



INTEL® NUC SOFTWARE STUDIO

Intel® NUC X15 Laptop Kit – User Guide

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Systems Product Group
Client Computing Group, Intel® Corporation

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Revision History

Version	Date	Description of Changes
1.0	4/22/2021	Initial Release

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1 Introduction

1.1 Overview

The Intel® NUC Software Studio allows an end user with Intel® NUC X15 laptop kit to monitor and tune various system, LED, display, and battery settings.

1.2 Supported Product

Intel® NUC X15 Laptop Kit

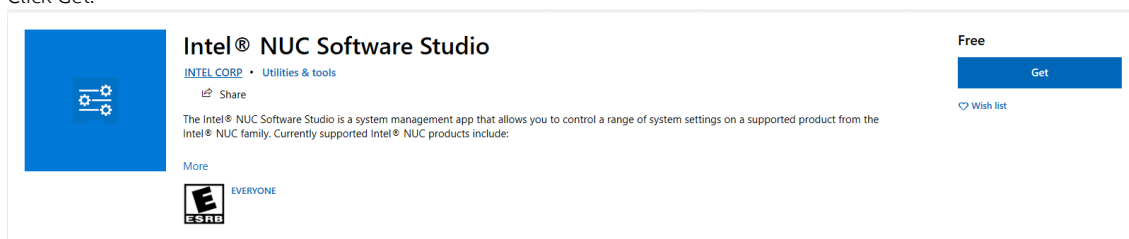
1.3 Supported Operating System

Windows 10 version 20H2 build 19042 or newer

2 Installation

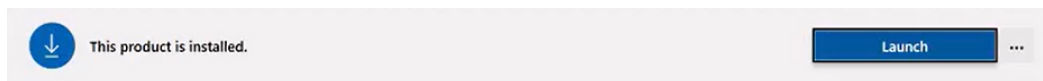
2.1 Application Installation

1. Search for **Intel® NUC Software Studio** application in the Microsoft Store.
2. Click Get.



Note: Make sure that the system OS is in the whitelist as mentioned in [Supported OS](#).

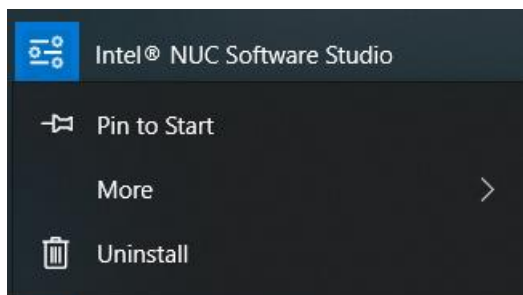
3. Once the application has been installed, you will see the following message:



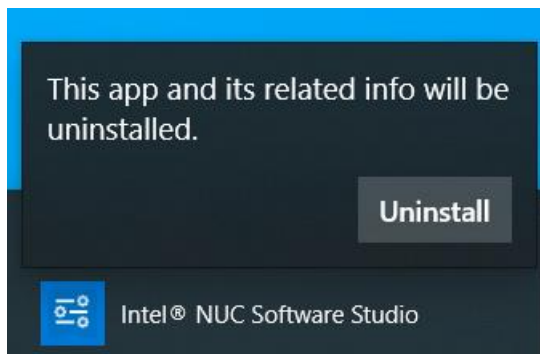
Note: If the system OS is not supported, an error message is displayed when the Launch button is clicked.

2.2 Application Uninstallation

1. Open the Windows Start Menu
2. Right Click on the Intel® NUC Software Studio icon.



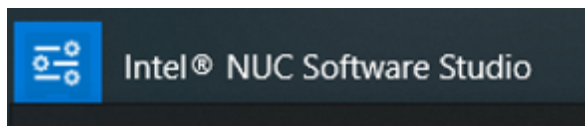
3. Choose Uninstall.



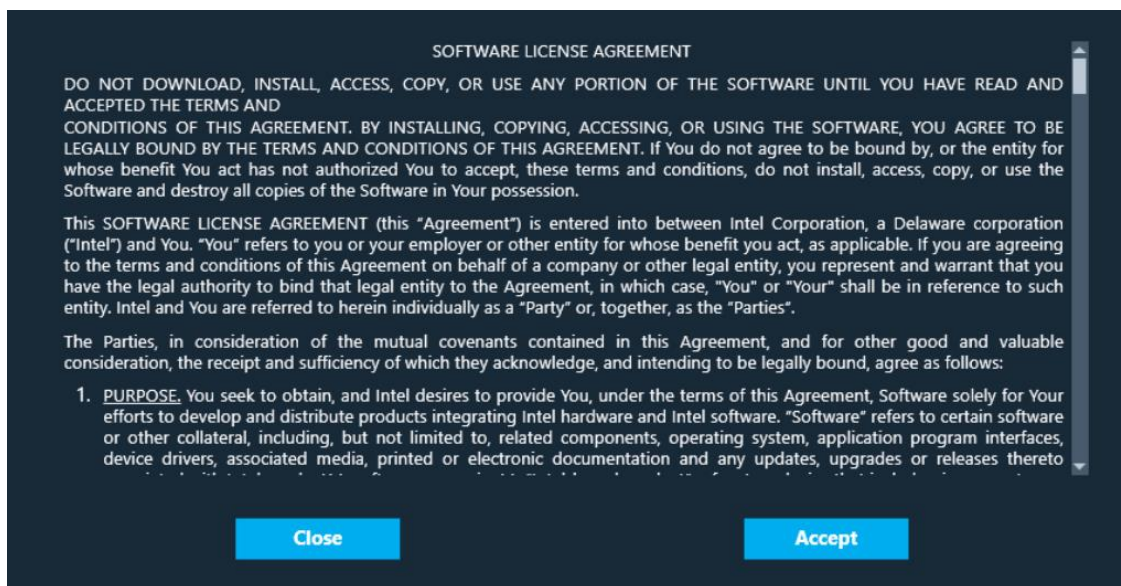
3 Intel® NUC Software Studio – Interface

3.1 Opening the Intel® NUC Software Studio

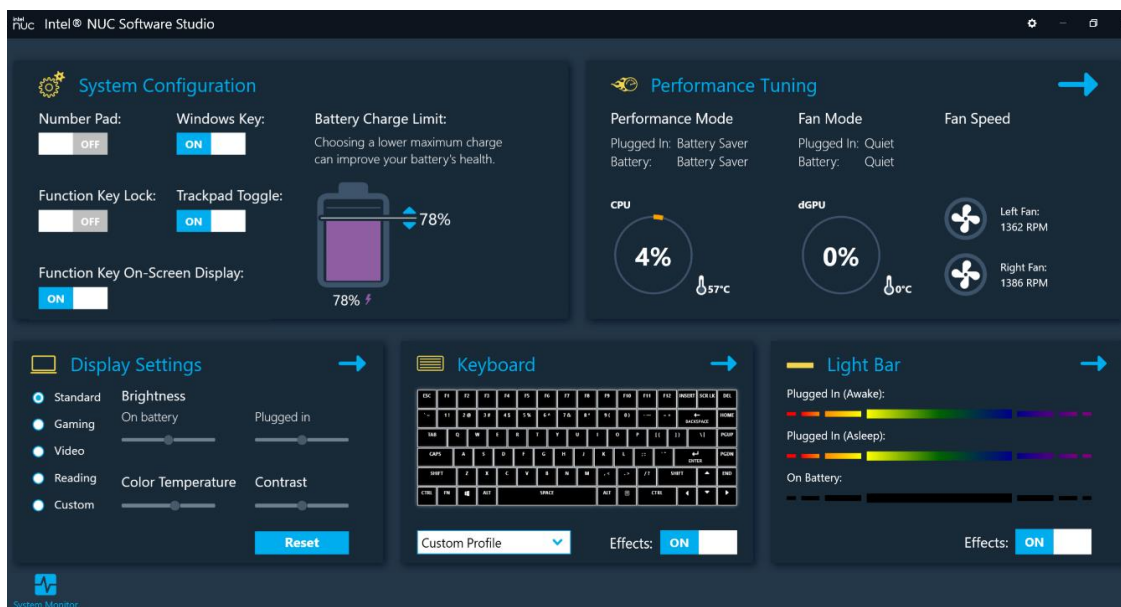
1. Click on the Windows Start menu icon
2. Select Intel® NUC Software Studio



