AAEON IPC EC Command Set User Guide

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Revision History

Revision	Description	Date	Editor
0.1(draft)	Initial Release	2020/04/08	Ayers_Deng

Contents

Chapter 1 Introduction

1.1 Principle

Text

Chapter 2 AAEON IPC EC Command Set

Host side OS utility/application can use IO port 0x584(DAT port) and 0x585(CMD port) to access/communicate with EC FW.

2.1 I/O Command Set

CMD	Function	Description/Usage

0x85	Get Panel brightness	Send Byte0:
		   Panel index (follow motherboard printing number)
		
		Received Byte0:
		   Brightness percentage level 0 to 10(100%)

0x86	Set Panel brightness	Byte0:
		   Panel index (follow motherboard printing number)
		Byte1:
		   Brightness percentage level 0 to 10(100%)

0x8E	Read MISC function	Send Byte0: Index number (refer to "CMD 8Eh/9Eh Index Table")

0x8F	Read HW ID	Send Byte0:
		   0x00 - Board ID
		   0x01 - Panel ID
		
		Received Byte0:
		   HW ID value

0x97	Read FAN RPM	Send Byte0:
		<table><tr><td>High nibble[7:4] - Type</td><td>Low nibble[3:0] - Number</td></tr><tr><td>0 - CPU</td><td>x - refer Note</td></tr><tr><td>1 - System</td><td>x - refer Note</td></tr><tr><td>2 - Chassis</td><td>x - refer Note</td></tr><tr><td>3 - Power Supply</td><td>x - refer Note</td></tr><tr><td colspan="2">Note:
		Number follow motherboard printing number, or zero as default(if exist)</td></tr></table>
		Received
		   Byte0: High Byte
		   Byte1: Low Byte

0x9E	Write MISC function	Byte0:
		   Index number (refer to "CMD 8Eh/9Eh Index Table")
		Byte1:
		   Write Data

0xAA	Read I2C/SMBus	Todo (ARStmp)
0xAB	Write I2C/SMBus	Todo (ARStmp)

0xBB	Read EC FW version	Received		
			Case 1 - Standard Platform EC	Byte0: 0x09 (return total bytes, included Byte0) Byte1: S - Standard platform EC Byte2: I/A - Intel/AMD chipset Byte3/4/5: Platform name Byte6: F/H/T - EC kernel version type (Formal/Hot Fix/Test) Byte7/8: version number Example: 　SICMLFxx = Standard Intel CometLake Formal EC kernel FW
			Case2 - for Project / Customize dedicated EC	Byte0: 0x13 (return total bytes, included Byte0) (part1) 　Byte1: P/C - Project/Customize dedicated EC 　Byte2: I/A - Intel/AMD chipset 　Byte3/4/5: Platform name 　Byte6: F/H/T - EC kernel version type (Formal/Hot Fix/Test) 　Byte7/8: version number 　Byte9: '.' - ASCII code 0x2E (part2) 　Byte 10 to 14: PROJECT_TAG 　Byte15: '.' - ASCII code 0x2E (part3) 　Byte16: F/T - FW version type (Formal/Test) 　Byte17/18: version number Example: 　PICMLT01.SMH41.T01 = 　　part1 - Project Intel CML Test EC kernel FW 　　part2 - for project SMS-H410 　　part3 - first Test version

0xC6	Get Watchdog status	Type	Value
		WDT status	Send Byte0: 0x00 Received Byte0: 0 - Inactive/Stop 1 - Activating
		Second/Minute mode	Send Byte0: 0x01 Received Byte0: 0 - Second (default) 1 - Minute
		Countdown value or Current Remaining value	Send Byte0: 0x02 Byte1: 0 - Countdown value 1 - Current Remaining Value Received Byte0: second Byte1: minute (only Minute mode report the byte)
		WDT Expired	Send Byte0: 0x03 Received Byte0: 0 - not Expired 1 - Expired (EC also set "WDT set(expired) LED" if the project supported the feature)

0xC7	Set Watchdog		Type	Value

			WDT Stop/Resume	Byte0:
				  0x00
				Byte1:
				  0 - Stop WDT (EC will stop WDT counter and record currently timer Remaining Countdown value. Turn off "WDT active LED", if the project supported WDT LED feature)
				  1 - Resume WDT (EC will restore previous Remaining Countdown value. Turn on "WDT active LED", if the project supported WDT LED feature)

			Second/Minute mode	Byte0:
				  0x01
				Byte1:
				  Definition the same as CMD 0xC6 Second/Minute mode "Received Byte0"
				Note: before switch mode which must clear "Countdown value" or "WDT Stop/Resume" value to 0 to Inactive/Stop WDT first

			Countdown value	Byte0:
				  0x02
				Byte1:
				  Value (0~255 second or minute)
				Note:
				  1. Set value as 0 - clear countdown value and inactive WDT function
				  2. Set valid value - active WDT function and start countdown
				  3. Follow "WDT Stop/Resume" LED behavior

			Reload/Retrigger WDT countdown value	Byte0:
				  0x03
				Note:
				  1. EC according Second/Minute mode to Reload previous Countdown value
				  2. Start WDT function

0xCC	Read thermal related	Send Byte0: Index number (refer to "CMD CCh/CDh Index Table")		

0xCD	Write thermal related	Byte0:
		  Index number (refer to "CMD CCh/CDh Index Table")
		Byte1:
		  Write Data		

0xD0	Get DIO pin status	Send Byte0: DIO pin index (follow motherboard printing number) Received Byte0:

<table>
<tr><th>High nibble[7:4] - Type</th><th>Low nibble[3:0] - Value</th></tr>
<tr><td>0 - Output</td><td>0 - Low
1 - High</td></tr>
<tr><td>1 - Input</td><td>0 - Low
1 - High</td></tr>
</table>

0xD1	Set DIO pin	Byte0: DIO pin index (follow motherboard printing number) Byte1:

<table>
<tr><th>High nibble[7:4] - Type</th><th>Low nibble[3:0] - Value</th></tr>
<tr><td>0 - Output</td><td>0 - Low
1 - High</td></tr>
<tr><td>1 - Input</td><td>0</td></tr>
</table>

0xD2	Get LED status	Send Byte0:

High nibble[7:4] - Type	Low nibble[3:0] - Number
0 - Power LED	0 - Power on LED (S0) 1 - AC IN LED 2 - Reserved 3 - Sleep LED (S3) 4 - Hibernate LED (S4) 5 - Soft off LED (S5)
1 - Battery LED	x - refer Note
2 - Watchdog LED	0 - WDT active LED 1 - WDT set(expired) LED
3 - Cap Lock LED	0
4 - Wireless LED	0
5 - Temperature Alert LED	x - refer Note
6 - FAN Alert LED	x - refer Note
7 - HDD Alarm LED (Note: On/Off controlled by SW)	x - refer Note
8 - Debug LED	0
Note: Number follow motherboard printing number, or zero as default(if exist)	

Received Byte0:

LED type	Value
General purpose LED	0 - LED not active 1 - LED active 2 - Toggle LED On/Off status (only for CMD 0xD3 Set LED Byte1)
Debug LED status	HW Error: 0x11 - Power failure 0x12 - System unable to power on 0x13 - Processor not installed 0x14 - New Processor 0x15 - Memory not installed 0x16 - Memory error 0x17 - CPU temperature abnormal 0x18 - FAN speed fault 0x19 - Case open 0x1A - Storage not found SW Error: 0x40 - POST fail 0x41 - Pre-video memory error 0x42 - Pre-video graphics error 0x43 - Bootable volume not found 0x44 - ROM checksum not valid

0xD3	Set LED	Byte0:
		    Definition the same as CMD 0xD2 "Send Byte0"
		Byte1:
		    Definition the same as CMD 0xD2 "Received Byte0"

0xD4	Get Voltage	Send Byte0:
		   0x00 - VCORE
		   0x01 - VCOREREFIN
		   0x02 - +12V
		   0x03 - +5V
		   0x04 - 5VSB
		   0x05 - 5VDUAL
		   0x06 - +3.3V
		   0x07 - 3VSB
		   0x08 - +1.8V
		   0x09 - VMEM
		   0x0A - RTC
		   0x0B - VBAT
		
		Received
		   Byte0: Integer part of Voltage value
		   Byte1: High byte of decimal point
		   Byte2: Low byte of decimal point

2.2 CMD 8Eh/9Eh Index Table

The index table intend for miscellaneous functions which access by CMD 0x8E, 0x9E.

Index	Function	Description/Usage

0x40	Get FAN mode	Send Byte1:
		   Definition the same as CMD 0x97 "Send Byte0"
		
		Received Byte0:
		   0x00 - Auto (default)
		   0x01 - Silent
		   0x02 - Performance
		   0x03 - Full speed
		   0x10 - Manual (Get only. Through Index 0x43 "Set FAN duty" of the 8Eh/9Eh index table to set value that EC will automatically change FAN mode to Manual mode)
		   0xFF - Disable

0x41	Set FAN mode	Byte1:
		   Definition the same as CMD 0x97 "Send Byte0"
		Byte2:
		   Definition the same as Index 0x40 - Get FAN mode "Received Byte0"

0x42	Get FAN duty	Send Byte1:
		   Definition the same as CMD 0x97 "Send Byte0"
		
		Received Byte0:
		   Duty cycle value 0 to 255

0x43	Set FAN duty	Byte1: Definition the same as CMD 0x97 "Send Byte0" Byte2: Duty cycle value 0 to 255
0x44	Get FAN Alert RPM	Send Byte1: Definition the same as CMD 0x97 "Send Byte0" Received Byte0: High Byte Byte1: Low Byte
0x45	Set FAN Alert RPM	Byte1: Definition the same as CMD 0x97 "Send Byte0" Byte2: High Byte Byte3: Low Byte Note: 1. Once EC detected FAN RPM lower or equal than the settings value, EC will turn on FAN Alert LED (if the project supported the LED). 2. Default FAN Alert RPM was 0.

2.3 CMD CCh/CDh Index Table

The index table functions intend for thermal related which access by CMD 0xCC, 0xCD.

Index	Function	Description/Usage
0x00	Read Temperature	Send Byte1: (Temperature Source) 0x00 - PECI 0x10 - Thermal Sensor: CPU 0x11 - Thermal Sensor: VCORE 0x12 - Thermal Sensor: Memory 0x13 - Thermal Sensor: PCIe Graphic 0x14 - Thermal Sensor: PCH 0x15 - Thermal Sensor: Ambient Received Byte0: Temperature value (degree C)
0x02	Get Sensor Alert Temperature	Send Byte1: Definition the same as Index 0x00 "Send Byte1" Received Byte0: Temperature value (degree C)

0x03	Set Sensor Alert Temperature	Byte1: Definition the same as Index 0x00 "Send Byte1" Byte2: Temperature value (degree C) Note: 1. Once EC detected Sensor temperature higher than the settings value, EC will turn on Temperature Alert LED (if the project supported the LED). 2. No default Alert Temperature.