



WMI Interface for Intel® NUC Products

WMI Specification

August 2018
Revision 0.64

Revision History

Revision	Description	Date
0.64	Add Logo and Disclaimer. Formatting Edits	2018/8/1
0.63	Add Notification of LED app into WMI functions	2018/4/3
0.62	Add Notification command for LED app	2018/4/2
0.6	Add Software Indicator instead of CPU Frequency Indicator in Table 3.3 and Table 3.4.5	2017/8/7
0.5	Add and insert a section of Introduction of programmed LED in section 2. Add below sub-sections for NUC new generation in order to support NUC LED Tray App. 3.3 Query LED support capability 3.4 New Get LED status 3.5 Set an Indicator option for the LED type 3.6 Set the value to the control item of the Indicator option and the LED type	2017/7/26
0.4	Add the read/set function call for USB Port	2017/5/4
0.3	Modify the read/set function call for LED	2016/10/21
0.1	Initial Version	2016/08/03

Disclaimer

INFORMATION IN THIS DOCUMENT IS PROVIDED IN CONNECTION WITH INTEL® PRODUCTS. NO LICENSE, EXPRESS OR IMPLIED, BY ESTOPPEL OR OTHERWISE, TO ANY INTELLECTUAL PROPERTY RIGHTS IS GRANTED BY THIS DOCUMENT. EXCEPT AS PROVIDED IN INTEL'S TERMS AND CONDITIONS OF SALE FOR SUCH PRODUCTS, INTEL ASSUMES NO LIABILITY WHATSOEVER, AND INTEL DISCLAIMS ANY EXPRESS OR IMPLIED WARRANTY, RELATING TO SALE AND/OR USE OF INTEL PRODUCTS INCLUDING LIABILITY OR WARRANTIES RELATING TO FITNESS FOR A PARTICULAR PURPOSE, MERCHANTABILITY, OR INFRINGEMENT OF ANY PATENT, COPYRIGHT OR OTHER INTELLECTUAL PROPERTY RIGHT. UNLESS OTHERWISE AGREED IN WRITING BY INTEL, THE INTEL PRODUCTS ARE NOT DESIGNED NOR INTENDED FOR ANY APPLICATION IN WHICH THE FAILURE OF THE INTEL PRODUCT COULD CREATE A SITUATION WHERE PERSONAL INJURY OR DEATH MAY OCCUR.

All Compute Cards are evaluated as Information Technology Equipment (I.T.E.) for installation in homes, offices, schools, computer rooms, and similar locations. The suitability of this product for other PC or embedded non-PC applications or other environments, such as medical, industrial, alarm systems, test equipment, etc. may not be supported without further evaluation by Intel.

Intel Corporation may have patents or pending patent applications, trademarks, copyrights, or other intellectual property rights that relate to the presented subject matter. The furnishing of documents and other materials and information does not provide any license, express or implied, by estoppel or otherwise, to any such patents, trademarks, copyrights, or other intellectual property rights.

Intel may make changes to specifications and product descriptions at any time, without notice.

Designers must not rely on the absence or characteristics of any features or instructions marked "reserved" or "undefined." Intel reserves these for future definition and shall have no responsibility whatsoever for conflicts or incompatibilities arising from future changes to them.

Intel processor numbers are not a measure of performance. Processor numbers differentiate features within each processor family, not across different processor families: Go to:

[Learn About Intel® Processor Numbers](#)

Contact your local Intel sales office or your distributor to obtain the latest specifications before placing your product order.

Intel, the Intel logo and Intel Core are trademarks of Intel Corporation in the U.S. and/or other countries.

* Other names and brands may be claimed as the property of others.

Copyright © 2018 Intel Corporation. All rights reserved.

1. WMI interface

What is required

WMI Explorer: <https://wmie.codeplex.com/>

MOFComp: [https://msdn.microsoft.com/en-us/library/aa823192\(v=vs.85\).aspx](https://msdn.microsoft.com/en-us/library/aa823192(v=vs.85).aspx)

An ability has been included in the bios of these NUCs which will allow a query and control of customized feature from the OS Environment such as Ring LED behavior, Eject feature, USB power on/off and HDMI CEC. WMI Explorer and the provided MOF must be used.