3. Accept the Software License Agreement.



4. The Intel® NUC Software Studio home screen is displayed as shown below.



4 Intel® NUC X15 Laptop Kit

4.1 Overview

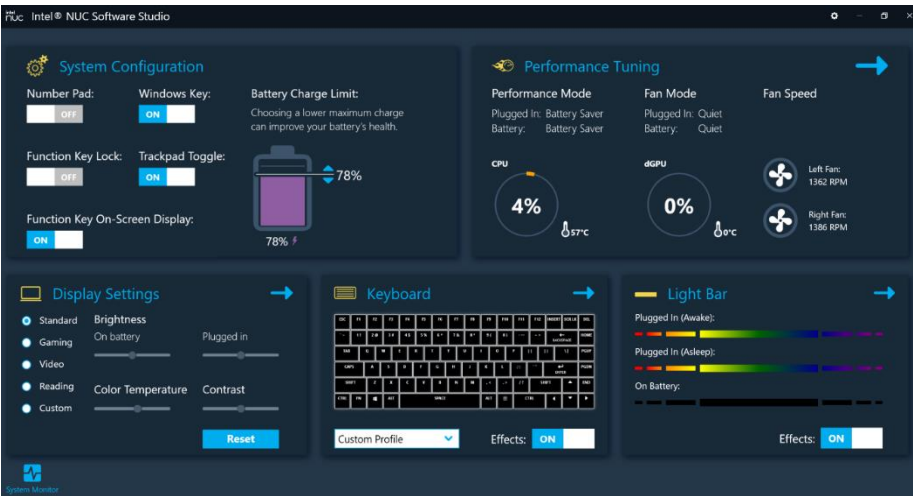
Intel® NUC Software Studio supports the below features on Intel® NUC X15 Laptop Kit:

- 1. Performance Tuning
- 2. Keyboard LEDs
- 3. Light Bar LEDs
- 4. Display Settings
- 5. System Monitor
- 6. On-Screen Display
- 7. System Settings like battery charge limit, windows lock, trackpad toggle, number pad, function key lock, and on-screen display.

4.2 Home Screen

On launch of the application, the home screen displays a summary of current settings. User can modify the supported settings from this page.

Clicking on the → button directs you to the detailed settings page to allow further customization of supported features.



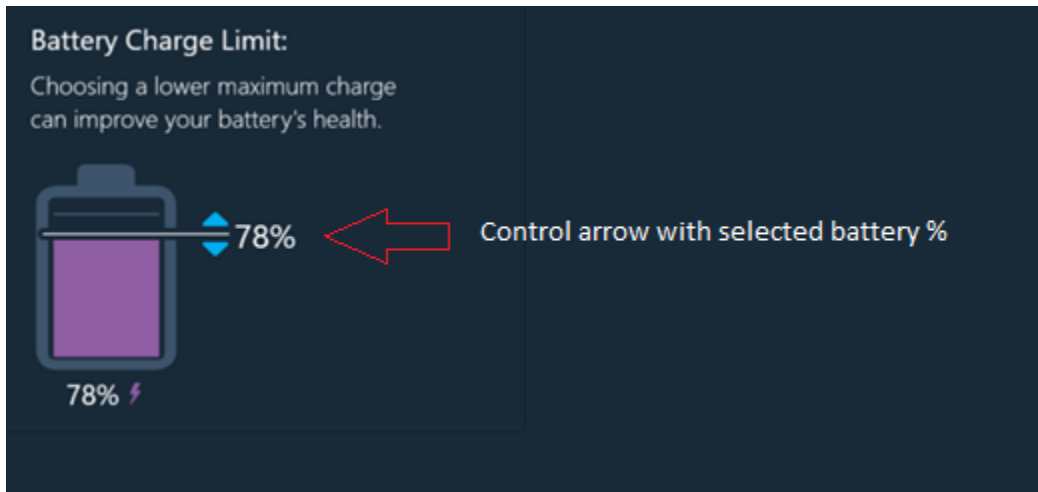
4.2.1 System Configuration

Allows you to enable/disable the following system settings using the toggle button:

	Number Pad	ON	Enable number lock functionality
		OFF	Disable number lock functionality
	Windows Key	ON	Enable windows key functionality.
		OFF	Disable windows key functionality. Gaming Mode.
	Function Key Lock	ON	Enable Fn lock.
		OFF	Disable Fn lock.
	Trackpad Pad Toggle	ON	Enable upper left corner button on touch pad that enables/disables the touch pad functionality.
		OFF	Disable upper left corner button on touch pad that enables/disables the touch pad functionality. Gaming Mode
	On-Screen Display	ON	Enable on-screen display for function keys, performance modes, and other features.
		OFF	Disable on-screen display for function keys, performance modes, and other features.

4.2.2 Battery Charge Limit

Allows you to customize the battery charge limit to any value between 50-100% using the control arrow. Selecting a lower charge limit can improve the system battery health. Optimal value is 60%.



When a new charging limit is selected:

- If the system is plugged in and above the selected limit, the battery charging will stop.
- If the system is plugged in and below the selected limit, charging will resume.

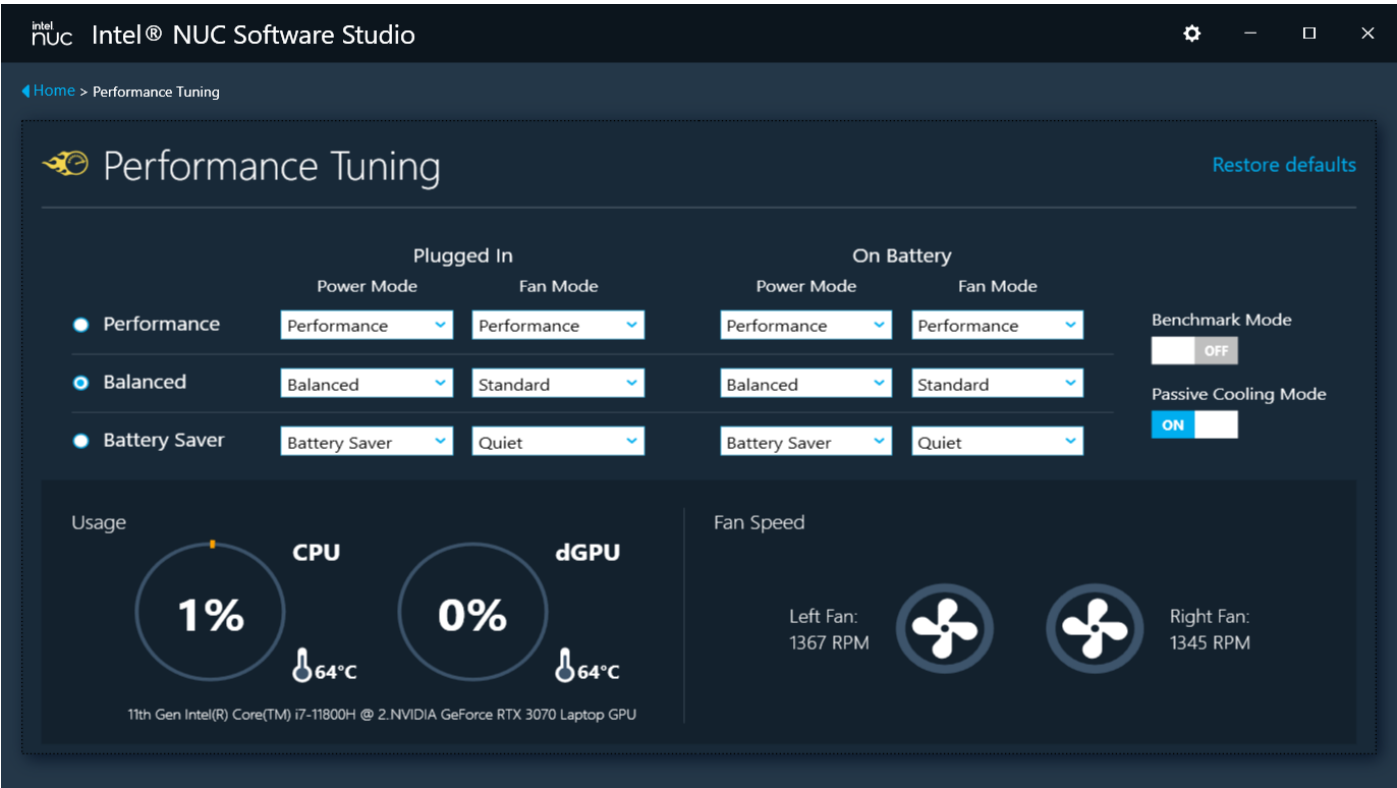
5 Performance Tuning

5.1 Performance Profiles

Performance Tuning supports the below profiles with default mapping of Power and Fan Modes. On startup, **Balanced** profile is applied by default.

User can toggle between profiles or modify a profile by changing the power or fan mode from the supported modes in the dropdown list. Selection will be applied immediately.

Performance Profile Name	Power Mode (Plugged In and On Battery)	Fan Mode (Plugged In and On Battery)
Performance	Performance	Performance
Balanced (default)	Balanced	Standard
Battery Saver	Battery Saver	Quiet



5.2 Restore Defaults

This will revert all profiles to their default mappings and switch the system back into the default Balanced Mode.

