

User Manual

-							

AIR-300

Fanless Embedded Box PC



Attention!

Please note:

This package contains a hard-copy user manual in Chinese for China CCC certification purposes. There is an English user manual included as a PDF file on the CD. Please disregard the Chinese hard copy user manual if the product is not to be sold and/or installed in China.

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Product Warranty (2 years)

Advantech warrants to you, the original purchaser, that each of its products will be free from defects in materials and workmanship for two years from the date of purchase.

This warranty does not apply to any products which have been repaired or altered by persons other than repair personnel authorized by Advantech, or which have been subject to misuse, abuse, accident or improper installation. Advantech assumes no liability under the terms of this warranty as a consequence of such events.

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- 1. Collect all the information about the problem encountered. (For example, CPU speed, Advantech products used, other hardware and software used, etc.) Note anything abnormal and list any onscreen messages you get when the problem occurs.
- 2. Call your dealer and describe the problem. Please have your manual, product, and any helpful information readily available.
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- 4. Carefully pack the defective product, a fully-completed Repair and Replacement Order Card and a photocopy proof of purchase date (such as your sales receipt) in a shippable container. A product returned without proof of the purchase date is not eligible for warranty service.
- 5. Write the RMA number visibly on the outside of the package and ship it prepaid to your dealer.

Declaration of Conformity

FCC Class B

Note: This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation.

This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

Technical Support and Assistance

- 1. Visit the Advantech web site at www.advantech.com/support where you can find the latest information about the product.
- 2. Contact your distributor, sales representative, or Advantech's customer service center for technical support if you need additional assistance. Please have the following information ready before you call:
 - Product name and serial number
 - Description of your peripheral attachments
 - Description of your software (operating system, version, application software, etc.)
 - A complete description of the problem
 - The exact wording of any error messages

Warnings, Cautions and Notes

Warning! Warnings indicate conditions, which if not observed, can cause personal injury!





Caution! Cautions are included to help you avoid damaging hardware or losing data. e.g.



There is a danger of a new battery exploding if it is incorrectly installed. Do not attempt to recharge, force open, or heat the battery. Replace the battery only with the same or equivalent type recommended by the manufacturer. Discard used batteries according to the manufacturer's instructions.



Notes provide optional additional information.



Packing List

Before installation, please ensure the following items have been shipped:

- 1 x AIR-300 Unit
- 1 x Mounting Kit
- 1 x User Manual (Simplified Chinese)
- 1 x China RoHS

Ordering Information

Part No.	CPU	DDR4	Gbe	VGA	HDMI	RS-232/ 422/485	USE 3.0	B MiniP- Cle	SIM	M.2	AC Input	Expansion
AIR-300- 00A1	LGA1151 Socket Type	Up to 32GB	4	1	1	4	8	2	1	1	100- 240V	1x PClex16

Note! CPU/Memory/Storage and operating system bundled by request.



AIR-300 Default SKU Option Items

Optional Item for Default SKU

Part Number	Description	
1702002600	Power cable 3-pin 183cm, USA type	
1702002605	Power cable 3-pin 183cm, EU type	
1702031801	Power cable 3-pin 183cm, UK type	
1700000237	Power cable, 3-Pin 183cm, PSE type	

Safety Instructions

- 1. Please read these safety instructions carefully.
- 2. Please keep this User's Manual for later reference.
- 3. Please disconnect this equipment from AC outlet before cleaning. Use a damp cloth. Don't use liquid or sprayed detergent for cleaning. Use moisture sheet or clothe for cleaning.
- 4. For pluggable equipment, the socket-outlet shall near the equipment and shall be easily accessible.
- 5. Please keep this equipment from humidity.
- 6. Lay this equipment on a reliable surface when install. A drop or fall could cause injury.
- 7. The openings on the enclosure are for air convection hence protecting the equipment from overheating. DO NOT COVER THE OPENINGS.
- 8. Make sure the voltage of the power source when connecting the equipment to the power outlet.
- 9. Place the power cord such a way that people cannot step on it. Do not place anything over the power cord.
- 10. All cautions and warnings on the equipment should be noted.
- 11. If the equipment is not used for long time, disconnect the equipment from mains to avoid being damaged by transient over-voltage.
- 12. Never pour any liquid into ventilation openings; this could cause fire or electrical shock.
- 13. Never open the equipment. For safety reasons, only qualified service personnel should open the equipment.
- 14. If one of the following situations arises, get the equipment checked by service personnel:
 - The power cord or plug is damaged.
 - Liquid has penetrated into the equipment.
 - The equipment has been exposed to moisture.
 - The equipment does not work well, or you cannot get it to work according to the user's manual.
 - The equipment has been dropped and damaged.
 - The equipment has obvious signs of breakage.
- 15. Do not leave this equipment in an environment where the storage temperature may go below -40° C (-40° F) or above 85° C (185° F). This could damage the equipment. the equipment should be in a controlled environment.
- 16. Caution: Any unverified component could cause unexpected damage. To ensure the correct installation, please always use the components (ex. screws) provided with the accessory box. ATTENTION: Tout composant non vérifiée pourrait causer des dommages inattendu. Pour garantir une installation correcte, s'il vous plaît utilisez toujours les composants (vis ex.) fournies avec la boîte d'accessoires.
- 17. CAUTION: The computer is provided with a battery-powered real-time clock circuit. There is a danger of explosion if battery is incorrectly replaced. Replace only with same or equivalent type recommended by the manufacture. Discard used batteries according to the manufacturers instructions. ATTENTION: L'ordinateur est muni d'un circuit en temps réel de l'horloge alimentée par batterie. Il ya un danger d'explosion si la pile est remplacée de façon incorrecte. Remplacez uniquement par un type identique ou equivalent vii User Manual recommandé par le fabricant. Jetez les piles usagées selon les instructions du fabricant.

18. CAUTION: Always completely disconnect the power cord from your chassis whenever you work with the hardware. Do not make connections while the power is on. Sensitive electronic components can be damaged by sudden power surges.

ATTENTION: Toujours débrancher complètement le cordon d'alimentation de votre châssis lorsque vous travaillez avec le matériel. Ne pas effectuer les raccordements lorsque l'appareil est sur. Composants électroniques sensibles peuvent être endommagés par les surtensions soudaines.

- 19. The sound pressure level at the operator's position according to IEC 704-1:1982 is no more than 70 dB (A).
- 20. RESTRICTED ACCESS AREA: The equipment should only be installed in a Restricted Access Area.
- 21. DISCLAIMER: This set of instructions is given according to IEC 704-1. Advantech disclaims all responsibility for the accuracy of any statements contained herein.

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General Introduction

This chapter gives background information on the AIR-300 series

1.1 Introduction

AIR-300, an intelligent, high performance desktop system powered by intel Xeon E3 and 6th&7th Gen Core i3/i5/i7 LGA1151 processor comes with multiple I/O combinations and a modular expansion solution. Expansion is supported by the riser card PCIex16 slot. AIR-300 supports a maximum of up to 65W processors and a 0~50°C operating temperature range. It provides multiple I/O up to 4 x COMs, up to 4 x GbE, 8 x USB 3.0, 2 miniPCIe (share with mSATA), and up to a maximum of 4 x 2.5" SATAIII hard drive bays.

Smart AI solution

AIR-300 is designed using high computing performance desktop processors. With the 260W supported PCIex16 expansion slot, customers can choose optional power GPU cards to build up a powerful AI system.

Built-in Intelligent Management Tools - Advantech SUSI API & WISE-PaaS/ Device On

Advantech SUSI API provides a valuable suite of programmable APIs such as multilevel watchdog, hardware monitoring, system restoration, and other user-friendly interfaces.

SUSI API is an intelligent self-management cross platform tool that monitors system status for problems and takes action if anything is abnormal. SUSI API offers a boot up guarantee in critical, low temperature environments so systems can automatically recover when voltages dip. SUSI API makes the entire system more reliable and intelligent. AIR-300 also supports Advantech's own WISE-PaaS/Device On, which provides easy remote management so users can monitor, configure, and control a large number of terminals to make maintenance and system recovery simpler than ever.

