# AMD Ryzen<sup>TM</sup> Embedded V1807B Processor Al Computing System with NVIDIA® Tesla®/Quadro®/GeForce®/AMD Graphics, High Performance



# **Record of Revision**

Version	Date	Page	Description	Remark
1.00	2021/05/07	All	Official Release	

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# **Order Information**

Model	GigE LAN	SSD Tray	PCle x8	USB 3.1	USB 2.0	СОМ	DP	System Fan
MIG-1000	2	1	1	2	2	2	4	Y

# **Optional 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
PWS-480W-WT	480W, 24V, 90V AC to 305V AC Power Supply, Wide-Temp, IP65
PWS-600W	600W, 24V, 90V AC to 305V AC Power Supply
PWS-600W-WT	600W, 28.8V, 90V to 305V AC Power Supply, Wide Temperature -40°C to +70°C
PWS-1000W-24V	1000W, 24V, 90V AC to 264V AC Power Supply

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# 1

# **GENERAL INTRODUCTION**

#### **1.1 Overview**

Vecow MIG-1000 Series is an AMD-based AI Computing System. Integrating Ryzen<sup>™</sup> embedded V1807B APU and NVIDIA<sup>®</sup> Tesla<sup>®</sup>/Quadro<sup>®</sup>/GeForce<sup>®</sup>/AMD Radeon<sup>™</sup> Graphics, Vecow MIG-1000 delivers outstanding computing and graphics performance.

Paired with AMD Radeon<sup>™</sup> Vega 11 Graphics, MIG-1000 supports up to 4K resolution at 60fps on 4 DisplayPort displays and provides 3D graphics quality to deliver breakthrough performance. This compact AI Computing engine allows limitless scalability functionalities. It features 2 GigE LAN, 1 SSD Tray, 2 USB 3.1, 2 COM, and PCIe x16 expansion that supports up to 750W power budget for advanced graphics computing performance.

Featuring AMD "Zen" CPU and "Vega" GPU architectures in a SoC solution, industrial-grade reliability and smart power budget up to 750W, Vecow MIG-1000 is your ideal solution for Autonomous Vehicles, Medical Imaging, Smart Manufacturing, Deep Learning, Gaming, Traffic Vision and any AloT/Industry 4.0 applications.

#### **1.2 Features**

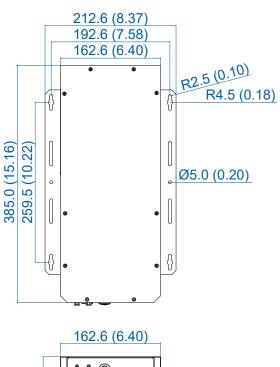
- 4-core 8 threads AMD Ryzen<sup>™</sup> Embedded V1807B APU running with integrated AMD Radeon<sup>™</sup> Vega 11 Graphics serves the performance AMD Zen CPU and Vega GPU architectures in SoC solution
- 2 DDR4 3200MHz memory, up to 64GB
- 0°C to 60°C Operating Temperature with CPU fan
- 4 DisplayPort support up to 4 independent 4K/60 fps displays and 4K Decode & Encode
- 9V to 55V wide range DC Power Input
- PCIe x16 expansion supports up to 750W Power Budget for independent 2-slot graphics card
- When PCIe Graphic card is installed, internal APU will not be able to function.

### 1.3 Specifications of MIG-1000

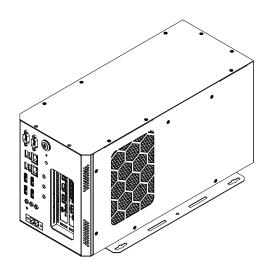
System					
Processor	AMD Ryzen™ Embedded V1807B APU				
Chipset	SoC integrated				
BIOS	AMI				
SIO	F81865F				
Memory	2 DDR4 3200MHz SO-DIMM, up to 64GB				
I/O Interface					
Serial	2 COM RS-232				
USB	• 2 USB 3.0 • 2 USB 2.0				
LED	HDD, Power				
Expansion					
PCle	1 PCIe x16 Slot				
Graphics					
Graphics Processor	AMD Radeon™ Vega 11 Graphics				
Interface	4 DisplayPort : Up to 4096 x 2160 @60Hz				
Storage					
SATA 1 SATA III (6Gbps)					
M.2	1 M.2 Key M Socket (2280, PCIe x4)				
Audio					
Audio Codec	Realtek <sup>®</sup> ALC662, 5.1 Channel HD Audio				
Audio Interface	1 Mic-in, 1 Line-out, 1 Line-in				
Ethernet					
LAN 1	Realtek RTL8111G GigE LAN				
LAN 2	Realtek RTL8111G GigE LAN				
Power					
Power Input	9V to 55V, DC-in				
Power Interface	2-pin Terminal Block : V+, V-				
Others					
HW Monitor	Monitoring temperature, voltages. Auto throttling control when CPU overheats.				

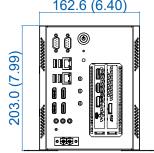
Software Support				
OS	Windows 10, Windows 7, Linux			
Mechanical				
Dimension (W x D x H)	162.6mm x 203.6mm x 385.0mm (6.4" x 8.02" x 15.16")			
Weight	5.3 kg (11.45 lb)			
Mounting	Wallmount by mounting bracket			
Environment				
Operating Temperature	0°C to 60°C (32°F to 147°F)			
Storage Temperature	-40°C to 85°C (-40°F to 185°F)			
Humidity	5% to 95% humidity, non-condensing			
Relative Humidity	95% at 60°C			
Shock	<ul> <li>IEC 61373 : 2010</li> <li>Railway Applications : Rolling Stock Equipment, Shock and Vibration Tests</li> </ul>			
EMC	CE, FCC, EN50155, EN50121-3-2			

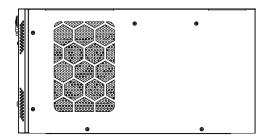
#### **1.4 Mechanical Dimension**



Unit : mm (inch)









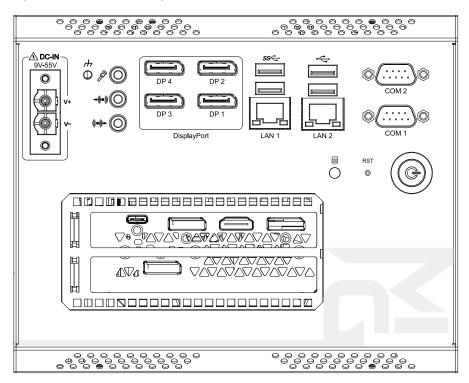
# **GETTING TO KNOW YOUR MIG-1000**

#### 2.1 Packing List

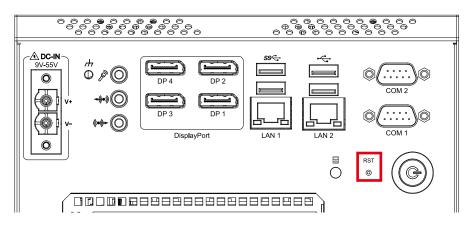
Item	Description								
1	MIG-1000								
Item	Description	Outlook	Usage	P/N	Qty				
1	PHILLPIS M4x16L with washer, Ni	S.	Mount	53-24D6416-30B	4				
2	M3x4 Screw	A PA	HDD	53-M006350-010	4				
3	Phillips F-Head M3*5 Z.B+Ny	4	Wall mount	53-M004950-310	6				
4	M3x4L, Ni	*	M.2 Slot	53-2426204-80B	1				
5	Terminal block 2-pin (10.16mm)		Switch	51-2701R02- R1Q	1				
6	MIG-1000 BP to GPU Cable	$\sim$	Cable	61-1400011-010	1				

#### 2.2 Front Panel I/O Functions

In Vecow MIG-1000 series family, all I/O connectors are located on front panel and rear panel. Most of the general connections to computer device, such as USB, LAN Jack, Audio, COM, DC-IN, Display Port and any additional Graphic Card, are placed on the front panel.

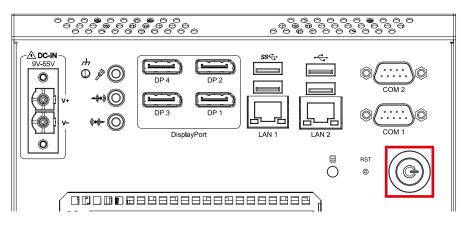


#### 2.2.1 Reset Tact Switch



It is a hardware reset switch. Use this switch to reset the system without power off the system. Press the Reset Switch for a few seconds, then reset will be enabled.

#### 2.2.2 Power Button



The Power Button is a non-latched switch with single color LED indication. It indicates power status S0.

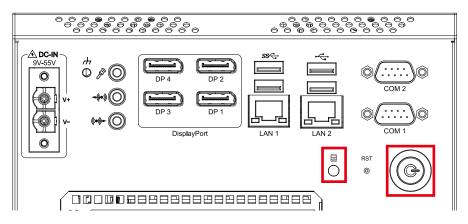
To power on the system, press the power button and then the Green LED is lightened.

To power off the system, you can either command shutdown by OS operation, or just simply press the power button.

If system error, you can just press the power button for 4 seconds to shut down the machine directly.

Please do note that a 4-second interval between each 2 power-on/power-off operation is necessary in normal working status. (For example, once turning off the system, you have to wait for 4 seconds to initiate another power-on operation).

#### 2.2.3 PWR & HDD LED Indicator

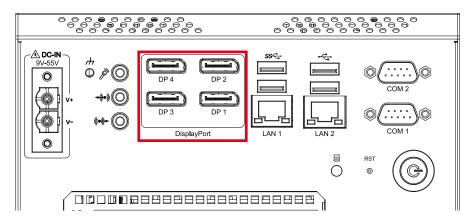


HDD LED/Green : A Hard Disk LED. If the LED is on, it indicates that the system's storage is functional. If it is off, it indicates that the system's storage is not functional. If it is flashing, it indicates data access activities.

Power LED/Green : If the LED is solid green, it indicates that the system is powered on.

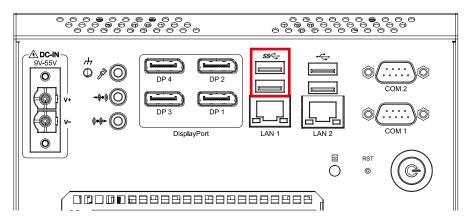
LED Color	Indication	System Status	
Green	HDD	<ul><li>On/Off : Storage status, function or not.</li><li>Twinkling : Data transferring.</li></ul>	
Green	Power	System power status (on/off)	

#### 2.2.4 DisplayPort



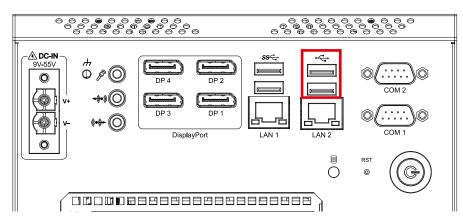
These DisplayPort are for DisplayPort monitor or other DisplayPort compatible devices.

