

BOXER-8254AI

Compact Fanless Embedded AI@Edge Box PC
with NVIDIA[®] Jetson Xavier[™] NX
User's Manual 2nd Ed

Copyright Notice

This document is copyrighted, 2022. All rights are reserved. The original manufacturer reserves the right to make improvements to the products described in this manual at any time without notice.

No part of this manual may be reproduced, copied, translated, or transmitted in any form or by any means without the prior written permission of the original manufacturer. Information provided in this manual is intended to be accurate and reliable. However, the original manufacturer assumes no responsibility for its use, or for any infringements upon the rights of third parties that may result from its use.

The material in this document is for product information only and is subject to change without notice. While reasonable efforts have been made in the preparation of this document to assure its accuracy, AAEMON assumes no liabilities resulting from errors or omissions in this document, or from the use of the information contained herein.

AAEMON reserves the right to make changes in the product design without notice to its users.

Acknowledgements

All other products' name or trademarks are properties of their respective owners.

- NVIDIA®, the NVIDIA logo, Jetson™ and Jetson Xavier™ NX are trademarks of the NVIDIA Corporation
- ITE is a trademark of Integrated Technology Express, Inc.
- IBM and VGA are trademarks of International Business Machines Corporation.
- Ubuntu is a registered trademark of Canonical

All other product names or trademarks are properties of their respective owners. No ownership is implied or assumed for products, names or trademarks not herein listed by the publisher of this document.

Packing List

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

Item	Quantity
● BOXER-8254AI	1
● Power Connector	1
● Wallmount Bracket	2
● Screw Package	1

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

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 at AAEON.com for the latest version of this document.

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. All cables and adapters supplied by AAEON are certified and in accordance with the material safety laws and regulations of the country of sale. Do not use any cables or adapters not supplied by AAEON to prevent system malfunction or fires.
3. Make sure the power source matches the power rating of the device.
4. Position the power cord so that people cannot step on it. Do not place anything over the power cord.
5. Always completely disconnect the power before working on the system's hardware.
6. No connections should be made when the system is powered as a sudden rush of power may damage sensitive electronic components.
7. 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.
8. Always disconnect this device from any AC supply before cleaning.
9. While cleaning, use a damp cloth instead of liquid or spray detergents.
10. Make sure the device is installed near a power outlet and is easily accessible.
11. Keep this device away from humidity.
12. Place the device on a solid surface during installation to prevent falls
13. Do not cover the openings on the device to ensure optimal heat dissipation.
14. Watch out for high temperatures when the system is running.
15. Do not touch the heat sink or heat spreader when the system is running
16. Never pour any liquid into the openings. This could cause fire or electric shock.

17. 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.
18. 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
19. **DO NOT LEAVE THIS DEVICE IN AN UNCONTROLLED ENVIRONMENT WITH TEMPERATURES BEYOND THE DEVICE'S PERMITTED STORAGE TEMPERATURES (SEE CHAPTER 1) TO PREVENT DAMAGE.**

FCC Statement

Warning!



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.

产品中有毒有害物质或元素名称及含量

AAEON System

QO4-381 Rev.A0

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

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，然而该部件仍符合欧盟指令 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。

Hazardous and Toxic Materials List

AAEON System

QO4-381 Rev.A0

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

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.
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.

Table of Contents

Chapter 1 - Product Specifications	1
1.1 Specifications	2
1.2 Product Notice	4
Chapter 2 – Hardware Information	5
2.1 Dimensions	6
2.2 Jumpers and connectors.....	8
2.3 List of Jumpers	10
2.3.1 Setting Jumpers	10
2.3.2 AT/ATX Mode Select (CN3 Pins 7-8)	11
2.3.3 Mini Card mSATA/PCIe Selection (CN13).....	11
2.4 List of Connectors.....	12
2.4.1 RTC Battery Connector (CN2).....	13
2.4.2 Front Panel Connector (CN3)	13
2.4.3 Recovery Micro USB Connector (CN4).....	14
2.4.4 HDMI Connector (CN5)	14
2.4.5 RS232/RS485 DB-9 Connector (CN6).....	15
2.4.6 CANBus Connector (CN7).....	16
2.4.7 UART Debug Header (CN8).....	16
2.4.8 microSD Card Socket (CN10)	17
2.4.9 M.2 E-Key 2230 (CN11).....	18
2.4.10 SIM Card Socket (CN12).....	19
2.4.11 USB3.2 Gen2/ USB2.0 Dual Port Connector (CN15)	19
2.4.12 SATA Connector (CN19)	20
2.4.13 DC Power In Connector (CN20).....	21
2.4.14 6-Bit GPIO (CN24).....	21
2.4.15 8-Bit GPIO Header (CN37).....	21

2.4.16	Internal COM RS232 Header (CN47)	22
2.4.17	RS-232/485 Select (SW1)	22
2.5	Hardware Assembly	23
2.5.1	2.5" SATA Drive Installation.....	23
2.5.2	Module Access & Installation.....	25
2.5.3	Wallmount Kit Installation	26
Chapter 3 – OS Flash Guide.....		27
3.1	Before Installation.....	28
3.2	Connecting to PC/Force Recovery Mode	29
3.3	Flash Image to Board.....	30

