RES-5000 USER Intel® Core™ i7 SoC IP67 Rugged Embedded System Waterproof M12 Connectors, Fanless -40°C to 70°C Extended Temperature



1.0.0 Edition 20240830

Record of Revision

Version	Date	Page	Description	Remark
1.00	2024/08/30	All	Official Release	

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Order Information

Model Name	LAN		СОМ	USB 3.0	DP
	2.5G	1G	COIVI	036 3.0	DP
RES-5000-1185G7E	1	1	2	2	2

Order Accessories

Part Number	Description
DDR4 32G	Certified DDR4 32GB 3200MHz RAM
DDR4 16G	Certified DDR4 16GB 3200MHz RAM
DDR4 8G	Certified DDR4 8GB 3200MHz RAM
DDR4 4G	Certified DDR4 4GB 3200MHz RAM
PWA-120W1	120W, 24V, 90V AC to 264V AC Power Adapter with 3-pin Terminal Block
M.2 Storage Module	M.2 Key B Storage Module
IP67 USB Cable	IP67 Rated USB Cable, 2M
IP67 DisplayPort Cable	IP67 Rated DisplayPort Cable, 2M
IP67 Ethernet Cable	IP67 Rated Ethernet Cable, M12 to RJ45, 2M
IP67 COM Cable	IP67 Rated COM Cable, M12 to DB9, 2M
PWA-120W	120W, 24V, 90V AC to 264V AC Power Adapter with 3-pin Terminal Block

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GENERAL INTRODUCTION

1.1 Overview

The Vecow RES-5000, an IP67-certified rugged embedded system, is designed for extreme environments. Powered by Intel® Core™ i7-1185G7E processor, it offers exceptional CPU performance with up to 15W TDP. Enhanced with Intel® vPro, TSN, TCC, and TPM 2.0 technologies, the RES-5000 delivers robust manageability and performance for diverse edge AI applications.

The RES-5000 is equipped with reliable connectivity options, including dual X-code M12 LAN ports and dual A-coded M12 COM RS-232/422/485 ports, all within an IP67-rated enclosure, making it ideal for AI deployments in harsh conditions.

With power range of 9V to 55V, ignition power control for industrial-grade stability, and a fanless design capable of operating in temperatures from -40°C to 70°C, the RES-5000 is perfectly suited for applications in irrigation systems, smart factories, outdoor automation, and more.

1.2 Features

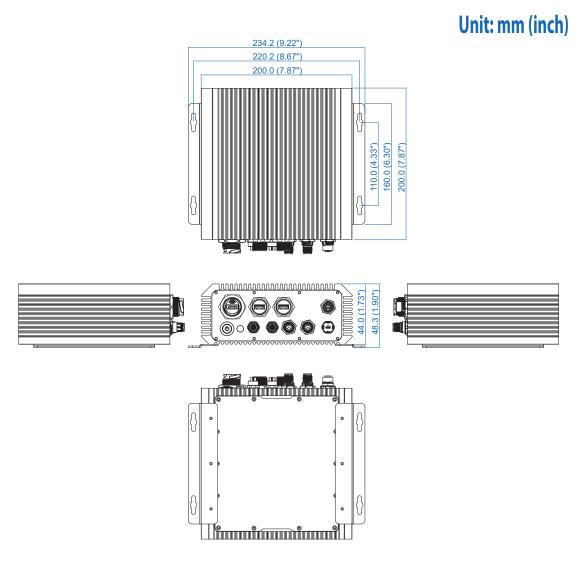
- Onboard Intel[®] Core[™] i7-1185G7E processor delivers high power CPU productivity, up to 15W TDP
- High-reliable IP67 protection
- Rugged connections : 2 X-coded M12 LAN, 2 A-coded M12 COM RS-232/422/485, 2 USB3
- Intel[®] vPro, TSN, TCC, and TPM 2.0 supported
- DC 9V to 55V wide range power input, Ignition Power Control
- Fanless -40°C to 70°C Operating Temperature
- Optional supports waterproof antenna for 5G/WiFi/4G/LTE
- Optional VHub One-Stop AloT Solution Service supports OpenVINO based Al accelerator and advanced Edge Al applications

System		
Processor	Onboard Intel® Core™ i7-1185G7E Processor (Tiger Lake UP3)	
Chipset	Intel [®] SoC	
BIOS	AMI	
SIO	IT8786E	
Memory	1 DDR4 3200MHz SO-DIMM, up to 32GB	
OS	Windows 11, Windows 10, Linux	
I/O Interface		
Serial	2 COM RS-232/422/485, A-coded M12 Connector	
USB	2 USB 3.1 Gen 2, IP67 Waterproof USB Type-A	
LED	Power, HDD	
Display	IP67 Waterproof DisplayPort : Up to 4096 x 2304 @60Hz	
Storage		
SATA	1 SATA III (6Gbps)	
M.2	1 M.2 Key B Socket (2260/2242, PClex2)	
Storage Device	 1 Internal 2.5" SSD/HDD Bracket 1 M.2 Key B Socket 	

1.3 Product Specification

Ethernet					
LAN 1	Intel [®] I219LM GigE LAN supports iAMT, X-coded M12 Connector				
LAN 2	Intel [®] I225 2.5GigE LAN supports TSN, X-coded M12 Connector				
Power					
Power Input	9V to 55V, DC-in				
Power/IGN Interface	A-coded M12 4-pin Connector				
Ignition Control	16-mode Ignition Control				
Power Switch	IP67 Waterproof Power Button				
Others					
ТРМ	Infineon SLB9670 supports TPM 2.0, SPI Interface				
Watchdog Timer	Reset : 1 to 255 sec./min. per step				
HW Monitor	Monitoring temperature, voltages. Auto throttling control when CPU overheats.				
Mechanical					
Dimension (W x L x H)	200mm x 200mm x 80mm (7.87" x 7.87" x 3.32")				
Weight	2.4kg (5.29lb)				
Mounting	Wallmount by mounting bracket				
Environment					
Operating Temperature	-40°C to 70°C (-40°F to 158°F)				
Storage Temperature	-55°C to 85°C (-67°F to 185°F)				
Humidity	5% to 95% Humidity, non-condensing				
Relative Humidity	95% at 70°C				
Shock	 IEC 60068-2-27 SSD : 50G @ Wallmount, Half-sine, 11ms 				
Vibration	IEC 60068-2-64SSD : 5Grms, 5Hz to 500Hz, 3 Axis				
EMC	CE, FCC, EN50155, EN50121-3-2				

1.4 Mechanical Dimensions



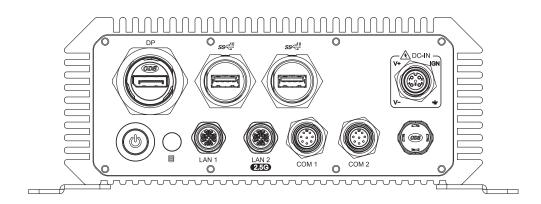


GETTING TO KNOW YOUR RES-5000

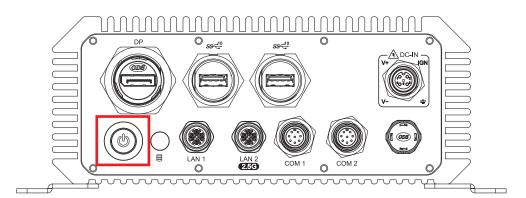
2.1 Packing List

Item		Descrip	tion		Qty
1	RES-5000 Rugged Embedded System (According to the configuration you order, the RES-5000 series may contain SSD/HDD and DDR4 SO-DIMM. Please verify these items if necessary.)				
Item	Description	Outlook	Usage	P/N	Qty
1	Terminal block 3-pin (5.0mm)		DC	51-2411R03-S1E	1
2	Terminal block 2-pin(5.0mm)		IGN	51-2411R02-S1B	1
3	M12 DC Cable with IGN		DC/IGN	61-1CB0002-000	1
4	PH-M3x6L black	*	Fast Wall Mount to system	53-2450000-218	6
5	Wall Mount RES-5000		Wall Mount	62-00P1540-03A	2