#### 2.2.5 USB 3.0



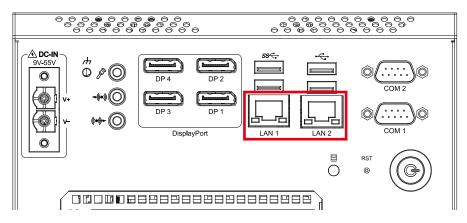
These 9-pin USB ports are for USB 3.0 devices.

#### 2.2.6 USB 2.0



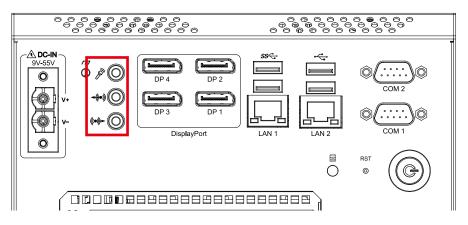
These 4-pin USB ports are for USB 2.0/1.1 devices.

#### 2.2.7 Ethernet Port



These ports allow Gigabit connection to Local Area Network (LAN) through a network hub.

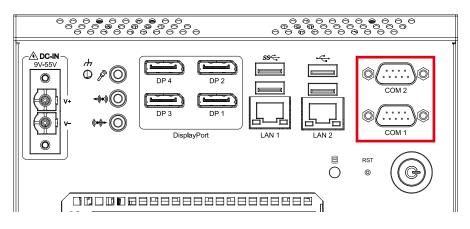
#### 2.2.8 Audio Connector



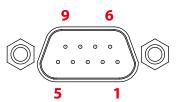
Line In port (light blue) : This port connects to the CD, DVD player, or other audio sources.

Line Out port (lime) : This port connects to a headphone or a speaker. Microphone Port (pink) : This port connects to a microphone.

#### 2.2.9 Serial Port

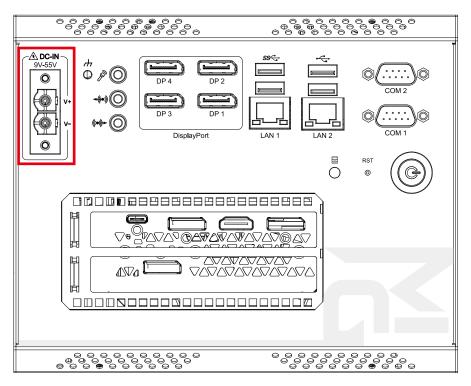


These 9-pin COM ports are for RS-232 devices. The pin assignments are listed in the following :



Pin No.	Description	Pin No.	Description		
1	Data carrier detect	2	Receive data		
3	Transmit data	4	Data terminal ready		
5	Signal ground	6	Data set ready		
7	Request to send	8	Clear to send		
9	Ring indicator				

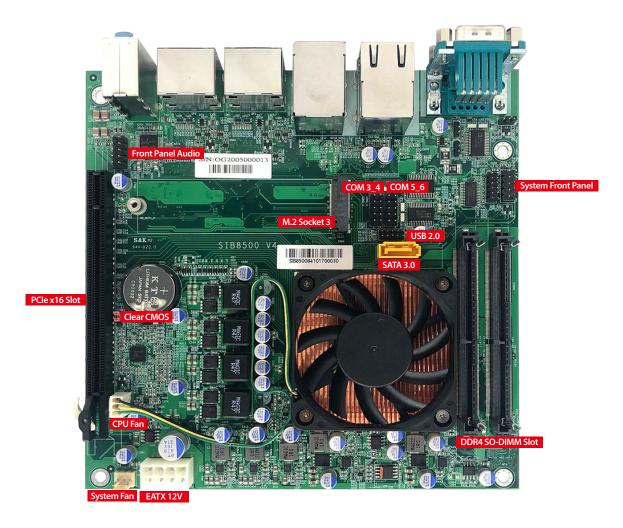
2.2.10 DC-in

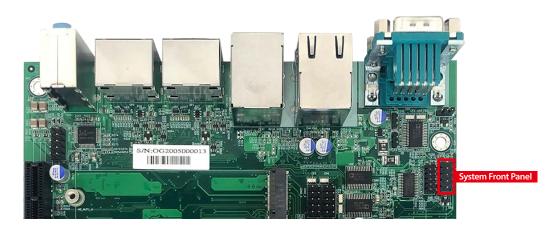


This 2-pin DC-in support 9V~55V DC power input.

#### 2.3 Main Board Expansion Connectors

2.3.1 Inside View of MIG-1000 Main Board with Connector Location



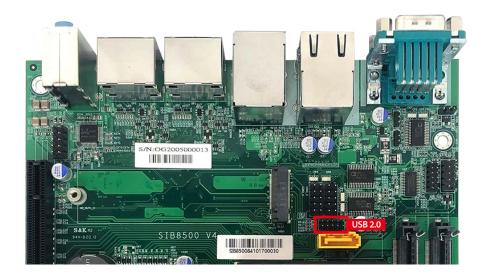


#### 2.3.2 System Front Panel Connector (10-1pin)

	Pin No.	Description	Pin No.	Description
2 10	1	HDD LED +	2	Power LED +
00000	3	HDD LED -	4	Power LED -
	5	Reset	6	GND
1	7	GND	8	Power ON
	9	NC	10	

#### 2.3.3 USB 2.0 Pin Header (2.0mm pitch)

1 x USB 2.0 pin headers support additional 2 USB 2.0 ports



		Pin No.	Description	Pin No.	Description
2	10	1	USB Power	2	USB Power
0000	0 0	3	D-	4	D-
	0 0	5	D+	6	D+
1		7	GND	8	GND
		9	GND	10	GND

#### 2.3.4 DDR4 SO-DIMM Slot

2 x SO-DIMMs, Max. 32GB, DDR4 3200MHz/2400MHz \* Support dual channel memory



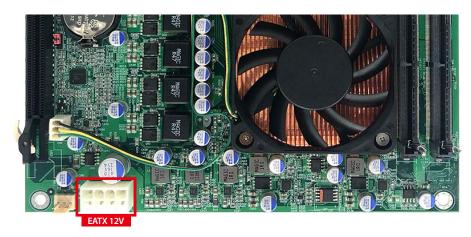
#### 2.3.5 SATA 6.0Gb/s Connectors

These connectors connect to Serial ATA 6.0 Gb/s Hard disk drives via Serial ATA 6.0 Gb/s signal cables.



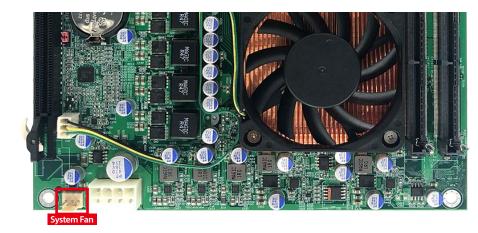
#### 2.3.6 ATX Power Connectors (8-pin EATX 12V)

This port connects to power supply. Power connector defined.



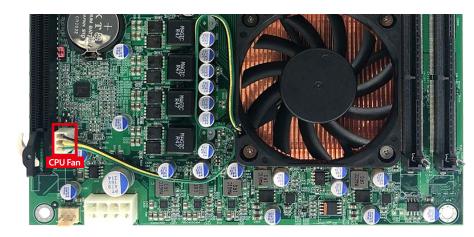
	Pin No.	Signal	Pin No.	Signal
	1	Ground	2	Ground
	3	Ground	4	Ground
5 8	5	+12V	6	+12V
	7	+12V	8	+12V

#### 2.3.7 System Fan Connector (3-Pin)



	Pin No.	Description
1 00 3	1	GND
	2	FAN_PWR
	3	FAN_PWM

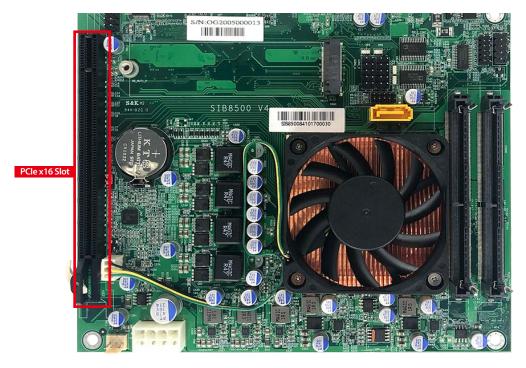
#### 2.3.7 CPU Fan Connector (3-Pin)



	Pin No.	Description
1 00 3	1	GND
	2	FAN_PWR
	3	FAN_PWM

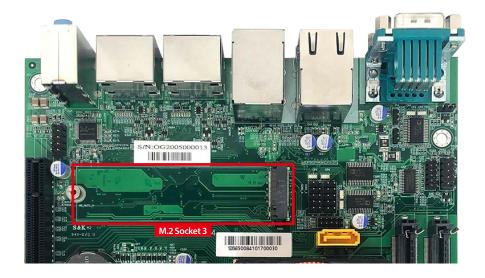
#### 2.3.8 PCle x16 Slot

This mainboard has one PCI Express 3.0/2.0 x16 slot (with PCIe Gen3 x8 lane) that supports PCI Express 3.0/2.0 x16 graphics cards complying with the PCI Express specifications.



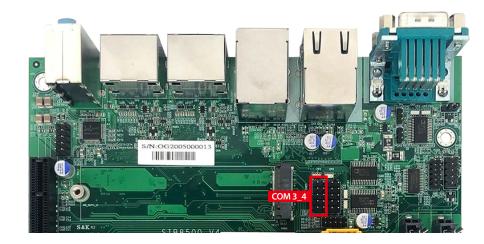
#### 2.3.9 M.2 Socket3

Support M Key type 2280 Storage devices. (PCIe x4 mode)



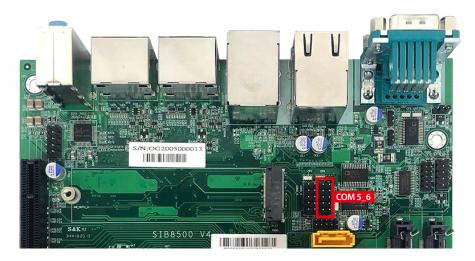
#### 2.3.10 COM Ports Connectors (COM3\_4)

This port connects to power supply. Power connector defined.



