

BOXER-8320AI

Compact Fanless Embedded AI@Edge Box PC

User's Manual 1st Ed

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Preface II

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Preface III

Packing List

Before setting up your product, please make sure the following items have been shipped:

Item		Quantity
•	BOXER-8320AI	1
•	Din Rail bracket	1
•	Screw Package	1
•	3 Pin DC-In Power Connector	1

If any of these items are missing or damaged, please contact your distributor or sales representative immediately.

Preface IV

About this Document

This User's Manual contains all the essential information, such as detailed descriptions and explanations on the product's hardware and software features (if any), its specifications, dimensions, jumper/connector settings/definitions, and driver installation instructions (if any), to facilitate users in setting up their product.

Users may refer to the product page on AAEON.com for the latest version of this document.

Preface V

Safety Precautions

Please read the following safety instructions carefully. It is advised that you keep this manual for future references

- 1. All cautions and warnings on the device should be noted.
- 2. Make sure the power source matches the power rating of the device.
- 3. Position the power cord so that people cannot step on it. Do not place anything over the power cord.
- 4. Always completely disconnect the power before working on the system's hardware
- 5. No connections should be made when the system is powered as a sudden rush of power may damage sensitive electronic components.
- If the device is not to be used for a long time, disconnect it from the power supply to avoid damage by transient over-voltage.
- 7. Always disconnect this device from any power supply before cleaning.
- 8. While cleaning, use a damp cloth instead of liquid or spray detergents.
- 9. Make sure the device is installed near a power outlet and is easily accessible.
- 10. Keep this device away from humidity.
- 11. Place the device on a solid surface during installation to prevent falls.
- 12. Do not cover the openings on the device to ensure optimal heat dissipation.
- 13. Watch out for high temperatures when the system is running.
- 14. Do not touch the heat sink or heat spreader when the system is running
- 15. Never pour any liquid into the openings. This could cause fire or electric shock.
- 16. As most electronic components are sensitive to static electrical charge, be sure to ground yourself to prevent static charge when installing the internal components. Use a grounding wrist strap and contain all electronic components in any static-shielded containers.

Preface VI

- 17. If any of the following situations arises, please the contact our service personnel:
 - i. Damaged power cord or plug
 - ii. Liquid intrusion to the device
 - iii. Exposure to moisture
 - iv. Device is not working as expected or in a manner as described in this manual
 - v. The device is dropped or damaged
 - vi. Any obvious signs of damage displayed on the device
- 18. Do not leave this device in an uncontrolled environment with temperatures beyond the device's permitted storage temperatures (see chapter 1) to prevent damage.
- 19. Do NOT disassemble the motherboard so as not to damage the system or void your warranty.
- 20. If the thermal pad had been damaged, please contact AAEON's salesperson to purchase a new one. Do NOT use those of other brands.
- 21. The Hex Cylinder Coppers on the front panel are not removable.
- 22. Repeatedly assemble and disassemble the system may cause damages to the exterior paint and surface and screw holes.
- 23. Use the right size screwdriver.
- 24. Use the screwdriver correctly to remove screws from the system.

Preface VII



This device complies with Part 15 FCC Rules. Operation is subject to the following two conditions: (1) this device may not cause harmful interference, and (2) this device must accept any interference received including interference that may cause undesired operation.

Caution:

There is a danger of explosion if the battery is incorrectly replaced. Replace only with the same or equivalent type recommended by the manufacturer. Dispose of used batteries according to the manufacturer's instructions and your local government's recycling or disposal directives.

Attention:

Il y a un risque d'explosion si la batterie est remplacée de façon incorrecte. Ne la remplacer qu'avec le même modèle ou équivalent recommandé par le constructeur. Recycler les batteries usées en accord avec les instructions du fabricant et les directives gouvernementales de recyclage.

Preface VIII

产品中有毒有害物质或元素名称及含量 AAEON System

QO4-381 Rev.A0

	有毒有害物质或元素					
部件名称	铅	汞	镉	六价铬	多溴联苯	多溴二苯醚
	(Pb)	(Hg)	(Cd)	(Cr(VI))	(PBB)	(PBDE)
印刷电路板	×	C	0	0	0	0
及其电子组件	^)	O	O	O	O
外部信号	×	C	0	0	0	0
连接器及线材	^)				O
外壳	0	0	0	0	0	0
中央处理器	×	0	0	0	0	0
与内存	Â)	O	0	0	O
硬盘	×	0	0	0	0	0
液晶模块	×	×	0	0	0	0
光驱	×	0	0	0	0	0
触控模块	×	0	0	0	0	0
电源	×	0	0	0	0	0
电池	×	0	0	0	0	0

本表格依据 SJ/T 11364 的规定编制。

- ○:表示该有毒有害物质在该部件所有均质材料中的含量均在 GB/T 26572标准规定的限量要求以下。
- ×:表示该有害物质的某一均质材料超出了GB/T 26572的限量要求,然而该部件 仍符合歐盟指令2011/65/EU 的规范。

备注:

- 一、此产品所标示之环保使用期限,系指在一般正常使用状况下。
- 二、上述部件物质中央处理器、内存、硬盘、光驱、电源为选购品。
- 三、上述部件物质液晶模块、触控模块仅一体机产品适用。

Preface IX

China RoHS Requirement (EN)

Hazardous and Toxic Materials List

AAEON System QO4-381 Rev.A0

		Hazardous or Toxic Materials or Elements				
Component Name	Lead (Pb)	Mercury (Hg)	Cadmium (Cd)	Hexavalent Chromium (Cr(VI))	Polybrominated biphenyls (PBBs)	Polybrominated diphenyl ethers (PBDEs)
PCB and Components	Χ	0	0	0	0	0
Wires & Connectors for Ext. Connections	Х	0	0	0	0	0
Chassis	0	0	0	0	0	0
CPU & RAM	Χ	0	0	0	0	0
HDD Drive	Х	0	0	0	0	0
LCD Module	Χ	Х	0	0	0	0
Optical Drive	Χ	0	0	0	0	0
Touch Control Module	Χ	0	0	0	0	0
PSU	Х	0	0	0	0	0
Battery	Χ	0	0	0	0	0

This form is prepared in compliance with the provisions of SJ/T 11364.