2.2 Front Panel I/O Functions



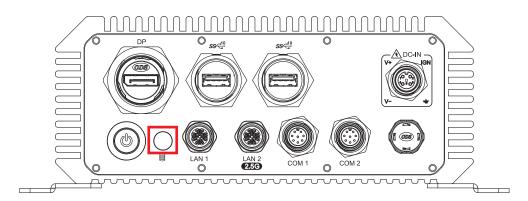
2.2.1 Power Button



The power button is a non-latched switch. In case of system halts, you can press and hold the power button for 4 seconds to compulsorily shut down the system. Please note that a 4 seconds interval is kept by the system between two on/off operations (i.e. once turning off the system, you shall wait for 4 seconds to initiate another power-on operation).

LED Color	Power Status	System Status
Blue	Power	System power status (on/off)

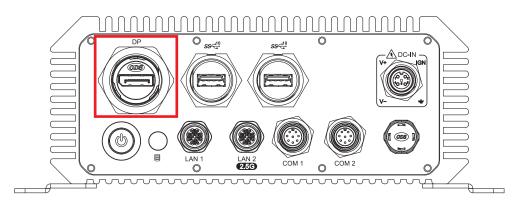
2.2.2 HDD LED Indicator



Orange-HDD LED: A hard disk LED. If the LED is on, it indicates that the system's storage is functional. If it is off, it indicates that the system's storage is not functional. If it is flashing, it indicates data access activities are in progress.

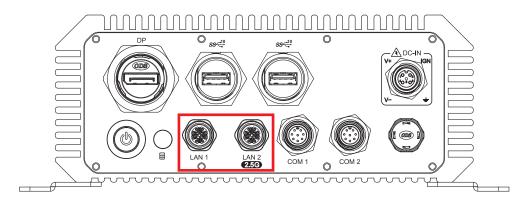
LED Color	Power Status	System Status
Orange	HDD	 On/Off : Storage status, function or not. Twinkling : Data transferring.

2.2.3 Display port Connector



The Displayport connector on the front panel supports up to 4096 x 2304 pixels resolution at 60 Hz.

2.2.4 10/100/1000/2500 Mbps Ethernet Port



There are 2 M12 jacks in the front side. Which LAN 1 is powered by Intel I219-LM Ethernet engine supporting 10/100/1000 Mbps and LAN 2 is powered by Intel i225-IT supporting 100/1000/2500 Mbps . When both LAN 1 and LAN 2 work in normal status, LAN1 iAMT 11.0 and LAN2 TSN function is enabled. Using suitable M12 LAN cable,

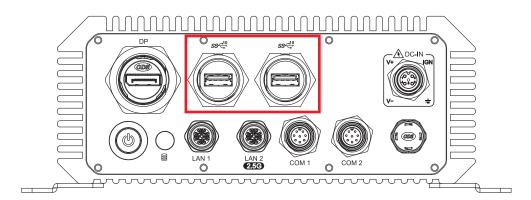


you can connect the system to a computer, or to any other devices with Ethernet connection, for example, a hub or a switch. Moreover, both of LAN 1 and LAN 2 supports Wake on LAN and Pre-boot functions. The pin-outs of LAN 1 and LAN 2 are listed as follows:

Pin No.	LAN1	LAN2
1	LAN0_MDI_1P	LAN1_MDI_1P
2	LAN0_MDI_1P	LAN1_MDI_1P
3	LAN0_MDI_2N	LAN1_MDI_2N
4	LAN0_MDI_2P	LAN1_MDI_2P
5	LAN0_MDI_4P	LAN1_MDI_4P
6	LAN0_MDI_4N	LAN1_MDI_4N
7	LAN0_MDI_3N	LAN1_MDI_3N
8	LAN0_MDI_3P	LAN1_MDI_3P

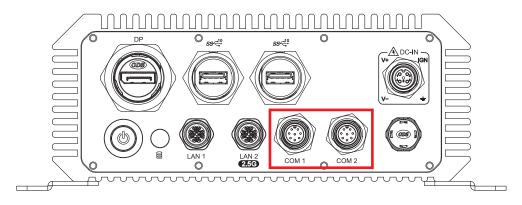
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2.2.5 USB 3.2 Connector



There are 2 USB 3.2 Gen2 connections available supporting up to 10GB per second data rate in the front side of RES-5000. They are also compliant with the requirements of SuperSpeed (SS), high speed (HS), full speed (FS) and low speed (LS)

2.2.6 Serial Port COM 1 and COM 2



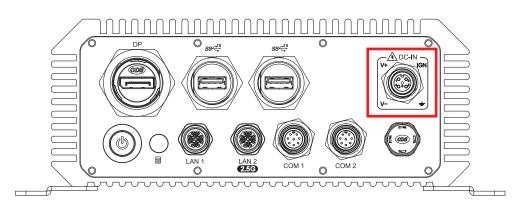
Serial port COM1 and COM2 can be configured for RS-232, RS-422, or RS-485 with auto flow control communication. The default definition of COM 1 and COM 2 is RS-232, if you want to change to RS-422 or RS-485, you can find the setting in BIOS.



The pin-outs of COM1 and COM2 are listed as follows:

Serial Port	Pin No.	RS-232	RS-422 (5-wire)	RS-485 (3-wire)
	1	DCD	TXD-	DATA-
	2	RXD	TXD+	DATA+
	3	TXD	RXD+	
COM1	4	DTR	RXD-	
COM2	5	DSR		
	6	RTS		
	7	CTS		
	8	GND	GND	GND

2.2.7 DC In Connector



This system supports 9V to 55V DC power input by M12 DC Cable in the front side.

The pin-outs of DC-IN M12 are listed as follows:

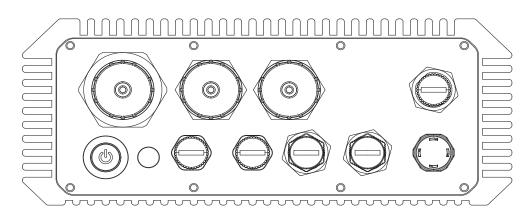
Pin No.	DC-IN	Pin No.	DC-IN
1	VIN	4	GND
2	IGN	5	NC
3	GND		



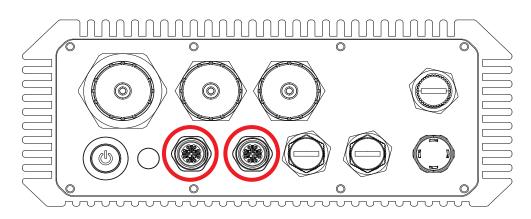
SYSTEM SETUP

3.1 How to Use Your RES-5000

Step 1 Remove waterproof cap.



Step 2 Confirm connector pin defined.(Example LAN)



Step 3 Confirm wire.

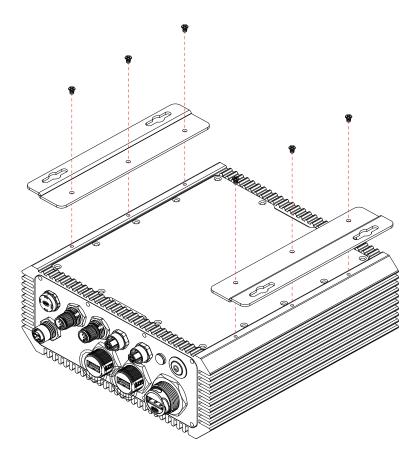


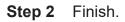
Step 4 Turn wire connector.