	Pin No.	Description	Pin No.	Description
2 10	1	C3_CTSC#	2	C4_CTSD#
00000	3	C3_RXC	4	C4_RXD
	5	C3_TXC	6	C4_TXD
1	7	C3_RTSC#	8	C4_RTSD#
	9	GND	10	GND

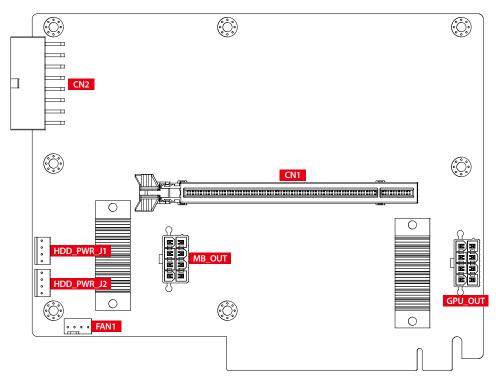
#### 2.3.11 COM Ports Connectors (COM5\_6)



	Pin No.	Description	Pin No.	Description
2 10	1	C5_CTSC#	2	C6_CTSD#
00000	3	C5_RXC	4	C6_RXD
	5	C5_TXC	6	C6_TXD
1	7	C5_RTSC#	8	C6_RTSD#
	9	GND	10	GND

#### 2.4 Main Board Expansion Connectors

2.4.1 Top View (Component Side) of MIG-1000-BP Backplane With Connector Location



#### 2.4.1.1 CN2 : DC Input Power Connector

	Pin No.	Definition	Pin No.	Definition
	1	GND	2	GND
	3	GND	4	GND
	5	+12V	6	+12V
	7	+12V	8	+12V
16 9	9	GND	10	GND
	11	GND	12	GND
	13	+12V	14	+12V
	15	+12V	16	+12V

Pin No.	Definition	Pin No.	Definition
1	GND	2	GND
3	GND	4	GND
5	+12V	6	+12V
7	+12V	8	+12V

#### 2.4.1.2 MB\_OUT : DC Output for Motherboard Power Connector

#### 2.4.1.3 GPU\_OUT : DC Output for Graphic Card Power Connector

Pin No.	Definition	Pin No.	Definition
1	GND	2	GND
3	GND	4	GND
5	+12V	6	+12V
 7	+12V	8	+12V

#### 2.4.1.4 FAN1 : Fan Connector

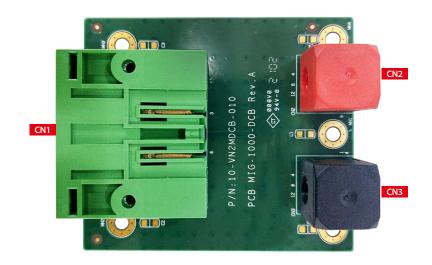
	Pin No.	Fuction
	1	GND
4 0 0 0 0 1	2	+12V (2A max)
	3	NC
	4	NC

#### 2.4.1.5 HDD\_PWR\_J1, HDD\_PWR\_J2 : SATA Power Connector

	Pin No.	Definition	Pin No.	Definition
1 0 0 0 0 4	1	+12V	2	GND
	3	GND	4	+5V

#### 2.4.2 DC- in Board Connectors

MIG-1000-DCB support 9V~55V DC power input by wire-to-board connector on the top side.



#### 2.4.2.1 CN1 : DC Input Power Connector

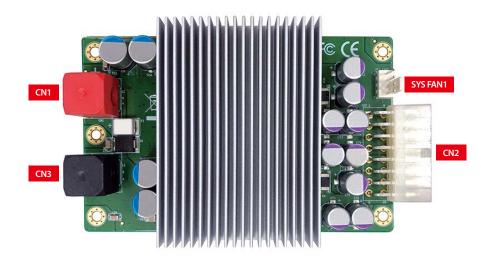
	Pin No.	Definition
	1	V+
	2	V-

#### 2.4.2.2 CN2: DC Output Power Connector

Pin No.	Definition
CN2	DC_OUT
CN3	GND

#### 2.4.3 Power Board Connectors

Wide range power module WPM-120 support 9V~55V DC Input power module, 12V output (750W).



#### 2.4.3.1 CN1, CN3 : DC Input Power Connector

Connector	Description
CN1	VIN +
CN3	VIN -

#### 2.4.3.2 CN2: DC Output Power Connector

	Pin No.	Definition	Pin No.	Definition
	1	GND	2	GND
	3	GND	4	GND
	5	+12V	6	+12V
	7	+12V	8	+12V
12 H	9	GND	10	GND
(T) (B)	11	GND	12	GND
8 16	13	+12V	14	+12V
	15	+12V	16	+12V

#### 2.4.3.3 SYS FAN : Fan Connector

The pin assignments of SYS FAN is listed in the following table.

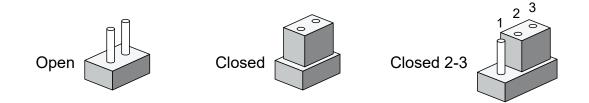
<b>4</b>	Pin No.	Definition	Pin No.	Definition
2	1	GND	2	NC
1	3	NC	4	+12V

#### 2.5 Main Board Jumper Settings



The figure below is the top view of the system main board which is the main board. It shows the location of the jumpers and the switches.

You may configure your card to match the needs of your application by setting jumpers. A jumper is a metal bridge used to close an electric circuit. It consists of two metal pins and a small metal clip (often protected by a plastic cover) that slides over the pins to connect them. To "close" a jumper, you connect the pins with the clip. To "open" a jumper, you remove the clip. Sometimes a jumper will have three pins, labeled 1, 2 and 3. In this case you would connect either pins 1 and 2, or 2 and 3.



#### Clear CMOS header (3pin)

1 00 3	Pin No.	Description
	1	VBAT
	2	VBAT_IN
	3	GND

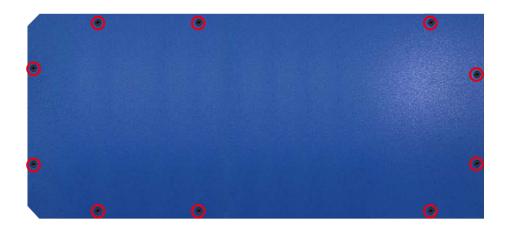
Jump Default 1-2



# **SYSTEM SETUP**

#### 3.1 How to Open Your MIG-1000

**Step 1** Remove Top Cover ten M3x5L screws.



#### Step 2 Fisish.

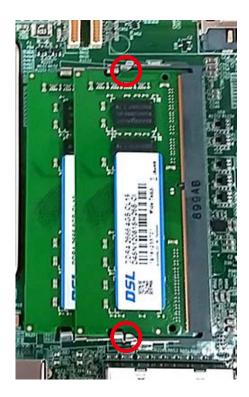


#### 3.2 Installing DDR4 SO-DIMM Modules

Step 1 Install DDR4 RAM module into SO-DIMM slot.



Step 2 Make sure the RAM module is locked by the memory slot.



#### 3.3 Installing M.2 (Key M)

**Step 1** Install M.2 card into the M.2 slot.

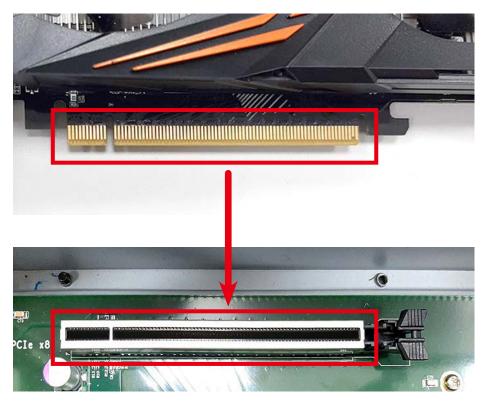


#### Step 2 Fasten one M3 screw.

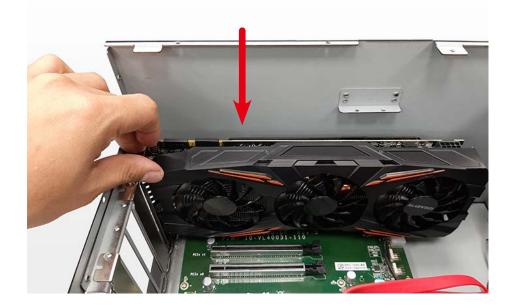


#### 3.4 Installing PCI/PCIe Card

**Step 1** Please align the gold finger of the PCIe card with the slot.

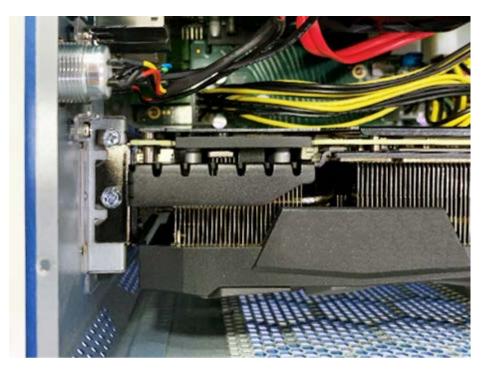


**Step 2** Press down the graphics card.







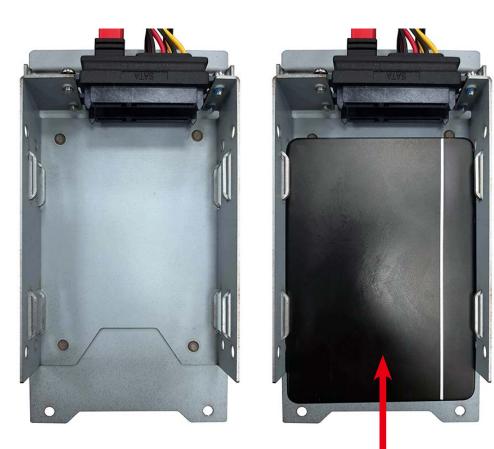


# 3.5 Installing SSD/HDD

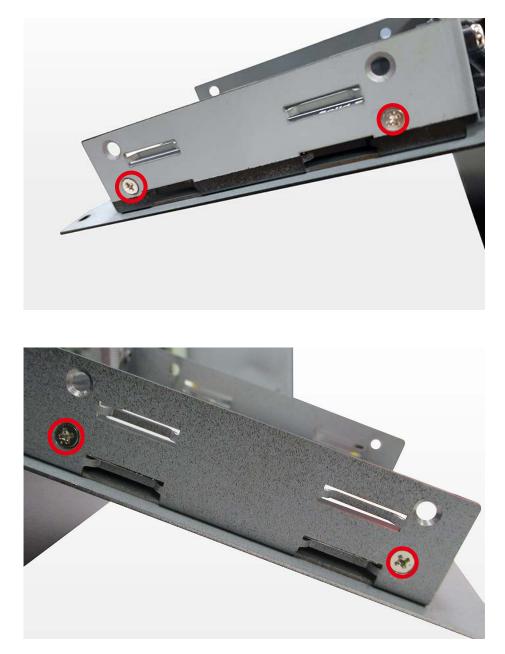
Step 1 Open HDD/SSD tray.