Chapter 1

Product Specifications

1.1 Specifications

System

AI Accelerator	NVIDIA® Jetson Xavier™ NX
CPU	6 Core ARM® Carmel® V8.2 64-bit CPU 6MB L2 + 4MB L3
System Memory	8GB LPDDR4x
Storage Device	16GB eMMC microSD Card expansion Full-size minicard slot x1 for mSATA (share with LTE slot) 2.5" SATA drive bay x 1
Display Interface	HDMI 2.0 x 1
Ethernet	GbE PoE/PSE x 8 (IEEE 802.3af, total 120W) 10/100/1000Base-TX x 2
I/O	RJ-45 x 8 for GbE PoE (802.3af, total 120W) RJ-45 x 2 for Gigabit Ethernet LAN USB3.2 Gen 2 Type A x 1 USB2.0 Type A x 3 Micro USB B x 1 for OS Flash HDMI Type A x1 for HDMI 2.0 a/b DB-9 x 1 for RS-232/485 COM Switch x 1 for RS-232/485 DB-9 x 1 for CANBus 2.0A DB-9 x 1 for Digital I/O 6-channel (programmable) microSD slot x 1 Power On/Off switch x 1 Recovery button x 1

System

	Reset button x 1
	Antenna Opening x 4
Expansion	Full-Size Mini Card slot x 1 (PCIe/USB/mSATA; default PCIe)
	M.2 E-Key 2230 x 1 for Wi-Fi
	SIM socket x 1
	SATA port x 1 (for 2.5" drive)
	RS-232 header x 1
	USB2.0 header x 1
Indicator	Power LED x 1
OS Support	NVIDIA Jetpack 4.5.1 and above

Power Supply

Power Requirement	24V DC with 2-pin terminal block ATX mode
--------------------------	---

Mechanical

Mounting	Wall-mount kit
Dimensions (W x D x H)	210mm x 164.2mm x 75mm
Gross Weight	7.5 lbs (3.4kg)
Net Weight	5.51 lbs (2.5kg)

Environmental

Operating Temperature	5°F ~ 140°F (-15°C ~ 60°C) according to IEC60068-2 with 0.5 m/s airflow
Storage Temperature	-40°F ~ 176°F (-40°C ~ 80°C)
Storage Humidity	5 ~ 95% at 40°C, non-condensing
Anti-Vibration	Random, 3.5 Grms/ 5 ~ 500Hz

Environmental

Anti-Shock	50G peak acceleration (11m/sec. duration, eMMC, microSD, SATA, or SSD)
Certification	CE / FCC class A

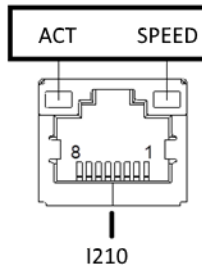
1.2 Product Notice

Micro-USB: Micro-USB port is ideally for flashing OS image only.

USB ports: USB ports do not support USB DVD ROM because of file system.

USB 3.2 Gen 2: USB3.2 Gen 1 is the current name for 10Gbps specification, formerly USB 3.1 Gen 2.

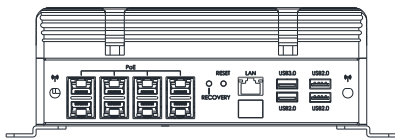
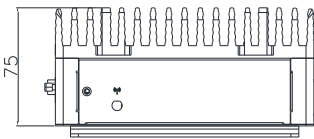
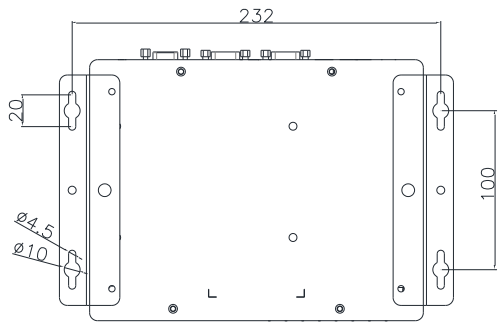
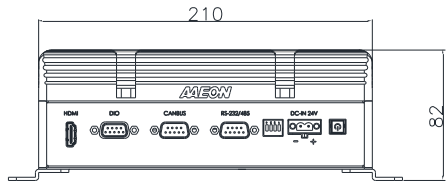
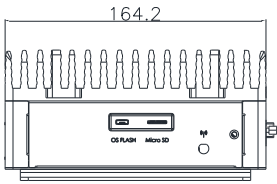
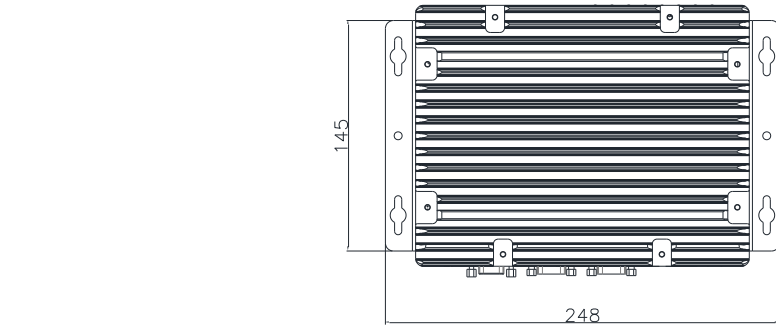
LAN Indicator Behavior