5.3 Usage

For any selected profile, the current CPU and dGPU usage along with fan speed will be displayed at the bottom of the page.

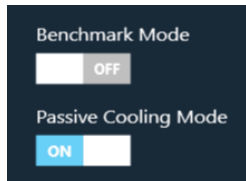
5.4 Benchmark Mode

Turning ON Benchmark mode will enable maximum performance mode with high fan RPMs.



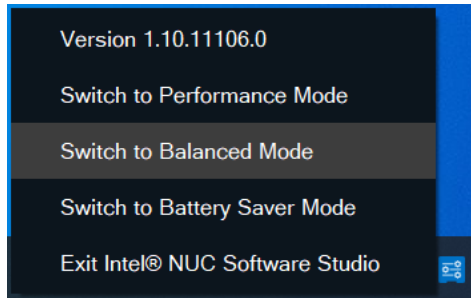
5.5 Passive Cooling Mode

Turning ON Passive cooling mode will minimize fan transitions by limiting time off. Passive Cooling Mode is on by default.



5.6 Tray Application

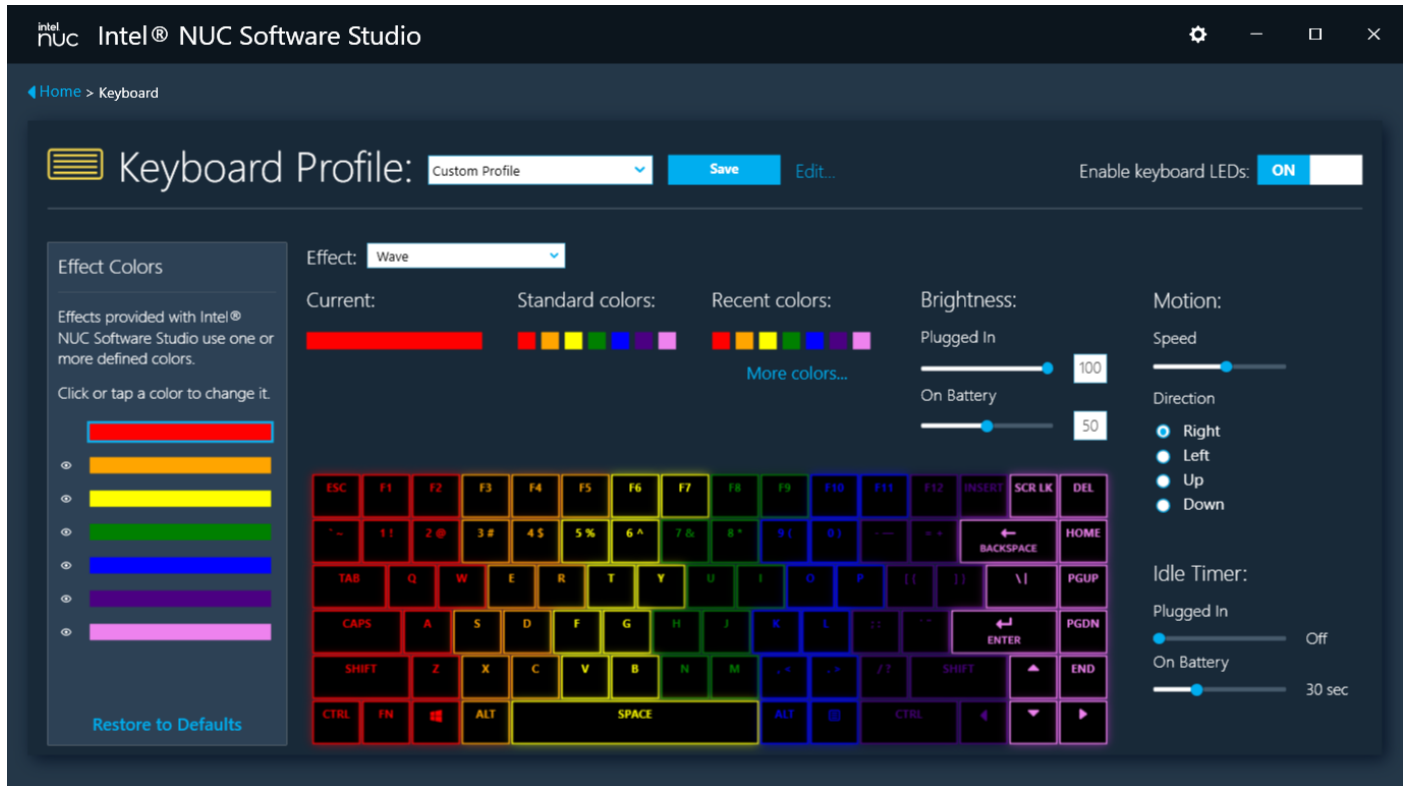
Switching to different Performance Profile can also be done from tray application right click menu.



6 Keyboard LEDs

In this feature, the user can switch between different Keyboard Profiles to customize effects, colors, brightness, and speed.

- You can also choose to disable the entire Keyboard LED zone by turning off the 'Enable Keyboard LEDs' toggle. All controls in the UI will be disabled.
- Keyboard LEDs will turn off when the idle timer expires and turn back on when the user next interacts with the system. This can be controlled using the Idle Timer slider while Plugged In or On Battery.



6.1 Keyboard Profiles and Preset LED Patterns

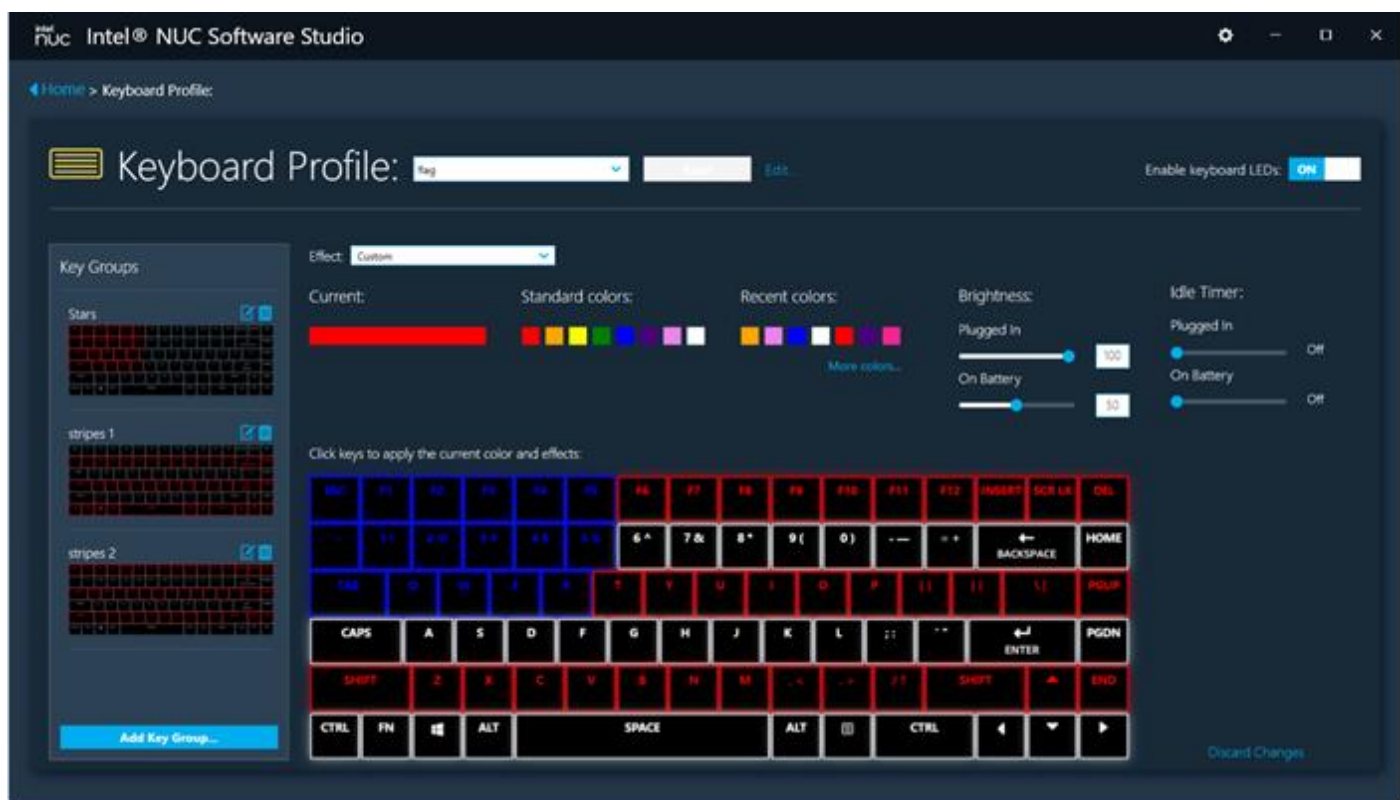
- User can toggle between profiles from the dropdown list or create and edit a profile name and settings.
- On startup, the default profile Mono color white is applied on the keyboard LEDs.
- For every profile, you can customize the light effects, brightness, speed, and direction using the 'Effect' dropdown. Preset patterns and supported settings are shown in the table below.