**Step 2** Push the HDD/SSD into the slot.



## Step 3 Fasten four M3 screw.



# 3.6 Installing Antenna Cable

Step 1 Check Antenna cable and washers.

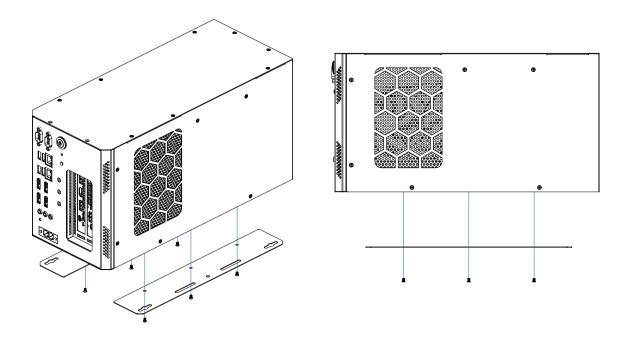


**Step 2** Put Antenna cable connector into the hole on rear panel and fasten the washer 1, washer 2 and washer 3 on Antenna cable connector.

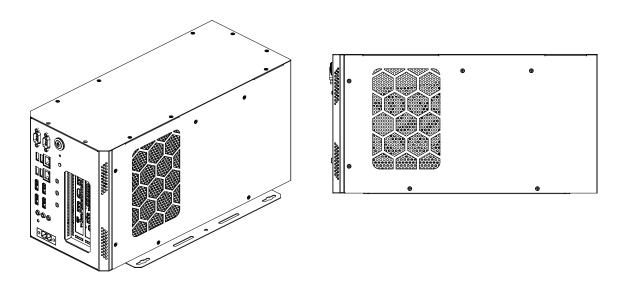


## 3.7 Mount Your MIG-1000

**Step 1** Ensure the screw holes on the right and left side of upper case match the ones on MIG-1000 wall mount bracket.



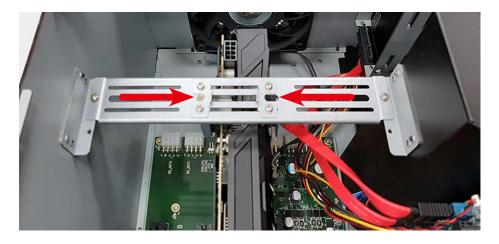
**Step 2** Fasten Six M3 screws then finish.



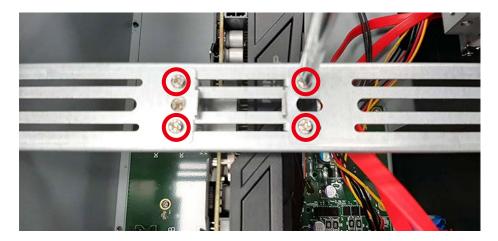
# 3.8 Installing Hold-down Kit



Step 1 Hold two brackets to the graphics card.



Step 2 Fasten four M3 screws.





# **BIOS SETUP**

# 4.1 Entering BIOS Setup

Aptio Setup Uti Main Advanced Chipset Sec	lity – Copyright (C) 2021 Americ Urity Boot Save & Exit	an Megatrends, Inc.
BIOS Information		Choose the system default
BIOS Vendor	American Megatrends	language
Core Version Compliancy	5.13 UEFI 2.7; PI 1.6	
Project Version	0ACKF 0.08 ×64	
Build Date and Time	03/09/2021 18:06:17	
Access Level	Administrator	
Memory Information		
Total Memory	Total Memory: 4096 MB (DDR4)	
System Language	16 mg 1 ds(h)	
		++: Select Screen
System Date	[Sun 01/01/2017]	↑↓: Select Item
System Time	[00:03:27]	Enter: Select
		+/-: Change Opt.
		F1: General Help F2: Previous Values
		F3: Optimized Defaults
		F4: Save & Exit
		ESC: Exit

Figure 4-1 : Entering Setup Screen

BIOS provide an interface for user to check and change system configuration. The BIOS setup program is accessed by pressing the <Del> key when POST display output then main BIOS Setup menu screen is displayed.

# 4.2 Main Menu

Main Advanced Chipset Se		and a second
BIOS Information		Choose the system default
BIOS Vendor	American Megatrends	language
Core Version	5.13	
Compliancy	UEFI 2.7; PI 1.6	
Project Version	0ACKF 0.08 ×64	
Build Date and Time	03/09/2021 18:06:17	
Access Level	Administrator	
Memory Information		
Total Memory	Total Memory: 4096 MB (DDR4)	
System Language	[Einglish]	
		++: Select Screen
System Date	[Sun 01/01/2017]	↑↓: Select Item
System Time	[00:03:27]	Enter: Select +/-: Change Opt. F1: General Help

Figure 4-2 : BIOS Main Menu

The main menu displays BIOS version and system information. There are two options on Main menu.

#### System Date

Set the date. Use <Tab> to switch between date elements.

#### System Time

Set the time. Use <Tab> to switch between time elements.

## 4.3 Advanced

AMD CBS	AMD CBS Setup Page
AMD PBS	
Tls Auth Configuration	
Trusted Computing	
AMD fTPM configuration	
ACPI Settings	
IDE Configuration	
Demo Board	
Hardware Monitor	
CPU Configuration	
SIO Configuration	
PCI Subsystem Settings	
Network Stack Configuration	
CSM Configuration	++: Select Screen
Debug Port Table Configuration	↑↓: Select Item
NVMe Configuration	Enter: Select
SDIO Configuration	+/-: Change Opt.
USB Configuration	F1: General Help
	F2: Previous Values
	F3: Optimized Defaults

Figure 4-3 : BIOS Advanced Menu

Select advanced tab to enter advanced BIOS setup options, such as CPU configuration, SATA configuration, and USB configuration, or etc.

## 4.3.1 AMD CBS Related Information

- Zen Common Options - DF Common Options - UMC Common Options - NBIO Common Options	AMD CBS	Zen Common Options
UMC Common Options	Zen Common Options	
	DF Common Options	
NBID Common Options	UMC Common Options	
	NBIO Common Options	

Figure 4-3-1 : AMD CBS Related Information Menu

## 4.3.1.1 Zen Common Options

Zen Common Options		From a workaround for GCC/C000005 issue for XV
RedirectForReturnDis	[Auto]	on CZ AO, setting MSRC001
L2 TLB Associativity	[Auto]	Decode Configuration (DE_
Platform First Error Handling	[Auto]	bit 14
Core Performance Boost	[Auto]	[DecfgNoRdrctForReturns]
Global C-state Control	[Auto]	
Streaming Stores Control	[Auto]	
Enable IBS	[Auto]	

Figure 4-3-1-1 : Zen Common Options Menu

#### **Redirect For ReturnDis**

From a workaround for GCC/C000005 issue for XV Core on CZ A0, setting MSRC001\_1029 Decode Configuration (DE\_CFG) bit 14[DecfgnoRdrctForReturns] to 1.

#### L2 TLB Associativity

0-L2 TLB ways [11:8] are fully associative. 1- =L2 TLB ways [11:8] are 4K only.

#### **Platform First Error Handing**

Enable/disable PFEH, cloak individual banks, and mask deferred error interrupts from each bank.

#### **Core Performance Boost**

AMD Turbo Core Enable/disable.

#### **Global C-state Control**

Controls IO based C-state generation and DF C-State.

#### **Streaming Stores Control**

Enable or disables the streaming stores functionality.

#### Enable IBS

When IBS is enabled, SpecLockMap and Stack Engine are diableed.

## 4.3.1.2 DF Common Options

DF Common Options		Provide a value that is t number of hours to scrub
DRAM scrub time	[Auto]	memory.
Redirect scrubber control	[Auto]	
Disable DF sync flood propagation	[Auto]	
GMI encryption control	[Auto]	
×GMI encryption control	[Auto]	
CC6 memory region encryption	[Auto]	
Location of private memory regions	[Auto]	
System probe filter	[Auto]	
Memory interleaving	[Auto]	
Memory interleaving size	[Auto]	
Channel interleaving hash	[Auto]	
DF C-state control	[Auto]	++: Select Screen
xGMI DLWM control	[Auto]	t↓: Select Item
Freeze DF module queues on error	[Auto]	Enter: Select
		+/-: Change Opt.
		F1: General Help

Figure 4-3-1-2 : DF Common Options Menu

#### **DRAM scrub time**

Provide a value that is the number of hours to scrub memory.

#### **Redirect scrubber control**

Control DF : RedirScrubCtrl [EnRedirScrub].

#### **Disable DF sync flood propagation**

Control DF : PIEConfig [DisSyncFloodProp].

**GMI encryption control** Control GMI link encryption.

## xGMI encryption control

Control xGmi link encryption.

#### CC6 memory region encryption

Control whether or not the CC6 save/restore memory is encrypted.

#### Location of private memory region

Controls whether, or not the private memory regions (PSP, SMU and CC6) are at the top of DRAM or distributed. Note that distributed requires memory on all dies. Note that it will always be the top of DRAM if some dies don't have memory regardless of this option's setting.

#### System probe filter

Controls whether, or not the probe filter is enabled. Has no effect on parts where the probe filter is fuse disabled.

#### **Memory interleaving**

Controls fabric level memory interleaving (AUTO, none, channel, die, socket). Note. That channel, die, and socket has requirement on memory populations and it will be ignored if the memory doesn't support the selected option.

#### Memory interleaving size

Controls the memory interleaving size. The valid values are AUTO, 256 bytes, 512bytes, 1Kbytes or 2Kbytes. This determines the starting address of the interleave (bit8, 9, 10 or 11).

#### **Channel interleaving hash**

Controls whether or not the address bits are hashed during channel interleave mode. This field should not be used unless the interleaving is set to channel and the interleaving size is 256 or 512 bytes.

#### **DF C-state control**

Enable/Disable DF C-states (DF : CstateControl[DfCstateDisable])

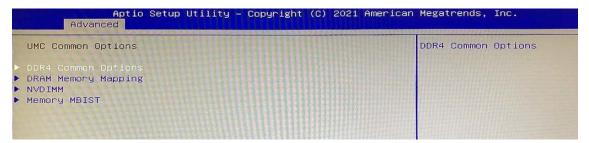
#### xGMI DLWM control

Controls xGMI dynamic link width management feature.