1.2 Product Features

1.2.1 General

- CPU: Intel
 R Xeon E3, 6th&7th Gen Core i3/i5/i7 LGA1151 desktop processor (up to 65W)
- System Chipset: Intel C236
- BIOS: AMI EFI 128Mbit
- System Memory: DDR4 2133Mhz up to 32GB
- Watchdog Timer: Single chip Watchdog 255-level interval timer, setup by software
- I/O Interface: 4 x RS232/422/485
- USB:
 - 8 x USB 3.0 compliant ports
- Audio: High Definition Audio (HD), Line out, Mic-in
- Storage: Up to 4 x 2.5" HDD drive bays (15mm height) and 2 x mSATA
- Expansion Interface:
 - 2 x Full size MiniPCIe (2 support mSATA and 1 with SIM holder, suggested installation at Advantech manufacturing)
 - 1 x PCle x16
 - 1 x M.2 (E key for Wifi, suggested installation at Advantech manufacturing)

1.2.2 Display

Controller: According to customer-specified CPU selection

Resolution:

- VGA: supports1920x1200 @ 60 Hz
- HDMI: supports HDMI 2.0, 3840 x 2160 @ 30 Hz

1.2.3 Ethernet

- Chipset:
 - LAN1 Intel® i219LM
 - LAN2/3/4 Intel® i210IT
- **Speed:** 10/100/1000 Mbps
- Interface: 4 x RJ45

1.3 Chipset

1.3.1 Functional specifications

1.3.1.1 Processor

Processor	Supports Intel 6th/7th Gen LGA1151 processor (up to 65W):
Memory	Supports DDR4 2133 MHz up to 32GB 2 x 260-pin SODIMM socket type

1.3.1.2 Chipset

Internal	Direct x 12, OpenGL 4.4
Graphics	VGA + HDMI + 3rd optional display module
Features	Intel® Display Power saving technology 6.0
Video Accelerator	 HW accelerated Media Decode: H.265/HEVC, H.264/MPEG-4 AVC, MPEG-2, VC-1/WMV9, JPEG/MJPEG, VP8 and VP9 HW accelerated Media Encode:H. H.265/HEVC, H.264/MPEG-4 AVC, MPEC 2, IPEC/MJPEC and VP2
	AVC, MPEG-2, JPEG/MJPEG and VP8
	Intel C236 chip supports:
OATA Interfere	Supports several optional selections of Serial ATA III
SATA Interface	Supports SATA data transfer rates of up to 6 Gb/s
	Integrated AHCI controller
	Supports mSATA socket
	Intel C236 chip supports:
	■ 1 x EHCI Host Controller, supporting SuperSpeed USB 3.0 ports
USB Interface	■ 1 x XHCI Host Controllers, supporting HighSpeed USB 2.0 ports
	Supports wake-up from sleep states S3
	Maximum 500mA for each USB port
	Intel C236 chip supports:
Dowor	Supports ACPI
Power Management	 ACPI-defined power states (processor driven C states)
Management	ACPI Power Management Timer
	■ SMI# generation

	BIOS	Inte	I C236 chip supports:				
	ы03	AMI 128-Mbit EFI Flash BIOS via SPI					
1.3.1.3	Others						
			Up to six serial ports.				
	Serial Ports		Supports IRQ Sharing among serial ports under Microsoft Windows OS				
			COM1,COM2,COM3,COM4: RS-232/422/485				
			COM5,COM6: RS-232 (Optional)				
		LA	N1 Intel i219LM, LAN2/3/4 Intel i210 IT				
	Ethernet		Supports 10/100/1000 Mbps.				
			LAN Connectors: Phone Jack RJ45 8P 90D(F)				
		Au	dio Codec: ALC888S-VD2-GR				
			Compliant with HD Audio specifications				
	Audio		Supports 16/20/24-bit DAC and 16/20/24-bit ADC resolution				
			Supports: Speak-out, Mic-in				
			Audio Connectors: Ear Phone Jack * 2				
	Battery Backup	BA	TTERY 3V/210 mAh with WIRE x 1				

1.3.2 SUSI 4.0

SUSI API	
Sequence Control	Supported
DIO	16-bit programmable DIO
Watchdog Timer	Multi-level WDT (set by Advantech iManager) Programmable 1-255 sec / min
Hardware Monitor	CPU Temperature / input Current / input Voltage
System Information	Running HR / Boot record

1.4 Mechanical Specifications

1.4.1 Dimensions

228.3mm x 230mm x 399.92mm (W x H x D)

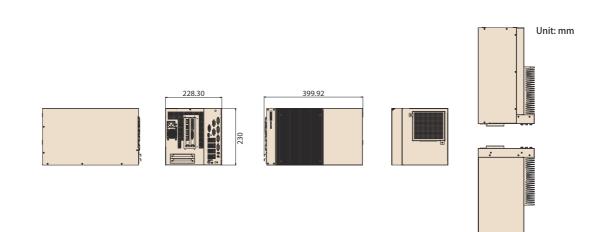


Figure 1.1 AIR-300 mechanical dimension drawing

1.4.2 Weight

10.2 kg

1.5 Power Requirements

1.5.1 System power

- Power Type: ATX
- Power Input Voltage: 100-240V AC
- Power Supply: 850W power supply

1.6 Environment Specifications

1.6.1 Operating temperature

■ With extended peripherals: 0 ~ 50° C with 0.7m/s air flow

1.6.2 Relative humidity

■ 95% @ 40° C (non-condensing)

1.6.3 Storage temperature

■ -20 ~ 80° C (-4 ~ 176° F)

1.6.4 Safety

- UL, CB, CCC, BSMI
- 1.6.5 EMC
 - CE/FCC Class B, CCC, BSMI

6



Hardware Configuration

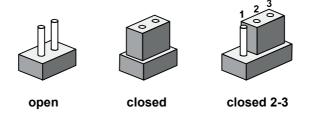
2.1 Introduction

The following sections show the internal jumper settings and the external connector pin assignments for application.

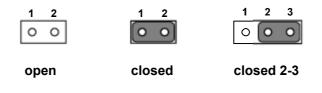
2.2 Jumpers

2.2.1 Jumper description

You may configure AIR-300 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, 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.



The jumper settings are schematically depicted in this manual as follows.



A pair of needle-nose pliers may be helpful when working with jumpers. If you have any doubts about the best hardware configuration for your application, contact your local distributor or sales representative before you make any changes. Generally, you simply need a standard cable to make most connections.

2.2.2 Jumper list

Table 2.1: Ju	Imper list	
J1	mSATA/PCIe setting (for CN31)	
J2	mSATA/PCIe setting (for CN32)	
J3	Auto Power On Setting	
J4	CMOS reset	
J5	COM1 power setting	
CN4	Expansion Riser Card SKU setting	

2.2.3 Jumper locations

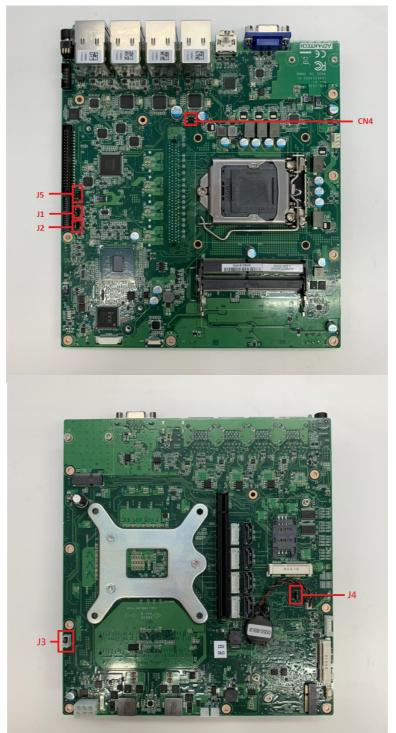


Figure 2.1 Jumper layout

2.2.4 Jumper settings

2.2.4.1 mSATA/PCIe settings for CN31 (J1)

J1 mSATA / PCIe Setting					
Part Number	1653003101				
Footprint	HD_3x1P_79_D				
Description	PIN HEADER 3x1P 2.0mm 180D(M) DIP				
Setting	Function				
(1-2)	mSATA				
(2-3)	PCIe (Default)				



2.2.4.2 mSATA/PCIe settings for CN32 (J2)