- O: The level of toxic or hazardous materials present in this component and its parts is below the limit specified by GB/T 26572.
- X: The level of toxic of hazardous materials present in the component exceed the limits specified by GB/T 26572, but is still in compliance with EU Directive 2011/65/EU (RoHS 2).

Notes:

1. The Environment Friendly Use Period indicated by labelling on this product is applicable only to use under normal conditions.

Preface X

- 2. Individual components including the CPU, RAM/memory, HDD, optical drive, and PSU are optional.
- 3. LCD Module and Touch Control Module only applies to certain products which feature these components.

Preface XI

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Chapter 1

Product Specifications

1.1 Specifications

System	
CPU	Intel® Core™ i3-6100U
Chipset	Intel® System on Chip
System Memory	DDR4 SODIMM slot x 1, supports 2133MHz, up to 16 GB
Al Solution	Intel® Movidius™ Myriad™ X x 2
Display Interface	HDMI, VGA
Storage Device	2.5" SATA Drive Bay x 1
Ethernet	10/100/1000 Base-TX x2
1/0	DB-9 x4 for RS-232/422/485
	RJ-45 x 2 for GbE (i210IT x 2)
	USB 3.0 x 4
	VGA x 1
	HDMI x 1
	Antenna Holes x 2
	Power Button
	Power Input
Indicator	Power LED
OS Support	Linux
Power Supply	

9 - 30V DC-In Power input x1

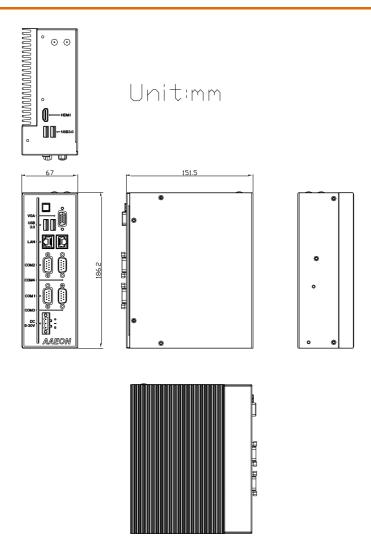
Power Requirement

Mechanical				
Mounting	DIN Rail Mount			
	Wallmount (Monting kit is optional)			
Dimensions (W x H x D)	67mm (W) x 186.2mm (H) x 151.5mm (D)			
Gross Weight	6.1 lbs. (2.8 kg)			
Net Weight	3.9 lbs. (1.8 kg)			

Environmental				
Operating Temperature	-25°C ~ 60°C with W.T. SSD (according to IEC68-2-14 with 0.5 m/s airflow; with industrial devices)			
Storage Temperature	-49°F ~ 176°F (-45°C ~ 80°C)			
Storage Humidity	95% @ 40°C, non-condensing			
Anti-Vibration	3 Grms/ 5 ~ 500Hz/ operation – SSD			
Certification	CE/FCC class A			

Chapter 2

Hardware Information



2.2 List of Jumpers

Please refer to the table below for all of the system's jumpers that you can configure for your application.

Label	Function
JP5	Auto Power Button Enable/Disable Selection
JP7	Clear CMOS Jumper
JP9	COM2 Pin8 Function Selection
JP10	COM1 Pin8 Function Selection

2.2.1 Auto Power Button Enable/Disable Selection (JP5)



Disable (Default)



Enable

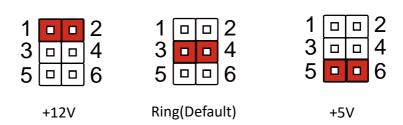
2.2.2 Clear CMOS (JP7)



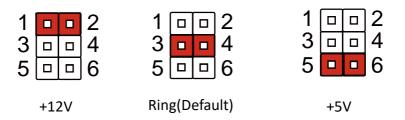
Normal (Default)



Clear CMOS



2.2.4 COM1 Pin8 Function Selection (JP10)



2.3 List of Connectors

Please refer to the table below for all of the system's connectors that you can configure for your application

Label	Function
CN12	+5V Output for SATA HDD
CN13	SATA Port
CN15	HDMI Connector
CN19	USB 3.0 Port
CN20	Battery
CN23	LAN Port (RJ45)
CN24	USB 3.0 Port
CN25	External Power Input
CN26	COM Port 2
CN27	COM Port 1

2.3.1 +5V Output for SATA HDD (CN12)



Pin	Pin Name	Signal Type	Signal Level
1	+5V	PWR	+5V
2	GND	GND	

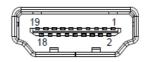
2.3.2 SATA Port (CN13)



Signal Type

Pin	Pin Name	Signal Type	Signal Level
1	GND	GND	
2	SATA_TX+	DIFF	
3	SATA_TX-	DIFF	
4	GND	GND	
5	SATA_RX-	DIFF	
6	SATA_RX+	DIFF	
7	GND	GND	

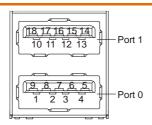
2.3.3 HDMI Connector (CN15)



Pin	Pin Name	Signal Type	Signal Level
1	DVI_D2+	OUT	_
2	GND	GND	
3	DVI_D2-	OUT	
4	DVI_D1+	OUT	
5	GND	GND	
6	DVI_D1-	OUT	
7	DVI_D0+	OUT	
8	GND	GND	

Pin	Pin Name	Signal Type	Signal Level
9	DVI_D0-	OUT	
10	DVI_CLK+	OUT	
11	GND	GND	
12	DVI_CLK-	OUT	
13	NC		
14	NC		
15	SCL	I/O	
_16	SDA	I/O	
17	GND	GND	
18	+5V	PWR	
19	HPD	IN	