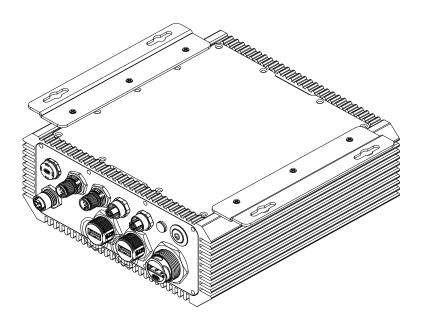


3.2 Mount Your RES-5000

Step 1 Fasten six PH-M3x6L screws.









BIOS SETUP 4.1 BIOS Settings

Main Advanced Chipset Security	Aptio Setup – AMI Boot Save & Exit	
BIOS Information BIOS Vendor Core Version Compliancy Project Version Build Date and Time Access Level	American Megatrends 5.19 UEFI 2.7; PI 1.6 E5000XXU3F00106 05/12/2022 13:44:48 Administrator	
Processor Information Name Type	TigerLake ULT 11th Gen Intel(R) Core(TM) i7–1185G7E @ 2.80GHz	
Speed ID Stepping Package	2800 MHz 0x806C1 B0 Not Implemented Yet	<pre>++: Select Screen 1↓: Select Item Enter: Select +/-: Change Opt.</pre>
Number of Processors Microcode Revision GT Info eDRAM Size	4Core(s) / 8Thread(s) 8A 0x9A49 N/A	F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit
IGFX GOP Version Memory RC Version Total Memory	17.0.1061 2.0.2.0 8192 MB	

Figure 4-1 : Entering Setup Screen

BIOS provides an interface for users to check and change system configuration. The BIOS setup program is accessed by pressing the key when POST display output is shown.

4.2 Main

Main Advanced Chipset Security	Aptio Setup – AMI Boot Save & Exit	
eDRAM Size	NZA	▲ Set the Time. Use Tab to switch between Time elements.
IGFX GOP Version	17.0.1061	
Memory RC Version	2.0.2.0	
Total Memory	8192 MB	
Memory Speed	2133 MT/s	
PCH Information		
Name	TGL PCH-LP	
PCH SKU	U Premium	
Stepping	BO	
ChipsetInit Base Revision	8	
ChipsetInit OEM Revision	0	
Package	Not Implemented Yet	↔: Select Screen
TXT Capability of Platform/PCH	Supported	↑↓: Select Item
Production Type	Production	Enter: Select
		+/-: Change Opt.
ME FW Version	15.0.30.1776	F1: General Help
ME Firmware SKU	Corporate SKU	F2: Previous Values
PMC FW Version	150.1.20.1036	F3: Optimized Defaults
System Language	[English]	F4: Save & Exit ESC: Exit
System Language	[LIIRIT20]	LOG. LAIT
System Date	[Wed 08/07/2024]	
System Time	[16:16:56]	

Figure 4-2 : BIOS Main Menu

The Main menu displays BIOS version and system information.

System Date

Set the Date. Use Tab to switch between Date elements. Default Ranges: Year: 1998-9999 Months: 1-12 Days: Dependent on month Range of Years may vary.

System Time

Set the Time. Use Tab to switch between Time elements.

4.3 Advanced Functions

Aptio Setup – AMI Main <mark>Advanced</mark> Chipset Security Boot Save & Exit	
 CPU Configuration Power & Performance PCH-FW Configuration Intel(R) Time Coordinated Computing Trusted Computing ACPI Settings SMART Settings IT8786 Super IO Configuration Hardware Monitor Serial Port Console Redirection Intel TXT Information Acoustic Management Configuration 	CPU Configuration Parameters
 PCI Subsystem Settings USB Configuration Network Stack Configuration CSM Configuration NVMe Configuration 	<pre>++: Select Screen fl: Select Item Enter: Select +/-: Change Opt. F1: General Help</pre>
 Intel(R) Ethernet Controller (3) I225-LM - 20:46:A1:FF:12:35 Driver Health 	F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit

Figure 4-3 : BIOS Advanced Menu

Select advanced tab to enter advanced BIOS setup options such as CPU configuration, IT8786 Super IO configuration, and USB configuration.

4.3.1 CPU Configuration

Main	Aptio Setup – AMI	
ID Speed L1 Data Cache L1 Instruction Cache L2 Cache L3 Cache L4 Cache VMX SMX/TXT	0x806C1 2800 MHz 48 KB x 4 32 KB x 4 1280 KB x 4 12 MB N/A Supported Supported	Enable/Disable CPU Flex Ratio Programming
CPU Flex Ratio Override CPU Flex Ratio Settings Hardware Prefetcher Adjacent Cache Line Prefetch Intel (VMX) Virtualization Technology Active Processor Cores Hyper-Threading AES Intel Trusted Execution Technology Alias Check Request DPR Memory Size (MB) Reset AUX Content Total Memory Encryption	[Enabled] [A11] [Enabled] [Enabled]	<pre>++: Select Screen 14: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit</pre>

Figure 4-3-1 : CPU Configuration

CPU Flex Ratio Override

Enable/Disable CPU Flex Ratio Programming.

CPU Flex Ratio Settings

This value must be between Max Efficiency Ratio (LFM) and Maximum nonturbo ratio set by Hardware (HFM).

Hardware Prefetcher

To turn on/off the MLC streamer prefetcher.

Adjacent Cache Line Prefetch

To turn on/off prefetching of adjacent cache lines.

Intel (VMX) Virtualization Technology

When enabled, a VMM can utilize the additional hardware capabilities provided by Vanderpool Technology.

Active Processor Cores

Number of cores to enable in each processor package.

Hyper-threading

Enabled or Disabled Hyper-Threading Technology.

AES

Enable/disable AES (Advanced Encryption Standard)

Intel Trusted Execution Technology

Enables utilization of additional hardware capabilities provided by Intel (R) Trusted Execution Technology. Changed require a full power cycle to take effect.

Alias Check Request

Enables Txt Alias Checking capability. Changes require full Txt capability before it will take effect. It is a one time only change, next reboot will be reset.

DPR Memory Size (MB)

Reserve DPR memory size (0-255) MB

Reset AUX Content

Reset TPM Aux content. Txt may not functional after AUX content gets reset.

Total Memory Encryption

Configure Total Memory Encryption (TME) to protect DRAM data from physical attacks. Either the IBECC or the TME can be enabled.

4.3.2 Power & Performance

Aptio Setu	IP - AMI
Power & Performance	CPU – Power Management Control Options
▶ CPU – Power Management Control ▶ GT – Power Management Control	

Figure 4-3-2 : Power & Performance

4.3.2.1 CPU - Power Management Control

Aptio Setup – AMI Main		
CPU – Power Management Control		Select the performance state that the BIOS will set
Boot performance mode	[Max Non-Turbo	starting from reset vector.
Intel(R) SpeedStep(tm)	Performance] [Enabled]	
Race To Halt (RTH)	[Enabled]	
Intel(R) Speed Shift Technology	[Enabled]	
Turbo Mode Config TDP Configurations	[Disabled]	
C states	[Disabled]	

Figure 4-3-2-1 : CPU - Power Management Control

Boot performance mode

Select the performance state that the BIOS will set starting from reset vector.

Intel (R) SpeedStep (tm)

Allow more than two frequency ranges to be supported.