J2	mSATA / PCIe Setting	
Part Number	1653003101	
Footprint	HD_3x1P_79_D	
Description	PIN HEADER 3x1P 2.0mm 180D(M) DIP	
Setting	Function	
(1-2)	mSATA	
(2-3)	PCIe (Default)	

2.2.4.3 Auto power on settings (J3)

J3	uto Power on Setting	
Part Number	1655303020	
Footprint	HD_3x1P_79_D	
Description	DIP WAFER BOX 3x1P 2.0 180D(M)	
Setting	Function	
(1-2)	Auto Power On	
(2-3)	Power Button for Power On (Default)	

	1
0	2
0	3

2.2.4.4 CMOS reset (J4)

J4	CMOS reset	
Part Number 1	653003101	
Footprint	HD_3x1P_79_D	
Description	PIN HEADER 3x1P 2.0mm 180D(M) DIP	
Setting	Function	
(1-2)	Normal Operation (Default)	
(2-3)	CMOS reset	



2.2.4.5 COM1 power setting (J5)

J5 PH_3x2V_S2.00mm	l
Part Number	1653003201
Footprint	HD_3x2P_79_D
Description	
Setting	Function
(1-2)	Normal (default)
(3-4)	+5V
(5-6)	+12V



2.2.4.6 Expansion riser card SKU setting (CN4)

NC AMO-R028 (default)

2.3 Connectors

2.3.1 AIR-300 front I/O panel



Figure 2.2 AIR-300 front I/O connector drawing

2.3.2 AIR-300 front I/O connectors

AIR-300 provides two USB 2.0 interface connectors, which give complete plug & play and hot swapping for up to 127 external devices. The USB interface complies with USB UHCI, and is Rev. 2.0 compliant. The USB interface can be disabled in the system BIOS setup. Please refer to Table. 2.2 for the pin assignments. The USB connectors are used to connect any device that conforms to the USB interface. Most digital devices conform to this standard. The USB interface supports Plug and Play.

* Supports power on/off switch in suspended mode (By customized BIOS Request support)

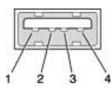


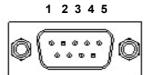
Figure 2.3 USB 2.0 connector

Table 2.2: USB 2.0 connector pin assignments			
Pin	Signal Name	Pin	Signal Name
1	+5V	2	USB_data-
3	USB_data+	4	GND

2.3.2.1 COM connector

AIR-300 provides up to eight D-sub 9-pin connectors, which offers RS-232/422/485 serial communication interface ports. Default setting is RS-232, the mode RS-422/485

of AIR-300 COM1~4 can be supported via BIOS setting. Optional COM 5-6 supports RS-232.



6 7 8 9 Figure 2.4 COM connector

Table 2.3: COM connector pin assignments			
	RS-232	RS-422	RS-485
Pin	Signal Name	Signal Name	Signal Name
1	DCD	Tx-	DATA-
2	RxD	Tx+	DATA+
3	TxD	Rx+	NC
4	DTR	Rx-	NC
5	GND	GND	GND
6	DSR	NC	NC
7	RTS	NC	NC
8	CTS	NC	NC
9	RI	NC	NC

Note! NC represents "No Connection".



····



2.3.2.2 Ethernet connector (LAN)

AIR-300 is equipped with up to 4 Ethernet controllers that are fully compliant with IEEE 802.3u 10/100/1000 Mbps CSMA/CD standards. The Ethernet port provides a standard RJ-45 jack connector with LED indicators on the front side to show its Active/Link status (Green LED) and Speed status (Yellow LED).



Figure 2.5 Ethernet connector

Table 2.4: E	Table 2.4: Ethernet connector pin assignments		
Pin	10/100/1000BaseT Signal Name		
1	TX+		
2	TX-		
3	RX+		
4	MDI2+		
5	MDI2-		
6	RX-		
7	MDI3+		

Table 2.4: Ethernet connector pin assignments8MDI3-

2.3.2.3 Power On/Off button

AIR-300 has a Power On/Off button with LED indicators on the front side that show On status (Green LED) and Off/Suspend status (Orange LED). The Power button supports dual functions: Soft Power -On/Off (Instant off or Delay 4 Seconds then off), and Suspend.



Figure 2.6 Power ON/OFF button

2.3.2.4 Audio connector

AIR-300 offers two stereo audio ports: Line_Out, Mic_In.

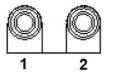


Figure 2.7 Audio connector

Table 2.5: A	able 2.5: Audio connector pin assignments	
Pin	Audio Signal Name	
1	Line out	
2	Mic in	

2.3.2.5 LED indicators

There are four LEDs on the front panel that indicate system status: HDD LED is for HDD status.



Figure 2.8 LED indicators

2.3.2.6 HDMI connector

An integrated, 19-pin receptacle connector HDMI Type A Interface is provided. The HDMI link supports resolutions up to 3840 x 2160 @ 30 Hz.

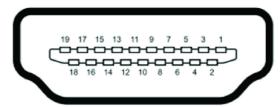


Figure 2.9 HDMI receptacle connector

Table 2.6: HDMI connector pin assignments			
Pin	Signal Name	Pin	Signal Name
1	TMDS Data 2+	2	TMDS Data 2 shield
3	TMDS Data 2-	4	TMDS Data 1+
5	TMDS Data 1 shield	6	TMDS Data 1-
7	TMDS Data 0+	8	TMDS Data 0 shield
9	TMDS Data 0-	10	TMDS clock+
11	TMDS clock shield	12	TMDS clock-
13	CEC	14	Reserved
15	SCL	16	SDA
17	DDC/CEC Ground	18	+5V
19	Hot Plug Detect		

2.3.2.7 USB3.0 connector

AIR-300 supports 8 USB 3.0 interfaces. The USB interfaces complies with USB UHCI, Rev. 3.0 standards. Please refer to Table 2.9 for its pin assignments. USB 3.0 connectors contain legacy pins to interface to USB 2.0 devices, and a new set of pins for USB 3.0 connectivity.

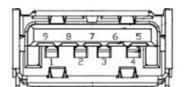


Figure 2.10 USB3.0 connector

Table 2.7: USB 3.0 connector pin assignments		
Signal Name	Pin	Signal Name
+5V	2	USB_data-
USB_data+	4	GND
SSRX-	6	SSRX+
GND	8	SSTX-
SSTX+		
	Signal Name +5V USB_data+ SSRX- GND	Signal NamePin+5V2USB_data+4SSRX-6GND8

2.3.2.8 VGA connector

AIR-300 provides an integrated 15-pin female VGA digital video interface, which supports up to 1920 x 1200 @ 60 Hz. Please refer to Table 2.10 for its pin assignments.

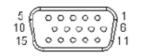
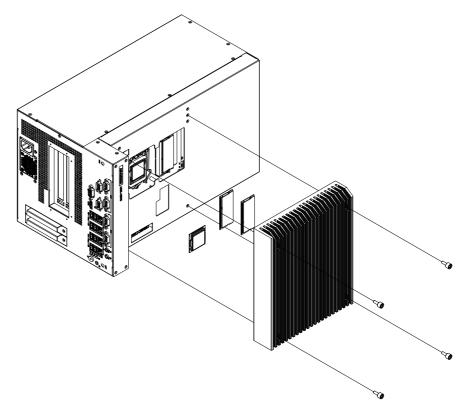


Figure 2.11 VGA connector

Table 2.8: VGA connector pin assignments				
Pin	Signal Name	Pin	Signal Name	
1	Red	2	Green	
3	Blue	4	NC	
5	GND	6	GND	
7	GND	8	GND	
9	NC	10	GND	
11	NC	12	DDAT	
13	H-SYNC	14	V-SYNC	
15	DCLK			

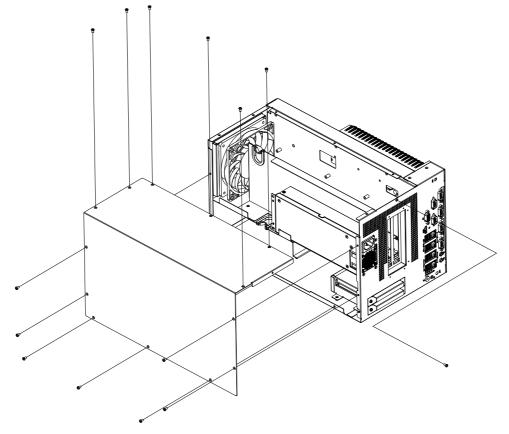
2.4 Installation

2.4.1 CPU/Memory installation



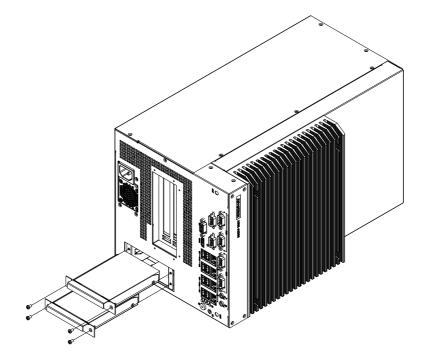
- 1. Unscrew the 4 screws on the top cover, and remove the top cover.
- 2. Install the CPU (LGA1151) and memory into the system.
- 3. Replace the top cover.