2.3.4 USB 3.0 Ports (CN19)



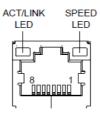
Pin	Pin Name	Signal Type	Signal Level
1	+5VSB	PWR	+5V
2	USB_D-	DIFF	
3	USB_D+	DIFF	
4	GND	GND	
5	USB_SSRX-	DIFF	
6	USB_SSRX+	DIFF	
7	GND	GND	·

Pin	Pin Name	Signal Type	Signal Level
8	USB_SSTX-	DIFF	
9	USB_SSTX+	DIFF	
10	+5VSB	PWR	+5V
11	USB_D-	DIFF	
12	USB_D+	DIFF	
13	GND	GND	
_14	USB_SSRX-	DIFF	
15	USB_SSRX+	DIFF	
16	GND	GND	
17	USB_SSTX-	DIFF	
18	USB_SSTX+	DIFF	

2.3.5 Battery (CN20)

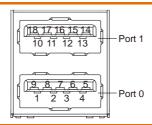
Pin	Pin Name	Signal Type	Signal Level
1	+3.3V	PWR	3.3V
2	GND	GND	

2.3.6 LAN (RJ45) Connector (CN23)



Pin	Signal	Pin	Signal
1	MDI0+	2	MDI0-
3	MDI1+	4	MDI2+
5	MDI2-	6	MDI1-
7	MDI3+	8	MDI3-

2.3.7 USB 3.0 Ports (CN24)



Pin	Pin Name	Signal Type	Signal Level
1	+5VSB	PWR	+5V
2	USB_D-	DIFF	
3	USB_D+	DIFF	
4	GND	GND	
5	USB_SSRX-	DIFF	
6	USB_SSRX+	DIFF	
7	GND	GND	
8	USB_SSTX-	DIFF	

Pin	Pin Name	Signal Type	Signal Level
9	USB_SSTX+	DIFF	
10	+5VSB	PWR	+5V
11	USB_D-	DIFF	
12	USB_D+	DIFF	
13	GND	GND	
14	USB_SSRX-	DIFF	
15	USB_SSRX+	DIFF	
16	GND	GND	
17	USB_SSTX-	DIFF	
18	USB_SSTX+	DIFF	

2.3.8 External Power Input (CN25)

Pin	Pin Name	Signal Type	Signal Level
1	+12V	PWR	+9~+24V (or +12V)
2	GND	GND	

2.3.9 COM Port 2 (CN26)

RS-232			
Pin	Pin Name	Signal Type	Signal level
1	DCD	IN	
2	RX	IN	
3	TX	OUT	±5V
4	DTR	OUT	±5V
5	GND	GND	
6	DSR	IN	
7	RTS	OUT	±5V
8	CTS	IN	
9	RI/+5V/+12V	IN/ PWR	+5V/+12V

RS-422			
Pin	Pin Name	Signal Type	Signal level
1	RS422_TX-	OUT	
2	RS422_TX+	OUT	
3	RS422_RX+	IN	
4	RS422_RX-	IN	
5	NC		
6	NC		
7	NC		
8	GND	GND	
9	NC/+5V/+12V	PWR	+5V/+12V

RS-485				
Pin	Pin Name	Signal Type	Signal level	
1	RS485_D-	I/O		
2	RS485_D+	I/O		
3	NC			
4	NC			
5	NC			
6	NC			
7	NC			
8	GND	GND		
9	NC/+5V/+12V	PWR	+5V/+12V	

^{*} COM2 RS-232/422/485 can be set through BIOS setting. Default is RS-232.

2.3.10 COM Port 1 (CN27)

RS-232			
Pin	Pin Name	Signal Type	Signal level
1	DCD	IN	
2	RX	IN	
3	TX	OUT	±5V
4	DTR	OUT	±5V
5	GND	GND	
6	DSR	IN	
7	RTS	OUT	±5V
8	CTS	IN	
9	RI/+5V/+12V	IN/ PWR	+5V/+12V

^{*} Pin 8 function can be set by JP11.

RS-422			
Pin	Pin Name	Signal Type	Signal level
1	RS422_TX-	OUT	
2	RS422_TX+	OUT	
3	RS422_RX+	IN	
4	RS422_RX-	IN	
5	NC		
6	NC		
7	NC		
8	GND	GND	
9	NC/+5V/+12V	PWR	+5V/+12V

RS-485			
Pin	Pin Name	Signal Type	Signal level
1	RS485_D-	I/O	
2	RS485_D+	I/O	
3	NC		
4	NC		
5	NC		
6	NC		
7	NC		
8	GND	GND	
9	NC/+5V/+12V	PWR	+5V/+12V

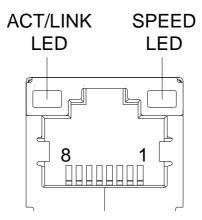
^{*} COM1 RS-232/422/485 can be set through BIOS setting. Default is RS-232.

^{*} Pin 8 function can be set by JP9.

2.4 List of Connectors (PER-T506)

Connectors on board access link to external devices such as hard disk drives, a keyboard.

Label	Function
CN2	LAN
CN9	COM3
CN10	COM4



Pin	Pin Name	Signal Type	Signal Level
1	MDI0+	DIFF	
2	MDI0-	DIFF	_
3	MDI1+	DIFF	
4	MDI2+	DIFF	_
5	MDI2-	DIFF	_
6	MDI1-	DIFF	_
7	MDI3+	DIFF	
8	MDI3-	DIFF	

2.4.2 COM Port 3 (CN9)

RS-232			
Pin	Pin Name	Signal Type	Signal level
1	DCD	IN	
2	RX	IN	
3	TX	OUT	±5V
4	DTR	OUT	±5V
5	GND	GND	
6	DSR	IN	
7	RTS	OUT	±5V
8	CTS	IN	
9	RI	IN	

RS-422			
Pin	Pin Name	Signal Type	Signal level
1	RS422_TX-	OUT	
2	RS422_TX+	OUT	
3	RS422_RX+	IN	
4	RS422_RX-	IN	
5	NC		
6	NC		
7	NC		
8	GND	GND	
9	NC		

RS-485			
Pin	Pin Name	Signal Type	Signal level
1	RS485_D-	I/O	
2	RS485_D+	I/O	
3	NC		
4	NC		
5	NC		
6	NC		
7	NC		
8	GND	GND	
9	NC		

Note: COM3 RS-232/422/485 can be set by BIOS setting. Default is RS-232.