#### Freeze DF module queues on error

Controls DF : DfGlobalCtrl[DisImmSyncFloodOnFatalError]. Disabling this option sets DF : DfGlobalCtrl[DisImmsyncFloodOnFatalError].

## 4.3.1.3 UMC Common Options



#### Figure 4-3-1-3 : UMC Common Options Menu

## 4.3.1.3.1 DDR4 Common Options

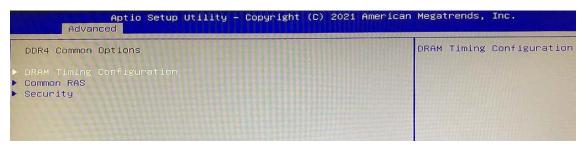


Figure 4-3-1-3-1 : DDR4 Common Options Menu

## 4.3.1.3.1.1 DRAM Timing Configuration

RAM Timing Configuration	I Decline
ARNING - DAMAGE CAUSED BY USE OF	
OUR AMD PROCESSOR OUTSIDE OF	
PECIFICATION OR IN EXCESS OF	
ACTORY SETTINGS ARE NOT COVERED	
NDER YOUR AMD PRODUCT WARRANTY	
ND MAY NOT BE COVERED BY YOUR	
YSTEM MANUFACTURER'S WARRANTY.	

Figure 4-3-1-3-1-1 : DRAM Timing Configuration

Display DRAM related information and features supported.

## 4.3.1.3.1.2 Common RAS

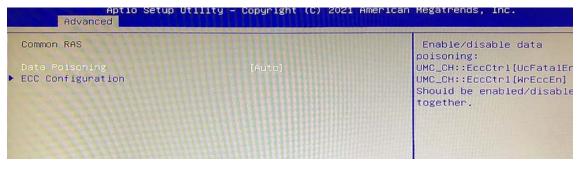


Figure 4-3-1-3-1-2 : Common RAS

#### **Data Poisoning**

Enable/disable data poisoning : UMC\_CH : EccCtrl [UcFataEn] UMC\_CH : EccCtrl [WreEccEN] Should be enabled/disabled together.

## 4.3.1.3.1.3 ECC Configuration

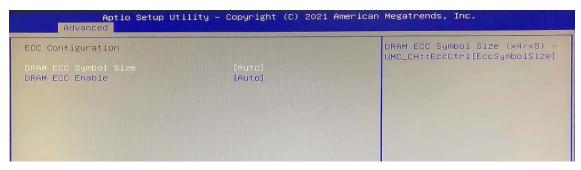


Figure 4-3-1-3-1-3 : ECC Configuration

#### DRAM ECC Symbol Size

DRAM ECC Symbol size (X4/X8)-UMC\_CH : EccCtrl[EccSymbolSize]

#### **DRAM ECC Enable**

Use this option to enable/disable DRAM ECC. Auto will set ECC to enable.

## 4.3.1.3.2 Security

Aptio Setup Uti Advanced	ility — Copyright (C) 2021 American	Megatrends, Inc.
Security		Transparent SME: AddrTwea 1; ForceEncrEn =1; DataEn
TSME	[Auto]	

Figure 4-3-1-3-2 : Security

#### **TSME**

Transparent SME : AddrTweakEN =1; ForceEncrEN =1; DataEncrEn =0.

## 4.3.1.3.3 DRAM Memory Mapping



Figure 4-3-1-3-3 : DRAM Memory Mapping

#### **Chipselect Interleaving**

Interleave memory blocks across the DRAM chip selects for node 0.

#### BankGroupSwap

Enable or disable BankGroupSwap.

#### Address Hash bank

Enable or disable bank address hashing.

#### Address Hash CS

Enable or disable CS address hashing.

#### 4.3.1.3.4 Memory MBIST

Aptio Set Advanced	up Utility – Copyright (C) 2021	American Megatrends, Inc.
Memory MBIST		Enable or disable Memory
	[Auto]	

Figure 4-3-1-3-4 : Memory MBIST

#### **MBIST Enable**

Enable or disable Memory MBIST.

## 4.3.1.4 NBIO Common Options

Aptio Setup Utilit Advanced	y — Copyright (C) 2021 Ama	erican Megatrends, Inc.
NBIO Common Options		GFX Configuration
GFX Configuration		
NB Configuration		
PCIe Configuration		
System Configuration	[Auto]	
Fan Control		
Audio IOs	[MAX HDA / MIN	
	SoundWire]	
System Temperature Tracking	[Auto]	

Figure 4-3-1-4 : NBIO Common Options

## 4.3.1.4.1 GFX Configuration

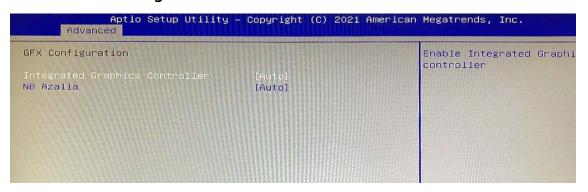


Figure 4-3-1-4-1 : GFX Configuration

#### Integrated Graphics Controller

Enable Integrated Graphics Controller.

#### **NB** Azalia

Enable Integrate HD Audio controller.

## 4.3.1.4.2 NB Configuration

Aptio Setup L Advanced	Jtility – Copyright (C) 2021 Amer.	ican Megatrends, Inc.
NB Configuration		Enable/Disable IOMMU
ТОММИ	[Auto]	

Figure 4-3-1-4-2 : NB Configuration

IOMMU Enable/Disable IOMMU.

## 4.3.1.4.3 PCIe Configuration

PCIe Configuration		No help string
PSPP Policy	[Disabled]	

Figure 4-3-1-4-3 : PCIe Configuration

#### **PSPP Policy**

Select PCIe Speed Power Policy Mode.

## 4.3.1.4.4 System Configuration

Select System Configuration may cause the system to hang, as some system configuration may not be supported by your OPN.

## 4.3.1.4.5 Fan Control

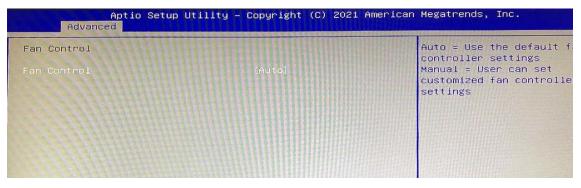


Figure 4-3-1-4-5 : FAN Configuration

Auto = Use the default fan controller settings. Manual = User can set customized fan controller settings. NOTE : There shows Fan Controller by APU.

## 4.3.1.4.6 Audio IOs

Audio IOs control. The default is MAX HDA/MIN Soundwire.

## 4.3.1.4.7 System Temperature Tracking

System Temperature Tracking [0 = Disabled; 1 = Enabled].

## 4.3.1.5 FCH Common Options

Aptio Setup Utility – Copyright (C) 2021 Ame Advanced	
FCH Common Options > SATA Configuration Options > USB Configuration Options > SD (Secure Digital) Options A C Power Loss Options > I2C Configuration Options > Uart Configuration Options > ESPI Configuration Options > ESPI Configuration Options > EMMC Options > LPC Options > System Control	SATA Configuration Optio
	↔+: Select Screen

Figure 4-3-1-5 : FCH Common Options

## 4.3.1.5.1 SATA Configuration Options



Figure 4-3-1-5-1 : SATA Configuration

#### SATA Controller

Disable or enable OnChip SATA controller.

#### SATA RAS Support

Disable or enable OnChip SATA RAS Support.

## SATA Disabled AHCI Prefetch

Disable or enable SATA Disabled AHCI Prefetch.

#### **Aggressive SATA Device Sleep Port 0** Disable or enable Aggressive SATA Device Sleep Port 0.

#### Aggressive SATA Device Sleep Port 1

Disable or enable Aggressive SATA Device Sleep Port 1.

## 4.3.1.5.2 USB Configuration Options

USB Configuration Options		Enable or disable USE controller.
XHCIO controller enable	[Auto]	
XHCI1 controller enable	[Auto]	

Figure 4-3-1-5-2 : USB Configuration

#### **XHCI0** controller enable

Enable or Disable USB3 controller.

# XHCI1 controller enable

Enable or Disable USB3 controller.

## 4.3.1.5.3 SD (Secure Digital) Options

(Secure Digital) Options		Select SD Mode
Configuration Mode	[SdDump]	

Figure 4-3-1-5-3 : SD Options

#### **SD Configuration Mode** Select SD Mode.

## 4.3.1.5.4 AC Power Loss Options

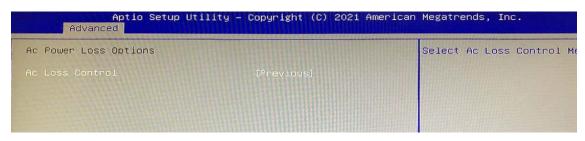


Figure 4-3-1-5-4 : AC Power Loss Options

#### **AC Loss Control**

Select Ac Loss Control Method.

## 4.3.1.5.5 I2C Configuration Options

Aptio Setup Uti Advanced	lity – Copyright (C) 202.	1 American Megatrends, Inc.
I2C Configuration Options		No help string
I2C 0 Enable	[Auto]	
I2C 1 Enable	[Auto]	
I2C 2 Enable	[Auto]	
I2C 3 Enable	[Auto]	
I2C 4 Enable	[Auto]	
I2C 5 Enable	[Auto]	

Figure 4-3-1-5-5 : I2C Configuration Option

#### I2C 0~5 Enable

Enable or Disable I2C 0~5

## 4.3.1.5.6 UART Configuration Options

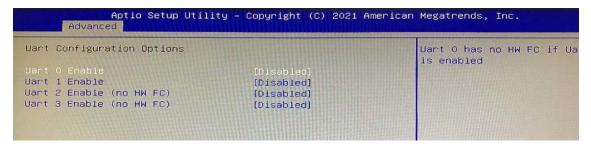


Figure 4-3-1-5-6 : UART Configuration Options

#### **UART 0 Enable**

UART 0 has no HW FC if UART 2 is enabled.

#### **UART 1 Enable**

UART 1 has no HW FC if UART 3 is enabled.

#### **UART 2 Enable (no HW FC)** Enable/Disable UART2.

## UART 3 Enable (no HW FC)

Enable/Disable UART3.

## 4.3.1.5.7 ESPI Configuration Options

Uart Configuration Options		Uart O has no HW FC if Ua is enabled
Jart O Enable	[Disabled]	
Jart 1 Enable	[Disabled]	
Jart 2 Enable (no HW FC)	[Disabled]	
Jart 3 Enable (no HW FC)	[Disabled]	

Figure 4-3-1-5-7 : ESPI Configuration Options

ESPI Enable Enable/Disable ESPI.