2.4.2 Remove side cover



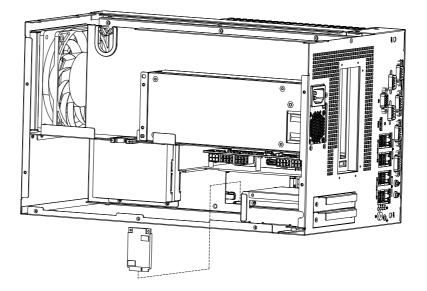
1. Unscrew 14 screws on the side cover.

2.4.3 External HDD/SSD installation



- 1. Unscrew 2 x screws on hard drive bay
- 2. Install HDD/SSD with 4 x screws on the HDD/SSD tray.
- 3. Push back the hard drive bay into the system and use the same screws to affix.

2.4.4 MiniPCle module installation



- 1. Remove the side cover.
- 2. Install miniPCIe/mSATA module (CN31_1/CN32_1) and screw it in place. (CN31_1 with SIM holder)
- 3. Replace the side cover and fix in place with screws.

2.4.5 Replace CPU thermal grease pad

Always use the grease pad provided by Advantech. The P/N of the grease pad is:

Part Number	Description
1990032969N000	Thermal-Pad 30x30x0.2 K=8 TP HW PTM-7988 AIR-300

To ensure the best thermal performance, it is recommended to replace the thermal grease for CPU thermal pole each time the top cover is opened.

- 1. To replace the thermal grease, clean up the CPU thermal pole by using paper tissue or soft cloth. DO NOT USE any kind of solvent to clean the thermal pole as this may damage the thermal grease inside the thermal pole.
- 2. Gently remove one of the protective papers on the grease pad and apply the grease to the CPU thermal pole. Press onto the grease pad for 30 seconds, then remove the protective paper gently from the grease pad.

2.4.6 Wide operating temperature support

To make sure the system works well under 0° C or over 40° C, please ensure your peripherals are i-grade, which support wide temperature operation.



BIOS Settings

3.1 Introduction

With the AMIBIOS Setup program, users can modify BIOS settings and control various system features. This chapter describes the basic navigation of the AIR-300 BIOS setup screens.

Aptio Setup Util Main Advanced Chipset Secu	l <mark>ity – Copyright (C) 2019 Ameri</mark> rity Boot Save & Exit	can Megatrends, Inc.
BIOS Information BIOS Vendor Core Version Compliancy Project Version Build Date and Time Access Level Power Type	American Megatrends 5.0.1.2 0.73 x64 UEFI 2.7; PI 1.6 AI30000CF60X002 05/27/2019 16:05:30 Administrator ATX	Set the Date. Use Tab to switch between Date elements.
Memory Information Total Memory Memory Frequency	8192 MB 2400 MHz	
System Date System Time	[Mon 07/08/2019] [11:16:37]	<pre>++: Select Screen fl: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit</pre>
Version 2.20.12	271. Copyright (C) 2019 America	n Megatrends, Inc.

AMI's BIOS ROM has a built-in Setup program that allows users to modify the basic system configuration. This information is stored in flash ROM so it retains the Setup information when the power is turned off.

3.2 Entering Setup

Turn on the computer and check for the patch code. If there is a number assigned to the patch code, it means that the BIOS supports your CPU. If there is no number assigned to the patch code, please contact an Advantech application engineer to obtain an up-to-date patch code file. This will ensure that your CPU's system status is valid. After ensuring that you have a number assigned to the patch code, press and you will immediately be allowed to enter Setup.

3.2.1 Main setup

When users first enter the BIOS Setup Utility, they will enter the Main setup screen. Users can always return to the Main setup screen by selecting the Main tab. There are two Main Setup options. They are described in this section. The Main BIOS Setup screen is shown below.

Aptio Setup Utility – Main Advanced Chipset Security	Copyright (C) 2019 American Boot Save & Exit	Megatrends, Inc.
BIOS Information BIOS Vendor Core Version Compliancy Project Version Build Date and Time Access Level Power Type Memory Information	American Megatrends 5.0.1.2 0.73 x64 UEFI 2.7; PI 1.6 AI30000CF60X002 05/27/2019 16:05:30 Administrator ATX	Set the Date. Use Tab to switch between Date elements.
Total Memory Memory Frequency	8192 MB 2400 MHz	
System Date System Time	[Mon 07/08/2019] [11:16:37]	<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>
Version 2.20.1271. C	opyright (C) 2019 American M	egatrends, Inc.

The Main BIOS setup screen has two main frames. The left frame displays all the options that can be configured. Grayed-out options cannot be configured; options in blue can. The right frame displays the key legend.

Above the key legend is an area reserved for a text message. When an option is selected in the left frame, it is highlighted in white. Often a text message will accompany it.

System time / System date

Use this option to change the system time and date. Highlight System Time or System Date using the <Arrow> keys. Enter new values through the keyboard. Press the <Tab> key or the <Arrow> keys to move between fields. The date must be entered in MM/DD/YY format. The time must be entered in HH:MM:SS format.

3.2.2 Advanced BIOS features setup

Select the Advanced tab from the AIR-300 setup screen to enter the Advanced BIOS Setup screen. Users can select any item in the left frame of the screen, such as CPU Configuration, to go to the sub menu for that item. Users can display an Advanced BIOS Setup option by highlighting it using the <Arrow> keys. All Advanced BIOS Setup options are described in this section. The Advanced BIOS Setup screens are shown below. The sub menus are described on the following pages.

Aptio Setup Utility Main Advanced Chipset Security	Copyright (C) 2019 American Megatrends, Inc. Boot Save & Exit
 CPU Configuration Power & Performance PCH-FW Configuration Network Stack Configuration Trusted Computing ACPI Settings NCT6106D Super IO Configuration NCT7802Y HW Monitor Embeded Controller Configuration S5 RTC Wake Settings Serial Port Console Redirection Intel TXT Information USB Configuration CSM Configuration 	CPU Configuration Parameters ++: Select Screen 1: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit
Version 2.20.1271.	pyright (C) 2019 American Megatrends, Inc.