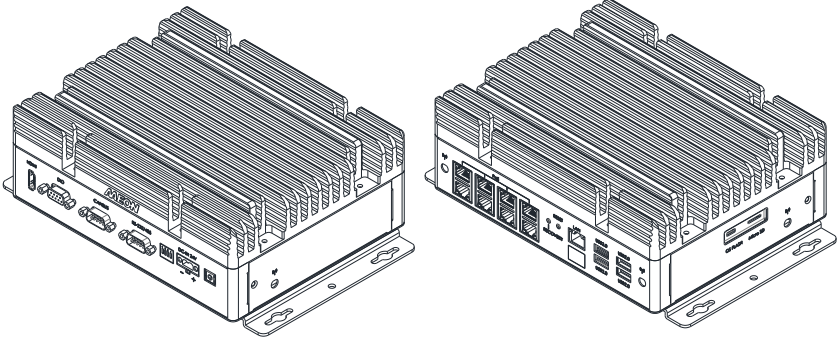


Chapter 2

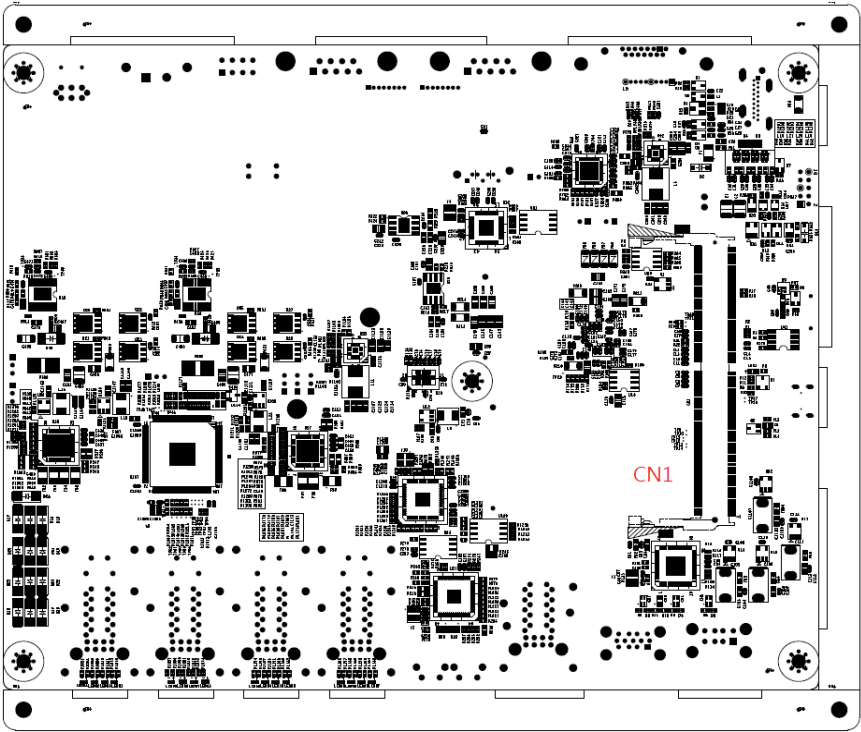
Hardware Information

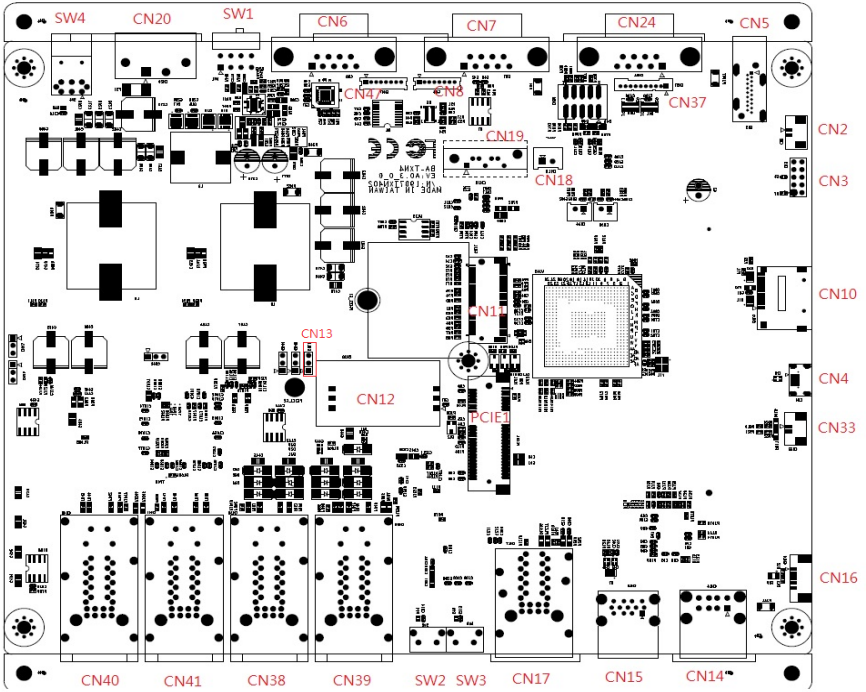
2.1 Dimensions





2.2 Jumpers and connectors





2.3 List of Jumpers

The board has a number of jumpers that allow you to configure your system to suit your application.

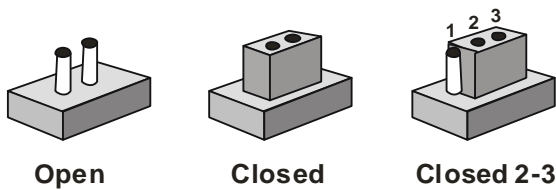
The table below shows the function of each of the board's jumpers

Label	Function
CN3	AT/ATX Selection (Front Panel Connector Pins 7-8)
CN13	Mini Card mSATA/PCIe Selection

2.3.1 Setting Jumpers

You can configure your system to match the needs of your application by setting jumpers. A jumper is the simplest kind of electric switch. It consists of two metal pins and a small metal clip (often protected by a plastic cover) that slides over the pins to connect them. To “close” a jumper you connect the pins with the clip.

To “open” a jumper you remove the clip. Sometimes a jumper will have three pins, labeled 1, 2 and 3. In this case you would connect either pins 1 and 2 or 2 and 3.



A pair of needle-nose pliers may be helpful when working with jumpers.

If you have any questions about the best hardware configuration for your application, contact your local distributor or sales representative before you make any changes.