Race To Halt (RTH)

Enable/Disable Race To Halt feature. RTH will dynamically increase CPU frequency in order to enter pkg C-State faster to reduce overall power. (RTH is controlled through MSR 1FC bit 20)

Intel (R) Speed Shift Technology

Enable/Disable Intel(R) Speed Shift Technology support. Enabling will expose the CPPC v2 interface to allow for hardware controlled P-states.

Turbo Mode

Enable/Disable processor Turbo Mode (requires EMTTM enabled too). AUTO means enabled.

Config TDP Configurations

Config TDP Configurations.

C states

Enable or disable CPU Power management. Allows CPU to go to C states when it's no 100% utilized.

4.3.2.2 GT – Power Management Control

Main	Aptio Setup – AMI	
GT – Power Management Control		Check to enable render standby support.
RC6(Render Standby)	[Enabled]	
Maximum GT frequency Disable Turbo GT frequency	[Default Max Frequency] [Disabled]	

Figure 4-3-2-2 : GT – Power Management Control

RC6 (Render Standby)

Check to enable render standby support.

Maximum GT frequency

Maximum GT frequency limited by the user. Choose between 100MHz (RPN) and 1350MHz (RP0). Value beyond the range will be clipped to min/max supported by SKU

Disable Turbo GT frequency

Enabled : Disables Turbo GT frequency. Disabled : GT frequency is not limited.

4.3.3 PCH-FW Configuration

Advanced	Aptio Setup – AMI	
ME Firmware Version ME Firmware Mode ME Firmware SKU ME Firmware Status 1 ME Firmware Status 2	15.0.30.1776 Normal Mode Corporate SKU 0x91000255 0x39858106	Configure Intel(R) Active Management Technology Parameters
ME State Manageability Features State AMT BIOS Features AMT Configuration ME Unconfig on RTC Clear Extend CSME Measurement to TPM-PCR	[Enabled] [Enabled] [Enabled] [Enabled] [Disabled]	

Figure 4-3-3 : PCH-FW Settings

ME State

When Disabled ME will be put into ME Temporarily Disabled Mode. Manageability Features State

Enable/Disable Intel(R) Manageability features.

NOTE: This option disables/enables Manageability Features support in FW. To disable support platform must be in an unprovisioned state first.

AMT BIOS Features

When disabled AMT BIOS Features are no longer supported and user is no longer able to access MEBx Setup. Note : This option does not disable Manageability Features in FW.

AMT Configuration

Configure Intel (R) Active Management Technology Parameters.

ME Unconfig on RTC Clear

When Disabled ME will not be unconfigured on RTC clear. **Extend CSME Measurement to TPM-PCR**

Enable/Disable Extend CSME Measurement to TPM-PCR[0] and AMT Config to TPM-PCR[1].

4.3.4 Intel[®] Time Coordinated Computing (Intel[®] TCC)

Main	Aptio Setup – AMI	
Intel(R) Time Coordinated Compu	ting (Intel(R) TCC)	Enable or Disable Alignment Check Exception (#AC). When
#AC Split Lock	[Disabled]	enabled, this will assert an
IFU Enable	[Disabled]	#AC when any atomic operation
Intel(R) TCC Authentication Men	1	has an operand that crosses
Intel(R) TCC Mode	[Disabled]	two cache lines.
Intel(R) TCC Mode Affected		
Settings		
IO Fabric Low Latency	[Disabled]	
OPIO Recentering	[Enabled]	

Figure 4-3-4 : Intel(R) Time Coordinated Computing (Intel(R) TCC)

#AC Split Lock

Enable or Disable Alignment Check Exception (#AC). When enabled, this will assert an #AC when any atomic operation has an operand that crosses two cache lines.

IFU Enable

Enable or Disable Instruction Fetch Unit(IFU). When enabled, Instructions will be prefetch to the cache.

Intel (R) TCC Authentication Menu

Intel (R) TCC Authentication Menu options.

Intel (R) TCC Mode

Enable or Disable Intel (R) TCC Mode. When enabled, this will modify system settings to improve real-time performance. The full list of settings and their current state are displayed below when Intel (R) TCC mode is enabled.

IO Fabric Low Latency

Enable or Disable IO Fabric Low Latency. This will turn off some power management in the PCH IO fabrics. This option provides the most aggressive IO Fabric performance setting. S3 state is NOT supported.

OPIO Recentering

Enable or Disable Opio Recentering to improve Pcie latency.

4.3.5 Trusted Computing

Advanced	Aptio Setup – AMI	
TPM 2.0 Device Found		Enables or Disables BIOS
Firmware Version:	7.85	support for security device.
Vendor:	IFX	O.S. will not show Security
Security Device Support	[Enable]	Device. TCG EFI protocol and INT1A interface will not be
Active PCR banks	SHA256	available.
Available PCR banks	SHA-1,SHA256	available.
AVAILADIE FUN DAINS	308-1,308230	
SHA-1 PCR Bank	[Disabled]	
SHA256 PCR Bank	[Enabled]	
Pending operation	[None]	
Platform Hierarchy	[Enabled]	
Storage Hierarchy	[Enabled]	↔: Select Screen
Endorsement Hierarchy	[Enabled]	↑↓: Select Item
TPM 2.0 UEFI Spec Version	[TCG_2]	Enter: Select
Physical Presence Spec Version	[1.3]	+/-: Change Opt.
TPM 2.0 InterfaceType	[TIS]	F1: General Help
Device Select	[Auto]	F2: Previous Values
		E3: Optimized Defaults

Figure 4-3-5 : Trusted Computing

Control the TPM device status and display related information if TPM chip is present.

4.3.6 ACPI Settings

Enables or Disables System ability to Hibernate (OS/S4
Sleep State). This option may not be effective with some
operating systems.
abled] (Suspend to RAM)]

Figure 4-3-6 : ACPI Settings

Enable Hibernation

Enables or Disables System ability to Hibernate (OS/S4 Sleep State). This option may not be effective with some operating systems.

ACPI Sleep State

Select the highest ACPI sleep state the system will enter when the SUSPEND button is pressed.

S3 Video Repost

Enable or Disable S3 Video Repost.

4.3.7 SMART Settings

Advanced	Aptio Setup – AMI	
SMART Settings		Run SMART Self Test on all
SMART Self Test	[Disabled]	HDDs during POST.

Figure 4-3-7 : SMART Settings

SMART Self Test

Run SMART self-test on all HDDs during POST.

4.3.8 IT8786 Super IO Configuration

Aptio Setup – AM Advanced		
IT8786 Super IO Configuration		Set Parameters of Serial Port 1 (COMA)
Super IO Chip > Serial Port 1 Configuration > Serial Port 2 Configuration > Serial Port 3 Configuration > Serial Port 4 Configuration	IT8786	

Figure 4-3-8 : Super IO Settings

4.3.8.1 Serial Port (X) Configuration

Advanced	Aptio Setup – AMI	
Serial Port 1 Configuration		Enable or Disable Serial Port (COM)
Serial Port	[Enabled]	
Device Settings	IO=3F8h; IRQ=4;	
Change Settings	[Auto]	
Interface Mode	[RS-232 Mode]	
High Speed Serial Port	[Disabled]	

Figure 4-3-8-1 : Serial Port (X) Configuration

Serial Port

Enable or Disable Serial Port (COM).

Change Settings

Select an optimal settings for Super IO Device.

Interface Mode

Serial Port Mode Selection; RS-232; RS-422; RS-485; Loop Back; High Speed Serial Port (Only Serial Port 1)

Enable or disable High Speed Serial Port. Note!!! A device driver is required on OS for high speed serial port function.