The WMI Explorer is a utility intended to provide the ability to browse and view WMI namespaces, classes, instances, and properties in a single pane of view. NUC provides a WMI interface within the BIOS that some utility for example, the Programmable LED tool, can access. More information about WMI and ACPI can be found here: [https://msdn.microsoft.com/en-us/library/windows/hardware/dn614028\(v=vs.85\).aspx](https://msdn.microsoft.com/en-us/library/windows/hardware/dn614028(v=vs.85).aspx)

1.2. MOF (Managed Object Format) – CISC provides a specific MOF in ACPI used for customer's programmed LED tool access.

1. GUID: 8C5DA44C-CDC3-46b3-8619-4E26D34390B7
2. _UID: 0
3. Object ID (AA): 65, 65
4. Instance Count: 1
5. Description: Method for get or set the Button or Ring LED state.
6. **WMI Object Name:** "CISC_WMI"
7. **Method ID(1):** "GetState"
8. **Parameter 1:** UINT32(Input)
9. **Parameter 2:** Package(Array Data)
10. **Method ID(2):** "SetState"
11. **Parameter 1:** UINT32(Input)
12. **Parameter 2:** Package(Array Data)

2. Introduction of programmed LED

NUC may have various types of LED placing on system such as Power Button LED, HDD LED and Front LED 1...etc. The physical color presentation on LED will bring each type of LED may use “Dual-color Blue / Amber”, “Dual-color Blue / White” and “RGB-color” for its LED color type.

Each type of LED can use/program as one of indicators/usage types like Power State Indicator and HDD Activity Indicator ...etc.

Each usage of indicator will have its own programmable control items such as “Brightness”, “Color” and “Behavior” for the LED Type.

Figure of NUC LED Tray App



Terminology

Term	Description
LED Type	Type of physical LED on NUC system like power button and Front LED 1...etc.
LED Color Type	Type of physical color presentation on LED like “Dual-color Blue / Amber”, “Dual-color Blue / White” and “RGB-color”.
LED Indicator option (Usage type)	Use/Program the LED Type to one of indicators/usage types like Power Indicator and HDD Activity Indicator ...etc.
Control items	Each usage of indicator will have its own programmable control items such as “Brightness”, “Color” and “Behavior” for the LED Type.

WMI Functions

Functions	Description
3.1. Get LED Status Function	For NUC AY/BN, to get the LED brightness state, Current LED blinking / fade state and color state.
3.2. Set LED Function	For NUC AY/BN, to set the LED brightness state, Current LED blinking / fade state and color state.
3.3 Query LED support capability	For NUC new generation, to query LED support capability to understand how many physical LED types present on the NUC and their physical LED Color Type and how many Indicator options support for the LED type and how many Control items support for the LED type as use to the Indicator option.
3.4 New Get LED status	For NUC new generation, to get LED status with current Indicator option for the LED type and current setting of the control item for the LED type as use to the Indicator option.
3.5 Set an Indicator option for the LED type	For NUC new generation, to set an Indicator option for the LED type.
3.6 Set the value to the control item of the Indicator option and the LED type	For NUC new generation, to set the value/setting to the control item for the LED type as use to the Indicator option.
3.7 Notification of LED App	For NUC new generation, Notification of LED App.

Usage scenario – use Hades Canyon as example

Hades Canyon designed with the physical LED Types included Power Button LED, Skull LED, Eyes LED, Front LED1, Front LED2 and Front LED3 and all the LED type with RGB Color LED. Each LED type is allowed to use/program as any one of LED Indicator options (Usage type) such as Power State Indicator, HDD Activity Indicator, Ethernet Indicator, WiFi Indicator, CPU Frequency Indicator, Power Limit Indicator and Disable.

Below using Hades Canyon as example if NUC LED Tray App want to know whether the Power Button LED is existing and whether it can be programmed as HDD Activity Indicator and query all list of support control items for the Power Button LED as HDD Activity Indicator.

Step1, it could query the list of existing LED Types on the NUC to know whether the Power Button LED is existing.

Step2, it could query the LED color type for the Power Button LED.

Step3, it could query the list of support Indicator options/usage types for the Power Button LED to know whether it can use/program as HDD Activity Indicator.

Step4, it could query the list of support control items for the Power Button LED as HDD Activity Indicator.

