

BOXER-8130AI

Compact Fanless Embedded AI@Edge Box PC

User's Manual 3rd Ed

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Packing List

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

Item	Quantity
● BOXER-8130AI	1
● Power Adapter (Option)	1
● Power Cord (Option)	1
● Phoenix Power Connector	1
● Wallmount bracket	2

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 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.

China RoHS Requirements (CN)

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 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.

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Chapter 1

Product Specifications

1.1 Specifications

System

- CPU HMP Dual Denver 2/2 MB L2 + Quad ARM® A57/2 MB L2
- Chipset N/A
- System Memory 8 GB 128-bit LPDDR4, 59.7 GB/s
- Display Interface HDMI 2.0 x 1
- Storage Device Onboard 32GB eMMC (via Jetson TX2)
- Ethernet N/A
- I/O
 - USB Type A x 2 for USB 3.0
 - RJ-45 x 1 for GbE LAN Ethernet
 - DB-9 x 1 for RS-232
 - Remote on/off switch x 1
 - Antenna opening x 2
 - MicroSD x 1
 - OTG x 1
- Expansion
 - SATA x 1 (option)
 - USB 2.0 x 1 (option)
 - MIPI CSI-2 board-to-board connector (see 1.2 for note)
- Indicator N/A
- OS Support AAEON ACLinux 4.9, Compliance with Ubuntu 18.04

Mechanical

- **Mounting** Wallmount
- **Dimensions (W x H x D)** 153mm(W) x 30mm(H) x 101mm(D)
- **Gross Weight** 4.40 lbs. (2 kg)
- **Net Weight** 2.20 lbs. (1 kg)

Environmental

- **Operating Temperature** -4°F ~ 122°F (-20°C ~ 50°C, with 0.5 m/s airflow)
- **Storage Temperature** -13°F ~ 176 °F (-25°C ~ 80°C)
- **Storage Humidity** 95% @ 40°C, non-condensing
- **Anti-Vibration** Random, 5 Grm, 5~500Hz
- **Certification** CE/FCC class A

Power Supply

- **Power Requirement** DC 10~24 V

1.2 Product Notice

MIPI CSI-2: The connector used on the carrier board is a Samtec QSH-060-01-H-D-A. The mating connector is a Samtec QTH-060-01-H-D-A.

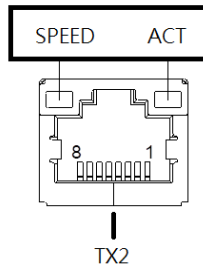
OTG: OTG port is ideally for flashing image only.

COM1: Support 1.8 meter length cable when baud rate 115200bps, and 15 meter cable when baud rate 9600bps.

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

LAN LED Status for 10/100 BASE-T is not supported.