3.2.2.1 CPU configuration

CPU Configuration		Enable/Disable CPU Flex Ratio
Туре	Intel(R) Xeon(R) CPU	i i ogi umiting
	E3-1275 v6 @ 3.80GHz	
ID	0×906E9	
Speed	3800 MHz	
L1 Data Cache	32 KB × 4	
L1 Instruction Cache	32 KB x 4	
L2 Cache	256 KB × 4	
L3 Cache	8 MB	
L4 Cache	N/A Summerstand	
VMX SMX/TXT	Supported Supported	
SMAZIAT	supporteu	++: Select Screen
CPU Flex Ratio Override	[Disabled]	f↓: Select Item
CPU Flex Ratio Settings	38	Enter: Select
Intel (VMX) Virtualization	[Enabled]	+/-: Change Opt.
Technology		F1: General Help
Active Processor Cores	[A11]	F2: Previous Values
Hyper-Threading	[Enabled]	F3: Optimized Defaults
Intel Trusted Execution Technology	[Disabled]	F4: Save & Exit
Alias Check Request	[Disabled]	ESC: Exit
DPR Memory Size (MB)	4	
Reset AUX Content	[no]	
<pre>Intel(R) SpeedStep(tm)</pre>	[Enabled]	· •

Aptio Setup Utility – Advanced	Copyright (C) 2019 American	Megatrends, Inc.
Type ID Speed L1 Data Cache L1 Instruction Cache L2 Cache L3 Cache L4 Cache L4 Cache VMX SMX/TXT	Intel(R) Xeon(R) CPU E3-1275 v6 @ 3.80GHz 0x906E9 3800 MHz 32 KB x 4 32 KB x 4 256 KB x 4 8 MB N/A Supported Supported	Enable/Disable CPU Power Management. Allows CPU to go to C states when it's not 100% utilized.
CPU Flex Ratio Override CPU Flex Ratio Settings Intel (VMX) Virtualization Technology Active Processor Cores Hyper-Threading Intel Trusted Execution Technology Alias Check Request DPR Memory Size (MB) Reset AUX Content Intel(R) SpeedStep(tm) C states	[Disabled] 38 [Enabled] [A11] [Enabled] [Disabled] 4 [no] [Enabled] [Disabled]	<pre>++: Select Screen fl: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit</pre>

CPU Flex Ratio Override

Enable/Disable CPU Flex Ratio Programming

Intel Trusted Execution Technology

Enables utilization of additional hardware capabilities provided by Intel (R) Trusted Execution Technology.

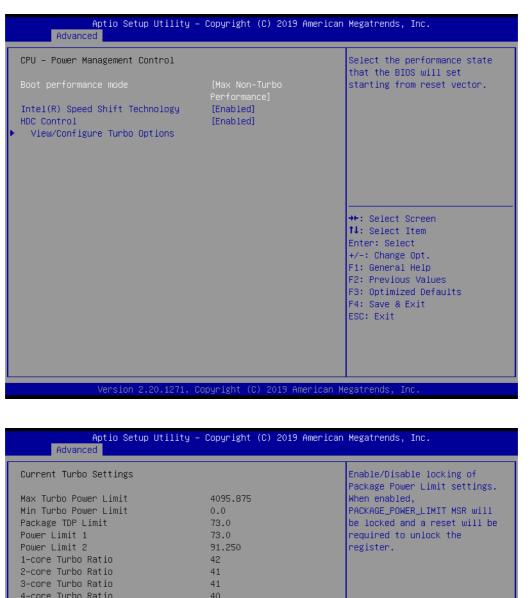
Hyper Threading Technology This item allows users to enable or disable Intel® Hyper Threading technology.

- Active Processor Cores This item allows users to set how many processor cores should be active.
- Intel Virtualization Technology This item allows users to enable or disable the intel virtualization technology.
- Intel® SpeedStep™ Allows more than two frequency ranges to be supported.
- CPU C states

Enable or disable CPU C states.

3.2.2.2 CPU - power management control

Aptio Setup Utility – Copyright (C) 2019 Am Advanced	merican Megatrends, Inc.
Power & Performance ▶ CPU – Power Management Control ▶ GT – Power Management Control	CPU – Power Management Control Options
	++: Select Screen 11: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit
Version 2.20.1271. Copyright (C) 2019 Amer	rican Megatrends, Inc.



4-core Turbo Ratio 40 Power Limit 1 Override Power Limit 2 Override [Disabled] ↔: Select Screen [Enabled] ↑↓: Select Item Power Limit 2 0 Enter: Select Energy Efficient Turbo [Auto] +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit sion 2.20.1271. Copyright (C) 2019 American Megatrends,

Boot Performance Mode

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

Intel® Speed Shift Technology Enable/Disable Intel® Speed Shift Technology support.

HDC Control

 This antian allows LIDC configuration

This option allows HDC configuration.

- Package Power Limit MSR Lock
 Enable/Disable locking of Package Power Limit settings.
- Power Limit 1/2 Override
 Enable/Disable Power Limit 1/2 override.
- Power Limit 2
 Power Limit 2 value in Milli Watts.
- Energy Efficient Turbo Enable/Disable Energy Efficient Turbo Feature.

3.2.2.3 GT – power management control

Aptio Setup Utility – Copyright (C) 2019 American Advanced	Megatrends, Inc.
Power & Performance ▶ CPU – Power Management Control ▶ GT – Power Management Control	GT – Power Management Control Options
	<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>
Version 2.20.1271. Copyright (C) 2019 American Mu	egatrends, Inc.

Advanced	– Copyright (C) 2019 America	n Megatrenus, Inc.
GT – Power Management Control RC6(Render Standby) Maximum GT frequency	[Enabled] [Default Max Frequency]	Check to enable render standby support.
		<pre>++: Select Screen fl: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit</pre>
Version 2.20,1271.	Copyright (C) 2019 American	Megatrends, Inc.

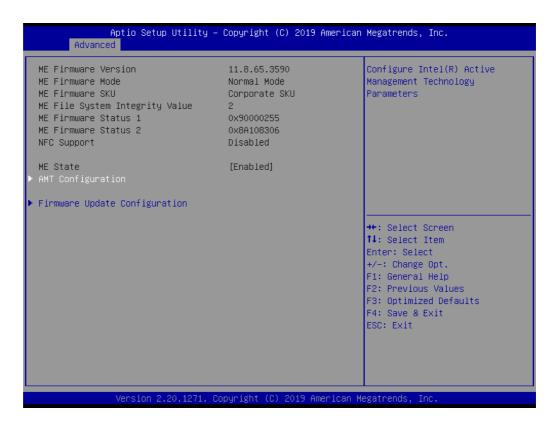
RC6 Render Standby

Check to enable render standby support.

Maximum GT frequency

Maximum GT frequency limited by the user. Choose between 350MHz and 1150MHz.

3.2.2.4 PCH- FW configuration



ME State (Intel AMT)

Enable/Disable Intel® Active Management Technology BIOS Extension.

Aptio Setup Utility - Advanced	- Copyright (C) 2019 Ame	rican Megatrends, Inc.
MEBx hotkey Pressed MEBx Selection Screen Hide Unconfigure ME Confirmation Prompt MEBx OEM Debug Menu Enable Unconfigure ME	[Disabled] [Disabled] [Disabled] [Disabled] [Disabled]	OEMFLag Bit 1: Enable automatic MEBx hotkey press.
		++: Select Screen 11: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit

- BIOS Hotkey Pressed

Enable/Disable BIOS hotkey press.

- MEBx Selection Screen

Enable/Disable MEBx selection screen.

- Hide Un-Configure ME Configuration Prompt

Hide Un-Configure ME without password Configuration Prompt.

- MEBx Debug Message Output

Enable MEBx debug message output.

- Un-Configure ME

Un-Configure ME without password.

3.2.2.5 Trusted computing

Aptio Setup Utility Main Advanced Chipset Security	Copyright (C) 2019 American Megatrends, Inc. Boot Save & Exit	
 CPU Configuration Power & Performance PCH-FW Configuration Network Stack Configuration Trusted Computing ACPI Settings NCT76105D Super IO Configuration NCT7802Y HW Monitor Embeded Controller Configuration S5 RTC Wake Settings Serial Port Console Redirection Intel TXT Information USB Configuration CSM Configuration 	Trusted Computing Settings ++: Select Screen 11: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit	
Version 2.20.1271.	pyright (C) 2019 American Megatrends, Inc.	

Aptio Setup Utility - Advanced	- Copyright (C) 2019 Americar	n Megatrends, Inc.
TPM20 Device Found Firmware Version: Vendor: Security Device Support Active PCR banks Available PCR banks	5.62 IFX [Enable] SHA-1,SHA256 SHA-1,SHA256	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 SHA256 PCR Bank Pending operation Platform Hierarchy Storage Hierarchy Endorsement Hierarchy TPM2.0 UEFI Spec Version Physical Presence Spec Version TPM 20 InterfaceType	[Enabled] [Enabled] [None] [Enabled] [Enabled] [Enabled] [TCG_2]	<pre>++: Select Screen fl: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit</pre>
Version 2.20.1271. 0	Copyright (C) 2019 American ⊧	legatrends, Inc.

