires	Grayed-out and Disabled if **Fast Boo**t is **Enabled**
Visual BIOS Page	Advanced > Boot > Boot Configuration

Network Boot

Type	One-of
Disable	Disable network boot.
Legacy PXE	Enable PXE boot in legacy boot.
Legacy iSCSI	Enable iSCSI boot in legacy boot.
UEFI PXE & iSCSI	Enable iSCSI and PXE boot in UEFI boot for platform supports both UEFI PXE and iSCSI boot.
UEFI PXE	Enable PXE boot in UEFI boot for platform does not support UEFI iSCSI boot.
Help	Enables or Disables the ability to boot from the network. Note: UEFI network boot option is automatically disabled if Legacy Boot setting is enabled.
Requires	Hide Legacy PXE option if Legacy Boot is set to Disabled. Hide Legacy iSCSI option if Legacy Boot is set to Disabled. Hide UEFI PXE & iSCSI option if Legacy Boot is set to Enabled or UEFI Boot is set to Disabled. Legacy PXE and Legacy iSCSI options in current value must switch to UEFI PXE & iSCSI option automatically if switching from Legacy Boot to UEFI Boot. UEFI PXE & iSCSI option in current value must switch to Legacy PXE option if Legacy Boot is enabled.
Visual BIOS Page	Advanced > Boot > Boot Configuration

Boot Display [Right Section]

Failsafe Watchdog

Type	Checkbox
Help	After a boot failure, uses BIOS defaults to allow the system to boot back into BIOS Setup while retaining the last used BIOS Setup values set by the user.
Visual BIOS Page	Advanced > Boot > Boot Configuration

BIOS Self Recovery

Type	Checkbox
Help	BIOS Self recovery happens once Failsafe Watchdog is triggered. BIO file is required.
Requires	Grayed-out and disabled if **Failsafe Watchdog** is disabled.
Visual BIOS Page	Advanced > Boot > Boot Configuration

Suppress Alert Messages At Boot

Type	Checkbox
Help	If enabled, BIOS will display POST error messages for five seconds without requiring user action (keyboard input) before continuing to boot. Subsequent error messages of the same type will be suppressed from the display but recorded in the Event Log.
Visual BIOS Page	Advanced > Boot > Boot Configuration

Expansion Card Text

Type	One-of
Enable	All PCI option ROM text is displayed during POST
Disable	Text from non-mass-storage PCI option ROMs is suppressed during POST
Hide All	Text from all PCI option ROMs is suppressed during POST
Help	Configures display of text from PCI option ROMs during POST.
Advanced Help	If set to Enable, BIOS will display text from any PCI option ROMs during POST. If set to Disable, BIOS will display text only from mass-storage PCI option ROMs during POST. If set to Hide All, BIOS will display no text from PCI option ROMs during POST.
Visual BIOS Page	Advanced > Boot > Boot Configuration

Keyboard Ready Beep

Type	Checkbox
Help	If enabled, BIOS will beep once during POST when ready for keyboard input. BIOS will beep only if both keyboard and video are detected. Beep is played via onboard audio.
Visual BIOS Page	Advanced > Boot > Boot Configuration

- Beep is 4 kHz for 50ms.

POST Function Hotkeys Displayed

Type	Checkbox
Help	If set to Enable, BIOS will display Function key prompts during POST. Function key input will still be accepted even if prompts are disabled.
Visual BIOS Page	Advanced > Boot > Boot Configuration

Display F2 to Enter Setup

Type	Checkbox
Help	If set to Enable, BIOS will display “F2 to Enter Setup” prompt. F2 key input will still be accepted if this prompt is disabled.
Requires	**POST Function Hotkeys Displayed** is set to **Enable**
Visual BIOS Page	Advanced > Boot > Boot Configuration

Display F7 to Update BIOS

Type	Checkbox
Help	If set to Enable, BIOS will display “F7 to Update BIOS” prompt. F7 key input will still be accepted if this prompt is disabled.
Requires	**POST Function Hotkeys Displayed** is set to **Enable**
Visual BIOS Page	Advanced > Boot > Boot Configuration

Display F8 to Activate Windows Recovery Mode

Type	Checkbox
Help	If set to Enable, BIOS will display “F8 to Activate Windows Recovery Mode” prompt. F8 key input will still be accepted if this prompt is disabled.
Requires	**POST Function Hotkeys Displayed** is set to **Enable**
Visual BIOS Page	Advanced > Boot > Boot Configuration

Display F9 for Remote Assistance

Type	Checkbox
Help	If set to Enable, BIOS will display “F9 for Remote Assistance” prompt. F9 key input will still be accepted if this prompt is disabled.
Requires	**POST Function Hotkeys Displayed** is set to **Enable.** Remote Assistance is supported.
Visual BIOS Page	Advanced > Boot > Boot Configuration