## 4.3.1.5.8 eMMc Options

eMMC Options		No help string
eMMC/SD Configure	[Auto]	
Driver Type	[Auto]	
D3 Cold Support	[Auto]	
eMMC Boot	[Auto]	

Figure 4-3-1-5-8 : eMMc Options

#### eMMc/SD Conguration

Select Emmc/SD Mode.

#### **Driver Type**

Bios will select MS driver for SD selections.

## **D3 Cold Support**

Enable/Disable D3 Cold Support.

#### **Emmc Boot**

Enable/Disable Emmc Boot.

## 4.3.1.5.9 LPC Options

Aptio Setup Util Advanced	lity — Copyright (C) 2021 Ame	erican Megatrends, Inc.
LPC Options		No help string

Figure 4-3-1-5-9 : LPC Options

## LPC Clock Run control

Enable/Disable LPC Clock Run control.

## 4.3.1.5.10 System Control

System Control	No help string	
Toggle All PwrGood On Cf9		

Figure 4-3-1-5-10 : System Control

#### **Toggle All PwrGood On Cf9** Enable/Disable Toggle All PwrGood On Cf9.

## 4.3.2 AMD PBS

AMD Firmware Version		Show all of AMD Firmwar
StallForUnlock	[Disabled]	Version
HDT BreakPoint for Boot	[Disabled]	
SW BreakPoint for S3	[Disabled]	
Special Display Features	[Disabled]	
Discrete GPU's Audio	[Disabled]	
Primary Video Adaptor	[Ext Graphics (PEG)]	
HDD Power Enable	[Enabled ]	
ODD Power Enable	[Enabled ]	
SSD Power Enable	[Enabled ]	
Eval Auto Detection	[Disabled]	
SD Power Enable	[Enabled ]	
SD Configuration Mode	[Disabled]	
MITT/WITT Selection	[Both disable]	++: Select Screen
Unused GPP Clocks Off	[Enabled ]	<b>↑↓</b> : Select Item
Clock PM: CLK_REQ4	[Disabled]	Enter: Select
Clock PM: CLK_REQ5	[Enabled ]	+/-: Change Opt.
Clock PM: CLK_REQ6	[Disabled]	F1: General Help
<bc support<="" td=""><td>[Enabled ]</td><td>F2: Previous Values</td></bc>	[Enabled ]	F2: Previous Values
SATA/ M.2 selection	[SATA M.2 ×1]	F3: Optimized Defaults
GBE Port Speed Selection	[1G]	F4: Save & Exit
/DDP voltage	[VDDP voltage (0.9v)]	ESC: Exit
AMD KVM Mouse Protocol	[Auto]	
BLINK LED	[Enabled ]	

Figure 4-3-2 : AMD PBS

## 4.3.2.1 AMD Firmware Version

AMD Firmware Version		
AGESA Version	RavenPI-FP5-AM4 1.1.0.6	
PSP BootLoader Version	0.8.0.46	
PSP SecureOS Version	0.8.0.46	1 million and a state of the state of the
ABL Version	18061520	
APCB Version	0029	
APOB Version	0012	
Ucode Patch Version	810100B	
SMU FW Version	0.30.74.0	
DXIO FW Version	001E.011C	
		→+: Select Screen
XHCI FW Version	37.4.13.47	↑↓: Select Item
VBIOS FW Version	0110	Enter: Select
GOP Driver Version	0	+/-: Change Opt.
		F1: General Help
		F2: Previous Values

Figure 4-3-2-1 : AMD Firmware Version

#### **StallForUnlock**

Enable/Disable StallForUnlock.

HDT BreakPoint for Boot Enable/Disable HDT BreakPoint for Boot.

SW BreakPoint for S3 Enable/Disable SW BreakPoint for S3.

#### **Special Display Features.**

Enable/Disable PowerXpress HybridGraphics.

#### **Discrete GPU's Audio**

Disable Discrete GPU's Audio is enabled or keep its HW default setting.

Primary Video Adaptor Select Internal/External Graphics.

HDD Power Enable Enable or disable the power of HDD.

**ODD Power Enable** Enable or disable the power of ODD.

**SSD Power Enable** Enable or disable the power of SDD.

**Eval Auto Detection** Disable or enable EVAL card auto detection.

**SD Power Enable** Enable or disable the power of SD.

**SD Configuration Mode** Select SD Mode.

MITT/WITT Selection MITT/WITT Selection.

Unused GPP Clocks off Turn Unused GPP Clocks off.

Clock PM: CLK\_REQ4 Enable or disable CLK\_REQ4.

Clock PM: CLK\_REQ5 Enable or disable CLK\_REQ5.

Clock PM: CLK\_REQ6 Enable or disable CLK\_REQ6.

KBC Support Enable or disable KBC Support under OS.

SATA/M.2 Selection The System not supported.

VDDP Voltage VDDP Voltage Setting.

AMD KVM Mouse Protocol Switch KVM Mouse Protocol between Absolut/Simple.

BLINK LED Enable/Disable BLINK LED to identify S3/S4 state.

## 4.3.3 Tls Auth Configuration

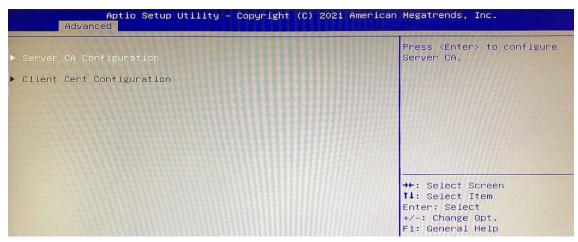


Figure 4-3-3 : Trusted Computing

## 4.3.3.1 Sever CA Configuration

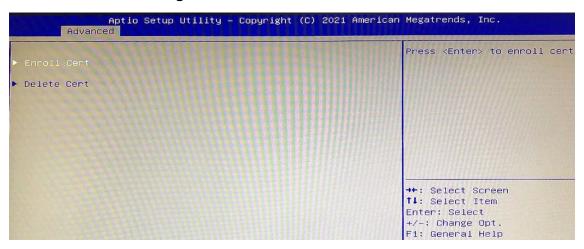


Figure 4-3-3-1 : Sever CA Configuration

#### Enroll Cert or Delete Cert To Enroll Cert or Delete Cert.

## 4.3.3.2 Client Cert Configuration

#### **Display Client Cert Configuration**

## 4.3.4 Trusted Computing

Aptio Setup Utility Advanced	– Copyright (C) 2021 Am∈	erican Megatrends, Inc.
TPM20 Device Found		Enables or Disables BIOS
Firmware Version:	3.21	support for security device
Vendor:	AMD	O.S. will not show Security Device. TCG EFI protocol an
Security Device Support	[Enable]	INT1A interface will not be
Active PCR banks	SHA-1,SHA256	available.
Available PCR banks	SHA-1,SHA256	
SHA-1 PCR Bank	[Enabled]	
SHA256 PCR Bank	[Enabled]	
Pending operation	[None]	
Platform Hierarchy	[Enabled]	
Storage Hierarchy	[Enabled]	++: Select Screen
Endorsement Hierarchy	[Enabled]	↑↓: Select Item
TPM2.0 UEFI Spec Version	[TCG_2]	Enter: Select
Physical Presence Spec Version	[1.3]	+/-: Change Opt.
TPM 20 InterfaceType	[CRB]	F1: General Help
Device Select	[Auto]	F2: Previous Values

Figure 4-3-4 : Trusted Computing

#### **Security Device Support**

Enables or Disables BIOS support for security device.O.S. will not show security Device. TCG EFI protocol and INT1A interface will not be available.

#### SHA-1 PCR Bank

Enable or Disable SHA-1 PCR Bank.

#### SHA256 PCR Bank

Enable or Disable SHA256 PCR Bank.

#### Pending operation

Schedule an Operation for the Security Device. NOTE : Your Computer will reboot during restart in order to change State of Security Device.

Platform Hierarchy Enable or Disable Platform Hierarchy.

**Storage Hierarchy** Enable or Disable Storage Hierarchy.

**Endorsement Hierarchy** Enable or Disable Endorsement Hierarchy.

#### **TPM 2.0 UEFI Spec Version**

Select the TCG2 Spec Version Support, TCG\_1\_2 : the Compatible mode for Win8/Win10, TCG2 : Support new TCG2 protocol and event format for Win10 or later.

#### **Physical Presence Spec Version**

Select to Tell O.S. to support PPI Spec Version 1.2 or 1.3. Note some HCK tests might not support 1.3.

#### **Device Select**

TPM 1.2 will restrict support to TPM 1.2 devices, TPM 2.0 will restrict support to TPM 2.0 devices, Auto will support both with the default set to TPM 2.0 devices if not found, TPM 1.2 devices will be enumerated.

## 4.3.5 AMD fTPM Configuration

Aptio Se Advanced	tup Utility – Copyright	(C) 2021 American	Megatrends, Inc.
AMD fTPM switch	[AMD CPU		To select.0:Auto(Depend on Tcg modudle). 1:Disabled fTPM. 2:OnBoard SPI TPM2.0

Figure 4-3-5 : AMD fTPM Configuration

#### AMD fTPM switch [AMD CPU fTPM]

To select.

- 0 : Auto (Depend on Tcgmodudle).
- 1 : Disabled fTPM.
- 2 : Onboard SPI TPM2.0.

## 4.3.6 ACPI Settings

Advanced	– Copyright (C) 2021 Americ	an Megatrenus, inc.
ACPI Settings		Enables or Disables BIOS AG Auto Configuration.
Enable ACPI Auto Configuration	[Disabled]	
Enable Hibernation	[Enabled]	
ACPI Sleep State	[S3 (Suspend to RAM)]	
Lock Legacy Resources	[Disabled]	

Figure 4-3-6 : ACPI Setting

#### **Enable ACPI Auto Configuration**

Enable/Disable BIOS ACPI Auto Configuration.

#### **Enable Hibernation**

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

#### **ACPI Sleep State**

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

#### Lock Legacy Resources

Enables or Disables Lock of Legacy Resources.

## 4.3.7 IDE Configuration

Advar		- Copyright (C) 202	021 American Megatrends, Inc.	
IDE Configur	ation			
SATA Porto		Not Present		
SATA Port1		Not Present		
SATA Port2		Not Present		
SATA Port3		Not Present		
SATA Port4		Not Present		
SATA Ports		Not Present		

Figure 4-3-7 : IDE Configuration

## IDE Devices Configuration. Shows SATA ports are present state.

## 4.3.8 Demo Board

Aptio Setup Utility Advanced	– Copyright (C) 2021 A	American Megatrends, Inc.
Onboard PCIE LAN PXE ROM AMD CRB EHCI Debug port switch > PCI-E Port	[Enabled] [Disabled]	The Onboard PCIE LAN PXE ROM
		<pre>++: Select Screen f↓: Select Item Enter: Select +/-: Change Opt. F1: General Help</pre>

Figure 4-3-8 : Demo Board

#### **Onboard PCIE LAN PXE ROM**

The System not supported.