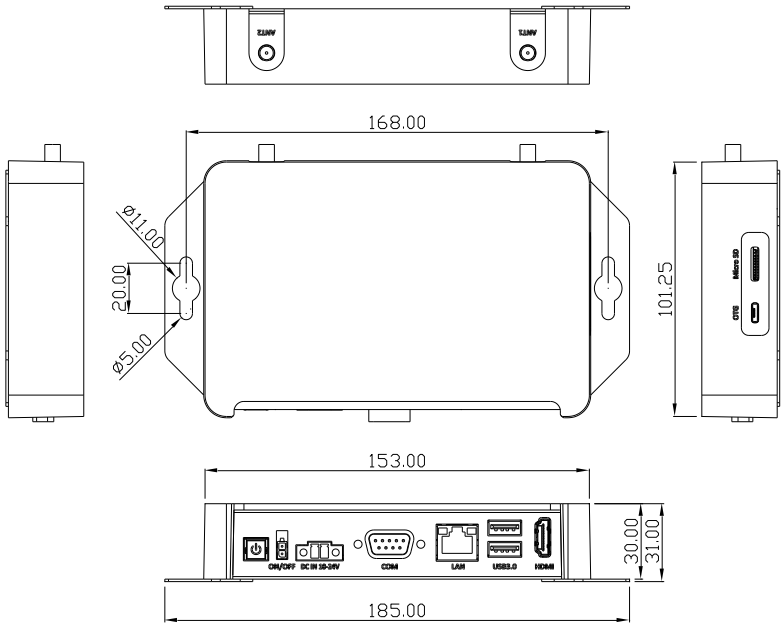
LAN LED Indicator Behavior



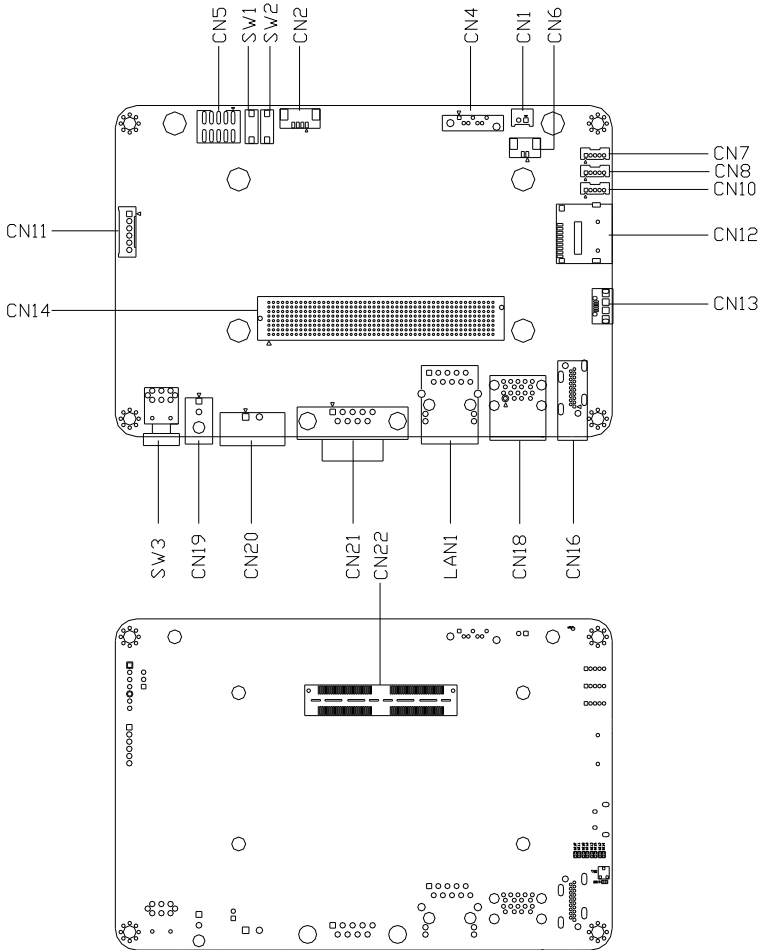
Chapter 2

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

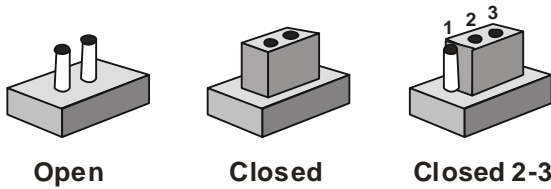
Label	Function
CN17	AT mode select

2.3.1 Setting Jumpers

You configure your card 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 doubts about the best hardware configuration for your application, contact your local distributor or sales representative before you make any change.

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

2.3.2 Auto Power Button (CN17)



Disable(Default)



Enable

CN17	Function
1-2	Open ATX (Default)
1-2	Close AT

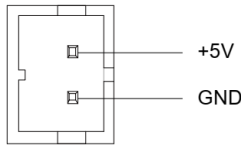
2.4 List of Connectors

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

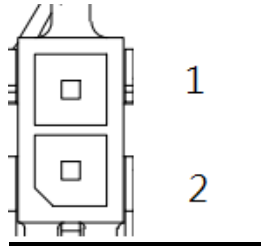
Label	Function
CN1	SATA PWR connector
CN2	FAN connector
CN4	SATA connector
CN6	RTC battery connector
CN7	USB 2.0 connector
CN8	USB 2.0 connector
CN10	USB 2.0 connector
CN11	Debug port connector
CN12	Micro SD connector
CN13	USB 2.0 OTG
CN14	TX2 Module connector
CN16	HDMI connector
CN18	USB 3.0 x 2
CN19	Remote button cable connector
CN20	Power In connector
CN21	COM 1
CN22	CSI x 6 connector
SW1	H/W Reset switch
SW2	Recovery switch
SW3	Power switch
LAN1	GIGA LAN 1