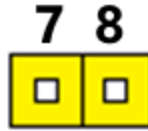
Generally, you simply need a standard cable to make most connections.

2.3.2 AT/ATX Mode Select (CN3 Pins 7-8)

The AT/ATX Mode Select functions by connecting pins 7 and 8 of CN3. To prevent damage to the system, do not connect pins 7 and 8 to any other pin.



Open – AT Mode



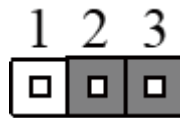
Closed – ATX Mode
(Default)

Note: AT Mode is selected when pins 7-8 are open; ATX Mode is selected when pins 7-8 are closed (default setting). If set to ATX Mode, the power button must be used to turn on the system.

2.3.3 Mini Card mSATA/PCIe Selection (CN13)



mSATA



PCIe (Default)

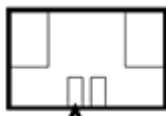
2.4 List of Connectors

The board has a number of connectors that allow you to configure your system to suit your application.

The table below shows the function of each of the board's connectors

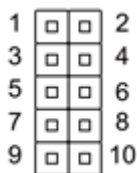
Label	Function
CN1	NVIDIA Xavier NX Module Connector
CN2	RTC Battery Connector
CN3	Front Panel Connector
CN4	Recovery micro-USB Connector
CN5	HDMI Connector
CN6	RS232/RS485 DSUB-9P Connector
CN7	CANBus DSUB-9P Connector
CN8	UART Debug Header
CN10	microSD Card Socket
CN11	M.2 E-Key Socket
CN12	SIM Card Socket
CN14	Dual USB2.0 Connector
CN15	USB3.2 Gen 2/USB2.0 Dual Port Connector
CN16	Internal USB2.0 Header
CN17	Dual Gigabit LAN Connector
CN18	SATA Power Connector (5V)
CN19	SATA Connector
CN20	2-pin 24V Power In
CN24	6-bit GPIO
CN37	8-bit GPIO Header
CN47	Internal COM RS232 Header
SW1	CN6 RS232/485 Selection

2.4.1 RTC Battery Connector (CN2)



Pin	Signal	Pin	Signal
1	+3V	2	GND

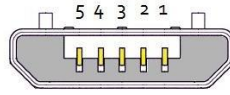
2.4.2 Front Panel Connector (CN3)



Pin	Signal	Pin	Signal
1	Button_PWR_ON	2	GND
3	FORCE_RECOVERY	4	GND
5	PMIC_SYS_RST	6	GND
7	LATCH_SET_BUT	8	LATCH_SET
9	3.3V	10	GND

Note: Pins 7-8 are used for setting AT/ATX Mode. See Ch 2.3.2 for details.

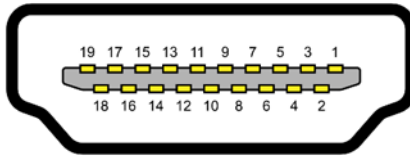
2.4.3 Recovery Micro USB Connector (CN4)



USB Micro-B

Pin	Signal	Pin	Signal
1	+5V	2	USB1-
3	USB1+	4	
5	GND		

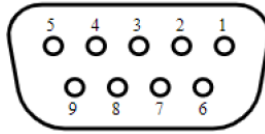
2.4.4 HDMI Connector (CN5)



Pin	Signal	Pin	Signal
1	HDMI_DATA2_P	2	GND
3	HDMI_DATA2_N	4	HDMI_DATA1_P
5	GND	6	HDMI_DATA1_N
7	HDMI_DATA0_P	8	GND
9	HDMI_DATA0_N	10	HDMI_CLK_P
11	GND	12	HDMI_CLK_N
13	NC	14	NC
15	HDMI_SCL	16	HDMI_SDA

Pin	Signal	Pin	Signal
17	GND	18	HDMI_PWR
19	HDMI_HDP		

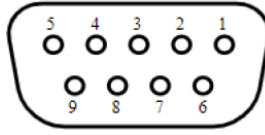
2.4.5 RS232/RS485 DB-9 Connector (CN6)



Pin	RS-232	RS-485
1		485-
2	RXD	485+
3	TXD	
4		
5	GND	
6		
7		
8		

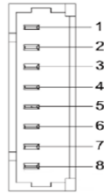
Note: RS-232/485 Mode can be set by SW1. See Ch2.4.17 for details and settings.

2.4.6 CANBus Connector (CN7)



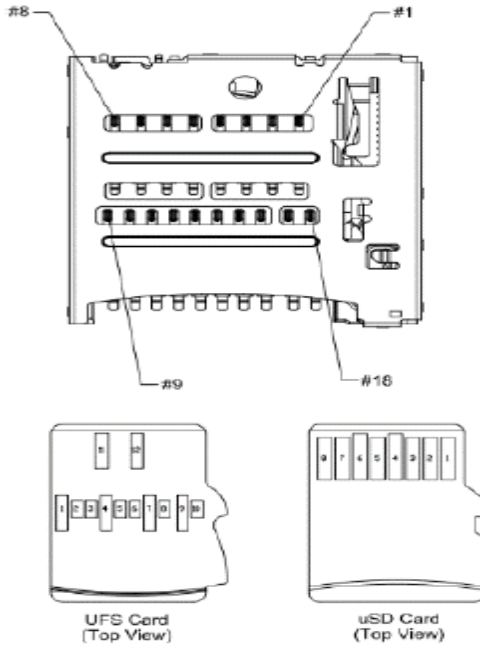
Pin	Signal	Pin	Signal
1	NC	2	CAN0_L
3	GND	4	NC
5	+5V	6	NC
7	CAN_H	8	NC
9	NC		