Arg 1 Method 03h to query LED support capability									
Step	Arg 2 (Function Number)				Return Value				Comment
	Byte 0	Byte 1	Byte 2	Byte 3	Byte	Byte	Byte	Byte	
	Fun	Par 0	Par 1	Par 2	0	1	2	3	
1	00h				00h	7Dh	00h	00h	Get how many physical LED types existing, return bits [6, 5, 4, 3, 2, 0] to 1 = 7Dh (refer Table 2.1 LED Type) (Hades Canyon designed with the physical LED Types of Power Button, Skull LED, Eyes LED, Front LED1, Front LED2 and Front LED3)
2	01h	00h			00h	04h	00h	00h	Get physical LED Color Type for Power Button LED, return bits [2] to 1 = 04h (refer Table 2.2 LED Color Type) (Hades Canyon used RGB-Color type for Power Button LED)
3	02h	00h			00h	7Fh	00h	00h	call fun(2, 0) to get how many Indicator options support for Power Button LED, return bits [6,5,4,3,2,1,0] to 1 = 7Fh (refer Table 2.3 LED Indicator options) (Hades Canyon can set Power Button LED as any one of Power State Indicator, HDD Activity Indicator, Ethernet Indicator, WiFi Indicator, CPU Frequency Indicator, Power Limit Indicator and Disable Indicator options)
4	03h	00h	01h		00h	1Fh	00h	00h	Get how many Control items support for the HDD activity Indicator of the Power Button LED, return bits[4, 3, 2, 1] to 1 = 1Fh (refer Table 2.4.2 Control items of HDD activity Indicator) (Hades Canyon is used RGB color type for Power Button LED, so there is no Brightness control item available as the Brightness has used for RGB color space combination, so it has color, color 2, color 3 and Behavior control items available)

If NUC LED Tray App want to get current Indicator option/usage type setting for Power Button LED and get current setting/value of each control item for the Power Button LED as HDD Activity Indicator.

Arg 1 Method 04h to get current LED status									
Step	Arg 2 (Function Number)				Return Value				Comment
	Byte 0	Byte 1	Byte 2	Byte 3	Byte	Byte	Byte	Byte	
	Fun	Par 0	Par 1	Par 2	0	1	2	3	
1	00h	00h			00h	01h	00h	00h	Get current Indicator option for Power Button LED, return 01h if current used as HDD Activity Indicator
2	01h	00h	01h	01h	00h	FFh	00h	00h	Get current color setting, return FFh for RED[7:0] if Red color (255,0,0) #FF0000 has set for RGB.
3	01h	00h	01h	02h	00h	00h	00h	00h	Get current color 2 setting, return 00h for GREEN[7:0] if Red color (255,0,0) #FF0000 has set for RGB.
4	01h	00h	01h	03h	00h	00h	00h	00h	Get current color 3 setting, return 00h for BLUE[7:0] if Red color (255,0,0) #FF0000 has set for RGB.
5	01h	00h	01h	04h	00h	00h	00h	00h	Get current Behavior setting, return 00h if current setting was "Normally off, ON when active"

If NUC LED Tray App want to set Power Button LED used as HDD Activity Indicator.

Arg 1 Method 05h to Set an Indicator option for the LED type									
Step	Arg 2 (Function Number)				Return Value				Comment
	Byte 0	Byte 1	Byte 2	Byte 3	Byte	Byte	Byte	Byte	
	Par 0	Par 1	Par 2	Par 3	0	1	2	3	
1	00h	01h			00h				Set Power Button LED used as HDD Activity Indicator.

If NUC LED Tray App want to set the color and Behavior of control items for the Power Button LED as HDD Activity Indicator.

Color = FFh ; for RED[7:0] - RGB color space, use RGB Red color (255,0,0) #FF0000 as example

Color 2 = 00h ; for GREEN[7:0] - RGB color space, use RGB Red color (255,0,0) #FF0000 as example

Color 3 = 00h ; for BLUE[7:0] - RGB color space, use RGB Red color (255,0,0) #FF0000 as example

Behavior = 00h ; 00h = Normally off, ON when active

Arg 1 Method 06h to Set the value to the control item of the Indicator option and the LED type									
Step	Arg 2 (Function Number)				Return Value				Comment
	Byte 0	Byte 1	Byte 2	Byte 3	Byte	Byte	Byte	Byte	
	Par 0	Par 1	Par 2	Par 3	0	1	2	3	
1	00h	01h	01h	FFh	00h				Set FFh (Red color for RGB) to the color control item for Power Button LED used as HDD Activity Indicator.
2	00h	01h	02h	00h	00h				Set 00h (Red color for RGB) to the color 2 control item for Power Button LED used as HDD Activity Indicator.
3	00h	01h	03h	00h	00h				Set 00h (Red color for RGB) to the color 3 control item for Power Button LED used as HDD Activity Indicator.
4	00h	01h	04h	00h	00h				Set 00h (Normally off, ON when active) to the Behavior control item for Power Button LED used as HDD Activity Indicator.