2.4.1 SATA PWR Port (CN1)



Pin	Signal	Pin	Signal
1	+5V	2	GND

2.4.2 Remote Power on connector (CN2)

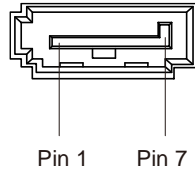


Pin	Signal	Pin	Signal
1	PANSWH#	2	GND

2.4.3 RTC Connector (CN6)

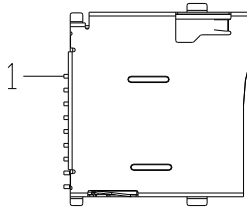
Pin	Signal	Pin	Signal
1	+3V	2	GND

2.4.4 SATA Port (CN4)



Pin	Signal	Pin	Signal
1	GND	2	SATA TX+
3	SATA TX-	4	GND
5	SATA RX-	6	SATA RX+
7	GND		

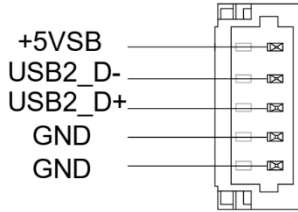
2.4.5 Micro SD (CN12)



Pin	Signal	Pin	Signal
1	SDCARD D3	2	SDCARD CMD
3	GND	4	SDCARD PWR(+3.3V)
5	SDCARD CLK	6	SDCARD D0
7	SDCARD D1	8	SDCARD D2
9	SDCARD CD	10	

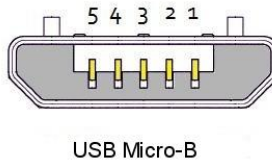
2.4.6 USB 2.0 Port (CN7/8/10)

USB2.0 connector (internal BOX connector)



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

2.4.7 USB 2.0 OTG connector (CN12)



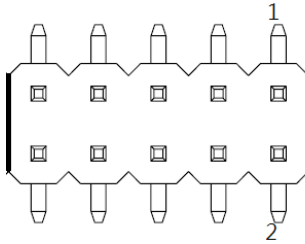
USB Micro-B

Pin	Signal	Pin	Signal
1	VBUS	2	USB1-
3	USB1+	4	ID
5	GND		

2.4.8 PWM FAN connector (CN2)

Pin	Signal	Pin	Signal
1	FAN PWM	2	FAN TACH
3	+5V	4	GND

2.4.9 Front Panel connector (CN5)

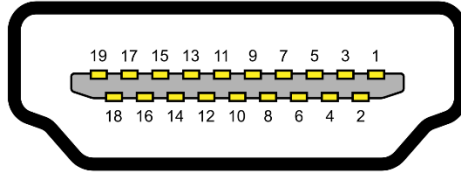


Pin	Signal	Pin	Signal
1	GND	2	Recovery
3	GND	4	Power
5	GND	6	Reset
7	GPIO_EXP_P3	8	GPIO_EXP_P1
9	GPIO_EXP_P4	10	GPIO_EXP_P2