Display F10 to Enter Boot Menu

Type	Checkbox
Help	If set to Enable, BIOS will display “F10 to Enter Boot Menu” prompt. F10 key input will still be accepted if this prompt is disabled.
Requires	**POST Function Hotkeys Displayed** is set to **Enable**
Visual BIOS Page	Advanced > Boot > Boot Configuration

Display F12 for Network Boot

Type	Checkbox
Help	If set to Enable, BIOS will display “F12 for Network Boot” prompt. F12 key input will still be accepted if this prompt is disabled.
Requires	**POST Function Hotkeys Displayed** is set to **Enable**
Visual BIOS Page	Advanced > Boot > Boot Configuration

Display CTRL-P for Intel@ MEBX

Type	Checkbox
Help	If set to Enable, BIOS will display “CTRL-P for Intel@ MEBX” prompt. CTRL-P input will still be accepted if this prompt is disabled.
Requires	**POST Function Hotkeys Displayed** is set to **Enable.** Board hardware supports AMT or SBA.
Visual BIOS Page	Advanced > Boot > Boot Configuration

Advanced > Boot > Secure Boot

Secure Boot

Type	Checkbox
Help	If Enabled, BIOS will only boot to trusted operating system images. Secure Boot is supported only via UEFI Boot.
Advanced Help	Enabling Secure Boot will allow boot only to trusted operating system installations. Enabling Secure Boot will also enable UEFI Boot and disable Legacy Boot.
Requires	Disabled if **UEFI Boot** is Disabled. Disabled if Legacy Boot is Enabled.
Visual BIOS Page	Advanced > Boot > Secure Boot

Secure Boot Mode

Type	Information
Visual BIOS Page	Advanced > Boot > Secure Boot

- Displays the Secure Boot Mode.

Platform Key (PKpub)

Type	Information
Visual BIOS Page	Advanced > Boot > Secure Boot

- Displays “Installed” or “Not Installed” based on the presence of the UEFI PKpub variable.

Key Exchange Key (KEK)

Type	Information
Visual BIOS Page	Advanced > Boot > Secure Boot

- Displays “Installed” or “Not Installed” based on the presence of the UEFI KEK variable.

Signature Database (db)

Type	Information
Visual BIOS Page	Advanced > Boot > Secure Boot

- Displays “Installed” or “Not Installed” based on the presence of the UEFI db variable.

Blacklisted Signature Database (dbx)

Type	Information
Visual BIOS Page	Advanced > Boot > Secure Boot

- Displays “Installed” or “Not Installed” based on the presence of the UEFI dbx variable.

Install Platform Key from File

Type	Action
Help	Installs a public Platform Key from a file. If the installation is successful, UEFI Secure Boot policies will be enforced.
Requires	Grayed-out if **Secure Boot** is Disabled. Grayed-out if pkPub UEFI Variable exists. Grayed-out if Force Secure Boot Defaults is Enabled Grayed-out if Clear Secure Boot Data is Enabled Grayed-out if Generate New Platform Key is Enabled.
Visual BIOS Page	Advanced > Boot > Secure Boot

- When selected, the user is presented with a file selection browser. If a file is selected, it is installed as UEFI PKpub.

Install Intel Platform Key

Type	Checkbox
Help	Installs a Secure Boot Platform Key from Intel during next boot. See Advanced Help for more information.
Advanced Help	This feature can be used if an OEM-generated Platform Key is not available, and the installed processor does not support Generate New Platform Key.
Requires	Disabled and grayed-out if **Secure Boot** is Disabled. Disabled and grayed-out if pkPub UEFI Variable exists. Disabled and grayed-out if Clear Secure Boot Data is Enabled.
Visual BIOS Page	Advanced > Boot > Secure Boot

Force Secure Boot Defaults

Type	Checkbox
Help	Restores factory default Secure Boot databases during next boot, placing the system in Standard Mode.
Requires	Disabled and grayed-out if **Secure Boot** is Disabled. Disabled if Clear Secure Boot Data is Enabled.
Visual BIOS Page	Advanced > Boot > Secure Boot

Clear Secure Boot Data

Type	Checkbox
Help	Clears Secure Boot databases (PKpub, KEK, db, and dbx) during next boot, placing the system in Custom Mode. Required to install a trusted operating system not supported by the factory default Secure Boot database.
Requires	Disabled and grayed-out if Secure Boot is Disabled. Disabled if Force Secure Boot Defaults is Enabled.
Visual BIOS Page	Advanced > Boot > Secure Boot

Generate New Platform Key

Type	Checkbox
Help	Generates a new Secure Boot Platform Key during next boot. The private half of the Platform Key is discarded. This requires the Intel® Secure Key processor feature.
Requires	Disabled and grayed-out if Secure Boot is Disabled. Disabled and grayed-out if pkPub UEFI Variable exists. Disabled and grayed-out if Clear Secure Boot Data is Enabled. Disabled and grayed-out if installed processor does not support the RDRAND instruction.
Visual BIOS Page	Advanced > Boot > Secure Boot