3. Specification of programmed LED

3.1 Get LED Status Function

		Description
Control method		WMAA
Arg 0		Instance
Arg 1		Method ID (01h) Get Function
Arg 2 Input Parameter	Byte 0	Function Number 01h – Get S0 Power LED command code 02h – Get S0 Ring LED command code
	Byte 1	Reserved
	Byte 2	Reserved
	Byte 3	Reserved
Return Value	Byte 0	Return Code. 00h: No Error. Byte 1~3 offer the state. E1h: Error (Function not support) E2h: Error (Undefined device) E3h: Error (EC no respond) E4h: Error (Invalid Parameter) EFh: Error (Unexpected error) Others: Reserved
	Byte 1	Current LED brightness state 00h: 0% 01h: 50% 02h: 100% <u>00h: 0% ~ 64h: 100%</u>
	Byte 2	Current LED blinking / fade state 01h: 1Hz 02h: 0.25Hz 03h: Fade 04h: Always on
	Byte 3	Current LED color state. Button LED Color: (Get Power LED setting) 00h: Disable 01h: Blue 02h: Amber Ring LED Color: (Get Ring LED setting) 00h: Disable 01h: Cyan 02h: Pink

		Description
		03h: Yellow 04h: Blue 05h: Red 06h: Green 07h: White

3.2 Set LED Function

		Description
Control method		WMAA
Arg 0		Instance
Arg 1		Method ID (02h) Set LED Function
Arg 2 Input Parameter	Byte 0	Select the LED 01h – Set S0 Power LED command code 02h – Set S0 Ring LED command code
	Byte 1	LED brightness setting 00h: 0% 01h: 50% 02h: 100% 00h: 0% ~ 64h: 100%
	Byte 2	LED blinking / fade state 01h: 1Hz 02h: 0.25Hz 03h: Fade 04h: Always on
	Byte 3	LED color setting. Button LED Color: (Get Power LED setting) 00h: Disable 01h: Blue 02h: Amber Ring LED Color: (Get Ring LED setting) 00h: Disable 01h: Cyan 02h: Pink 03h: Yellow 04h: Blue 05h: Red 06h: Green 07h: White
Return Value	Byte 0	Error Code of Ring LED brightness

		Description
		00h: No Error E1h: Error (Function not support) E2h: Error (Undefined device) E3h: Error (EC no respond) E4h: Error (Invalid Parameter) EFh: Error (Unexpected error) Others: Reserved
	Byte 1	Error Code of Ring LED blinking / fade 00h: No Error E1h: Error (Function not support) E2h: Error (Undefined device) E3h: Error (EC no respond) E4h: Error (Invalid Parameter) EFh: Error (Unexpected error) Others: Reserved
	Byte 2	Error Code of Ring LED color 00h: No Error E1h: Error (Function not support) E2h: Error (Undefined device) E3h: Error (EC no respond) E4h: Error (Invalid Parameter) EFh: Error (Unexpected error) Others: Reserved
	Byte 3	Reserved

3.3 Query LED support capability

		Description
Control method		WMAA
Arg 0		Instance
Arg 1		Method ID (03h) Query LED support capability
Arg 2 Input Parameter	Byte 0	Function Number 00h: List all LED types support in the platform 01h: Query to know the LED Color Type for the LED type 02h: Query to know all Indicator options support for the LED type 03h: Query to know all Control items support for the Indicator option of the LED type
	Byte 1	Parameter 0 Fun(0) - No require Fun(1/2/3) - Index of LED Type (refer to Table 3.1 LED Type)

		Description
	Byte 2	Parameter 1 Fun(0/1/2) – No require Fun(3) – Index of Indicator option (refer to Table 3.3 LED Indicator options)
	Byte 3	Parameter 2 Reserved
Return Value	Byte 0	Return Code. 00h: No Error. Byte 1~3 offer the state. E1h: Error (Function not support) E2h: Error (Undefined device) E3h: Error (EC no respond) E4h: Error (Invalid Parameter) EFh: Error (Unexpected error) Others: Reserved
	Byte 1	Return '1' to the corresponding bitmap [0:7] if corresponding type/options support in the platform Fun(0) - Refer to bit number of Table 3.1 LED Type Fun(1) - Refer to bit number of Table 3.2 LED Color Type Fun(2) - Refer to bit number of Table 3.3 LED Indicator options Fun(3) - Refer to bit number of Table 3.4.x Control items
	Byte 2	Return '1' to the corresponding bitmap [8:15] if corresponding type/options support in the platform Fun(0) - Refer to bit number of Table 3.1 LED Type Fun(1) - Refer to bit number of Table 3.2 LED Color Type Fun(2) - Refer to bit number of Table 3.3 LED Indicator options Fun(3) - Refer to bit number of Table 3.4.x Control items
	Byte 3	Return '1' to the corresponding bitmap [16:23] if corresponding type/options support in the platform Fun(0) - Refer to bit number of Table 3.1 LED Type Fun(1) - Refer to bit number of Table 3.2 LED Color Type Fun(2) - Refer to bit number of Table 3.3 LED Indicator options Fun(3) - Refer to bit number of Table 3.4.x Control items