2.4.7 UART Debug Header (CN8)



Pin	Signal	Pin	Signal
1	3.3V	2	UART0_TXD_HDR
3	UART0_RXD_HDR	4	NC
5	NC	6	ID_I2C_SCL
7	ID_I2C_SDA	8	GND

2.4.8 microSD Card Socket (CN10)



Pin (Card)	Pin (Connector)	Function
1	#1	DAT2
2	#2	CD/DAT3
3	#3	CMD
4	#4	VDD
5	#5	CLK
6	#6	VSS
7	#7	DAT0
8	#8	DAT1

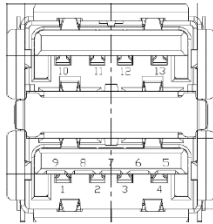
2.4.9 M.2 E-Key 2230 (CN11)

74	3.3V	GND	75
72	3.3V	RESERVED/REFCLKn1	73
70	UIM_POWER_SRC/GPIO1/PEWAKE1#	RESERVED/REFCLKp1	71
68	UIM_POWER_SNK/CLKREQ1#	GND	69
66	UIM_SWP/PERST1#	RESERVED/PETn1	67
64	RESERVED	RESERVED/PETp1	65
62	ALERT# (O)(0/3.3V)	GND	63
60	I2C_CLK (I)(0/3.3V)	RESERVED/PERn1	61
58	I2C_DATA (I/O)(0/3.3V)	RESERVED/PERp1	59
56	W_DISABLE1# (I)(0/3.3V)	GND	57
54	W_DISABLE2# (I)(0/3.3V)	PEWAKE0# (I/O)(0/3.3V)	55
52	PERST0# (I)(0/3.3V)	CLKREQ0# (I/O)(0/3.3V)	53
50	SUSCLK(32kHz) (I)(0/3.3V)	GND	51
48	COEX1 (I/O)(0/1.8V)	REFCLKn0	49
46	COEX2(I/O)(0/1.8V)	REFCLKp0	47
44	COEX3(I/O)(0/1.8V)	GND	45
42	VENDOR DEFINED	PETn0	43
40	VENDOR DEFINED	PETp0	41
38	VENDOR DEFINED	GND	39
36	UART CTS (I)(0/1.8V)	PERn0	37
34	UART RTS (O)(0/1.8V)	PERp0	35
32	UART RXD (I)(0/1.8V)	GND	33
	Module Key	Module Key	
	Module Key	Module Key	
	Module Key	Module Key	
	Module Key	Module Key	
22	UART TXD (O)(0/1.8V)	SDIO RESET# (I)(0/1.8V)	23
20	UART WAKE# (O)(0/3.3V)	SDIO WAKE# (O)(0/1.8V)	21
18	GND	SDIO DATA3(I/O)(0/1.8V)	19
16	LED2# (O)(OD)	SDIO DATA2(I/O)(0/1.8V)	17
14	PCM_IN/I2S SD_IN (I)(0/1.8V)	SDIO DATA1(I/O)(0/1.8V)	15
12	PCM_OUT/I2S SD_OUT (O)(0/1.8V)	SDIO DATA0(I/O)(0/1.8V)	13
10	PCM_SYNC/I2S WS (I/O)(0/1.8V)	SDIO CMD(I/O)(0/1.8V)	11
8	PCM_CLK/I2S SCK (I/O)(0/1.8V)	SDIO CLK(I)(0/1.8V)	9
6	LED1# (O)(OD)	GND	7
4	3.3V	USB_D-	5
2	3.3V	USB_D+	3
		GND	1

2.4.10 SIM Card Socket (CN12)

Pin	Pin Name	Signal Type
1	UIM_PWR	PWR
2	UIM_RST	IN
3	UIM_CLK	IN
4	GND	GND
5	UIM_VPP	PWR
6	UIM_DATA	PWR

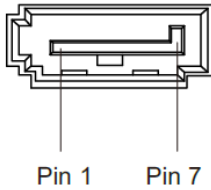
2.4.11 USB3.2 Gen2/ USB2.0 Dual Port Connector (CN15)



Pin	Signal	Pin	Signal
USB3.2		USB2.0	
U1	VBUS_1	U10	VBUS_2
U2	(A)D-	U11	(B)D-
U3	(A)D+	U12	(B)D+
U4	GND	U13	GND
U5	(A)SSRX-		
U6	(A)SSRX+		
U7	GND		

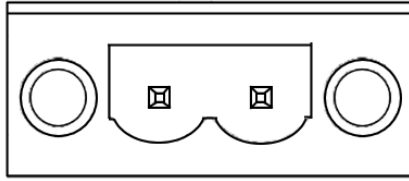
Pin	Signal	Pin	Signal
USB3.2		USB2.0	
U8	(A)SSTX-		
U9	(A)SSTX+		

2.4.12 SATA Connector (CN19)



Pin	Pin Name	Signal Type
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

2.4.13 DC Power In Connector (CN20)



Pin	Signal	Pin	Signal
1	PWR IN	2	GND

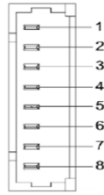
2.4.14 6-Bit GPIO (CN24)

Pin	Signal	Pin	Signal
1	21_SPI0_MISO_LS (GPIO492)	2	19P_SPI0_MOSI_LS_205 (GPIO493)
3	13P_SPI1_SCK_LS (GPIO480)	4	22P_SPI1_MISO_LS (GPIO481)
5	GND	6	37P_SPI1_MOSI_LS (GPIO482)
7	18P_SPI1_CS0_LS (GPIO483)	8	NC
9	+V3.3S		