4.3.9 Hardware Monitor

Advanced	Aptio Setup – AMI	
Pc Health Status System temperature1 System temperature2 CPU temperature Fan1 Speed VCORE DDR +12V +5V +3.3V	: +35 % : +34 % : +46 % : N/A : +1.309 V : +1.188 V : +12.012 V : +4.977 V : +3.337 V	Smart Fan Support. Work with Full Speed if "Smart Fan Support" is Disabled.
Smart Fan Support Smart Fan Mode Start Temperature PWM Start Value(%) Full Speed Temperature	[Enabled] [User] 45 15 90	<pre>**: Select Screen *1: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit</pre>

Figure 4-3-9 : Hardware Monitor and Settings

Smart Fan Support

Smart Fan Support. Work with Full Speed if "Smart Fan Support" is Disabled. **Smart Fan Mode**

Default: Using the default smart fan table. User: Setting parameters by user.

Start Temperature

Temperature Limit value of Fan Start (Degree C). (Range : 10-80)

PWM Start Value (%)

Default PWM Value of Fan. (Range : 15%-100%)

Full Speed Temperature

Temperature Limit value of Fan Full Speed (Degree C). (Range : 50-90)

4.3.10 Serial Port Console Redirection

Aptio Setup – AMI Advanced	
COMO Console Redirection [Disabled] Console Redirection Settings Legacy Console Redirection Legacy Console Redirection Settings Serial Port for Out-of-Band Management/ Windows Emergency Management Services (EMS) Console Redirection EMS [Disabled]	Console Redirection Enable or Disable.

Figure 4-3-10 : Serial Port Console Redirection Settings

Console Redirection

Console redirection enable or disable. Console Redirection Settings

The settings specify how the host computer and the remote computer (which the user is using) will exchange data. Both computers should have the same or compatible settings.

4.3.11 Intel TXT Information

Advanced	Aptio Setup – AMI	
Intel TXT Information		
Chipset BiosAcm Chipset Txt	Production Fused Production Fused Supported	
Cpu Txt	Supported	
Error Code Class Code Major Code Minor Code	None None None None	

Figure 4-3-11 : Intel TXT Information

Display Intel TXT information.

4.3.12 Acoustic Management Configuration

Aptio Setup – AM: Advanced	I
Acoustic Management Configuration	Option to Enable or Disable Automatic Acoustic Management
Acoustic Management Configuration [Disabled] ▶ SATA Controller 0 - PCI Bus 00 Dev 17 Fun 00	

Figure 4-3-12 : Acoustic Management Settings

Acoustic Management Configuration

Option to enable or disable automatic acoustic management.

4.3.13 PCI Subsystem Settings



Figure 4-3-13 : PCI Subsystem Settings

Re-Size BAR Support

If system has Resizable BAR capable PCIe Devices, this option Enables or Disables Resizable BAR Support.

BME DMA Mitigation

Re-enable Bus Master Attribute disabled during Pci enumeration for PCI Bridges after SMM Locked.

4.3.14 USB Configuration

Advanced	Aptio Setup – AMI	
USB Configuration		Enables Legacy USB support. AUTO option disables legacy
USB Module Version	26	support if no USB devices are connected. DISABLE option will
USB Controllers:		keep USB devices available
2 XHCIs		only for EFI applications.
USB Devices:		
1 Drive, 1 Keyboard, 1 Mouse		
Legacy USB Support	[Enabled]	
XHCI Hand-off	[Enabled]	
USB Mass Storage Driver Support	[Enabled]	
USB hardware delays and time-outs:		↔+: Select Screen
USB transfer time-out	[20 sec]	↑↓: Select Item
Device reset time-out	[20 sec]	Enter: Select
Device power-up delay	[Auto]	+/-: Change Opt.
		F1: General Help
		F2: Previous Values
		F3: Optimized Defaults
		F4: Save & Exit
		ESC: Exit

Figure 4-3-14 : USB Settings

Legacy USB Support

Enables Legacy USB support.

AUTO option disables legacy support if no USB devices are connected. DISABLE option will keep USB devices available only for EFI applications. **XHCI Hand-off**

This is a workaround for OSes without XHCI hand-off support. The XHCI ownership change should be claimed by XHCI driver.

USB Mass Storage Driver Support

Enable/disable USB Mass storage driver support.

USB transfer time-out

The time-out value for Control, Bulk, and Interrupt transfers. **Device reset time-out**

USB mass storage device Start Unit command time-out.

Device power-up delay

Maximum time the device will take before it properly reports itself to the host controller. 'Auto' uses default value : for a root port it is 100ms, for a hub port the delay is taken from hub descriptor.

4.3.15 Network Stack Configuration

Advanced		
Network Stack	[Enabled]	Enable/Disable UEFI Network
IPv4 PXE Support	[Disabled]	Stack
IPv4 HTTP Support	[Disabled]	
IPv6 PXE Support	[Disabled]	
IPv6 HTTP Support	[Disabled]	
PXE boot wait time	0	
Media detect count	1	

Figure 4-3-15 : Network Stack Configuration

Network Stack

Enable/disable UEFI Network Stack.

Ipv4 PXE Support

Enable/Disable IPv4 PXE boot support. If disabled, IPv4 PXE boot support will not be available.

Ipv4 HTTP Support

Enable/Disable IPv4 HTTP boot support. If disabled, IPv4 HTTP boot support will not be available.

Ipv6 PXE Support

Enable/Disable IPv6 PXE boot support. If disabled, IPv6 PXE boot support will not be available.

Ipv6 HTTP Support

Enable/Disable IPv6 HTTP boot support. If disabled, IPv6 HTTP boot support will not be available.

PXE boot wait time

Wait time in seconds to press ESC key to abort the PXE boot. Use either +/- or numeric keys to set the value.

Media detect count

Number of times the presence of media will be checked. Use either +/- or numeric keys to set the value.

4.3.16 CSM Configuration

Advanced	Aptio Setup – AMI	
Compatibility Support Module	Configuration	Enable/Disable CSM Support.
CSM Support	[Enabled]	
CSM16 Module Version	N/A, reset required	
GateA20 Active INT19 Trap Response	[Upon Request] [Immediate]	

Figure 4-3-16 : CSM Configuration

CSM Support

Enable/Disable CSM Support.

GateA20 Active

UPON REQUEST - GA20 can be disabled using BIOS services. ALWAYS - do not allow disabling GA20; this option is useful when any RT code is executed above 1MB.

INT19 Trap Response

BIOS reaction on INT19 trapping by Option ROM: IMMEDIATE - execute the trap right away; POSTPONED - execute the trap during legacy boot. Boot option filter

This option controls Legacy/UEFI ROMs priority.

Network

Controls the execution of UEFI and Legacy Network OpROM.

Storage

Controls the execution of UEFI and Legacy Storage OpROM.

Video

Controls the execution of UEFI and Legacy Video OpROM.

Other PCI devices

Determines OpROM execution policy for devices other than Network, Storage, or Video.

4.3.17 NVMe Configuration

Advanced	Aptio Setup – AMI	
NVMe Configuration		
No NVME Device Found		

Figure 4-3-17 : NVMe Configuration

Display NVMe Controller and Drive information.

4.4 Chipset Functions

Aptio Setup – AMI Main Advanced <mark>Chipset</mark> Security Boot Save & Exit	
 System Agent (SA) Configuration PCH-IO Configuration SW Ignition Configuration LVDS Configuration 	System Agent (SA) Parameters

Figure 4-4 : BIOS Chipset Menu

Select Chipset tab to enter chipset BIOS setup options, such as System Agent (SA) Configuration, PCH-IO Configuration, and SW Ignition Configuration.