2.4.10 TX2 Module connector (CN14)

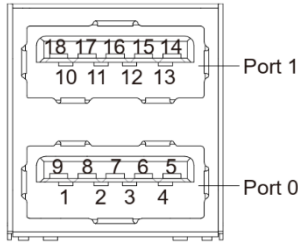
	A	B	C	D	E	F	G	H
1	VDD IN	VDD IN	VDD IN	RSVD	FORCE RECOV#	AUDIO MCLK	I2S0 SDIN	I2S0 LRCLK
2	VDD IN	VDD IN	VDD IN	RSVD	SLEEP#	GPIO19 AUD_RST	I2S0 CLK	I2S0 SDOUT
3	GND	GND	GND	RSVD	SP10 CLK	SP10 CS0#	GND	GPIO20 AUD_INT
4	GND	GND	GND	RSVD	SP10 MISO	SP10 MOSI	RSVD	RSVD
5	RSVD	RSVD	RSVD	RSVD	I2S3 SDIN	I2S3 LRCLK	I2S2 CLK	I2S2 LRCLK
6	I2C PM CLK	I2C PM DAT	I2C CAM CLK	I2C CAM DAT	I2S3 CLK	I2S3 SDOUT	I2S2 SDIN	I2S2 SDOUT
7	CHARGING#	CARRIER STBY#	BATLOW#	GPIO5_CAM_FLASH_EN	RSVD	GPIO1_CAM1_PWR#	GPIO4_CAM_STROBE	GPIO3_CAM1_RST#
8	GPIO14_AP_WAKE_MOM	VIN_PWR_BAD#	RSVD	RSVD	RSVD	CAM1_MCLK	GPIO0_CAM0_PWIN#	GPIO2_CAM0_RST#
9	GPIO5_APMOM_READY	GPIO17_MOMGAP_READY	RSVD	UART1_TX	UART1_RTS#	CAM0_MCLK	UART3_CTS#	UART3_RX
10	GPIO18_MOM_WAKE_AP	GPIO18_MOM_COOLDBOOT	RSVD	UART1_RX	UART1_CTS#	GND	UART3_RTS#	UART3_TX
11	RSVD	ITAG_TCK	RSVD	RSVD	RSVD	RSVD	UART0_RTS#	UART0_CTS#
12	ITAG_TMS	ITAG_TDI	RSVD	RSVD	RSVD	RSVD	UART0_RX	UART0_TX
13	ITAG_TDO	ITAG_GPO	RSVD	I2S1 LRCLK	SP11 CS1#	SP11 MOSI	SP11 CLK	GPIO8_ALS_PWOK_INT
14	ITAG_RTCK	GND	I2S1 SDIN	I2S1 SDOUT	SP11 CS0#	SP11 MISO	GPIO9_MOTION_INT	SP12 CLK
15	UART2_CTS#	UART2_RX	I2S1 CLK	I2C GPO DAT	I2C GPO CLK	GND	SP12 MOSI	SP12 MISO
16	UART2_RTS#	UART2_TX	FAN_PWM	RSVD	RSVD	SP12 CS1#	SP12 CS0#	SDCARD_PWR_EN
17	USB0_EN_OC#	FAN_TACH	RSVD	RSVD	RSVD	SDCARD_CD#	GND	SDCARD_D1
18	USB1_EN_OC#	RSVD	RSVD	RSVD	RSVD	SDCARD_D3	SDCARD_CLK	SDCARD_D0
19	RSVD	GPIO11_AP_WAKE_BT	RSVD	RSVD	GND	SDCARD_D2	SDCARD_CMD	GND
20	I2C GP1 DAT	GPIO0_WHY_WAKE_AP	RSVD	GND	CS19 D1-	SDCARD_WP	GND	CS14 D1-
21	I2C GP1 CLK	GPIO12_BT_EN	GND	CS15 CLK-	CS19 D1+	GND	CS14 CLK-	CS14 D1+
22	GPIO EXP1 INT	GPIO13_BT_WAKE_AP	CS15 DO-	CS15 CLK+	GND	CS14 DO-	CS14 CLK+	GND
23	GPIO EXP0 INT	GPIO7_TOUCH_RST	CS15 DO+	GND	CS19 D1-	CS14 DO+	GND	CS12 D1-
24	RSVD	TOUCH_CLK	CS15 DO-	CS13 CLK-	CS19 D1+	GND	CS12 CLK-	CS12 D1+
25	LCD_TE	GPIO6_TOUCH_INT	CS13 DO-	CS13 CLK+	GND	CS12 DO-	CS12 CLK+	GND
26	RSVD	LCD_VDD_EN	CS13 DO+	GND	CS14 D1-	CS12 DO+	GND	CS10 D1-
27	RSVD	LCDO_BKLT_PWM	GND	CS11 CLK-	CS11 D1+	GND	CS10 CLK-	CS10 D1+
28	GND	LCDO_BKLT_EN	CS11 DO-	CS11 CLK+	GND	CS10 DO-	CS10 CLK+	GND
29	SDIO_RST#	SDIO_CMD	CS11 DO+	GND	DS18 D1+	CS10 DO+	GND	DS12 D1+
30	SDIO D3	SDIO CLK	GND	RSVD	DS18 D1-	GND	DS12 CLK+	DS12 D1-
31	SDIO D2	GND	DS18 DO+	RSVD	GND	DS12 DO+	DS12 CLK-	GND
32	SDIO D1	SDIO D0	DS18 DO-	GND	DS11 D1+	DS12 DO-	GND	DS10 D1+
33	DP1_HPD	HDMI_CEC	GND	RSVD	DS11 D1-	GND	DS10 CLK+	DS10 D1-
34	DP1_AUX_CH-	DP0_AUX_CH-	DS11 DO+	RSVD	GND	DS10 DO+	DS10 CLK-	GND
35	DP1_AUX_CH+	DP0_AUX_CH+	DS11 DO-	GND	DP1_TX3-	DS10 DO-	GND	DP0_TX3-
36	USB0_OTG_ID	DP0_HPD	GND	DP1_TX2-	DP1_TX3+	GND	DP0_TX2-	DP0_TX3+
37	GND	USB0_VBUS_DET	DP1_TX1-	DP1_TX2+	GND	DP0_TX1-	DP0_TX2+	GND
38	USB1_D+	GND	DP1_TX1+	GND	DP1_TX0-	DP0_TX1+	GND	DP0_TX0-
39	USB1_D-	USB0_D+	GND	PEX_RFU_TX+	DP1_TX0+	GND	PEX_RFU_RX+	DP0_TX0+
40	GND	USB0_D-	PEX2_TX+	PEX_RFU_TX-	GND	PEX2_RX+	PEX_RFU_RX-	GND
41	RSVD	GND	PEX2_TX-	GND	PEX1_TX+	PEX2_RX-	GND	PEX1_RX+
42	RSVD	USB2_D+	GND	USB_S51_TX+	PEX1_TX-	GND	USB_S51_RX+	PEX1_RX-
43	GND	USB2_D-	USB_S50_TX+	USB_S51_TX-	GND	USB_S50_RX+	USB_S51_RX-	GND
44	PEX0_REFCLK+	GND	USB_S50_TX-	GND	PEX0_TX+	USB_S50_RX-	GND	PEX0_RX+
45	PEX0_REFCLK-	PEX1_REFCLK+	GND	SATA_TX+	PEX0_TX-	GND	SATA_RX+	PEX0_RX-
46	RESET_OUT#	PEX1_REFCLK-	RSVD	SATA_TX-	GND	GBE_LINK100#	SATA_RX-	GND
47	RESET_IN#	GND	PEX1_CLKREQ#	RSVD	GBE_LINK_ACT#	GBE_MDI0+	GND	GBE_MDI3+
48	CARRIER_PWR_ON	RSVD	PEX0_CLKREQ#	RSVD	GBE_MDI0+	GBE_MDI1-	GBE_MDI2+	GBE_MDI3-
49	CHARGER_PRSENT#	RSVD	PEX0_RST#	RSVD	GBE_MDI0-	GND	GBE_MDI2-	GND
50	VDD_RTC	POWER_BTN#	RSVD	RSVD	PEX1_RST#	GBE_LINK100#	GND	RSVD