2.4.15 8-Bit GPIO Header (CN37)

Pin	Signal	Pin	Signal
1	+V3.3S	2	GPIO14 (GPIO345)
3	16P_SPI1_CS1_LS (GPIO484)	4	15P_GPIO12_LS (GPIO268)
5	32P_GPIO07_LS (GPIO424)	6	209P_UART1_CTS_LS (GPIO479)
7	31P_GPIO11_LS (GPIO422)	8	33P_GPIO13_LS (GPIO393)
9	26P_SPI0_CS1_LS (GPIO495)	10	GND

2.4.16 Internal COM RS232 Header (CN47)



Pin	Signal	Pin	Signal
1	3.3V	2	NC
3	RXC_2	4	NC
5	TXC_2	6	NC
7	GND	8	NC

2.4.17 RS-232/485 Select (SW1)



Mode	S-1	S-2	S-3	S-4
1T/1R RS-232	On	On		
1T/1R RS-485	Off	On		
Enable RS-422/RS-485 bias and termination resistors			On	
Disable RS-422/RS-485 bias and termination resistors			Off	
250kbps for RS-232 and RS-485/RS-422				On
RS-232 to 3Mbps RS-485/RS-422 to 20Mbps				Off

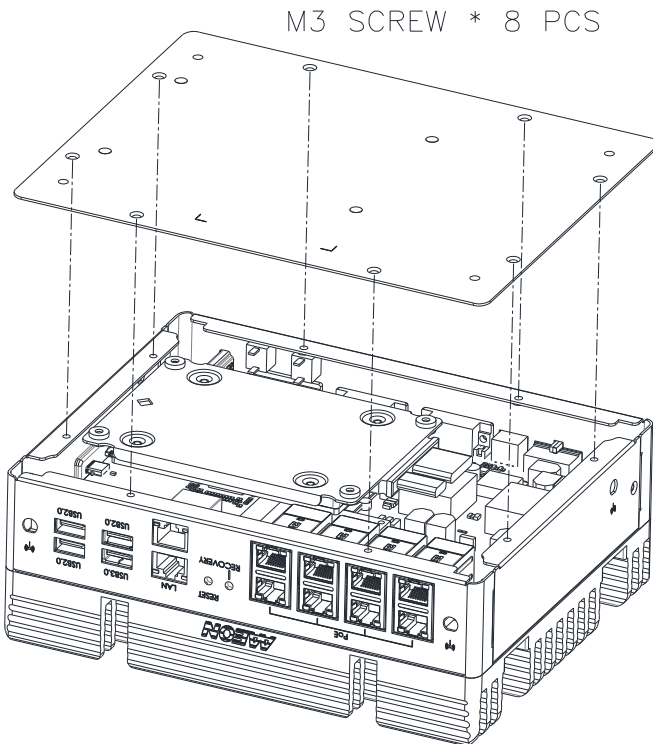
Note: SW1 controls the RS-232/485 mode for CN6. See Ch 2.4.5 for Pin Definitions

2.5 Hardware Assembly

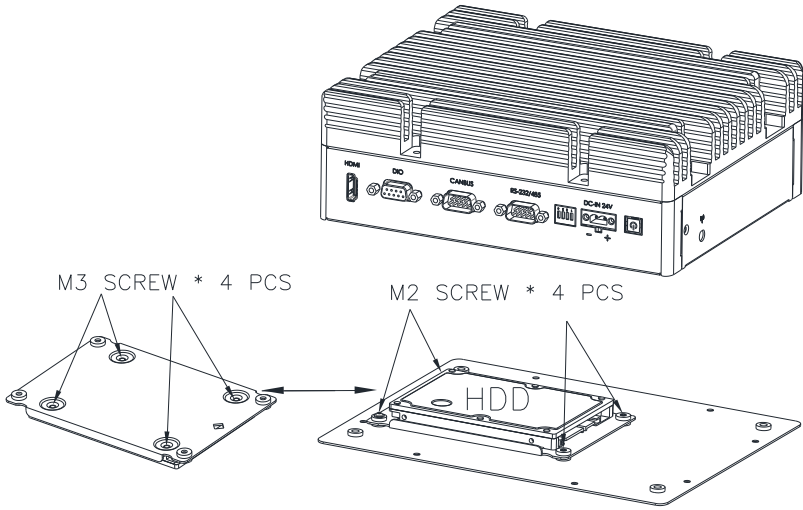
This section details the hardware assembly steps for the BOXER-8254AI. Please read this section thoroughly before beginning installation and ensure you have all necessary components ready. A Phillips head screwdriver is required.

2.5.1 2.5" SATA Drive Installation

Step 1: Access the bottom panel by removing the eight (8) screws securing it to the chassis, as shown.



Step 2: Place the 2.5" Drive onto the drive carrier and secure with four screws. Then, fasten the carrier to the bottom panel as shown. Note the direction of the connectors!