3.4 New Get LED status

		Description
Control method		WMAA
Arg 0		Instance
Arg 1		Method ID (04h) New Get LED status
Arg 2 Input Parameter	Byte 0	Function Number 00h: Get current Indicator option for the LED type 01h: Get current setting for the control item of the Indicator option and the LED type
	Byte 1	Parameter 0 Index of LED Type (refer to Table 3.1 LED Type)
	Byte 2	Parameter 1 Fun(0) - No require Fun(1) - Index of Indicator option (refer to Table 3.3 LED Indicator options)
	Byte 3	Parameter 2 Fun(0) - No require Fun(1) - Index of Control item (refer to Table 3.4.x Control items)
Return Value	Byte 0	Return Code. 00h: No Error. Byte 1~3 offer the state. E1h: Error (Function not support) E2h: Error (Undefined device) E3h: Error (EC no respond) E4h: Error (Invalid Parameter) EFh: Error (Unexpected error) Others: Reserved
	Byte 1	Fun(0) – Return current Indicator option for the LED type (refer to Table 3.3 LED Indicator options) Fun(1) – Return current setting for the control item of the Indicator option and the LED type (refer to Table 3.4.x Control items)
	Byte 2	Reserved
	Byte 3	Reserved

3.5 Set an Indicator option for the LED type

		Description
Control method		WMAA
Arg 0		Instance
Arg 1		Method ID (05h) Set an Indicator option for the LED type
Arg 2 Input Parameter	Byte 0	Parameter 0 Index of LED Type (refer to Table 3.1 LED Type)
	Byte 1	Parameter 1 Index of Indicator option (refer to Table 3.3 LED Indicator options)
	Byte 2	Parameter 2 No require
	Byte 3	Parameter 3 No require
Return Value	Byte 0	Return Code. 00h: No Error. Byte 1~3 offer the state. E1h: Error (Function not support) E2h: Error (Undefined device) E3h: Error (EC no respond) E4h: Error (Invalid Parameter) EFh: Error (Unexpected error) Others: Reserved
	Byte 1	Reserved
	Byte 2	Reserved
	Byte 3	Reserved

3.6 Set the value to the control item of the Indicator option and the LED type

		Description
Control method		WMAA
Arg 0		Instance
Arg 1		Method ID (06h) Set the value to the control item of the Indicator option and the LED type
Arg 2 Input Parameter	Byte 0	Parameter 0 Index of LED Type (refer to Table 3.1 LED Type)
	Byte 1	Parameter 1 Index of Indicator option (refer to Table 3.3 LED Indicator options)
	Byte 2	Parameter 2 Index of Control item (refer to Table 3.4.x Control items)
	Byte 3	Parameter 3 Control item value (refer to Table 3.4.x Control items)
Return Value	Byte 0	Return Code. 00h: No Error. Byte 1~3 offer the state. E1h: Error (Function not support) E2h: Error (Undefined device) E3h: Error (EC no respond) E4h: Error (Invalid Parameter) EFh: Error (Unexpected error) Others: Reserved
	Byte 1	Reserved
	Byte 2	Reserved
	Byte 3	Reserved

3.7 Notification of LED App

		Description
Control method		WMAA
Arg 0		Instance
Arg 1		Method ID (07h) Notification of LED App
Arg 2 Input Parameter	Byte 0	Function Number 01h – Notification for saving all LED configurations
	Byte 1	Parameter 1 No require
	Byte 2	Parameter 2 No require
	Byte 3	Parameter 3 No require
Return Value	Byte 0	Error Code of Extended function 00h: No Error E1h: Error (Function not support) Others: Reserved
	Byte 1	Reserved
	Byte 2	Reserved
	Byte 3	Reserved

Table 3.1 LED Type

Bit Number	Index	Type
0	0	Power Button LED
1	1	HDD LED
2	2	Skull LED
3	3	Eyes LED
4	4	Front LED1
5	5	Front LED2
6	6	Front LED3

Table 3.2 LED Color Type

Bit Number	Type
0	Dual-color Blue / Amber
1	Dual-color Blue / White
2	RGB-color

Table 3.3 LED Indicator options (Usage type)

Bit Number	Index	Options
0	0	Power State Indicator
1	1	HDD Activity Indicator
2	2	Ethernet Indicator
3	3	WiFi Indicator
4	4	Software Indicator
5	5	Power Limit Indicator
6	6	Disable