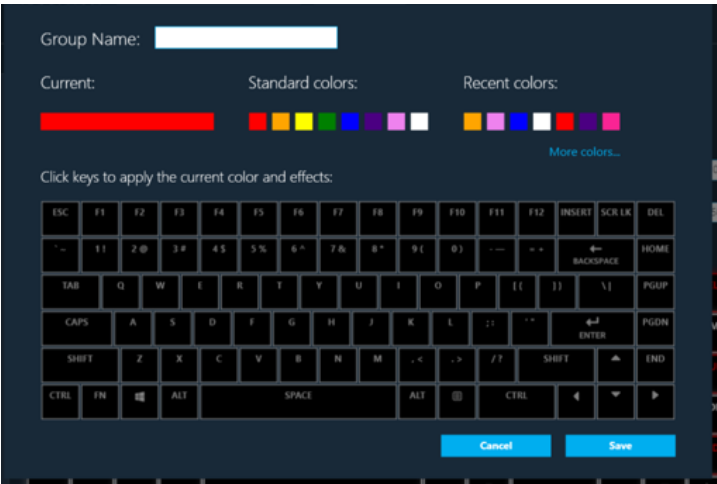
Name	Number of Colors	Default Color(s)	Speed	Effect
Monocolor (Default)	1	White	Not Supported	Not Supported
Rainbow	7	Red, Orange, Yellow, Green, Blue, Indigo, Violet	Not Supported	Not Supported
Gaming Mode	1	Red	Not Supported	Not Supported
Breathing	1 – 7	Red, Orange, Yellow, Green, Blue, Indigo, Violet	Supported Default = 5	Not Supported
Raindrop	1 – 7	Red, Orange, Yellow, Green, Blue, Indigo, Violet	Supported Default = 5	Not Supported
Marquee	1 – 7	Red, Orange, Yellow, Green, Blue, Indigo, Violet	Supported Default = 5	Not Supported
Music	1 – 7	Red, Orange, Yellow, Green, Blue, Indigo, Violet	Not Supported	Up (Default) Out In Down
Wave	2 – 7	Red, Orange, Yellow, Green, Blue, Indigo, Violet	Supported Default = 5	Right (Default) Left Up Down
Reactive	1 – 7	Red, Orange, Yellow, Green, Blue, Indigo, Violet	Supported Default = 5	Auto (Default) Press Any Key

Name	Number of Colors	Default Color(s)	Speed	Effect
Ripple	1 – 7	Red, Orange, Yellow, Green, Blue, Indigo, Violet	Supported Default = 5	Auto (Default) Press Any Key
Spark	1 – 7	Red, Orange, Yellow, Green, Blue, Indigo, Violet	Supported Default = 5	Auto (Default) Press Any Key
Aurora	1 – 7	Red, Orange, Yellow, Green, Blue, Indigo, Violet	Supported Default = 5	Auto (Default) Press Any Key

6.2 Custom LED Patterns

- This feature enables the keyboard as an interactive control to select individual or groups of keys to set different colors.
- Key selection can be made by clicking on an individual key or dragging and highlighting groups of keys. A color picker will be available to select any single color.
- Discard Changes button reverts the custom effect to its state when last saved into the profile, or when this effect was last loaded.
- A sample custom pattern with three key groups is shown below





6.2.1 Key Groups

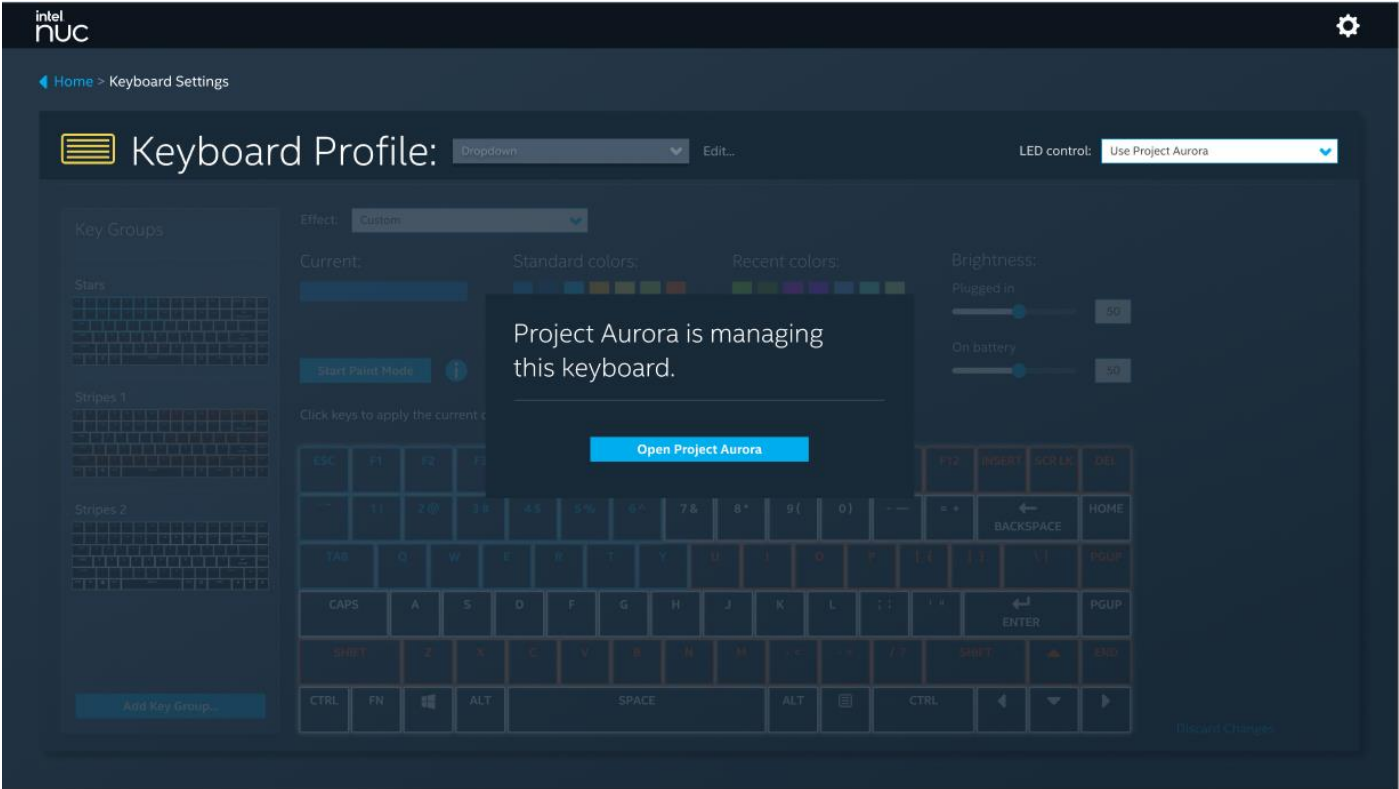
	<p>The edit button will re-open the group settings to modify group name or keys or color selection</p>
	<p>The delete button will allow user to delete the selected key group</p>
	<p>Add Key Group button will allow the user to specify a group name for a given selection of keys from the keyboard layout</p>

6.2.2 Project Aurora

Project Aurora is a utility that unifies RGB lighting devices across different brands and enables them to work alongside each other, all while adding and improving RGB lighting support for various games that previous had none or little RGB lighting support." More info for Project Aurora can be found here: <https://www.project-aurora.com/>

Intel® NUC Software Studio can switch control over to 'Project Aurora' if the application is installed on the system.

If the user selects Project Aurora from the LED control dropdown, all the keyboard settings of Intel® NUC Software Studio will be disabled and the hardware behaves according to the controls selected in Project Aurora.



7 Light Bar LED

In this feature, the user can switch between different colors and modes on the Light Bar LEDs

7.1 Turn off LEDs

- You can choose to disable the entire LED zone by turning off the 'Enable Light Bar' toggle
- You can also choose to turn off the LEDs using the option "Turn off light bar for this state" while plugged in or on battery

7.2 Color selection

- You can apply any color value between 0-100% PWM for Red, Blue and Green using the sliders. Current selection will be displayed in the swatch above the slider.