Security Device Support

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

3.2.2.6 ACPI settings

 CPU Configuration Power & Performance PCH-FW Configuration Network Stack Configuration Trusted Computing 	System ACPI Parameters.
 ACPI Settings NCT6106D Super IO Configuration NCT7802Y HW Monitor Embeded Controller Configuration S5 RTC Wake Settings Serial Port Console Redirection Intel TXT Information 	
 USB Configuration CSM Configuration 	<pre>++: Select Screen 11: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit</pre>

Aptio Setup Utility – Advanced	Copyright (C) 2019 American	Megatrends, Inc.
ACPI Settings		Enables or Disables BIOS ACPI Auto Configuration.
Enable ACPI Auto Configuration	[Disabled]	huto configuration.
Enable Hibernation ACPI Sleep State Lock Legacy Resources S3 Video Repost	[Enabled] [S3 (Suspend to RAM)] [Disabled] [Disabled]	
		<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>
Version 2.20.1271. Co	ppyright (C) 2019 American M	egatrends, Inc.

Enable ACPI Auto Configuration

Enable or 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.

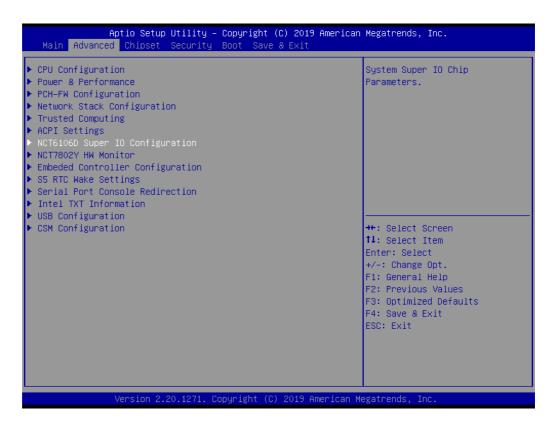
ACPI Sleep State

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.

S3 Video Repost Enable or Disable S3 Video Repost.

3.2.2.7 Super I/O configuration



NCT6106D 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 Serial Port 5 Configuration Serial Port 6 Configuration	NCT6106D	
		<pre> ++: Select Screen 11: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit</pre>

- Serial Port 1 Configuration Set Parameters of Serial Port 1.
- Serial Port 2 Configuration Set Parameters of Serial Port 2.
- Serial Port 3 Configuration Set Parameters of Serial Port 3.
- Serial Port 4 Configuration
 Set Parameters of Serial Port 4.
- Serial Port 5Configuration Set Parameters of Serial Port 5.
- Serial Port 6 Configuration Set Parameters of Serial Port 6.

3.2.2.8 HW monitor



Smart Fan Mode Configuration		Fan1 Mode Select.
Fan1 Mode FAN1 Temperature 1 FAN1 DC/PWM 1 FAN1 Temperature 2 FAN1 DC/PWM 2 FAN1 Temperature 3 FAN1 DC/PWM 3 FAN1 Temperature 4 FAN1 DC/PWM 4 FAN1 Critical Temperature	[SMART FAN IV Mode] 15 100 50 120 57 180 65 255 65	
		++: Select Screen 14: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit

Smart Fan Function

Enable or Disable Smart Fan.

- Fan1 Mode
 Fan1 Mode Select.
- FAN1 Temperature 1/2/3/4 Input the System Smart Fan IV Temperature 1/2/3/4.
- FAN1 DC/PWM 1/2/3/4 Input the System Smart Fan IV DC/PWM 1/2/3/4 Value.
- FAN1 Critical Temperature
 Input the System Smart IV Critical Temperature.

3.2.2.9 Embedded controller configuration

Main Advanced Chipset Secur		American Megatrends, Inc.
PU Configuration 'ower & Performance 'CH-FW Configuration letwork Stack Configuration 'rusted Computing ICPI Settings ICT6106D Super IO Configuration ICT7802Y HW Monitor imbeded Controller Configuration 55 RTC Wake Settings ierial Port Console Redirection intel IXT Information		Monitor hardware status
ISB Configuration SM Configuration		++: Select Screen 14: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit
	71. Copyright (C) 2019 Ame ity – Copyright (C) 2019 f	
Aptio Setup Utili Advanced		
Aptio Setup Utili	ity – Copyright (C) 2019 f	American Megatrends, Inc. Select Ite8518 Power Saving

Version 2.20.1271. Copyright (C) 2019 American Megatrends, Inc.

EC Hardware Monitor

This page display all information about system Temperature/Voltage/Current.

Power Saving Mode This item allows users to set the board's power saving mode when off.

Watch Dog Timer (PreBoot)

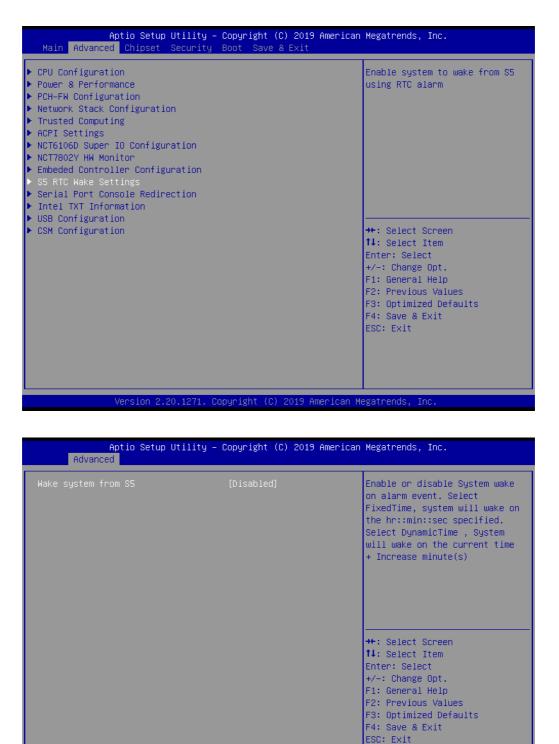
Enable or Disable Watch Dog Timer function (Starts from power on, stops before booting to OS)

Chapter 3 BIOS Settings

Watch Dog Timer

Enable or Disable Watch Dog Timer function (Starts before OS boots).

3.2.2.10 S5 RTC wake settings



Wake system from S5

Enable or disable System wake on alarm event. Select FixedTime, system will wake on the hr:min:sec specified.

3.2.2.11 Serial port console redirection

 CPU Configuration Power & Performance PCH-FW Configuration Network Stack Configuration Trusted Computing ACPI Settings NCT6106D Super IO Configuration NCT7802Y HW Monitor Embeded Controller Configuration S5 RTC Wake Settings Serial Port Console Redirection Intel TXT Information USB Configuration CSM Configuration 	Megatrends, Inc.
and the second	Serial Port Console Redirection
	<pre>++: Select Screen 11: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit</pre>

Aptio Setup Util Advanced	ity – Copyright (C) 2019 Ame	erican Megatrends, Inc.
COM1 Console Redirection ▶ Console Redirection Settings	[Disabled]	Console Redirection Enable or Disable.
		<pre> ++: Select Screen 11: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit</pre>
Version 2.20.12	71. Copyright (C) 2019 Amer:	ican Megatrends, Inc.

Console Redirection

This item allows users to enable or disable console redirection for Microsoft Windows Emergency Management Services (EMS).

Console Redirection Setting

This item allows users to configure console redirection detail settings.

Chapter 3 BIOS Settings

3.2.2.12 Intel TXT information

CPU Configuration	Display Intel TXT information
Power & Performance	
PCH-FW Configuration	
Network Stack Configuration	
Trusted Computing	
ACPI Settings	
NCT6106D Super IO Configuration NCT7802Y HW Monitor	
Embeded Controller Configuration	
S5 RTC Wake Settings	
Serial Port Console Redirection	
Intel TXT Information	
USB Configuration	We Gebeet General
CSM Configuration	++: Select Screen 14: Select Item
	Enter: Select
	+/-: Change Opt.
	F1: General Help
	F2: Previous Values
	F3: Optimized Defaults
	F4: Save & Exit FSC: Exit
	ESC. EXIC

Aptio Setup Utility – Advanced	Copyright (C) 2019 American	Megatrends, Inc.
Intel TXT Information		
Chipset BiosAcm Chipset Txt Cpu Txt Error Code Class Code Major Code Minor Code	Production Fused Production Fused Supported None None None None	<pre>++: Select Screen 11: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit</pre>
Version 2.20.1271. Co	opyright (C) 2019 American Mu	egatrends, Inc.