Table 3.4.1 Control items of Power State Indicator

Bit Number	Index	Control Item	Options												
0	0	S0 Indicator Brightness	00h/0% ~ 64h/100% (1% increments up to 100%)												
1	1	S0 Indicator Blinking Behavior	<table><tr><th>Index</th><th>Options</th></tr><tr><td>0</td><td>Solid</td></tr><tr><td>1</td><td>Breathing</td></tr><tr><td>2</td><td>Pulsing</td></tr><tr><td>3</td><td>Strobing</td></tr></table>	Index	Options	0	Solid	1	Breathing	2	Pulsing	3	Strobing		
Index	Options														
0	Solid														
1	Breathing														
2	Pulsing														
3	Strobing														
2	2	S0 Indicator Blinking Frequency	01h/0.1Hz ~ 0Ah/1.0Hz (0.1Hz increments up to 1.0Hz)												
3	3	S0 Indicator Color	<div>For LED Color Type - Dual-color Blue / Amber</div> <table><tr><th>Index</th><th>Options</th></tr><tr><td>0</td><td>Blue</td></tr><tr><td>1</td><td>Amber</td></tr></table> <div>For LED Color Type - Dual-color Blue / White</div> <table><tr><th>Index</th><th>Options</th></tr><tr><td>0</td><td>Blue</td></tr><tr><td>1</td><td>White</td></tr></table> <div>For LED Color Type - RGB-color RED[7:0] - RGB color space</div>	Index	Options	0	Blue	1	Amber	Index	Options	0	Blue	1	White
Index	Options														
0	Blue														
1	Amber														
Index	Options														
0	Blue														
1	White														
4	4	S0 Indicator Color 2	<div>For LED Color Type - RGB-color GREEN[7:0] - RGB color space</div>												
5	5	S0 Indicator Color 3	<div>For LED Color Type - RGB-color BLUE[7:0] - RGB color space</div>												
6	6	S3 Indicator Brightness	same above												
7	7	S3 Indicator Blinking Behavior	same above												
8	8	S3 Indicator Blinking Frequency	same above												
9	9	S3 Indicator Color	same above												
10	A	S3 Indicator Color 2	same above												

Bit Number	Index	Control Item	Options
11	B	S3 Indicator Color 3	same above
12	C	Ready Mode Brightness	same above
13	D	Ready Mode Blinking Behavior	same above
14	E	Ready Mode Blinking Frequency	same above
15	F	Ready Mode Color	same above
16	10	Ready Mode Color 2	same above
17	11	Ready Mode Color 3	same above
18	12	S5 Indicator Brightness	same above
19	13	S5 Indicator Blinking Behavior	same above
20	14	S5 Indicator Blinking Frequency	same above
21	15	S5 Indicator Color	same above
22	16	S5 Indicator Color 2	same above
23	17	S5 Indicator Color 3	same above

Table 3.4.2 Control items of HDD activity Indicator

Bit Number	Index	Control Item	Options												
0	0	Brightness	00h/0% ~ 64h/100% (1% increments up to 100%)												
1	1	Color	<div>For LED Color Type - Dual-color Blue / Amber<table><tr><th>Index</th><th>Options</th></tr><tr><td>0</td><td>Blue</td></tr><tr><td>1</td><td>Amber</td></tr></table></div> <div>For LED Color Type - Dual-color Blue / White<table><tr><th>Index</th><th>Options</th></tr><tr><td>0</td><td>Blue</td></tr><tr><td>1</td><td>White</td></tr></table></div> <div>For LED Color Type - RGB-color RED[7:0] - RGB color space</div>	Index	Options	0	Blue	1	Amber	Index	Options	0	Blue	1	White
Index	Options														
0	Blue														
1	Amber														
Index	Options														
0	Blue														
1	White														
2	2	Color 2	<div>For LED Color Type - RGB-color GREEN[7:0] - RGB color space</div>												
3	3	Color 3	<div>For LED Color Type - RGB-color BLUE[7:0] - RGB color space</div>												
4	4	Behavior	<table><tr><th>Index</th><th>Options</th></tr><tr><td>0</td><td>Normally off, ON when active</td></tr><tr><td>1</td><td>Normally on, OFF when active</td></tr></table>	Index	Options	0	Normally off, ON when active	1	Normally on, OFF when active						
Index	Options														
0	Normally off, ON when active														
1	Normally on, OFF when active														