7.3 Rainbow mode

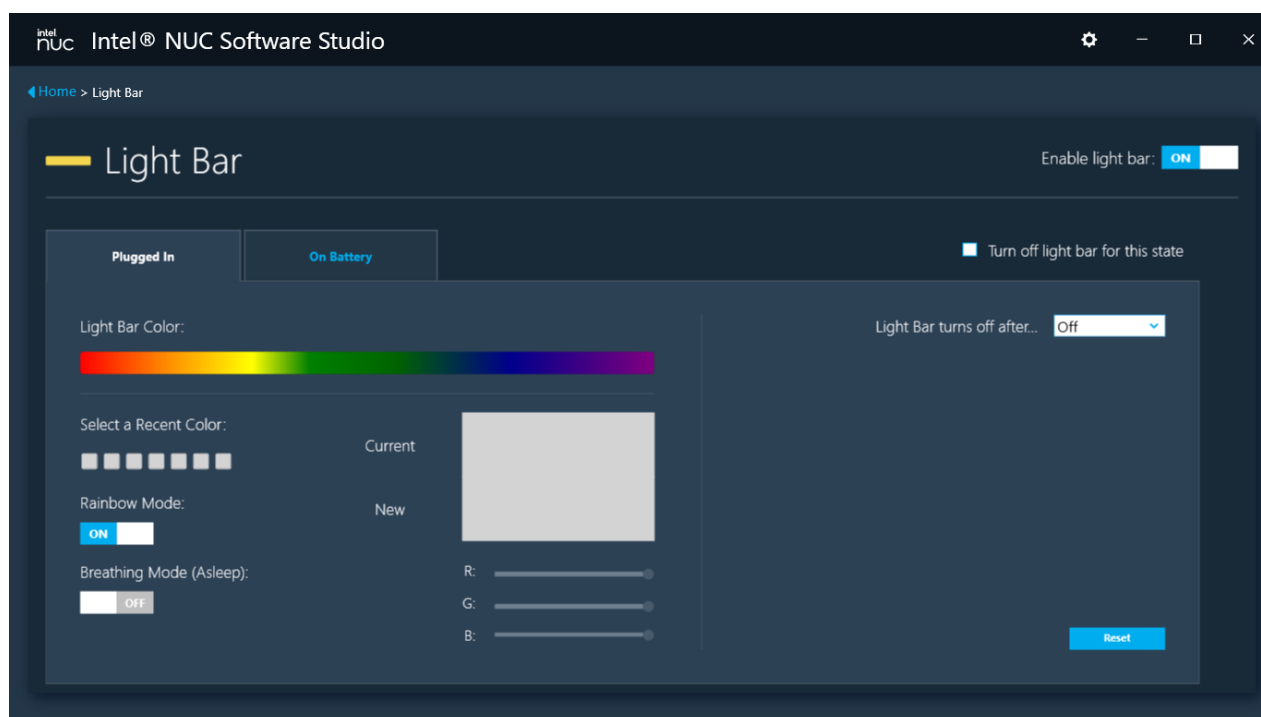
- Supported while plugged in and on battery
- When turned on the LEDs will rotate through rainbow colors, instead of using the Red, Green, and Blue values set above.

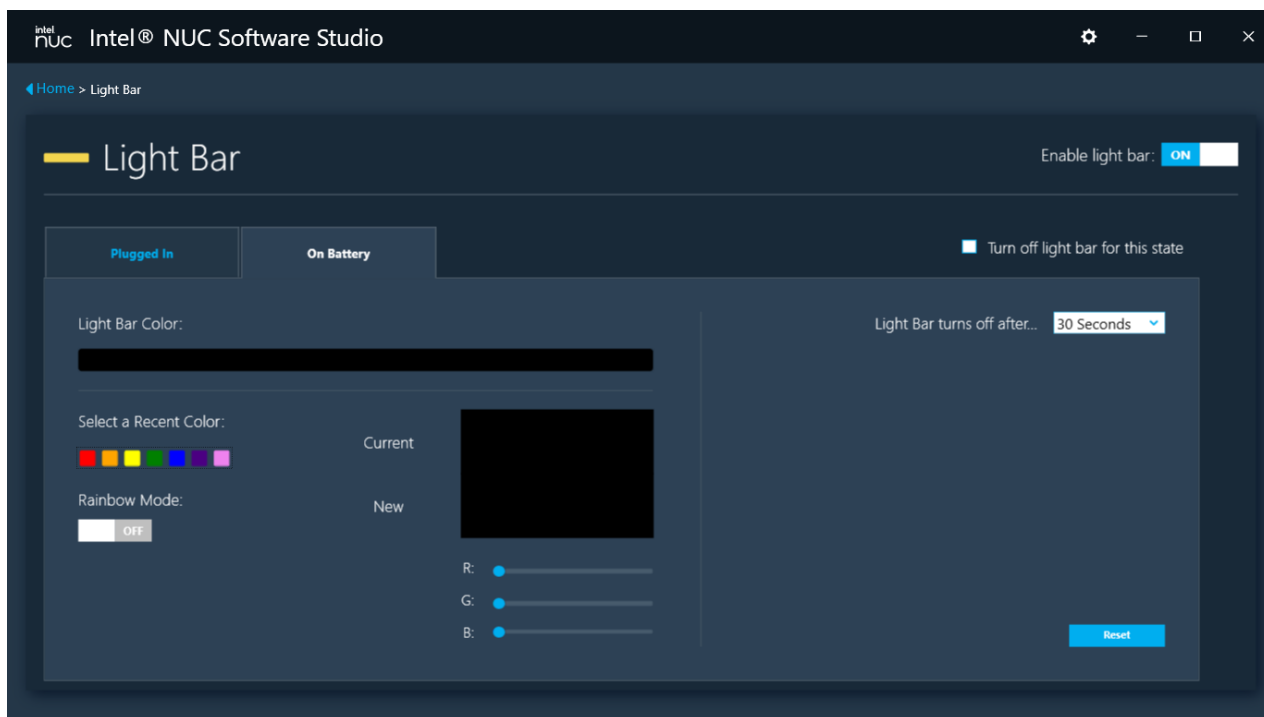
7.4 Breathing mode

- Supported while plugged in and the system is asleep
- When turned on the LEDs will display a breathing animation

7.5 Reset

- This will revert to the default LED selection





8 Display Settings

This feature allows the user to switch between Display Profiles with varying Brightness, Contrast and Color.

On application launch, 'Standard' mode is selected by default. Switching between profiles updates the physical display instantly.

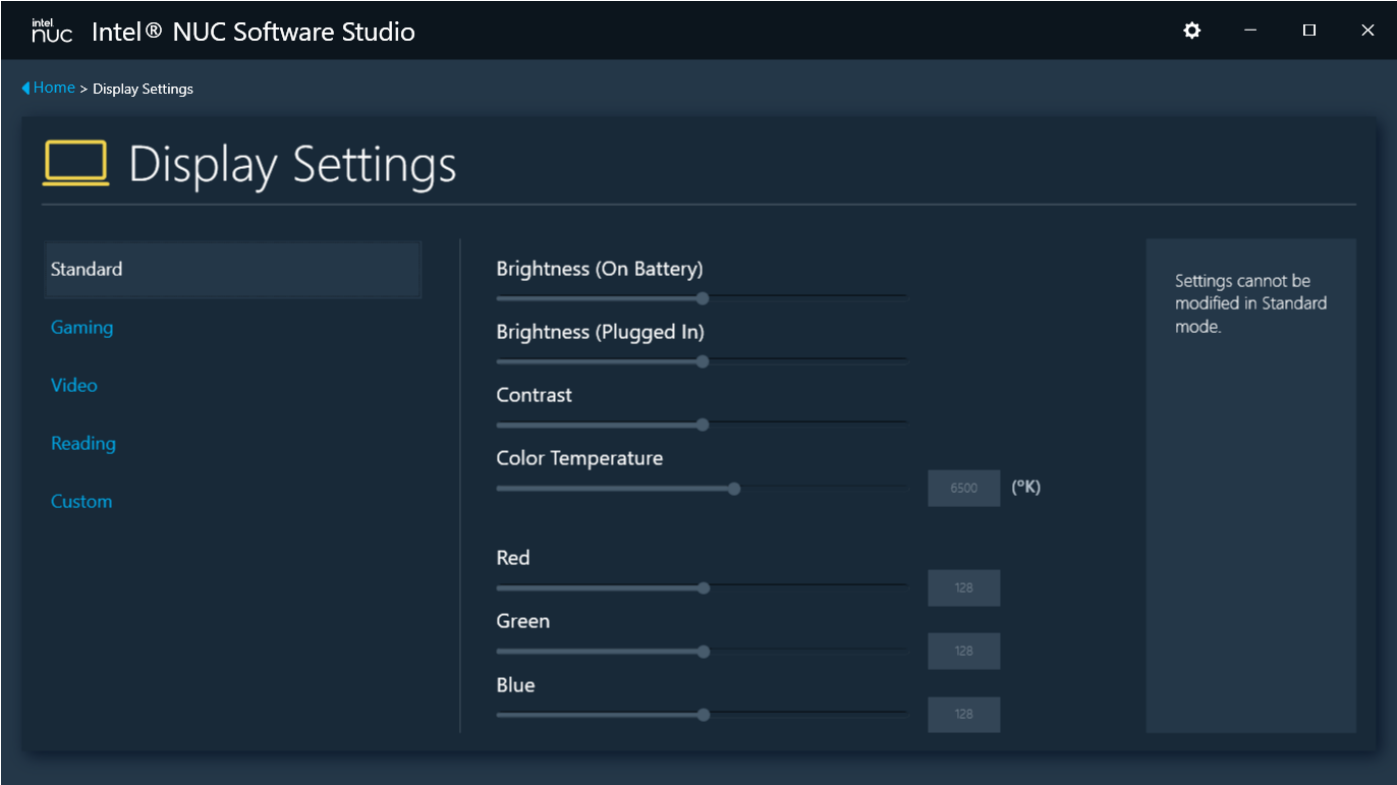
Clicking "Reset" on any mode restores the currently selected display profile's default settings.