Intel TXT Information

Display Intel TXT information.

3.2.2.13 USB configuration

Aptio Setup Utility – Copyright (C) 2019 Am Main Advanced Chipset Security Boot Save & Exit	erican Megatrends, Inc.
 CPU Configuration Power & Performance PCH-FW Configuration Network Stack Configuration Trusted Computing ACPI Settings NCT6106D Super IO Configuration NCT7802Y HW Monitor Embeded Controller Configuration S5 RTC Wake Settings Serial Port Console Redirection Intel TXT Information 	USB Configuration Parameters
▶ USB Configuration ▶ CSM Configuration	<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>

Aptio Setup Utility – Advanced	Copyright (C) 2019 American	Megatrends, Inc.
USB Configuration		Enables Legacy USB support.
USB Module Version	23	AUTO option disables legacy support if no USB devices are connected. DISABLE option will
USB Controllers: 1 XHCI		keep USB devices available only for EFI applications.
USB Devices:		only for the approactions.
1 Drive, 1 Keyboard, 1 Mouse,	1 Hub	
Legacy USB Support	[Enabled]	
XHCI Hand-off USB Mass Storage Driver Support	[Enabled] [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
Mass Storage Devices:		F2: Previous Values
JetFlashTS4GJFV30 8.07	[Auto]	F3: Optimized Defaults F4: Save & Exit
		F4: Save & EXIC ESC: Exit
		LSC. EXIT
Version 2.20.1271. Co	pyright (C) 2019 American M	egatrends, Inc.

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 OS 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

Time-out value for control, bulk, and interrupt transfers.

Device reset time-out

Selects the USB mass storage device start unit command timeout.

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.

3.2.2.14 Network stack configuration

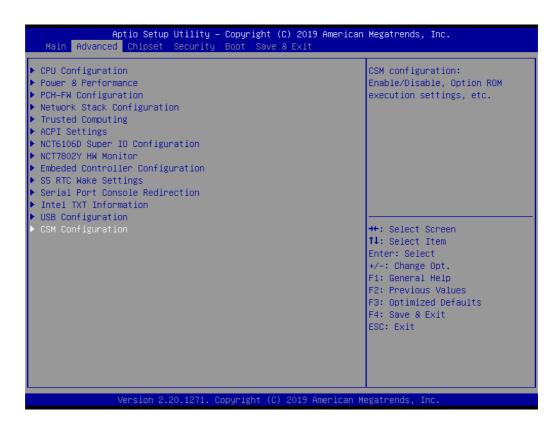
Aptio Setup Utility – Main Advanced Chipset Security	pyright (C) 2019 American Megatrends, Inc. ot Save & Exit
 CPU Configuration Power & Performance PCH-FW Configuration Network Stack Configuration Trusted Computing ACPI Settings NCT6106D Super IO Configuration NCT7802Y HW Monitor Embeded Controller Configuration S5 RTC Wake Settings Serial Port Console Redirection Intel TXT Information USB Configuration CSM Configuration 	Network Stack Settings ++: Select Screen 11: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit
Version 2.20.1271. Co	right (C) 2019 American Megatrends, Inc.



Network Stack

Enable/Disable UEFI Network Stack.

3.2.2.15 CSM configuration



Compatibility Support Module	Configuration	Enable/Disable CSM Support.
CSM Support	[Enabled]	
CSM16 Module Version	07.81	
GateA20 Active INT19 Trap Response	[Upon Request] [Immediate]	
Boot option filter	[UEFI only]	
Option ROM execution		
Network Storage Video Other PCI devices	[UEFI] [UEFI] [UEFI] [UEFI]	<pre>++: Select Screen fl: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit</pre>

CSM Support

Enable/Disable CSM Support.

Gate A20 Active

This item is useful when RT code is executed above 1MB. When this is set as "UPON RQUEST", GA20 can be disabled using BIOS services. When it's set as "Always", it does not allow disabling GA20.

Option ROM Message

BIOS 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.

3.2.3 Chipset configuration

Select the Chipset tab from the AIR-300 setup screen to enter the Chipset BIOS Setup screen. You can display a Chipset BIOS Setup option by highlighting it using the <Arrow> keys. All Plug and Play BIOS Setup options are described in this section. The Plug and Play BIOS Setup screen is shown below.

Main		Utility – Copyright (Security Boot Save		Megatrends, Inc.
	Agent (SA) Configu Configuration	ration		System Agent (SA) Parameters
				<pre>++: Select Screen 11: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit</pre>
	Version 2.	20.1271. Copyright (C)	2019 American Me	egatrends, Inc.

3.2.3.1 Memory configuration options

Aptio Setup Utility Chipset	– Copyright (C) 2019 Ame	erican Megatrends, Inc.
System Agent (SA) Configuration		Memory Configuration Parameters
SA PCIE Code Version VT-d	3.7.3.0 Supported	
 Memory Configuration Graphics Configuration PEG Port Configuration 		
VT-d Above 4GB MMIO BIOS assignment	[Enabled] [Disabled]	
		<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>
Version 2.20.1271.	Copyright (C) 2019 Ameri	ican Megatrends, Inc.

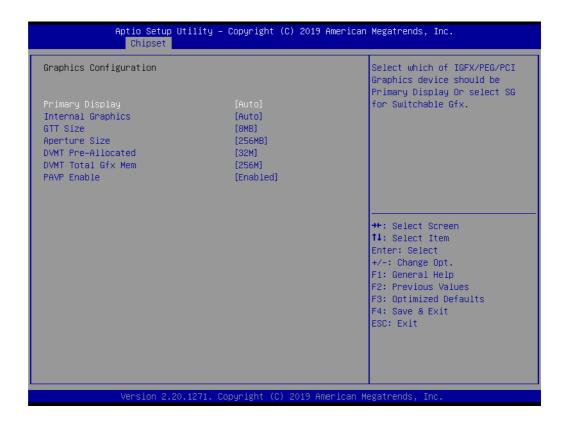
Memory Configuration		Maximum Memory Frequency Selections in Mhz.
Memory RC Version Memory Frequency Total Memory Memory Timings (tCL–tRCD–tRP–tRAS)	3.7.3.0 2400 MHz 8192 MB 17-17-17-39	
DIMMA1 Size Number of Ranks Manufacturer DIMMB1 Maximum Memory Frequency	Populated & Enabled 8192 MB (DDR4) 2 UnKnown Not Populated / Disabled Fauto]	
Max TOLUD Max TOLUD Mrc Fast Boot BDAT ACPI Table Support BDAT Memory Data Schema BDAT Memory Test Type	[Dynamic] [Enabled] [Disabled] [68] [Rank Margin Tool Rank]	<pre>++: Select Screen f↓: Select Item Enter: Select +/-: Change Opt. F1: General Help</pre>
Rank Margin Tool Loop Count	0	F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit

Memory Configuration

This item allows users to configure memory detail settings.

3.2.3.2 Graphics configuration

Aptio Setup Utility – <mark>Chipset</mark>	Copyright (C) 2019 American	Megatrends, Inc.
System Agent (SA) Configuration		Graphics Configuration
SA PCIe Code Version VT-d	3.7.3.0 Supported	
 Memory Configuration Graphics Configuration PEG Port Configuration 		
VT-d Above 4GB MMIO BIOS assignment	[Enabled] [Disabled]	
		<pre>++: Select Screen fl: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit</pre>
Version 2.20.1271. Co	ppyright (C) 2019 American M	egatrends, Inc.



Primary Display

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

Internal Graphics

Keep IGFX enabled based on the setup options.

GTT Size

Selects the GTT Size.

Aperture Size

Selects the Aperture Size.

DVMT Pre-Allocated

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

DVMT Total Gfx Mem

Selects DVMT 5.0 Total Graphic Memory size used by the Internal Graphics Device.

PAVP Enable

Enable/Disable PAVP.