2.4.11 HDMI connector (CN16)



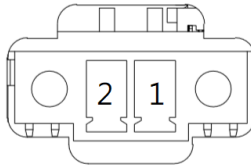
Pin	Signal	Pin	Signal
1	HDMI_DATA2_P	2	GND
3	HDMI_DATA2_N	4	HDMI_DATA1_P
5	GND	6	HDMI_DATA1_N
7	HDMI_DATA0_P	8	GND
9	HDMI_DATA0_N	10	HDMI_CLK_P
11	GND	12	HDMI_CLK_N
13	NC	14	NC
15	HDMI_SCL	16	HDMI_SDA
17	GND	18	HDMI_PWR
19	HDMI_HDP		

2.4.12 USB3.0 connector (CN18)



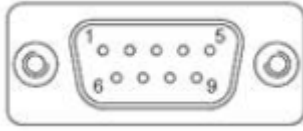
Pin	Signal	Pin	Signal
U1	VBUS_1	U10	VBUS_2
U2	(A)D-	U11	(B)D-
U3	(A)D+	U12	(B)D+
U4	GND	U13	GND
U5	(A)SSRX-	U14	(B)SSRX-
U6	(A)SSRX+	U15	(B)SSRX+
U7	GND	U16	GND
U8	(A)SSTX-	U17	(B)SSTX-
U9	(A)SSTX+	U18	(B)SSTX+