The following profiles can be customized by applying different Brightness, Contrast, Colors (Red, Green, Blue), and Color Temperature values as supported.

Display Profile Name	Supported Display Settings
Standard (default mode)	All sliders are disabled, and settings cannot be modified in Standard mode.
Gaming	Brightness Contrast Colors (Red, Green, Blue) Color Temperature
Video	Brightness Color Temperature
Reading	Brightness Color Temperature Color – Blue
Custom	Brightness Contrast Colors (Red, Green, Blue) Color Temperature

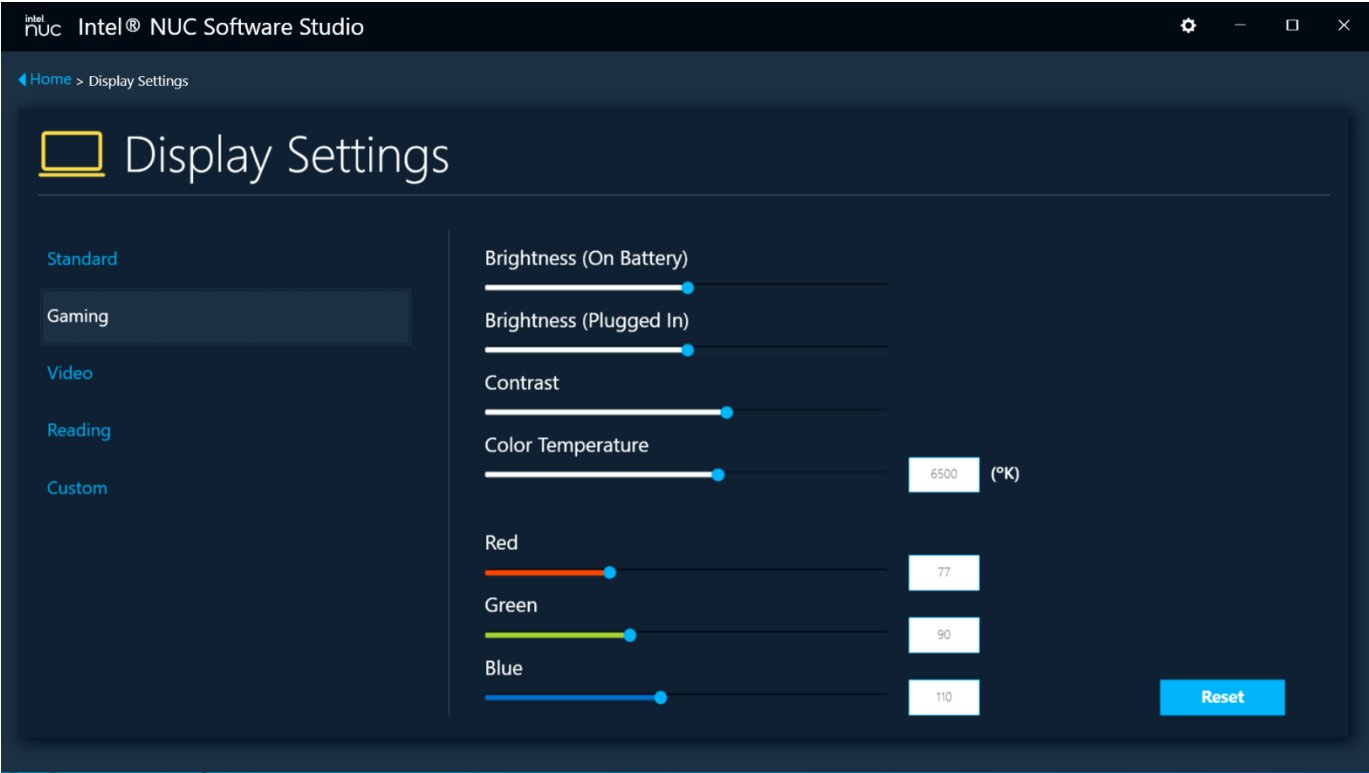
8.1 Standard Profile

This is the default mode when application launches. All sliders are disabled, and settings cannot be modified in this mode. Standard Mode is enabled by default.



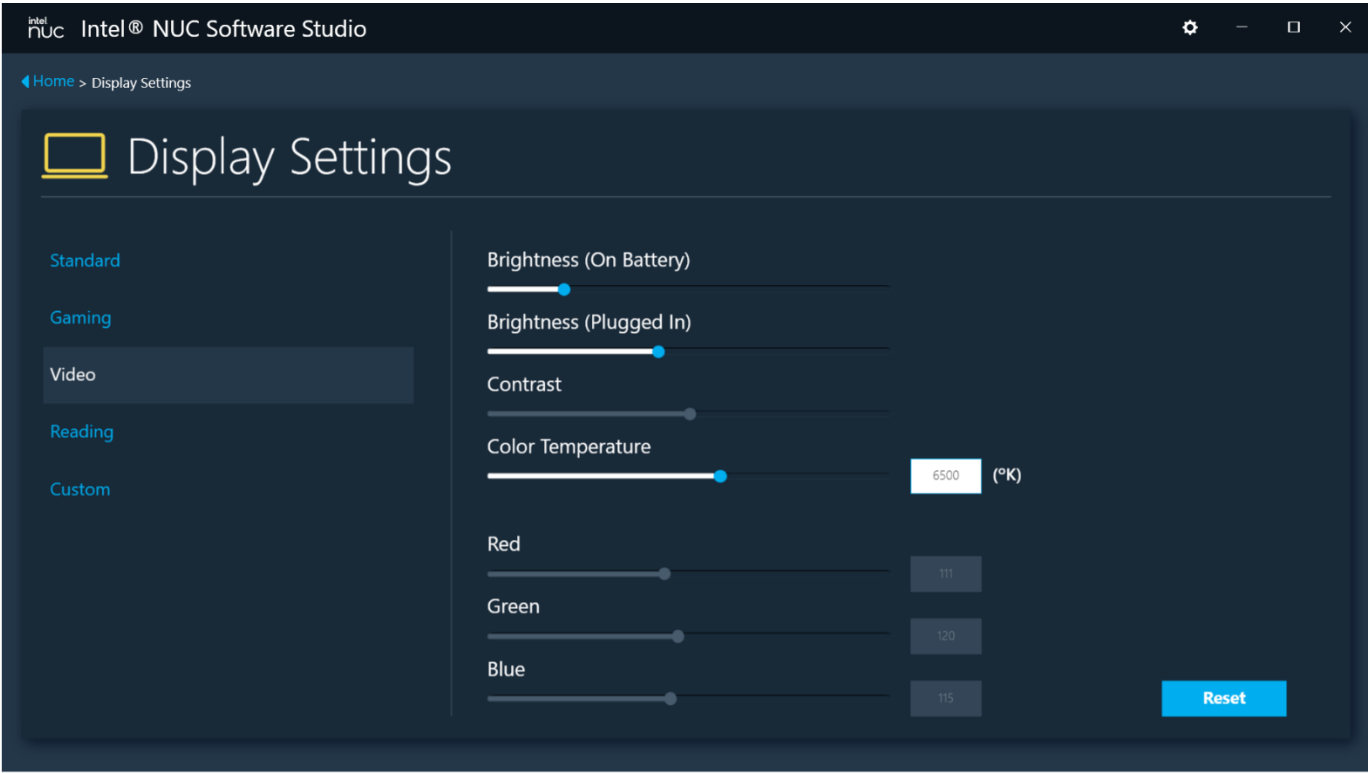
8.2 Gaming Profile

This mode can be selected while gaming and allows the user to modify brightness, contrast, color (Red, Blue, Green) and color temperature values.