4.4.1 System Agent (SA) Configuration

Aptio Setup – AMI	
	Memory Configuration Parameters
Supported	

Figure 4-4-1 : System Agent Settings

VT-d

VT-d capability. Above 4GB MMIO BIOS assignment

Enable/disable above 4GB MemoryMappedIO BIOS assignment. This is disabled automatically when aperture size is set to 2048MB.

4.4.1.1 Memory Configuration

Chipset	Aptio Setup – AMI	
Memory Configuration		
Memory RC Version Memory Speed Memory Timings (tCL-tRCD-tRP-tRAS) Controller O Channel O Slot O Size Number of Ranks Manufacturer	2.0.2.0 2133 MT/s 15–15–15–36 Populated & Enabled 8192 MB (DDR4) 1 Kingston	

Figure 4-4-1-1 : Memory Information Display Memory information and configuration.

4.4.1.2 Graphics Configuration

Chipset	Aptio Setup – AMI	
Graphics Configuration		Graphics turbo IMON current values supported (14–31)
Graphics Turbo IMON Current	31	
Skip Scaning of External Gfx Card	[Disabled]	
Primary Display	[Auto]	
External Gfx Card Primary Display C	Configuration	
Internal Graphics	[Auto]	
GTT Size	[8MB]	
Aperture Size	[256MB]	
PSMI SUPPORT	[Disabled]	
DVMT Pre-Allocated	[60M]	
DVMT Total Gfx Mem	[256M]	

Figure 4-4-1-2 : Graphics Settings

Graphics Turbo IMON Current

Graphics turbo IMON current values supported (14-31).

Skip Scaning of External Gfx Card

If Enable, it will not scan for External Gfx Card on PEG and PCH PCIE Ports. **Primary Display**

Select which of IGFX/PEG/PCI Graphics device should be Primary Display Or select HG for Hybrid Gfx.

External Gfx Card Primary Display Configuration

External Gfx Card Primary Display Configuration.

Internal Graphics

Keep IGFX enabled based on the setup options.

GTT Size

Select the GTT Size.

Aperture Size

Select the Aperture Size

Note: Above 4GB MMIO BIOS assignment is automatically enabled when selecting 2048MB aperture. To use this feature, please disable CSM Support. **PSMI SUPPORT**

PSMI Enable/Disable.

DVMT Pre-Allocated

Select DVMT 5.0 Pre-Allocated (Fixed) Graphics Memory size used by the Internal Graphics Device.

DVMT Total Gfx Mem

Select DVMT5.0 Total Graphic Memory size used by the Internal Graphics Device.

4.4.1.3 VMD setup menu

Chipset	Aptio Setup – AMI	
VMD Configuration		Enable/Disable to VMD controller
Enable VMD controller	[Enabled]	
Enable VMD Global Mapping	[Disabled]	

Figure 4-4-1-3 : VMD setup menu

Enable VMD controller

Enable/Disable to VMD controller. Enable VMD Global Mapping

Enable/Disable to VMD Global Mapping.

4.4.1.4 PCI Express Configuration

Aptio Setup — AMI Chipset		
	PCI Express Clock Gating Enable/Disable for each root	
	port.	
[Disabled]		
[Enabled]		
	[Enabled] [Enabled] [Disabled] [Enabled]	

Figure 4-4-1-4 : PCI Express Configuration

PCI Express Clock Gating

PCI Express Clock Gating Enable/Disable for each root port. PCI Express Power Gating

PCI Express Power Gating Enable/Disable for each root port. **Compliance Test Mode**

Enable when using Compliance Load Board.

Enable ClockReq Messaging

Enable or Disable ClockReq Messaging.

PCI Express Configuration (SA)

PCI Express Root Port settings.

4.4.2 PCH-IO Configuration

Chipset	Aptio Setup – AMI	
PCH-IO Configuration		PCI Express Configuration settings
PCI Express Configuration		
SATA And RST Configuration		
Security Configuration		
PCH LAN Controller	[Enabled]	
Wake on LAN Enable	[Enabled]	
State After G3	[S5 State]	

Figure 4-4-2 : PCH-IO Configuration

PCH LAN Controller

Enable/Disable onboard NIC. Wake on LAN Enable

Enable/Disable integrated LAN to wake the system.

State After G3

Specify what state to go to when power is re-applied after a power failure (G3 state).

4.4.2.1 PCI Express Configuration (PCH-IO)

Chipset	Aptio Setup – AMI	
PCI Express Configuration		The control of Active State Power Management of the DMI
DMI Link ASPM Control Native PCIE Enable	[L1] [Disabled]	Link.
М.2 Кеу В	Lane configured as USB/SATA/UFS/GbE	
 M.2 Key E SUMIT A(PCIe x1) 		
 Intel(R) Ethernet Controller I225 Intel(R) Ethernet Controller I219 	Lane configured as USB/SATA/UFS/GbE	
▶ SUMIT B(PCIe ×1)		

Figure 4-4-2-1 : PCI Express Configuration (PCH-IO)

DMI Link ASPM Control

The control of Active State Power Management of the DMI Link. **Native PCIE Enable**

- Bit PCIe Native * control
- 0 ~ Hot Plug
- 1 SHPC Native Hot Plug control
- 2 ~ Power Management Events
- 3 PCIe Advanced Error Reporting control
- 4 PCIe Capability Structure control
- 5 Latency Tolerance Reporting control

PCI Express Root Port (PCH-IO)

PCI Express Root Port Setting.

4.4.2.2 SATA And RST Configuration

Chipset	Aptio Setup – AMI	
SATA And RST Configuration		Enable/Disable SATA Device.
SATA Controller(s) SATA Mode Selection ▶ Software Feature Mask Configuration Aggressive LPM Support	[Enabled] [AHCI] [Disabled]	
Serial ATA Port 0 Software Preserve Port 0 Hot Plug Configured as eSATA External Spin Up Device SATA Device Type Serial ATA Port 1 Software Preserve Port 1 Hot Plug Configured as eSATA External Spin Up Device SATA Device Type	Empty Unknown [Enabled] [Disabled] Hot Plug supported [Disabled] [Disabled] [Hard Disk Drive] 2.5" SATA SSD (256.0GB) SUPPORTED [Enabled] [Disabled] Hot Plug supported [Disabled] [Disabled] [Disabled] [Disabled] [Disabled] [Hard Disk Drive]	<pre>++: Select Screen 1↓: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit</pre>

Figure 4-4-2-2 : SATA And RST Configuration

SATA Controller(s)

Enable or disable SATA Device.

SATA Mode Selection

Determines how SATA controllers operate.

Software Feature Mask Configuration

RST Legacy OPROM/RST UEFI driver will refer to the SWFM configuration to enable/disable the storage features.

Aggressive LPM Support

Enable PCH to aggressively enter link power state.

Port (x)

Enable or Disable SATA Port.

Hot Plug

Designates this port as Hot Pluggable.

External

Marks this port as external.

Spin Up Device

If enabled for any of ports Staggerred Spin Up will be performed and only the drives which have this option enabled will spin up at boot. Otherwise all drives spin up at boot.

SATA Device Type

Identify the SATA port is connected to Solid State Drive or Hard Disk Drive.

4.4.2.3 BIOS Security Configuration of PCH-IO

Chipset	Aptio Setup – AMI	
Security Configuration		Enable/Disable the PCH BIOS Lock Enable feature. Required
BIOS Lock	[Enabled]	to be enabled to ensure SMM
Force unlock on all GPIO pads	[Disabled]	protection of flash.