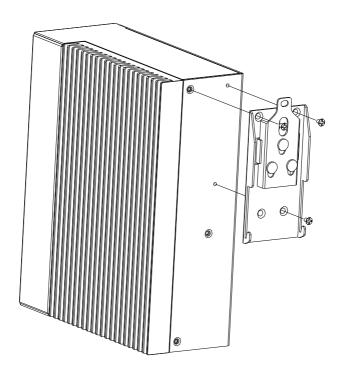
2.4.3 COM Port 4 (CN10)

RS-232				
Pin	Pin Name	Signal Type	Signal level	
1	DCD	IN		
2	RX	IN		
3	TX	OUT	±5V	
4	DTR	OUT	±5V	
5	GND	GND		
6	DSR	IN		
7	RTS	OUT	±5V	
8	CTS	IN		
9	RI	IN		

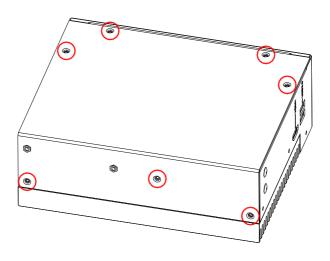
RS-422			
Pin	Pin Name	Signal Type	Signal level
1	RS422_TX-	OUT	
2	RS422_TX+	OUT	
3	RS422_RX+	IN	
4	RS422_RX-	IN	
5	NC		
6	NC		
7	NC		
8	GND	GND	
9	NC		

RS-485			
Pin	Pin Name	Signal Type	Signal level
1	RS485_D-	I/O	
2	RS485_D+	I/O	
3	NC		
4	NC		
5	NC		
6	NC		
7	NC		
8	GND	GND	
9	NC		

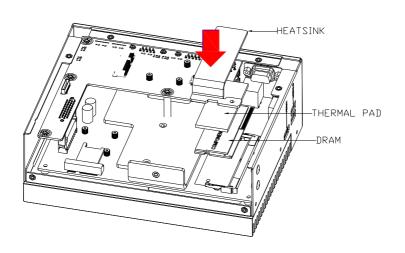
Note: COM4 RS-232/422/485 can be set by BIOS setting. Default is RS-232.



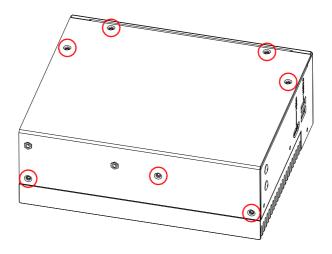
Step 1: Remove the baseplate as instructed below



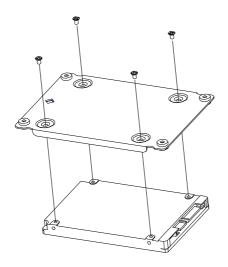
Step 2: Push down to secure the RAM



Step 1: Remove the baseplate as instructed below.

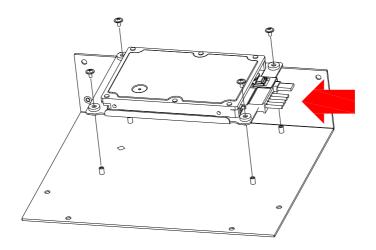


Step 2: Secure the HDD/SSD to the bracket plate.



Step 3: Connect the SATA and Power cables to the HDD/SSD assembly.

Step 4: Secure the HDD/SSD assembly to the baseplate as shown. Check that the assembly is oriented properly.



Chapter 3

AMI BIOS Setup

3.1 System Test and Initialization

The system uses certain routines to perform testing and initialization during the boot up sequence. If an error, fatal or non-fatal, is encountered, the system will output a few short beeps or an error message. The board can usually continue the boot up sequence with non-fatal errors.

The system configuration verification routines check the current system configuration against the values stored in the CMOS memory. If they do not match, an error message will be output, and the BIOS setup program will need to be run to set the configuration information in memory.

There are three situations in which the CMOS settings will need to be set or changed:

- Starting the system for the first time
- The system hardware has been changed
- The CMOS memory has lost power and the configuration information is erased

The system's CMOS memory uses a backup battery for data retention. The battery must be replaced when it runs down.

3.2 AMI BIOS Setup

The AMI BIOS ROM has a pre-installed Setup program that allows users to modify basic system configurations, which is stored in the battery-backed CMOS RAM and BIOS NVRAM so that the information is retained when the power is turned off.

To enter BIOS Setup, press immediately while your computer is powering up.

The function for each interface can be found below.

Main – Date and time can be set here. Press < Tab > to switch between date elements

Advanced - Enable/disable boot option for legacy network devices

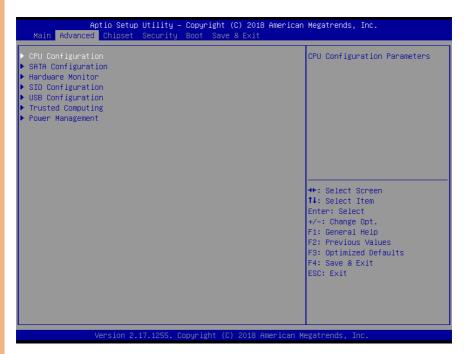
Chipset – For hosting bridge parameters

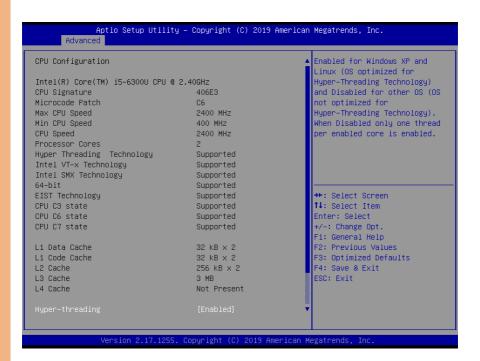
Security – The setup administrator password can be set here