## AMD CRB EHCI Debug port Switch

To select 0- disable debug port. 1 -enable EHCI debug port for WHCK –DEBUG Capability test.

#### 4.3.8.1 PCI-E Port

Aptio Setup Uti Advanced	lity – Copyright (C) 2021	American Megatrends, Inc.
PCI-E Port	HILL THE PARTY	Disabled: Skip this page setup
	[Enabled]	item, and use the default CRB
Device 1 Fun 1	[Auto]	setting
ASPM Mode Control	[Auto]	2 8 8 8 2 1 4 8 2 7 7 7 7 7 7 8 9 S L.
Hotplug Mode Control	[Auto]	**************************************
Device 1 Fun 3	[Auto]	1 1 1 1 7 4 4 4 4 4 1 1 1 7 7 7 7 7 7 8 6 6 5 L I I I I
ASPM Mode Control	[Auto]	17744-14415577788-9-8-5-1.
Hotplug Mode Control	[Auto]	
Device 1 Fun 7	[Auto]	1 4 4 4 4 1 4 1 1 3 2 7 7 7 8 4 4 4 5 5 5 7 7 8 4 4 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5
ASPM Mode Control	[Auto]	A A A A A A A A A A A A A A A A A A A
Hotplug Mode Control	[Auto]	I I I I I I I I I I I I I I I I I I I
Device 1 Fun 2	[Auto]	A data a second of the second s
ASPM Mode Control	[Auto]	
Hotplug Mode Control	[Auto]	++: Select Screen
		↑↓: Select Item
		Enter: Select
		+/-: Change Opt.
		F1: General Help
		F2: Previous Values
		E9. Ostimized Defaulte

Figure 4-3-8.1 : PCI-E Port

## PCIe port Control

Disabled or Enabled PCIe Port.

## ASPM Mode Control

NB Root Port ASPM Mode Control.

#### **Hotplug Mode Control**

NB Root Port Hotplug Mode Control.

## 4.3.9 Hardware Monitor

Aptio Setup Ut Advanced	ility – Copyright (C) 2021 f	American Megatrends, Inc.
FAN1 MODE FAN1 RPM	[Auto] [5400 RPM]	FAN1 MODE
FAN2 MODE FAN2 RPM	[Auto] [5400 RPM]	
Pc Health Status		
System temperature1	: +30 %	
System temperature2	: +27 °c	
Fan1 Speed	: 4885 RPM	
Fan2 Speed	: N/A	
VINO	: +0.936 V	
VIN1	: +1.016 V	++: Select Screen
VIN2	: +0.992 V	t↓: Select Item
VINS	: +0.600 V	Enter: Select
VCC3V	: +3.360 V	+/-: Change Opt.
VSB3V	: +3.392 V	F1: General Help
VBAT	: +0.448 V	F2: Previous Values F3: Optimized Defaults F4: Save & Exit

Figure 4-3-9 : Hardware Monitor

The F81865 SIO features an enhanced hardware monitor providing thermal, fan speed and system voltages status monitoring.

#### FAN MODE

Auto = Use the default fan controller settings. Manual = User can set customized fan controller settings.

#### FAN RPM

There are 5 segments of FAN PRM.

## 4.3.10 CPU Configuration

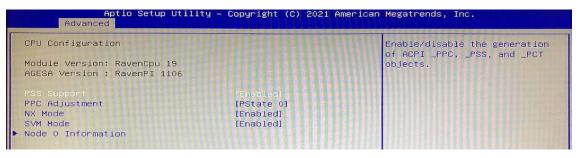


Figure 4-3-10 : CPU Configuration

CPU Configuration Parameters.

#### **PSS Support**

Enable/disable the generation of ACPI\_PPC, \_PSS, and \_PCT objects.

#### PPC Adjustment

Provide to adjust \_PPC object.

#### NX Mode

Enable/disable No-execute page protection Function.

#### SVM Mode

Enable/disable CPU Virtualization.

#### Node 0 Information

Display CPU related information

## 4.3.11 SIO Configuration

Advanced Advanced	
AMI SIO Driver Version : A5.07.03 Super IO Chip Logical Device(s) Configuration [*Active*] Serial Port 1 [*Active*] Serial Port 2 [*Active*] Serial Port 3 [*Active*] Serial Port 4 [*Active*] Serial Port 5 [*Active*] Serial Port 6	View and Set Basic properties of the SIO Logical device. Like IO Base, IRQ Range, DMA Channel and Device Mode.
WARNING: Logical Devices state on the left side of the control, reflects the current Logical Device state. Changes made during Setup Session will be shown after you restart the system.	↔: Select Screen †∔: Select Item

Figure 4-3-11 : SIO Configuration

#### Serial Port 1 Configuration Set Parameters of Serial Port 1 (COM1).

Serial Port 2 Configuration Set Parameters of Serial Port 2 (COM2).

Serial Port 3 Configuration Set Parameters of Serial Port 3 (COM3).

#### Serial Port 4 Configuration Set Parameters of Serial Port 4 (COM4).

Serial Port 5 Configuration

Set Parameters of Serial Port 5 (COM5).

#### **Serial Port 6 Configuration**

Set Parameters of Serial Port 6 (COM6).

## 4.3.12 PCI Subsystem Settings



Figure 4-3-12 : PCI Subsystem Settings

#### Above 4G Decoding

Globally Enables or Disables 64bit capable Devices to be Decoded in Above 4G Address Space (Only if System Supports 64 bit PCI Decoding).

#### **SR-I0V Support**

If system has SR-I0V capable PCIe Devices, this option Enables or disables Single Root IO Virtualization Support.

#### **BME DMA Mitigation**

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

## 4.3.13 Network Stack Configuration

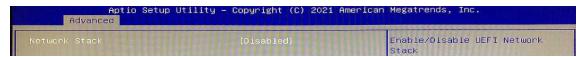


Figure 4-3-13 : Network Stack Configuration
Network Stack

Enable/Disable UEFI Network Stack.

## 4.3.14 CSM Configuration

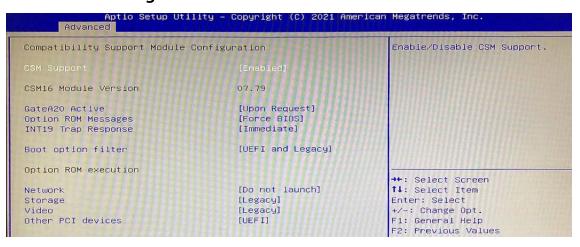


Figure 4-3-14 : CSM Configuration

## **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.

Option ROM Messages Set display mode for Option ROM.

**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 PXE 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.

## 4.3.15 Debug Port Table Configuration

Debug Port Table		Debug Port Table
Debug Port Table	[Disabled]	
Debug Port Table 2	[Disabled]	
		HARD HER BURGER

Figure 4-3-15 : Debug Port Table Configuration

## Debug Port Table

Enable/Disable Debug Port Table.

## 4.3.16 NVMe Configuration

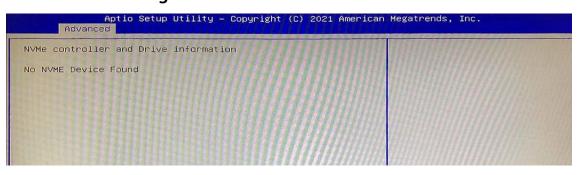


Figure 4-3-16 : NVMe Configuration

Display NVMe Controller and drive information.

## 4.3.17 SDIO Configuration

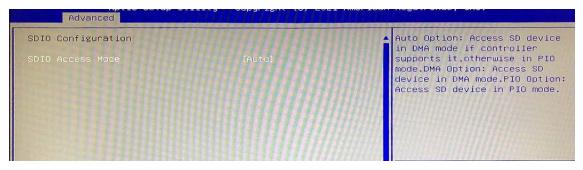


Figure 4-3-17 : SDIO Configuration

#### **SDIO Access Mode**

Auto Option : Access SD device in DMA mode if controller supports it, otherwise in PIO mode. DMA Option : Access SD device in DMA mode. PIO Option : Access SD device inPIO mode.

## 4.3.18 USB Configuration

Aptio Setup Utility – Advanced	Copyright (C) 2021 American	Megatrends, Inc.
USB Configuration		Enables Legacy USB support. AUTO option disables legacy
USB Module Version	19	support if no USB devices are connected. DISABLE option will
USB Controllers: 2 XHCIs		keep USB devices available only for EFI applications.
USB Devices: 2 Drives, 1 Keyboard		
Legacy USB Support XHCI Hand-off	[Enabled] [Enabled]	
USB Mass Storage Driver Support	[Enabled]	
USB hardware delays and time-outs:		++: Select Screen
USB transfer time-out	[20 sec]	11: Select Item
Device reset time-out Device power-up delay	[20 sec] [Auto]	Enter: Select +/-: Change Opt.
Device power-up derag	[Hato]	F1: General Help
Mass Storage Devices:		F2: Previous Values
Generic Flash Disk 8.07	[Auto]	F3: Optimized Defaults
SanDisk	[Auto]	F4: Save & Exit
		ESC: Exit
		14 Million and the second second

Figure 4-3-18 : USB Configuration

#### Legacy USB Support

Enables Legacy USB support.

AUTO option disables legacy support if no USB devices are connected. ISABLE 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 100 ms, for a Hub port the delay is taken from Hub descriptor.

# 4.4 Chipset Function

	Security Boot Save & Exi	21 American Megatrends, Inc. t
South Bridge GFX Configuration North Bridge		South Bridge Parameters

Figure 4-4 : Chipset Function

## 4.4.1 South Bridge

Chipset		
AMD Reference Code Version :	RavenPI-FP5-AM4 1.1.0.6	Options For SB USB Configuration
SB Power Saving		
<ul> <li>SB Debug Configuration</li> </ul>		

Figure 4-4-1 : South Bridge

## 4.4.1.1 SB USB Configuration

	Aptio Setup Utility – Copyright (C) 2021 Am Chipset	merican Megatrends, Inc.
XHCIO Port O	[Enabled]	Enabled/Disabled XHCIO Port
XHCIO Port 1	[Enabled]	O(XHCI/EHCI)
XHCIO Port 2	[Enabled]	
XHCIO Port 3	[Enabled]	
XHCI1 Port 0	[Enabled]	
XHCI1 Port 1	[Enabled]	

Figure 4-4-1-1 : SB USB Configuration

#### XHCI Port 0~3

Enable/Disabled XHCI0 Port0 (XHCI/EHCI).