Figure 4-4-2-3 : BIOS Security Settings

BIOS Lock

Enable/Disable the PCH BIOS Lock Enable feature. Required to be enabled to ensure SMM protection of flash.

Force unlock on all GPIO pads

If Enabled BIOS will force all GPIO pads to be in unlocked state.

4.4.3 SW Ignition Configuration

Chipset	Aptio Setup — AMI	
SW Ignition Configuration		[Normal] System power on by power button.
Ignition F/W Version	00.06	[Ignition] System power on by
Current Ignition control method	[Hardware]	ignition pin.
System power on method	[Ignition]	
Delay On Timer (Seconds)	0	
Delay Off Timer (Seconds)	5	
Force Shutdown Timer (Minutes)	1	
Voltage Guard	[Enabled]	
Voltage Guard Lower limit value	9	
Voltage Guard higher limit value	15	

Figure 4-4-3 : SW Ignition Configuration

System power on method

[Normal] System power on by power button. [Ignition] System power on by ignition pin.

Delay On Timer (Seconds)

The delay time after user trigger ignition on signal (Seconds). **Delay Off Timer (Seconds)**

The delay time after user trigger ignition off signal (Seconds). **Force Shutdown Timer (Minutes)**

Used to force cut off system power when OS unable gracefully shutdown system successfully.

Voltage Guard

Voltage Guard enable or disable, only effect on Ignition mode.

Voltage Guard Lower limit value

Voltage Guard lower limit value setting. Range: 9v ~ 40v. **Voltage Guard higher limit value**

Voltage Guard Higher limit value setting. Range: 15v ~ 55v.

4.4.4 LVDS Configuration

Chipset	Aptio Setup – AMI	
LCD Resolution Control LCD Panel Type	[1024x768 LVDS]	Select LCD Panel Resolution 800x600-NLB104SV01L-01 1024x600 LVDS

Figure 4-4-4 : LVDS Panel Settings

LCD Panel Type

Select LCD Panel Resolution.

4.5 Security

Main Advanced Chipset S	Aptio Setup – AM ecurity Boot Save & Exit	I
Password Description		Set Administrator Password
If ONLY the Administrator's then this only limits access only asked for when entering If ONLY the User's password is a power on password and o boot or enter Setup. In Setu have Administrator rights. The password length must be in the following range: Minimum length	s to Setup and is g Setup. is set, then this must be entered to up the User will 3	
Maximum length	20	↔: Select Screen
Administrator Password		↑↓: Select Item
User Password		Enter: Select
		+/-: Change Opt.
		F1: General Help
		F2: Previous Values
HDD Security Configuration:		F3: Optimized Defaults
P1:2.5" SATA SSD 3ME4		F4: Save & Exit
N Oracina Dant		ESC: Exit
▶ Secure Boot		

Figure 4-5 : BIOS Security Menu

Administrator Password Set administrator password.

User Password

Set user password.

4.5.1 HDD Security Configuration

Aptio Setup – AMI Security		
HDD Password Description : Allows Access to Set, Modify and Clear Hard Disk User Password and Master Password. User Password is mandatory to Enable HDD Security. If Master password is installed (optional), it can also be used to unlock the HDD. If the 'Set User Password' option is hidden, do power cycle to enable the option again. HDD PASSWORD CONFIGURATION:		Set HDD User Password. *** Advisable to Power Cycle System after Setting Hard Disk Passwords ***. Discard or Save changes option in setup does not have any impact on HDD when password is set or removed. If the 'Set HDD User Password' option is hidden, do power cycle to enable the option again
Security Supported : Security Enabled : Security Locked : Security Frozen : HDD User Pwd Status: HDD Master Pwd Status : Set User Password Set Master Password	Yes No No NOT INSTALLED INSTALLED	<pre>++: Select Screen f↓: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit</pre>

Figure 4-5-1 : HDD Security Settings

Set User Password

Set HDD user password.

*** Advisable to power cycle system after setting hard disk passwords ***. Discard or save changes option in setup does not have any impact on HDD when password is set or removed. If the 'Set HDD User Password' option is hidden, do power cycle to enable the option again.

Set Master Password

Set HDD Master Password.

*** Advisable to Power Cycle System after Setting Hard Disk Passwords *** Discard or Save changes option in setup does not have any impact on HDD when password is set or removed. If the 'Set HDD Master option' is hidden, user might have entered setup with user HDD Security privilege(expected) or else do power cycle to enable the option again.

4.5.2 Security Boot

Aptio Setup – AMI Security		
System Mode	Setup	Secure Boot feature is Active if Secure Boot is Enabled,
Secure Boot	[Enabled] Not Active	Platform Key(PK) is enrolled and the System is in User mode. The mode change requires
Secure Boot Mode ▶ Restore Factory Keys ▶ Reset To Setup Mode	[Standard]	platform reset
▶ Key Management		

Figure 4-5-2 : Security Boot Settings

Secure Boot

Secure Boot feature is Active if Secure Boot is Enabled, Platform Key (PK) is enrolled and the System is in User mode. The mode change requires platform reset.

Secure Boot Mode

Secure Boot mode options : Standard or Custom.

In Custom mode, Secure Boot Policy variables can be configured by a physically present user without full authentication.

Restore Factory Keys

Force System to User Mode. Install factory default Secure Boot key databases. **Reset To Setup Mode**

Delete all Secure Boot key databases from NVRAM.

Key Management

Enables expert users to modify Secure Boot Policy variables without full authentication.

4.6 Boot Function

Main Advanced Chipset Secu	Aptio Setup – AMI rity <mark>Boot</mark> Save & Exit	
Boot Configuration Setup Prompt Timeout Bootup NumLock State Quiet Boot	<mark>1</mark> [Off] [Disabled]	Number of seconds to wait for setup activation key. 65535(0xFFFF) means indefinite waiting.
Boot Option Priorities		
Boot Option #1	[UEFI: USB, Partition 1 (USB)]	
Boot Option #2	[Windows Boot Manager (P1: 2.5" SATA SSD 3ME4)]	
Boot Option #3	[UEFI: Built-in EFI Shell]	++: Select Screen

Figure 4-6 : BIOS Boot Menu

Setup Prompt Timeout

Number of seconds to wait for setup activation key. 65535(0xFFFF) means indefinite waiting.

Bootup NumLock State

Select the keyboard NumLock state.

Quiet Boot

Enables or disables quiet boot option. **Boot Option Priorities**

Sets the system boot order.

4.7 Save & Exit

Aptio Setup – AM Main Advanced Chipset Security Boot Save & Exit	I
Save Options	
Save Changes and Exit	
Discard Changes and Exit	
Save Changes and Reset	
Discard Changes and Reset	
Save Changes	
Discard Changes	
Default Options	
Restore Defaults	
Save as User Defaults	
Restore User Defaults	++: Select Screen
	↑↓: Select Item
Boot Override	Enter: Select
UEFI: Built-in EFI Shell	+/-: Change Opt.
UEFI: USB, Partition 1 (USB)	F1: General Help
Windows Boot Manager (P1: 2.5" SATA SSD 3ME4)	F2: Previous Values
	F3: Optimized Defaults
	F4: Save & Exit
	ESC: Exit

Figure 4-7 : Save & Exit Menu

Save Changes and Exit

Exit system setup after saving the changes. **Discard Changes and Exit**

Exit system setup without saving any changes.

Save Changes and Reset

Reset the system after saving the changes. **Discard Changes and Reset**

Reset system setup without saving any changes.