Boot – Enable/disable Quiet Boot option

Save & Exit – Save your changes and exit the program







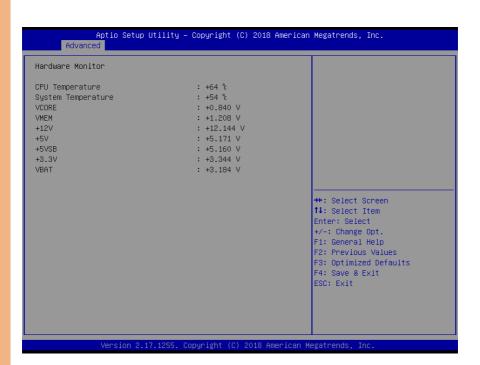
	– Copyright (C) 2019 A	merican Megatrends, Inc.
Advanced		
Microcode Patch	C6	▲ Allows more than two frequency
Max CPU Speed	2400 MHz	ranges to be supported.
Min CPU Speed	400 MHz	
CPU Speed	2400 MHz	
Processor Cores	2	
Hyper Threading Technology	Supported	
Intel VT-x Technology	Supported	
Intel SMX Technology	Supported	
64-bit	Supported	
EIST Technology	Supported	
CPU C3 state	Supported	
CPU C6 state	Supported	
CPU C7 state	Supported	
		→+: Select Screen
L1 Data Cache	32 kB x 2	↑↓: Select Item
L1 Code Cache	32 kB x 2	Enter: Select
L2 Cache	256 kB x 2	+/-: Change Opt.
L3 Cache	3 MB	F1: General Help
L4 Cache	Not Present	F2: Previous Values
		F3: Optimized Defaults
Hyper-threading	[Enabled]	F4: Save & Exit
Active Processor Cores	[A11]	ESC: Exit
Intel Virtualization Technology	[Enabled]	
CPU C states	[Disabled]	
Intel(R) SpeedStep(tm)		▼

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Options Summary			
Hyper-threading	Disabled		
	Enabled	Optimal Default	
Enabled for Windows	XP and Linux (OS optimized fo	or Hyper-Threading Technology)	
And Disabled for oth	er OS (OS not optimized for Hy	per-Threading Technology).	
When Disabled only	one thread per enabled core is	enabled	
Active Processor	1		
Cores	All	Optimal Default	
Number of cores to e	enable in each processor package	ge.	
Intel Virtualization	Disabled		
Technology	Enabled	Optimal Default	
When enabled, a VM	M can utilize the additional har	dware capabilities provided by	
Vanderpool Technolo	9 У		
CPU C States	Disabled	Optimal Default	
	Enabled		
Enable or disable CPU C states			
Intel(R)	Disabled	Optimal Default	
SpeedStep(tm)	Enabled		
Allows more than two frequency ranges to be supported.			

Aptio Setup U Advanced	tility – Copyright (C) 2018 America	n Megatrends, Inc.
SATA Configuration		Enable or disable SATA Device.
Serial ATA Port Port Hot Plug mSATA Port Port Hot Plug	TOSHIBA MQO1AA (320.0GB) [Enabled] [Disabled] Empty [Enabled] [Disabled]	++: Select Screen †1: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit
		ESC: Exit
Version 2.17	.1255. Copyright (C) 2018 American	Megatrends, Inc.

Options Summary			
SATA Controller(s)	Enabled	Optimal Default	
	Disabled		
Enable or Disable SA	TA Device.		
Port	Enabled	Optimal Default	
	Disabled		
Enable or Disable SATA Port.			
Hot Plug	Enabled		
	Disabled	Optimal Default	
Designates this port as Hot Pluggable.			



Aptio Setup Utility – Copyright (C) 2019 American Megatrends, Inc. Advanced AMI SIO Driver Version: A5.05.03 View and Set Basic properties of the SIO Logical device. Super IO Chip Logical Device(s) Configuration Like IO Base, IRQ Range, DMA Channel and Device Mode. [*Active*] Serial Port 2 [Disabled] Serial Port 3 [Disabled] Serial Port 4 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 Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit Version 2.17.1255. Copyright (C) 2019 American Megatrends, Inc.

outic Octor Mailian	0isht (0) 0040 0i	Managaraha Tan
Advanced Advanced	Copyright (C) 2018 American	megatrenus, Inc.
Serial Port 1 Configuration		Enable or Disable this Logical
Use This Device		
Logical Device Settings: Current : IO=3F8h; IRQ=4;		
Possible:	[Use Automatic Settings]	
Mode :	[RS232]	
WARNING: Disabling SIO Logical Devices may have unwanted side effects. PROCEED WITH CAUTION.		++: Select Screen 11: Select Item Fnter: Select
		+/-: Change Opt.
		F1: General Help F2: Previous Values
		F3: Optimized Defaults F4: Save & Exit
		ESC: Exit
Version 2.17.1255. (opyright (C) 2018 American M	egatrends. Inc.

<i>(</i>	
Disabled	
Enabled	Optimal Default
this Logical Device.	
Use Automatic Settings	Optimal Default
IO=2F8h; IRQ=3;	
IO=3F8h; IRQ=4;	
inge Device's Resource settings. New	settings will be reflected on This
System restarts.	
RS232	Optimal Default
RS422	
RS485	
485 selection	
	Disabled Enabled this Logical Device. Use Automatic Settings IO=2F8h; IRQ=3; IO=3F8h; IRQ=4; Inge Device's Resource settings. New System restarts. RS232 RS422 RS485

Aptio Setup Utility – Advanced	Copyright (C) 2018 American	Megatrends, Inc.
Serial Port 2 Configuration		Enable or Disable this Logical Device.
Use This Device		Device.
Logical Device Settings: Current : IO=2F8h; IRQ=3;		
Possible:	[Use Automatic Settings]	
Mode :	[RS232]	
,		++: Select Screen 14: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit
Version 2.17.1255. Co	pyright (C) 2018 American M	egatrends, Inc.