Table 3.4.3 Control items of Ethernet Indicator

Bit Number	Index	Control Item	Options		
0	0	Type	Index	Options	
			0	LAN1	
			1	LAN2	
			2	LAN1 + LAN2	
1	1	Brightness	00h/0% ~ 64h/100% (1% increments up to 100%)		
2	2	Color	For LED Color Type - Dual-color Blue / Amber		
			Index	Options	
			0	Blue	
			1	Amber	
			For LED Color Type - Dual-color Blue / White		
			Index	Options	
			0	Blue	
			1	White	
			For LED Color Type - RGB-color		
			RED[7:0] - RGB color space		
3	3	Color 2	For LED Color Type - RGB-color GREEN[7:0] - RGB color space		
4	4	Color 3	For LED Color Type - RGB-color BLUE[7:0] - RGB color space		

Table 3.4.4 Control items of WiFi Indicator

Bit Number	Index	Control Item	Options						
0	0	Brightness	00h/0% ~ 64h/100% (1% increments up to 100%)						
1	1	Color	For LED Color Type - Dual-color Blue / Amber						
			<table><tr><td>Index</td><td>Options</td></tr><tr><td>0</td><td>Blue</td></tr><tr><td>1</td><td>Amber</td></tr></table>	Index	Options	0	Blue	1	Amber
			Index	Options					
			0	Blue					
			1	Amber					
			For LED Color Type - Dual-color Blue / White						
			<table><tr><td>Index</td><td>Options</td></tr><tr><td>0</td><td>Blue</td></tr><tr><td>1</td><td>White</td></tr></table>	Index	Options	0	Blue	1	White
			Index	Options					
			0	Blue					
			1	White					
For LED Color Type - RGB-color									
RED[7:0] - RGB color space									
For LED Color Type - RGB-color									
GREEN[7:0] - RGB color space									
For LED Color Type - RGB-color									
BLUE[7:0] - RGB color space									

Table 3.4.5 Control items of Software Indicator

Bit Number	Index	Control Item	Options												
0	0	Brightness	00h/0% ~ 64h/100% (1% increments up to 100%)												
1	1	Blinking Behavior	<table><tr><th>Index</th><th>Options</th></tr><tr><td>0</td><td>Solid</td></tr><tr><td>1</td><td>Breathing</td></tr><tr><td>2</td><td>Pulsing</td></tr><tr><td>3</td><td>Strobing</td></tr></table>	Index	Options	0	Solid	1	Breathing	2	Pulsing	3	Strobing		
Index	Options														
0	Solid														
1	Breathing														
2	Pulsing														
3	Strobing														
2	2	Blinking Frequency	01h/0.1Hz ~ 0Ah/1.0Hz (0.1Hz increments up to 1.0Hz)												
3	3	Color	<div>For LED Color Type - Dual-color Blue / Amber<table><tr><th>Index</th><th>Options</th></tr><tr><td>0</td><td>Blue</td></tr><tr><td>1</td><td>Amber</td></tr></table></div> <div>For LED Color Type - Dual-color Blue / White<table><tr><th>Index</th><th>Options</th></tr><tr><td>0</td><td>Blue</td></tr><tr><td>1</td><td>White</td></tr></table></div> <div>For LED Color Type - RGB-color RED[7:0] - RGB color space</div>	Index	Options	0	Blue	1	Amber	Index	Options	0	Blue	1	White
Index	Options														
0	Blue														
1	Amber														
Index	Options														
0	Blue														
1	White														
4	4	Color 2	<div>For LED Color Type - RGB-color GREEN[7:0] - RGB color space</div>												
5	5	Color 3	<div>For LED Color Type - RGB-color BLUE[7:0] - RGB color space</div>												

Table 3.4.6 Control items of Power Limit Indicator

Bit Number	Index	Control Item	Options
0	0	Indication Scheme	Index Options
			0 Green to Red
			1 Single Color
1	1	Brightness (for Green to Red)	00h/0% ~ 64h/100% (1% increments up to 100%)
2	2	Color (For Single Color)	For LED Color Type - Dual-color Blue / Amber
			Index Options
			0 Blue
			1 Amber
			For LED Color Type - Dual-color Blue / White
			Index Options
			0 Blue
			1 White
			For LED Color Type - RGB-color
			RED[7:0] - RGB color space
3	3	Color 2 (For Single Color)	For LED Color Type - RGB-color GREEN[7:0] - RGB color space
4	4	Color 3 (For Single Color)	For LED Color Type - RGB-color BLUE[7:0] - RGB color space