Chapter 3 BIOS Settings

3.2.3.3 PEG port configuration

System Agent (SA) Configuration		PEG Port Options
SA PCIe Code Version VT-d	3.7.3.0 Supported	
Memory Configuration Graphics Configuration PEG Port Configuration		
VT-d Above 4GB MMIO BIOS assignment	[Enabled] [Disabled]	
		++: Select Screen 11: Select Item Enter: Select
		+/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit
		ESC: Exit
		erican Megatrends, Inc.



- PEG Link and Speed Information
- Enable Root Port Enable or Disable the Root Port.
- Max Link Speed Configure PEG Max Speed.

ASPM

Enable PCI Express Active State Power Management settings.

- VT-d VT-d capability.
- Above 4GB MMIO BIOS assignment Enable/Disable above 4GB MemoryMappedIO BIOS assignment.

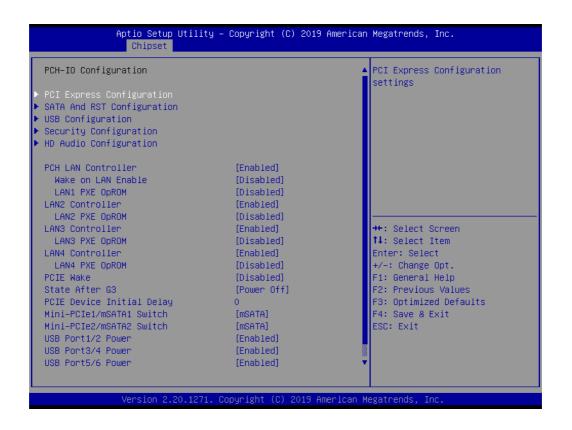
Program PCIe ASPM after OpROM Enabled: PCIe ASPM will be programmed after OpROM

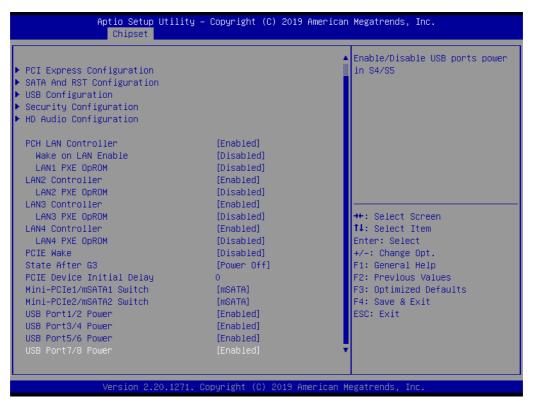
Enabled: PCIe ASPM will be programmed after OpROM. Disabled: PCIe ASPM will be programmed before OpROM.

PCIe Spread Spectrum Clocking Allows disableing Spread Spectrum Clocking for compliance testing.

3.2.3.4 PCH- I/O configuration

Aptio Setup Utility – Copyright (C) 2019 American Main Advanced <mark>Chipset</mark> Security Boot Save & Exit	Megatrends, Inc.
 System Agent (SA) Configuration PCH-IO Configuration 	PCH Parameters
	<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>
Version 2.20.1271. Copyright (C) 2019 American Me	gatrends, Inc.





- PCI Express Configuration
 PCI Express Configuration Settings.
- USB Configuration
 USB Configuration Settings.
- HD Audio Configuration

HD Audio Susbsystem Configuration Settings.

- PCH LAN Controller
 Enable or Disable onboard NIC.
- LAN Option ROM Enable or Disable onboard LAN's PXE option ROM.
- Wake on LAN Enable or Disable Integrated LAN to wake the system from S5.
- PCIE Wake

Enable or Disable PCIE to wake the system from S5.

State After G3

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

- PCIE Device Initial Delay
 The PCIE device initial delay 0~30 second.
- Mini-PCle/mSATA Switch

Selects mini-PCIe or mSATA function support.

USB Power
 Enable or Disable USB standby power.

3.2.3.5 PCI express configuration

Aptio Setup Chipset	Utility – Copyright (C) 2019 American	Megatrends, Inc.
PCI Express Configuration PCI Express Clock Gating Legacy IO Low Latency DMI Link ASPM Control PCIE-USB Glitch W/A ▶ PCI Express Gen3 Eq Lanes	[Enabled] [Disabled] [Enabled] [Disabled]		PCI Express Clock Gating Enable/Disable for each root port.
<pre>M.2 mPCIE1 Lane1 mPCIE1 Lane2 mPCIE2 Lane1 mPCIE2 Lane2 </pre>			++: Select Screen 11: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit
Version 2.2	0.1271.Copyright (C)	2019 American Me	egatrends, Inc.

PCI Express Clock Gating

Enable or disable PCI Express Clock Gating for each root port.

DMI Link ASPM Control

Enable/Disable the control of Active State Power Management on SA side of the DMI Link.

Chapter 3 BIOS Settings

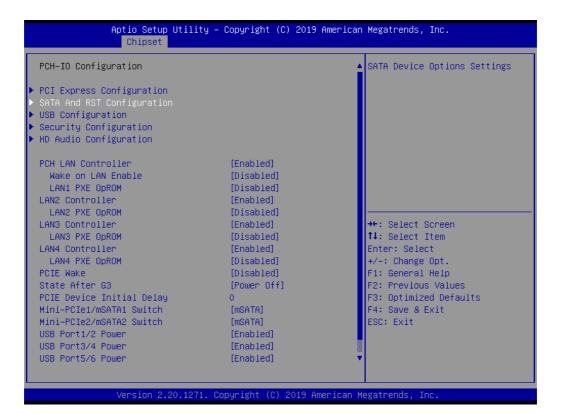
m.2 Setting

Set up m.2 related function.

mPCIE Setting

Set up mPCIE related function.

3.2.3.6 SATA and RST configuration



Aptio Setup Utility - Chipset	· Copyright (C	:) 2019 American	Megatrends, Inc.
SATA And RST Configuration			Enable/Disable SATA Device.
SATA Controller(s) SATA Mode Selection SATA Controller Speed Serial ATA Port 1 Software Preserve Port 1 Serial ATA Port 2	[Enabled] [AHCI] [Default] Empty Unknown [Enabled] Empty		
Software Preserve Port 2 Serial ATA Port 3 Software Preserve Port 3 Serial ATA Port 4 Software Preserve Port 4 NSATA 2 Software Preserve mSATA 2 NSATA 1 Software Preserve	Unknown [Enabled] Empty Unknown [Enabled] Empty Unknown [Enabled] Empty Unknown [Enabled] Empty Unknown		++: Select Screen 11: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit
	Unknown [Enabled]	2018 American M	

- SATA Controller
 Enable / Disable SATA Device.
- SATA Mode Selection
 Determines how the SATA controller operates.
- SATA Controller Speed Indicates the maximum speed the SATA controller can support.
- Port 1 / Port 2 / Port3 / Port4 / mSATA1 / mSATA2 Enable/Disable SATA device.



Watchdog Timer Sample Code

A.1 EC Watchdog Timer Sample Code

EC_Command_Port = 0x29Ah EC_Data_Port = 0x299h Write EC HW ram = 0x89 Watch dog event flag = 0x57Watchdog reset delay time = 0x5E Reset event = 0x04Start WDT function = 0x28 _____ .model small .486p .stack 256 .data .code org 100h .STARTup mov dx, EC_Command_Port mov al,89h ; Write EC HW ram. out dx.al mov dx, EC_Data_Port mov al, 5Fh ; Watchdog reset delay time low byte (5Eh is high byte) index, Timebase: 100ms out dx,al mov dx, EC_Data_Port mov al, 64h ;Set 10 seconds delay time. out dx.al mov dx, EC_Command_Port mov al,89h ; Write EC HW ram. out dx,al mov dx, EC_Data_Port mov al, 57h ; Watch dog event flag. out dx.al mov dx, EC_Data_Port mov al, 04h ; Reset event. out dx,al mov dx, EC Command Port mov al,28h ; start WDT function. (Stop: 0x29, Reset: 0x2A) out dx,al .exit END



USB 3.0 Drivers Installation Instruction

B.1 USB 3.0 Drivers Installation Instruction

For customers using Windows 7 OS, they need to install drivers to active the USB 3.0 function. Please download driver installation instructions from the Intel website. (https://www.intel.com/content/www/us/en/support/articles/000017241/mini-pcs.html)



www.advantech.com

Please verify specifications before quoting. This guide is intended for reference purposes only.

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