Options Summary			
Use This Device	Disabled		
	Enabled	Optimal Default	
Enable or Disable	this Logical Device.		
Possible:	Use Automatic Settings	Optimal Default	
	IO=2F8h; IRQ=3;		
	IO=3F8h; IRQ=4;		
Allows user to change Device's Resource settings. New settings will be reflected on This			
Setup Page after S	System restarts.		
Mode:	RS232	Optimal Default	
	RS422		
	RS485		
UART RS232, 422,	485 selection		

3.4.4.3 SIO Configuration: Serial Port 3 Configuration

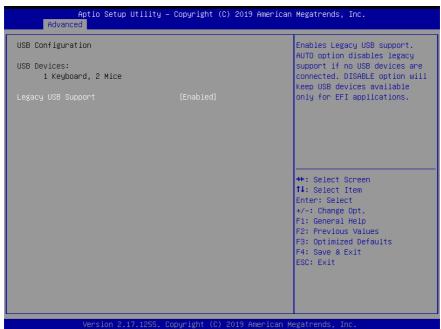
Aptio Setup Utility – Copyright (C) 2019 American Advanced	Megatrends, Inc.
Serial Port 3 Configuration	Enable or Disable this Logical Device.
Use This Device [Enabled]	bevice.
Logical Device Settings: Current : To Refresh – Reset Required!	
WARNING: Disabling SIO Logical Devices may have unwanted side effects. PROCEED WITH CAUTION.	
	++: Select Screen 11: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit
Version 2.17.1255. Copyright (C) 2019 American M	egatrends, Inc.

Options Summary		
Use This Device	Disabled	
	Enabled	Optimal Default
Enable or Disable this Logical Device.		

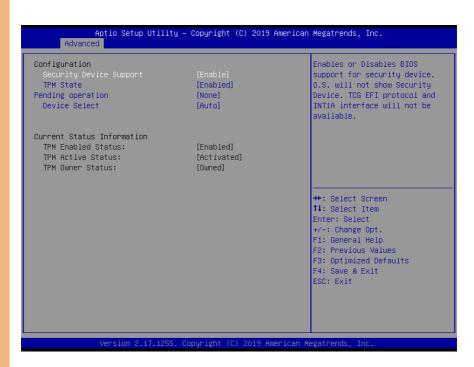
Advanced

Aptio Setup Utility - Copyright (C) 2019 American Megatrends, Inc.

Options Summary	У	
Use This Device	Disabled	
	Enabled	Optimal Default
Enable or Disable	this Logical Device.	



Options Summary			
Legacy USB Support	Enabled	Optimal Default	
	Disabled		
	Auto		
Enables Legacy USB support. AUTO option disables legacy support if no USB devices			
are connected. DISABLE option will keep USB devices available only for FEL applications.			



Options Summary					
Security Device Support	Enable	Optimal Default			
	Disable				
Enables or Disables BIOS supp	Enables or Disables BIOS support for security device. OS will not show Security Device.				
TCG EFI protocol and INT1A ir	nterface will not be	available.			
TPM State	Enable	Optimal Default			
	Disable				
Enables or Disables security device. Note : Your Computer will reboot during restart in					
order to change State of the Device.					
Pending operation	None	Optimal Default			
	TPM Clear				
Schedule an Operation for the Security Device. Note: Your computer will reboot during					
restart in order to change State of Security Device.					

Table Continues on Next Page

Options Summary		
Device Select	TPM 1.0	
	TPM 2.0	
	Auto	Optimal Default

TPM 1.2 will restrict support to TPM1.2 devices, TPM 2.0 will restrict support to TPM 2.0 devices, Auto will support both with the default set to TPM2.0 devices if not found, TPM.2 devices will be enumerated.



Options Summary		
Power Mode	ATX Type	Optimal Default
	AT Type	
Select power supply	mode.	
Restore AC Power	Last State	Optimal Default
Loss	Power On	
	Power Off	
Select power state w	hen power is re-applied after a	power failure.
RTC wake system	Disabled	Optimal Default
from S5	Fixed Time	
	Dynamic Time	
Fixed Time: System v	will wake on the hr::min::sec spe	cified./n Dynamic Time: System will
wake on the current	time + Increase minute(s)	
Resume from PCIE	Enabled	Optimal Default
	Disabled	
Enable/Disable Resu	me from PCIE	

Options Summary			
Resume from	Enabled	Optimal Default	
LAN/RI	Disabled		
Enable/Disable Resume from LAN/RI			