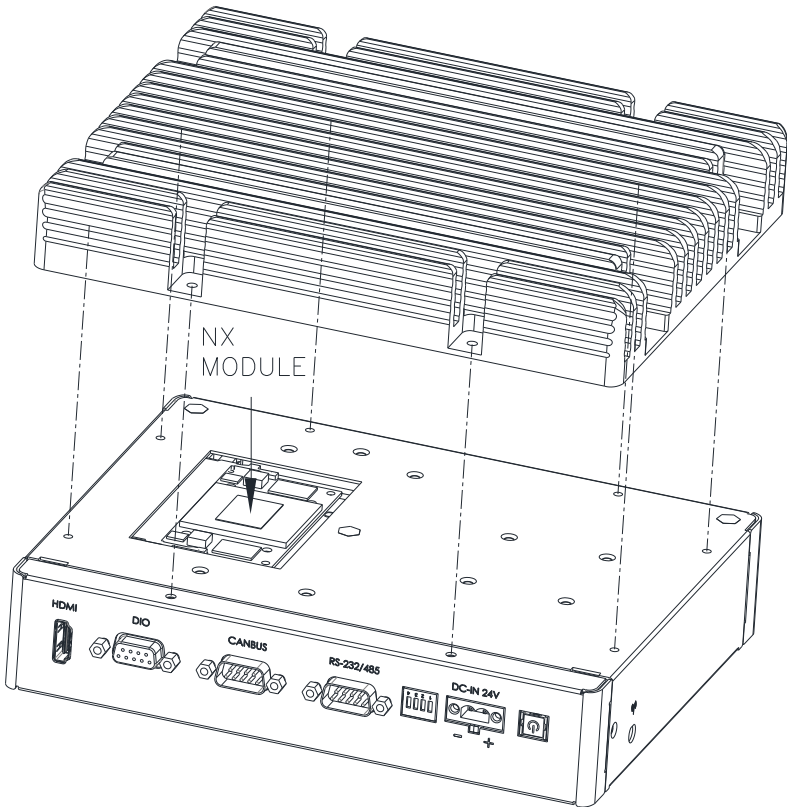
Step 3: Attach the SATA and SATA Power cables to the 2.5" drive and to the corresponding connectors on the board.

Step 4: Reattach the bottom panel.

2.5.2 Module Access & Installation

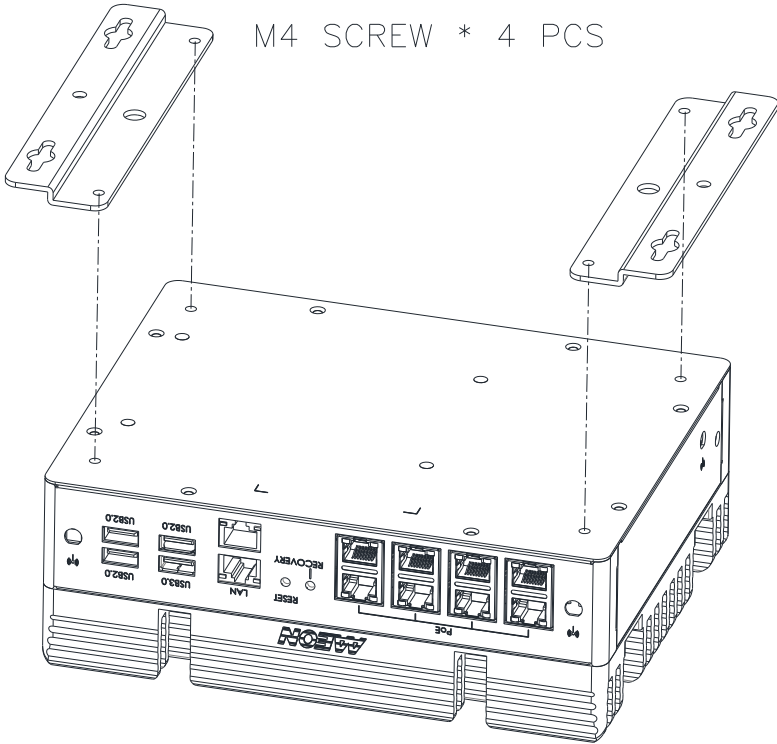
The Xavier NX module is located under the top heat sink. To access, remove the eight (8) screws securing the heatsink to the chassis, then lift the heatsink off. The module will be located as shown.

M3 SCREW * 8 PCS



2.5.3 Wallmount Kit Installation

To install the wallmount kit, simply line up the brackets as shown and secure with four (4) screws (two for each bracket).

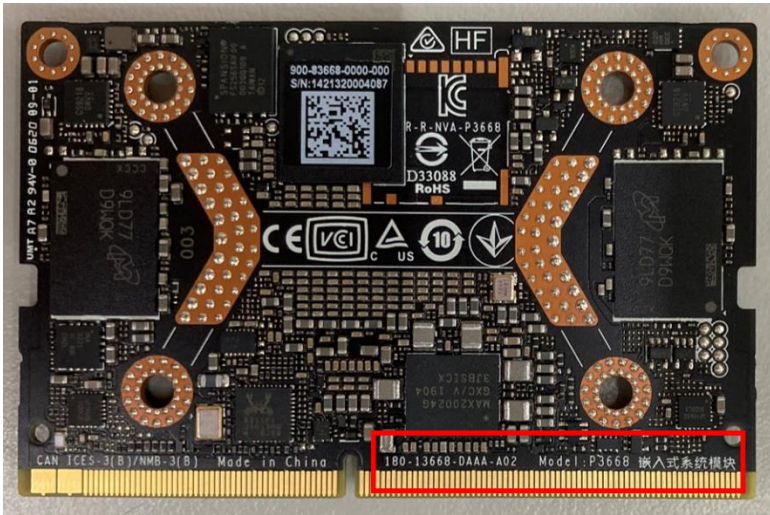


Chapter 3

OS Flash Guide

3.1 Before Installation

Before starting the process make sure your BOXER-8254AI system is turned off and the power in is disconnected. You will need a host PC running Ubuntu 16.04 or 18.04, and make sure the NVIDIA Jetson Xavier NX module is installed onto the BOXER-8254AI carrier board/ system.