#### XHCI port 0~1

Enable/Disabled XHCI0 Port0 (XHCI/EHCI).

## 4.4.1.2 SB Power Saving

Aptio Setu Chipset	o Utility – Copyright (C) 2021 f	American Megatrends, Inc.
AB Clock Gating	[Auto]	Enable/Disable AB Internal
PCIB Clock Run	[Auto]	Clock Gating

Figure 4-4-1-2 : SB Power Saving

## **AB Clock Gating**

Enable/Disable AB Internal Clock Gating.

#### **PCIB Clock Rum**

Enable The Auto Clkrun Functionality.

## 4.4.1.3 SB Debug Configuration



Figure 4-4-1-3 : SB Debug Configuration

**SB SATA DEBUG Configuration** Options For SATA DEBUG Configuration.

**SB FUSTION DEBUG Configuration** Options For SB FUSTION DEBUG Configuration.

**SB SPI DEBUG Configuration** Options For SB SPI DEBUG Configuration.

**SB Device D3 DEBUG Configuration** Options For Device D3 DEBUG Configuration.

**SB MISC DEBUG Configuration** Options For SB MISC DEBUG Configuration.

## 4.4.2 GFX Configuration

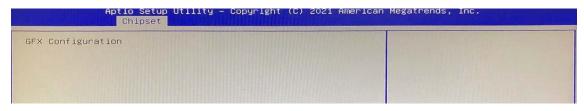


Figure 4-4-2 : GFX Configuration

## 4.4.3 North Bridge



Figure 4-4-3 : GFX Configuration

View Information related to Socket 0.

# 4.5 Security

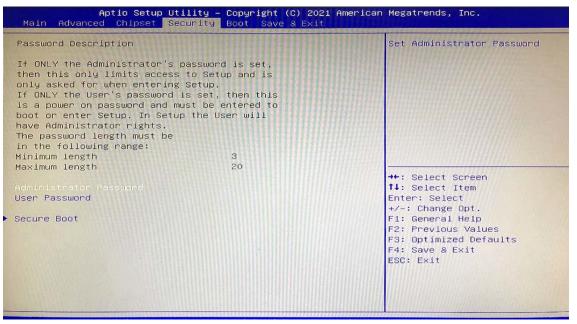


Figure 4-5 : Security

#### **Administrator Password**

Set administrator password.

User Password Set user password.

#### **Secure Boot**

Secure Boot configuration.

# 4.6 Boot Functions

Boot Configuration		Number of seconds to wait for
Setup Prompt Timeout Bootup NumLock State	1 [On]	setup activation key. 65535(0×FFFF) means indefinite
Quiet Boot	[Enabled]	waiting.
Boot Option Priorities		
Boot Option #1	[UEFI: Generic Flash Disk 8.07, Partition 1]	
Boot Option #2	[UEFI: SanDisk, Partition 1]	
Boot Option #3	[Generic Flash Disk 8.071	
Fast Boot	[Enabled]	
SATA Support	[Last Boot HDD Only]	++: Select Screen
VGA Support	[EFI Driver]	↑↓: Select Item
USB Support	[Full Initial]	Enter: Select
PS2 Devices Support	[Enabled]	+/-: Change Opt.
NetWork Stack Driver Support	[Disabled]	F1: General Help
Redirection Support	[Disabled]	F2: Previous Values F3: Optimized Defaults
New Boot Option Policy	[Default]	F4: Save & Exit ESC: Exit
Hard Drive BBS Priorities		

Figure 4-6 : Boot Functions

#### **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 #x**

Sets the system boot order.

#### **Hard Drive BBS Priorities**

Set the order of the legacy devices in this group.

## 4.7 Save & Exit

#### 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.

Default 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 : Power Consumption**

Testing Board	MIG-1000
RAM	16GB * 2
USB 1	USB Micsoft Wired Keyboard 600
USB 2	USB Mouse HP G1K28AA
USB 3	USB Flash Transecnd 3.0 8GB
USB 4	USB Flash Transecnd 3.0 16GB
SATA 0	Transcend SATA SSD420 128GB
LAN 1 (RTL8111G)	1.0 Gbps
LAN 2 (RTL8111G)	1.0 Gbps
Graphics output	DP
Power Plan	Balance (Windows10 Power plan)
Power Source	Chroma 62006P-100-25
Test Program 1	BurnInTest
Test Program 2	FurMark

# A.1 AMD Ryzen<sup>™</sup> Embedded V1807B (2M Cache, up to 3.80GHz)

Power on and boot to Win 10 64-bit

				Power on and boot to Win10 64-bit			
CPU	Power		by Mode	Sleep Mode		idle status CPU usage less 3%	
			Max Consumption	Max Current	Max Consumption	Max Current	Max Consumption
	9V	0.157A	01.89W	0.180A	02.16W	0.975A	11.70W
AMD Embedded	12V	0.108A	02.59W	0.104A	02.50W	0.532A	12.77W
V1807B	24V	0.067A	02.40W	0.073A	02.64W	0.371A	13.36W
	55V	0.054A	02.94W	0.052A	02.87W	0.256A	14.08W

		Power on and boot to Win10 64-bit				
CPU	Power Input	Run 100% CPU usage with 2D		Run 100% CPU usage with 3D		
		Max Current	Max Consumption	Max Current	Max Consumption	
	9V	5.054A	60.64W	5.158A	61.90W	
AMD Byzop™	12V	2.720A	65.28W	2.812A	67.49W	
Ryzen™ V1807B	24V	1.961A	70.60W	1.990A	71.64W	
	55V	1.125A	61.88W	1.216A	66.86W	

# A.2 AMD Ryzen<sup>™</sup> Embedded V1807B Add GeForce RTX 3090

Power on and boot to Win 10 64-bit

CPU Power Input				Power on and boot to Win10 64-bit			
				Sleep Mode		idle status CPU usage less 3%	
			Max Consumption	Max Current	Max Consumption	Max Current	Max Consumption
	9V	0.168A	02.02W	0.195A	02.34W	5.524A	66.28W
	12V	0.106A	02.55W	0.110A	02.63W	2.961A	71.06W
Ryzen™ V1807B	24V	0.071A	02.57W	0.076A	02.74W	1.941A	69.89W
	55V	0.053A	02.93W	0.055A	03.00W	1.216A	66.87W

		Power on and boot to Win10 64-bit				
CPL	Power Input	Run 100% CPU usage with 2D		Run 100% CPU usage with FurMark		
		Max Current	Max Consumption	Max Current	Max Consumption	
	9V	7.976A	95.71W	41.258A	495.10W	
	12V	4.041A	96.99W	20.535A	492.84W	
Ryzen™ V1807B	24V	2.535A	91.26W	13.965A	502.74W	
	55V	1.833A	100.79W	9.125A	501.88W	



# APPENDIX B : Supported Memory & Storage List

# **B.1 Supported Memory List**

Testing Board	MIG-1000	
Memory Test	MemTest86 V8.4	
BurnInTest	BurnInTest Pro V8.1 (build 1025)	

## **Tset Item**

Channel	Memtest	Bunin	Flash BIOS	Remove Battery
*2	PASS	PASS	PASS	PASS
*1 (Socket 1)	PASS	PASS	N/A	PASS
*1 (Socket 2)	PASS	PASS	N/A	PASS

# **B.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	25°C
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	25°C
SL-Link 16GB DDR4-2666 SODIMM	J4AGSH1G8QHFC	25°C
SL-Link 32GB DDR4-2666 SODIMM	J4BGSS2G8QHXI	25°C

# **B.3 Supported Storage Device List**

Туре	Brand	Model	Capacity
	Kingston	SUV500/120G	120GB
	Intel	540s SSDSC2KW120H6	120GB
	Intel	E5400s SSDSC2KR120H6	120GB
	FORESEE	S903S128G	128GB
SATA SSD	WD	GREEN WDS240G2G0A	240GB
	SAMSUNG	860 EVO MZ-76E250	250GB
	FORESEE	S903S256G	256GB
	LITE-ON	K8-L1256	256GB
	LITE-ON	K8-L1512	512GB
	Innodisk	M.2 (P80) 3TE6 DEM28-01TDD1ECAQF-H03	1TB
		M.2 (P80) 3TG3-P DGM28-02TDA1ECBEH-H03	2TB
	Intel	760P SSDPEKKW128G8	128GB
M.2 PCle SSD	SAMSUNG	970 EVO PLUS MZ-V7S250	250GB
	FORESEE	FSGPMMC-256G	256GB
	TOSHIBA	KXG50ZNV512G	512GB
	Kingston	SA1000M8	240GB
	Kingston	SA2000MB	500GB



# **APPENDIX C : Graphics Benchmark**

# **C.1** Performance Test

3DMAF	RK (v2-16-7117)	RTX 2080	RTX 3090
	Time Spy Extreme Score	3578	5023
Time Spy Extreme	Graphics Score	3893	9465
Time Spy Extreme (V1.2)	CPU Score	1419	1373
	Resolution (screen)	3840 x 2160	3840 x 2160
	Time Spy Score	7690	9823
Time Spy	Graphics Score	10236	15136
(V1.2)	CPU Score	3193	3287
	Resolution (screen)	3840 x 2160	3840 x 2160
PORT ROYAL	Port Royal Score	5976	6909
(V1.2)	Resolution (screen)	3840 x 2160	3840 x 2160
	Fire Strike Extreme Score	6067	9882
	Graphics score	6199	11370
Fire Strike Ultra (V1.1)	Physics score	9979	9768
(VI.I)	Combined score	3474	5033
	Resolution (screen)	3840 x 2160	3840 x 2160
	Fire Strike Ultra Score	10420	14483
Fine Otailee Fortunate	Graphics Score	12304	21561
Fire Strike Extreme (V1.1)	Physics Score	9870	9696
(VI.I)	Combined Score	5047	5322
	Resolution (screen)	3840 x 2160	3840 x 2160
	Fire Strike Score	15636	17609
	Graphics Score	24291	32788
Fire Strike (V1.1)	Physics Score	9951	9702
(VI.I)	Combined Score	5554	5419
	Resolution (screen)	3840 x 2160	3840 x 2160
Wild Life Unlimited	Wild Life Unlimited Score	45608	48776
(V1.0)	Resolution (screen)	3840 x 2160	3840 x 2160
	Night Raid Score	22126	21927
Night Raid	Graphics Score	52119	51653
(V1.1)	CPU Score	5193	5146
	Resolution (screen)	3840 x 2160	3840 x 2160

\*\* If more help is needed, please contact Vecow Technical Support.



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

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