3.5 Setup submenu: Chipset



3.5.1 Chipset: System Agent (SA) Configuration

Aptio Setup Util Chipset	ity – Copyright (C) 2018 f	American Megatrends, Inc.
System Agent Bridge Name	Skylake	Maximum Value of TOLUD.
Memory Configuration		Dynamic assignment would adjust TOLUD automatically
Memory Frequency	2133 MHz	based on largest MMIO length
Total Memory	4096 MB	of installed graphic controlle
Max TOLUD	[Dynamic]	, april 00111 00111 00111 00111 00111 00111 00111 00111 00111 00111 00111 00111 00111 00111 00111 00111 00111 00111 00111 00111 00111 00111 00111 00111 00111 00111 00111 00111 00111 00111 00111 00111 00111 00111 00111 00111 00111 00111 00111 00111 00111 00111 00111 00111 00111 00111 00111 00111 00111 00111 00111 00111 00111 00111 00111 00111 00111 00111 00111 00111 00111 00111 00111 00111 00111 00111 00111 00111 00111 00111 00111 00111 00111 00111 00111 00111 00111 00111 00111 00111 00111 00111 00111 00111 00111 00111 00111 00111 00111 00111 00111 00111 00111 00111 00111 00111 00111 00111 00111 00111 00111 00111 00111 00111 00111 00111 00111 00111 00111 00111 00111 00111 00111 00111 00111 00111 00111 00111 00111 00111 00111 00111 00111 00111 00111 00111 00111 00111 00111 00111 00111 00111 00111 00111 00111 00111 00111 00111 00111 00111 00111 00111 00111 00111 00111 00111 00111 00111 00111 00111 00111 00111 00111 00111 00111 00111 00111 00111 00111 00111 00111 00111 00111 00111 00111 00111 00111 00111 00111 00111 00111 00111 00111 00111 00111 00111 00111 00111 00111 00111 00111 00111 00111 00111 00111 00111 00111 00111 00111 00111 00111 00111 00111 00111 00111 00111 00111 00111 00111 00111 00111 00111 00111 00111 00111 00111 00111 00111 00111 00111 00111 00111 00111 00111 00111 00111 00111 00111 00111 00111 00111 00111 00111 00111 00111 00111 00111 00111 00111 00111 00111 00111 00111 00111 00111 00111 00111 00111 00111 00111 00111 00111 00111 00111 00111 00111 00111 00111 00111 00111 00111 00111 00111 00111 00111 00111 00111 00111 00111 00111 00111 00111 00111 00111 00111 00111 00111 00111 00111 00111 00111 00111 00111 00111 00111 00111 00111 00111 00111 00111 00111 00111 00111 00111 00111 00111 00111 00111 00111 00111 00111 00111 00111 00111 00111 00111 00111 00111 00111 00111 00111 00111 00111 00111 00111 00111 00111 00111 00111 00111 00111 00111 00111 00111 00111 00111 00111 00111 00111 00111 00111 00111 00111 00111 00111 00111 00111 00111 001110011 00111 00111 00111 00111 00111 00111 00111 00111 00111 001110
Graphics Configuration		
a apriles com iga actor		
		→+: Select Screen
		↑↓: Select Item
		Enter: Select
		+/-: Change Opt.
		F1: General Help
		F2: Previous Values
		F3: Optimized Defaults
		F4: Save & Exit
		ESC: Exit
Version 2 17 12	55. Copyright (C) 2018 Ame	erican Megatrende Inc

Options Summary		
Max TOLUD	Dynamic	Optimal Default
	1 GB	
	1.25 GB	
	1.5 GB	
	1.75 GB	
	2 GB	
	2.25 GB	
	2.5 GB	
	2.75 GB	
	3 GB	

Maximum Value of TOLUD (Top of Low Usable DRAM)\nDynamic assignment would adjust TOLUD automatically based on largest MMIO length of installed graphic controller.\nChanging this value may cause side effect, if reserved memory is lesser than MMIO required. This happens often when GfX device with large MMIO requirement.



Options Summary			
Primary IGFX Boot	VBIOS default	Optimal Default	
Display	HDMI		
	LVDS		

Select the Video Device which will be activated during POST.

This has no effect if external graphics present.

Secondary boot display selection will appear based on your selection.

VGA modes will be supported only on primary display

Chipset: PCH-IO Configuration

Aptio Setup Utility – Copyright (C) 2018 American Megatrends, Inc. Chipset Control Detection of the PCH-IO Configuration HD-Audio device. Disabled = HDA will be unconditionally disabled Enabled = HDA will be unconditionally enabled Auto = HDA will be enabled if present, disabled otherwise. ↔÷: Select Screen ↑↓: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit Version 2.17.1255. Copyright (C) 2018 American Megatrends, Inc.

Options Summary			
HD Audio	Disabled		
	Enabled	Optimal Default	
Control Detection of the HD-Audio device.			
Disabled = HDA will be unconditionally disabled			
Enabled = HDA will be unconditionally enabled			
Auto = HDA will be enabled if present, disabled otherwise.			



Change User/Administrator Password

You can set an Administrator Password or User Password. An Administrator Password must be set before you can set a User Password. The password will be required during boot up, or when the user enters the Setup utility. A User Password does not provide access to many of the features in the Setup utility.

Select the password you wish to set, and press Enter. In the dialog box, enter your password (must be between 3 and 20 letters or numbers). Press Enter and retype your password to confirm. Press Enter again to set the password.

Removing the Password

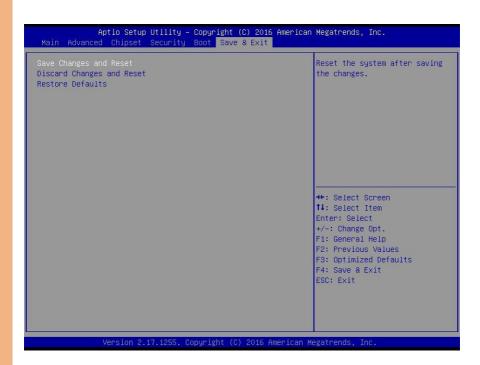
Select the password you want to remove and enter the current password. At the next dialog box press Enter to disable password protection.

3.7 Setup submenu: Boot



Options Summary			
Quiet Boot	Disabled		
	Enabled	Optimal Default	
Enables or disables Quiet Boot option.			
Launch PXE OpROM	Disabled	Optimal Default	
	Enabled		
Controls the execution of UEFI and Legacy PXE OpROM.			





Chapter 4

OS Flash guide

4.1 Introduction to this Section

Chapter 4 details the steps of how to load an OS image onto the BOXER-8320Al using the Clonezilla Restore tool. Before you start, make sure you have two USB storage devices (thumb drive) with the appropriate amount of free space. It is also recommended that you download and install a bootable USB drive creator tool such as Rufus before you begin.

4.2 Create Clonezilla-live USB

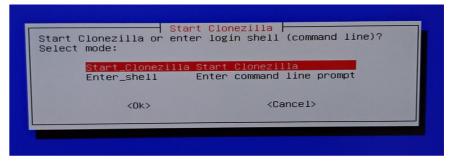
- Step 1 Download the Clonezilla-live ISO file from the Clonezilla official website at: https://clonezilla.org/downloads.php
- Step 2 Attach one USB device to your computer and run a bootable USB drive creator tool, i.e. Rufus.
- **Step 3** Find and select the Clonezilla-live ISO file from the file location.
- **Step 4** Click "Start" to build the Clonezilla-live USB drive.
- **Step 5** Select "Write in ISO Image mode" and click OK.
- **Step 6** Once the process is complete, click "Close". Be sure to properly eject your USB device before you disconnect it from the computer to prevent damaging the device.