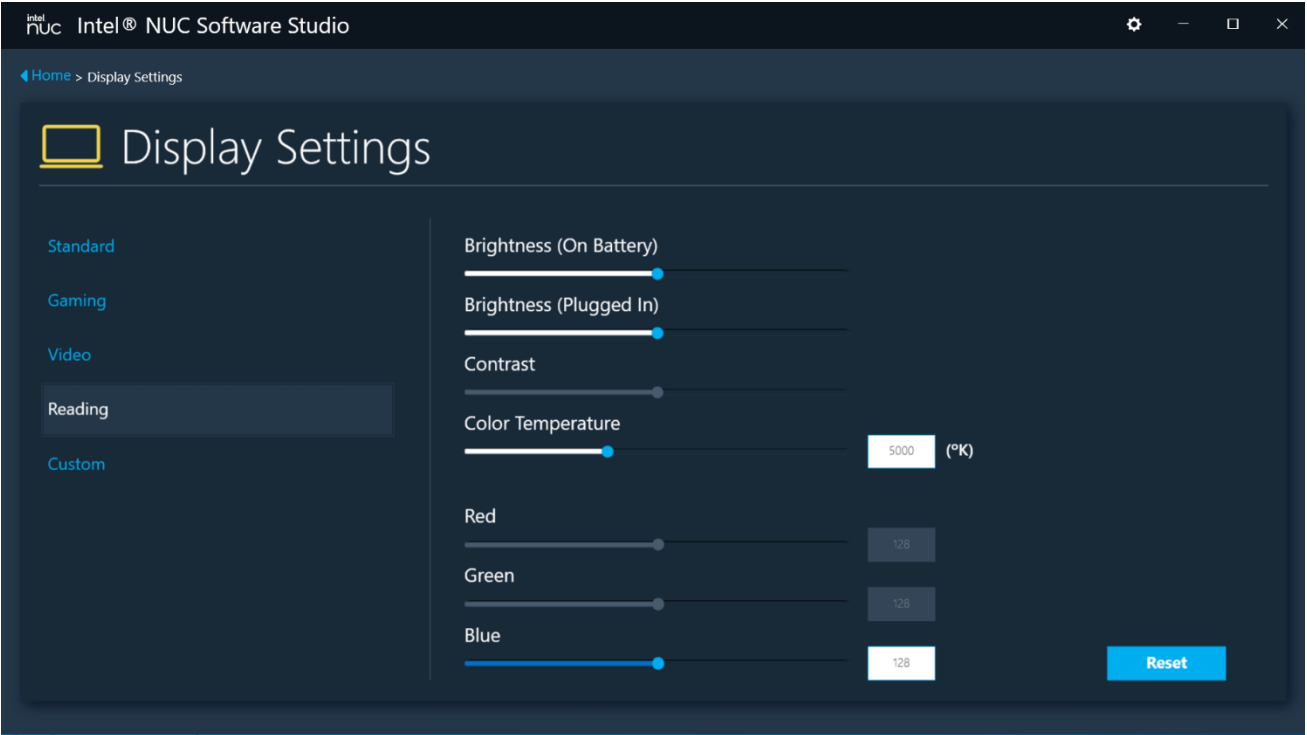
8.3 Video Profile

This mode can be selected while playing video and allows the user to modify brightness and color temperature values.



8.4 Reading Profile

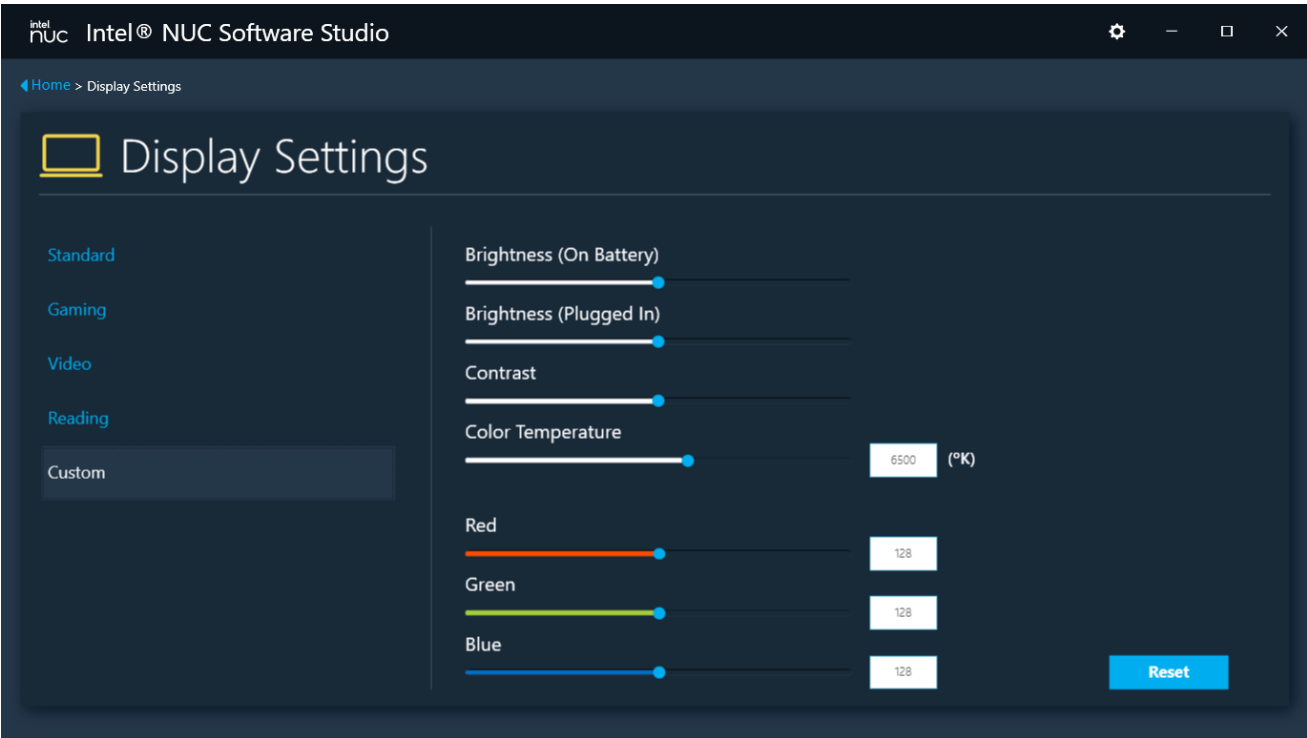
This mode can be selected while reading and allows the user to modify brightness, color temperature and blue color values.



8.5 Custom Display Profile

This mode can be selected for applying any custom setting and allows customization of brightness, contrast, color (Red, Blue, Green) and color temperature values. It is possible to manually input the following parameters:

- Color (Red, Green, Blue) - numerical value between 0-255.
- Color Temperature – numerical value between 2400-9500.



9 System Monitor

System Monitor displays the real time indication of the hardware's system settings.

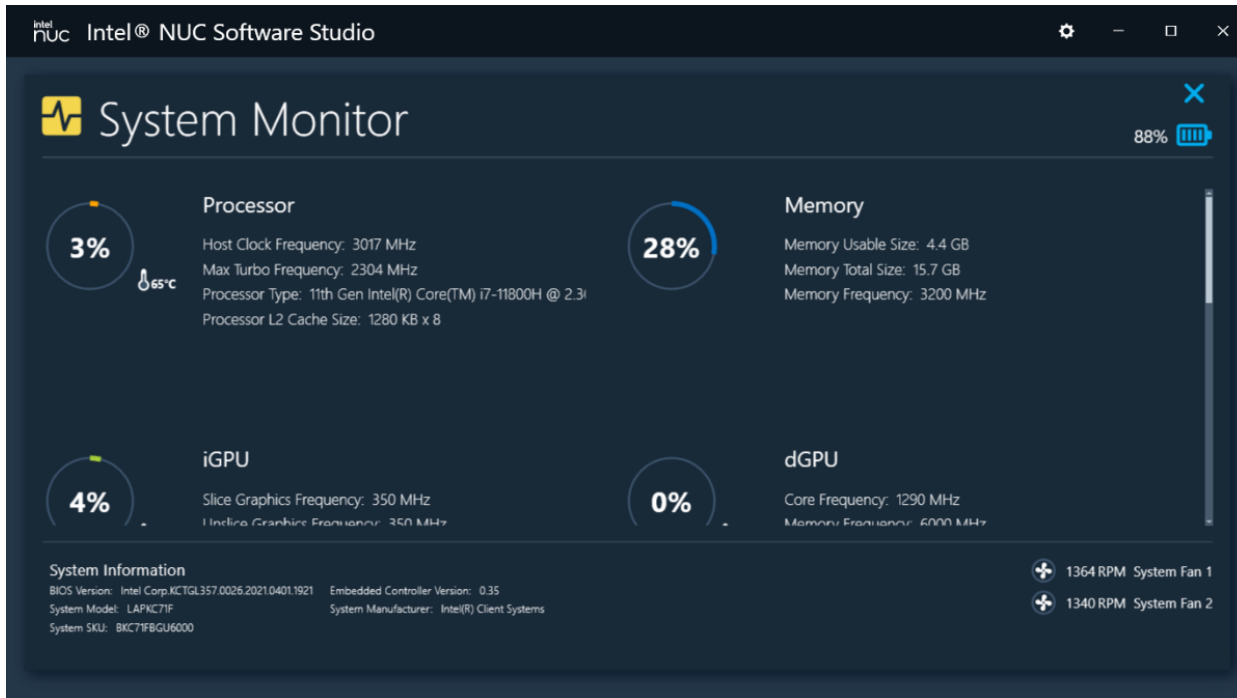
The System Monitor's data includes:

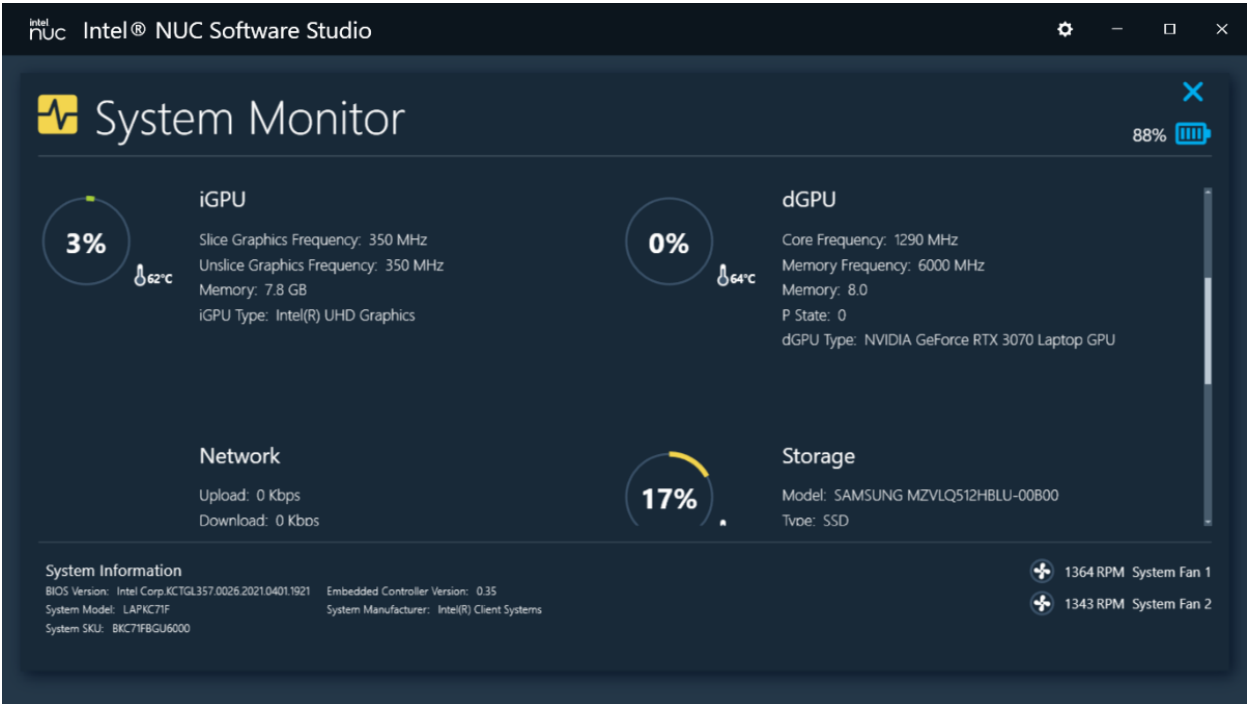
- CPU
- Memory
- iGPU
- dGPU
- Network speed
- Storage
- Battery health indicator
- System information
- Fan speed

Battery charge data indicates the following:

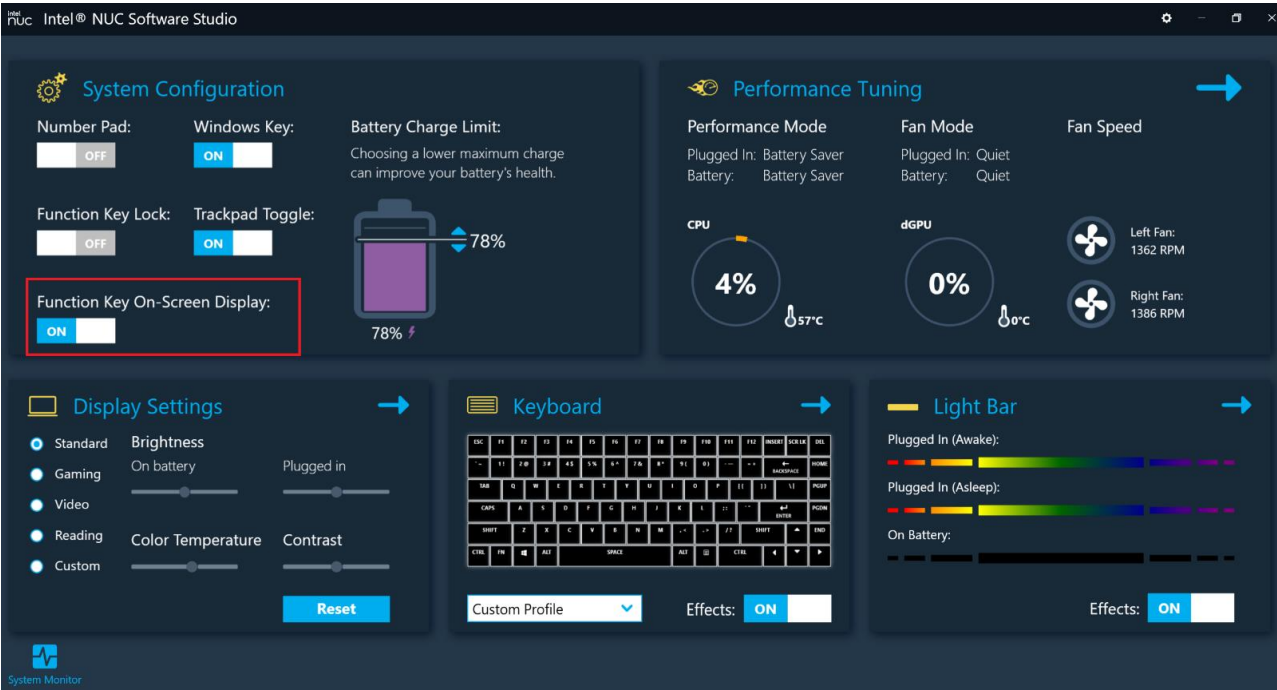


- Percentage battery remaining
- Battery icon:
 - All 4 lines displayed -> Remaining Battery is >75%
 - 3 lines displayed -> Remaining Battery is >50% and <=75%
 - 2 lines displayed -> Remaining Battery is >25% and <=50%
 - 1 line displayed -> Remaining Battery is >10% and <=25%
 - Indicator color change to Red -> Remaining Battery <10%












10 On-Screen Display




To enable On-Screen Display, set the toggle “Function Key On-Screen Display” to On from the System Configuration page.

When this feature is enabled, the following state changes triggers a toast notification in the User Interface.

Type	Status	Description	Display Message
Performance Mode	Performance	Indicates when the current performance mode has changed from Performance Tuning page or the tray application.	 Battery Saver Mode
	Balanced		 Performance Mode
	Battery Saver		 Balanced Mode
FN Lock	Disabled	Standard function keys activated.	 FN Lock OFF
	Enabled	Alternate functions activated.	 FN Lock ON
Num Pad	Disabled	Standard keys activated.	 Num Pad OFF
	Enabled	Numpad values activated.	 Num Pad ON

Type	Status	Description	Display Message
Caps Lock	Disabled	Caps Lock off.	 Caps Lock OFF
	Enabled	Caps Lock on.	 Caps Lock ON
Airplane Mode	Disabled	Airplane Mode off.	 Airplane Mode OFF
	Enabled	Airplane Mode on.	 Airplane Mode ON
Touchpad On/Off	Disabled	Touchpad disabled.	 Touchpad OFF
	Enabled	Touchpad on.	 Touchpad ON
Windows Key Lock	Disabled	Windows Key unlocked.	 Windows Key OFF
	Enabled	Windows Key locked.	 Windows Key ON
Microphone Mute	Mute	Microphone muted.	 Mic Mute ON
	On	Microphone unmuted.	 Mic Mute OFF
Keyboard Brightness	0%	Keyboard brightness 0%.	
	50%	Keyboard brightness 50%.	
	100%	Keyboard brightness 100%.	
Touchpad Toggle	Disabled	Touchpad Toggle Disabled	 Touchpad Toggle OFF

Type	Status	Description	Display Message
	Enabled	Touchpad Toggle Enabled	 Touchpad Toggle ON