4. Specification of CEC feature control

4.1. Get Physical address/Logical address for each of HDMI Port via CEC

		Description
Control method		WMAA
Arg 0		Instance
Arg 1		Method ID (201h) Get Physical address/Logical address via CEC
Arg 2 Input Parameter	Byte 0	HDMI Port number HDMI Port number 01h – HDMI Port 1 in NUC (Connected to EC) 02h – HDMI Port 2 in NUC (Connected to CEC module)
	Byte 1	Reserved
	Byte 2	Reserved
	Byte 3	Reserved
Return Value	Byte 0	Return Code. 00h: No Error. E1h: Error (Function not support) E2h: Error (No display device connected) E3h: Error (EC no respond) E4h: Error (Invalid Parameter) EFh: Error (Unexpected error) Others: Reserved
	Byte 1	HDMI Physical address – The physical address of each node is determined through the physical address discovery process. All addresses are 4 digits identified in the form of n.n.n.n. Please reference Chapter “Physical Address” in HDMI Specification.
	Byte 2	
	Byte 3	Return HDMI Logical address if HDMI Port 1 connected to EC is selected other than return 0xFF. NUC could be regarded as Player Device whose address could be assigned to 4, 8, 11 or 14. Please reference Chapter “Logical Address” in HDMI Specification.

Logical Addresses

Address	Device
0	TV
1	Recording Device 1
2	Recording Device 2
3	Tuner 1
4	Playback Device 1
5	Audio System
6	Tuner 2
7	Tuner 3
8	Playback Device 2
9	Recording Device 3
10	Tuner 4
11	Playback Device 3
12	Reserved
13	Reserved
14	Specific Use
15	Unregistered (as Initiator address) Broadcast (as Destination address)

4.2. Get EDID information Function

		Description
Control method		WMAA
Arg 0		Instance
Arg 1		Method ID (201h) Get EDID information via CEC
Arg 2 Input Parameter	Byte 0	HDMI Port number 01h – HDMI Port 1 in NUC (Connected to EC) 02h – HDMI Port 2 in NUC (Connected to CEC module)
	Byte 1	Reserved
	Byte 2	Reserved
	Byte 3	Reserved
Return Value	Byte 0 ~ Byte 255	Return Value

5. Specification of USB Power control

5.1. Get USB Power Status Function

		Description
Control method		WMAA
Arg 0		Instance
Arg 1		Method ID (301h) Get Function
Arg 2 Input Parameter	Byte 0	Function Number 01h – Get power status of USB ports
	Byte 1	Reserved
	Byte 2	Reserved
	Byte 3	Reserved
Return Value	Byte 0	Return Code. 00h: No Error. Byte 1~3 offer the state. E1h: Error (Function not support) E2h: Error (Undefined device) E3h: Error (EC no respond) E4h: Error (Invalid Parameter) EFh: Error (Unexpected error) Others: Reserved
	Byte 1	Current power state for each of external USB ports. Each of Bit presents the power on/off for each of USB port. "0" means power off and "1" means power on. Bit0: USB Port0 Bit1: USB Port1 Bit2: USB Port2 Bit3: USB Port3 Bit4: USB Port4 ---
	Byte 2	Current power state for each of internal USB ports. Each of Bit present the power on/off for each of USB port. "0" means power off and "1" means power on. Bit0: Internal USB Port 1 Bit0: Internal USB Port 2 ---
	Byte 3	Current power state for each of USB charging ports. Each of Bit present the power on/off for each of USB port. "0" means power off and "1" means power on. Bit0: USB charging Port 1 ---

5.2. Set USB Power Status Function

		Description
Control method		WMAA
Arg 0		Instance
Arg 1		Method ID (302h) Set LED Function
Arg 2 Input Parameter	Byte 0	Set power state for each of external USB ports. Each of Bit presents the power on/off for each of USB port. "0" means power off and "1" means power on. Bit0: USB Port0 Bit1: USB Port1 Bit2: USB Port2 Bit3: USB Port3 Bit4: USB Port4 ---
	Byte 1	Set power state for each of internal USB ports. Each of Bit present the power on/off for each of USB port. "0" means power off and "1" means power on. Bit0: Internal USB Port 1 Bit0: Internal USB Port 2 ---
	Byte 2	Set power state for each of USB charging ports. Each of Bit present the power on/off for each of USB port. "0" means power off and "1" means power on. Bit0: USB charging Port 1 ---
	Byte 3	Reserved
Return Value	Byte 0	Error Code of Ring LED brightness 00h: No Error E1h: Error (Function not support) E2h: Error (Undefined device) E3h: Error (EC no respond) E4h: Error (Invalid Parameter) EFh: Error (Unexpected error) Others: Reserved
	Byte 1	Reserved
	Byte 2	Reserved
	Byte 3	Reserved

A Tools for verification

WMI Explorer is a utility intended to provide the ability to browse and view WMI namespaces/classes/instances/properties in a single pane of view. It can be downloaded from <https://wmie.codeplex.com/>