Save Changes

Save changes done so far to any of the setup options. **Discard Changes**

Discard changes done so far to any of the setup options. **Restore Defaults**

Restore/load default values for all the setup options. **Save as User Defaults**

Save the changes done so far as user defaults. **Restore User Defaults**

Restore the user defaults to all the setup options.



APPENDIX A : Watchdog Function

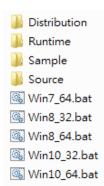
A.1 Software Package contain

 \cdot Distribution folder include x32 and x64 versions, use batch file for installation. There are included as fallowed:

Win10_32.bat, and Win10_64.bat: Installation for driver, and Uninstall_32.bat, and Uninstall_64.bat: Uninstallation for driver Run batch file as Administrator.

Make sure Windows version before installation.

- Header folder include head file for software developer or System Integration.
- · Manual folder include API description.
- Sample folder include sample program, driver library, and API library for Windows/Linux
- Source folder include sample program source code that compile on Visual Studio 2008/Ubuntu18.04.

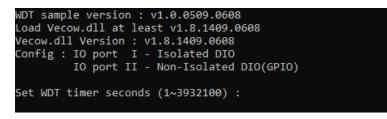


A.2 Sample

Execute demo tool.



Sample, as shown below :



Vecow_WDT



APPENDIX B : Software Functions

B.1 Driver API Guide

In Header folder, Vecow.h and VecowLinux.h contain usabled API for Windows/Linux.

BOOL get_WDT(DWORD *WDT)

Get watchdog timer setup.

• WDT: watchdog timer setup.

Unit: second (Range: 0 ~ 65535 sec, 1093 ~ 65535 min (=65580 ~ 3932100 sec)). Return:

TRUE (1): Success.

FALSE (0): Fail (Initial error, or call by pointer error, or hardware problem).

BOOL set_WDT(DWORD WDT)

Set watchdog timer setup.

• WDT: watchdog timer setup.

Unit: second (Range: 0 ~ 65535 sec, 1093 ~ 65535 min (=65580 ~ 3932100 sec)).

Return:

TRUE (1): Success. FALSE (0): Fail (Initial error, or setup 0, or hardware problem).

BOOL cancel_WDT()

Cancel watchdog timer.

Return:

TRUE (1): Success. FALSE (0): Fail (Initial error or hardware problem). FALSE (0): Fail (Driver not exists, or version is too old, or out of range error).

BOOL config_COMPORT(BYTE *PORT_NUM)

Set COMPORT configuration.

• PORT_NUM: Usable COMPORT number.

Range: 1~6.

Return:

TRUE (1): Success.

FALSE (0): Fail (Initial error, or setup 0, or hardware problem).

BOOL set_COMPORT_mode(BYTE port, BYTE mode, BYTE term) Set COMPORT mode.

• port: which port set. Range: 1~6. • mode: Usable COMPORT number.

0: RS232 mode; 1: RS422-5Wire mode.

2: RS422-9Wire mode; 4: RS485 mode.

4: Loopback mode.

• term: Termination enable for RS422/RS485 mode.

1: Enable; 0: Disable.

Return:

TRUE (1): Success.

FALSE (0): Fail (Initial error or hardware problem).

BOOL get_COMPORT_mode(BYTE port, BYTE *mode, BYTE term)

Get COMPORT mode.

• port: which port get.

Range: 1~6.

• mode: Usable COMPORT number.

0: RS232 mode; 1: RS422-5Wire mode.

2: RS422-9Wire mode; 4: RS485 mode.

4: Loopback mode.

• term: Termination enable for RS422/RS485 mode.

1: Enable; 0: Disable.

Return:

TRUE (1): Success.

FALSE (0): Fail (Initial error or hardware problem).



APPENDIX C: Power Consumption

Testing Board	RES-5000	
RAM	32GB * 1	
USB-1 : (USB 2.0)	USB Micsoft Wired Keyboard 600	
USB-2 : (USB 2.0)	USB Mouse HP G1K28AA	
SATA 0	Transcend SATA SSD420 128GB	
LAN 1 (i219)	1.0 Gbps	
LAN 2 (i225)	1.0 Gbps	
Graphics Output	DP	
Power Plan	Balance (Windows10 Power plan)	
Power Source	Chroma 62006P-100-25	

C.1 Intel[®] Core[™] i7-1185G7E 2.8GHz (12M Cache, up to 4.40 GHz)

					Power on and boot to Win 10 (64-bit)				
CPU	Power Input	Standby Mode		Sleep Mode		idle status CPU usage less 3%			
		Max Current	Max Consumption	Max Current	Max Consumption	Max Current	Max Consumption		
Core™ i7- 1185G7E	9V	0.380A	03.42W	0.399A	03.59W	1.870A	16.83W		
	12V	0.328A	03.94W	0.317A	03.81W	1.575A	18.90W		
	24V	0.167A	04.00W	0.207A	04.96W	0.779A	18.69W		
	55V	0.116A	06.36W	0.144A	07.93W	0.409A	22.50W		

CPU		Power on and boot to Win10 (64-bit)					
	Power Input		0% CPU with 2D	Run 100% CPU usage with 3D			
		Max Current	Max Consumption	Max Current	Max Consumption		
	9V	3.345A	30.10W	3.863A	34.77W		
Core™ i7-	12V	2.452A	29.42W	2.429A	29.15W		
1185G7E	24V	1.269A	30.46W	1.320A	31.68W		
	55V	0.617A	33.91W	0.634A	34.88W		



APPENDIX D : Supported Memory & Storage List

D.1 Test Item

Testing Board	RES-5000	
Memory Test	MemTest86 V8.2	
BurnIn Test	BurnInTest Pro V8.1 (build 1025)	

	Channel	Memory Test	Burn-in Test	Flash BIOS	Remove Battery	Sleep	Hibernate	Reset	CPU-Z
*	1(DIMM 1)	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS

D.2 Supported Non-ECC Memory List

Brand	Info	Test Temp.(Celsius)
innodisk 32G DDR4-3200 SO-DIMM	M4S0- BGS2OCEM-H03	25°C
innodisk 32G DDR4-3200 SO-DIMM	M4S0- BGS2O5EM-H03	25°C
innodisk 16G DDR4-3200 SO-DIMM	M4S0- AGS1O5EM-H03	25ºC
SL-Link 16GB DDR4-3200 SODIMM	J4AGSH1G8TMFC	25°C
SL-Link 32GB DDR4-3200 SODIMM	J4BGSH2G8TMFC	25°C
SL-Link 8GB DDR4-3200 SODIMM	J4AGSH1G8TMEC	25°C
innodisk 16GB DDR4-2666 SODIMM	M4S0-AGS1O5IK-H03	25ºC
SL-Link 16GB DDR4-2666 SODIMM	J4AGSH1G8QHFC	25°C
SL-Link 32GB DDR4-2666 SODIMM	J4BGSS2G8QHXI	25°C

D.3 Supported Storage List

Туре	Brand	Model	Capacity
M.2 SSD	innodisk	M.2 (P42) 3TE6	256GB
	Transcend	SSD370 TS64GSSD370	64GB
	innodisk	3MG2-P DGS25-64GD81BC1QC	64GB
	Innouisk	3TE7 DES25-B56DK1GC3QL-H03	256GB
	Kingston	SA400S371120G	120GB
		SUV400S37	120GB
SATA SSD	Intel	SSD E 5400s SSDSC2KR120H6	120GB
	MEMXPRO	M3A MI3MA1212802WN	128GB
	FORESEE	S903S128G	128GB
	FORESEE	S903S256G	256GB
	LITE-ON	K8-L1256	256GB
	LITE-ON	K8-L1512	512GB



For further support information, please visit www.vecow.com

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