Download the compressed OS image file. The file name will follow the format of:

`ACLinux_4.9_{OS_IF}_{PLF_IF}_{PJ_IF}_{BN}.tar.gz`

For example:

`ACLinux_4.9_NJ451X.NV05.BOXER-8254AI.2.tar.gz`

Note: Filename may differ from this example.

- I. `{OS_IF}` is OS Information. For example, `NJ451X` which `NJ` means NVIDIA Jetpack, `451` means NVIDIA Jetpack 4.5.1 and `X` means Desktop version.
- II. `{PLF_IF}` is Platform Information; e.g. `NV05`
- III. `{PJ_IF}` is Project Information; e.g. `BOXER-8254AI`
- IV. `{BN}` is Build Number; e.g. 0, 1, 2, etc.

3.2 Connecting to PC/Force Recovery Mode

On Host Computer, open Linux terminal and enter the following command to extract compressed OS image files (*file name may vary*):

```
$ tar -zxvf ACLinux_4.9_NJ451X.NV05.BOXER-8254AI.2.tar.gz
```

Next, perform the following steps to force the system to start in USB Recovery Mode:

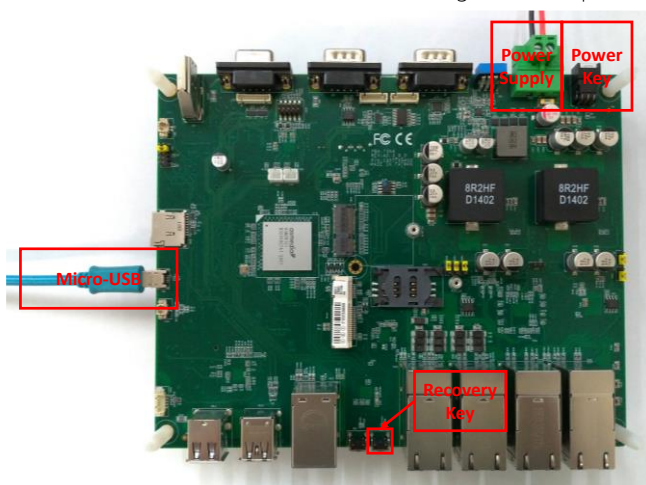
1. Connect the Micro-USB plug on the USB cable to the Recovery Port on the BOXER-8254AI and the other end to an available USB port on the host PC.
2. Connect the BOXER-8254AI power supply.
3. Press and hold the recovery key button. While holding the recovery key button, power on the system, and continue to hold the recovery key button for two seconds, then release. The BOXER-8254AI should enter recovery mode.
4. To check if device is in recovery mode, enter lsusb command in terminal on host.

```
$ lsusb | grep 0955:7e19
```

If successful, the command will return "0955:7e19 Nvidia Corp"

```
~ $ lsusb | grep 0955:7e19
Bus 003 Device 018: ID 0955:7e19 NVidia Corp.
```

Recovery mode can be initiated with the system disassembled. Ensure the NVIDIA Jetson Xavier NX module is installed and refer to the image below to perform the steps:



3.3 Flash Image to Board

Use the following steps to flash the OS to the BOXER-8254AI.

- 1) Open terminal on Ubuntu host PC, then access the bootloader folder you extracted in the previous section.
- 2) Enter the following command in terminal to flash the image:

```
$ sudo ./flashall.sh
```

```
~/ACLinux_4.9_NJ451X.NV05.BOXER-8254AI.2/bootloader $ sudo ./flashall.sh
[sudo] password for marble:
Welcome to Tegra Flash
version 1.0.0
Type ? or help for help and q or quit to exit
Use ! to execute system commands

[ 0.0153 ] tegrasign_v2 --key None --getmode mode.txt
[ 0.0172 ] Assuming zero filled SBK key
[ 0.0369 ]
[ 0.0373 ] Generating RCM messages
[ 0.0501 ] tegrahost_v2 --chip 0x19 0 --magicid MB1B --appendsigheader mb1_t194_prod.bin zerosbk
[ 0.0516 ] Header already present for mb1_t194_prod.bin
[ 0.0637 ]
[ 0.0649 ] tegrasign_v2 --key None --getmode mode.txt
[ 0.0660 ] Assuming zero filled SBK key
```

- 3) Wait as the image is installed. Once finished you should see the following:

```
[ 749.5183 ] Bootloader version 01.00.0000
[ 749.5201 ] Writing partition MB1_BCT_b with mb1_cold_boot_bct_MB1_sigheader.bct.encrypt
[ 749.5212 ] [.....] 100%
[ 749.7247 ]
[ 749.7277 ] tegradevflash_v2 --write MEM_BCT mem_coldboot_sigheader.bct.encrypt
[ 749.7293 ] Bootloader version 01.00.0000
[ 749.7314 ] Writing partition MEM_BCT with mem_coldboot_sigheader.bct.encrypt
[ 749.7321 ] [.....] 100%
[ 750.9913 ]
[ 750.9927 ] tegradevflash_v2 --write MEM_BCT_b mem_coldboot_sigheader.bct.encrypt
[ 750.9938 ] Bootloader version 01.00.0000
[ 750.9959 ] Writing partition MEM_BCT_b with mem_coldboot_sigheader.bct.encrypt
[ 750.9968 ] [.....] 100%
[ 752.2562 ]
[ 752.2564 ] Flashing completed
[ 752.2566 ] Coldbooting the device
[ 752.2591 ] tegrarcm_v2 --ismb2
[ 752.2773 ]
[ 752.2801 ] tegradevflash_v2 --reboot coldboot
[ 752.2816 ] Bootloader version 01.00.0000
[ 752.3017 ]
~/ACLinux_4.9_NJ451X.NV05.BOXER-8254AI.2/bootloader $
```