4.3 Create Image USB

- Step 1 Download the image folder from the official AAEON website at: https://www.aaeon.com/en/p/intel-ai-solution-myriad-x-embedded-box-pc-boxer-8320ai
- Step 2 Connect the second USB device.
- **Step 3** Format the USB device to the FAT32 file system.
- **Step 4** Copy the image folder onto the USB device. Safely remove the USB device.

4.4 Restore System with Image File

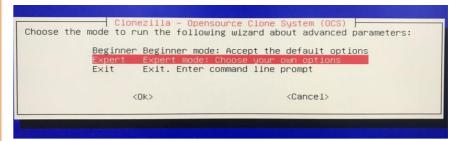
- Step 1 Attach both the Clonezilla-live USB and Image USB devices to the BOXER-8320AI.
- Step 2 Boot from the Clonezilla-live USB.
- Step 3 Choose Clonezilla-live (Default settings, VGA 800x600).
- Step 4 Choose "eh_US.UTF-8 English".
- Step 5 Choose "Start_Clonezilla Start Clonezilla".



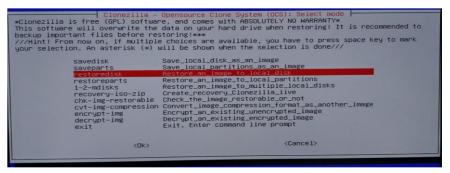
Step 6 Choose "device-image work with disks or partitions using images".

Step 7 Choose "Use local device (E.g.: hard drive, USB drive)".

- **Step 8** The system will detect available disks on the system. Press Ctrl-C to continue.
- Step 9 Choose the Image USB device.
- **Step 10** Check "have existing image file", and use Tab button to choose "Done".
- **Step 11** Choose "Expert mode: Choose your own options".



Step 12 Choose "Restore_an_image_to_local_disk".



- **Step 13** Choose the image file.
- **Step 14** Choose the option to restore disk.
- **Step 15** Use Tab to select "OK" to use default parameters.

```
Set advanced parameters (multiple choices available). If you have no idea, keep the default values and do NOT change anything. Just press Enter. (Press space key to mark your selection. An asterisk (*) will be shown when the selection is done)

[M] —g auto Reinstall grub in client disk MBR (only if grub config exists)
(*) —e1 auto Automatically adjust filesystem geometry for a NTES boot partition if exists stdisk uses CHS of hard drive from EDD(for non-grub boot loader)
( )—nogui Use text output only, no TUI/GNI output
( )—hno PC Change MS Win hostname (based on IP address) after clone
( )—hni PC Change MS Win hostname (based on HAC address) after clone
( )—batch Run clone in batch mode (DeNnEROUS))
( )—c Client waits for confirmation before cloning
( )—t Client skip restoring the MBR (Master Boot Record)
( )—t2 Client skip restoring the MBR (Master Boot Record)
( )—t2 Client skip restoring the EBR (Extended Boot Record)
( )—t7 to resize the filesystem to fit partition size
( )—e stdisk uses the CHS value of hard drive from the saved image
( )—icrc Ignore CRC checking of partclone
( )—irrh Do not remove Linux udev hardware record after restoring.
( )—irvd Do not remove NTFS volume dirity flag after it is restored
( )—ius Do not update syslinux—related files after restoring.
( )—iefi Skip updating boot entries in EFI NVRAM after restoring
( )—iif Mrite MBR (S12 B) again after linge is restored. Not OK for partition table diffe
( )—iif Check image by MDS checksums
( )—cmf Inspect checksum for files in device after restoring
( )—cmf Inspect checksum for files in device after restoring
( )—cmf Inspect checksum for files in device after restoring
```

Step 16 Choose "Create partition table proportionally".

Step 17 Choose "Yes, check the image before restoring"

```
Before restoring the image, do you want to check if the image is restorable or not? ///NOTE///
This action will only check the image is restorable or not, and it will not write any data to
the harddrive.

Yes, check the image before restoring
-scr No, skip checking the image before restoring

(Ok)

(Cancel)
```

Step 18 Choose which action to perform when everything is finished.

```
Mode: savedisk

The action to perform when everything is finished:

—p choose Choose reboot/shutdown/etc when everything is finished
—p reboot Reboot
—p poweroff Shutdown

<Ok>
<Cancel>
```

Step 19 The system will check the image file. This may take a few moments.

```
Partclone
Partclone v0.2.91 http://partclone.org
Starting to check image (-)
Calculating bitmap... Please wait... done!
File system:
              EXTFS
Device size:
Space in use:
                 13.2 GB = 3232256 Blocks
                  4.1 GB = 995954 Blocks
Free Space:
                  9.2 GB = 2236302 Blocks
Block size:
                4096 Byte
Image Version:
                   0001
                                                      5.22GB/min
Elapsed: 00:00:02 Remaining: 00:00:44
                                             Rate:
Current Block: 63346 Total Block: 3232256
Data Block Process:
                                                             4.27%
Total Block Process:
                                                             1.96%
```

Step 20 Apply to restore image.

Step 21 The system will now restore the image. This may take a few moments.

```
Partclone
Partclone v0.2.91 http://partclone.org
Starting to restore image (-) to device (/dev/mmcblkOp2)
Calculating bitmap... Please wait... done!
File system:
              EXTFS
Device size:
               13.2 GB = 3232256 Blocks
Space in use:
                4.1 GB = 995954 Blocks
                9.2 GB = 2236302 Blocks
Free Space:
Block size:
              4096 Byte
Image Version:
                 0001
                                                 5.03GB/min
                                         Rate:
Elapsed: 00:00:02 Remaining: 00:00:46
Current Block: 61810 Total Block: 3232256
Data Block Process:
                                                       4.11%
Total Block Process:
                                                       1.91%
```

Step 22 Select "Reboot" to finish disk restoration.