2.4.13 Power in connector (CN20)



Pin	Signal	Pin	Signal
1	PWR IN	2	GND

2.4.14 COM port connector (CN21)

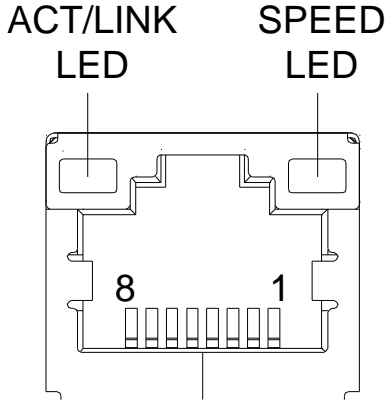


Pin	RS-232
1	
2	RXD
3	TXD
4	
5	GND
6	
7	RTS
8	CTS
9	

2.4.15 UART Debug port connector (CN11)

Pin	Signal	Pin	Signal
1	+3.3V	2	CTS
3	TXD	4	RTS
5	RXD	6	GND

2.4.16 LAN (RJ-45) Port (LAN1)



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

2.4.17 Camera Expansion Header (CN22)

The connector used on the carrier board is a Samtec QSH-060-01-H-D-A. The mating connector is a Samtec QTH-060-01-H-D-A.

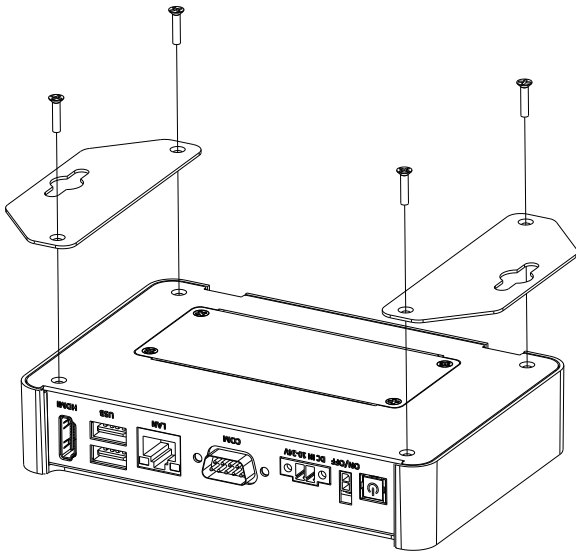
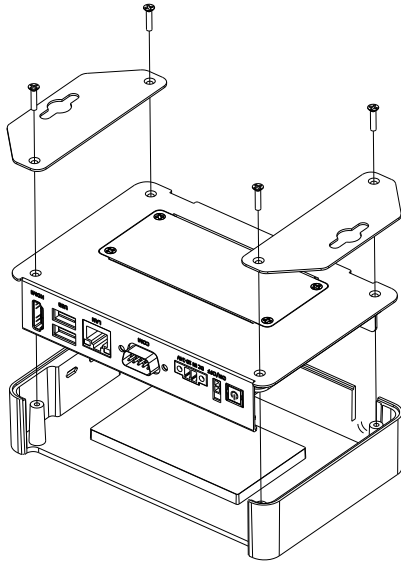
Pin #	Signal Name	Jetson Module Pin Name	Usage/Description	Type/Dir Default	Pin #	Signal Name	Jetson Module Pin Name	Usage/Description	Type/Dir Default
1	CDN_CSI_A_D0_P	CSI0_D0+	CSI A Data 0+	Input	2	CDN_CSI_B_D0_P	CSI1_D0_P	CSI B Data 0+	Input
3	CDN_CSI_A_D0_N	CSI0_D0-	CSI A Data 0-	Input	4	CDN_CSI_B_D0_N	CSI1_D0_N	CSI B Data 0-	Input
5	GND	-	Ground	Ground	6	GND	-	Ground	Ground
7	CDN_CSI_A_CLK_P	CSI0_CLK+	CSI A Clock+	Input	8	CDN_CSI_B_CLK_P	CSI1_CLK_P	CSI B Clock+	Input
9	CDN_CSI_A_CLK_N	CSI0_CLK-	CSI A Clock-	Input	10	CDN_CSI_B_CLK_N	CSI1_CLK_N	CSI B Clock-	Input
11	GND	-	Ground	Ground	12	GND	-	Ground	Ground
13	CDN_CSI_A_D1_P	CSI0_D1+	CSI A Data 1+	Input	14	CDN_CSI_B_D1_P	CSI1_D1_P	CSI B Data 1+	Input
15	CDN_CSI_A_D1_N	CSI0_D1-	CSI A Data 1-	Input	16	CDN_CSI_B_D1_N	CSI1_D1-	CSI B Data 1-	Input
17	GND	-	Ground	Ground	18	GND	-	Ground	Ground
19	CDN_CSI_C_D0_P	CSI2_D0+	CSI C Data 0+	Input	20	CDN_CSI_D_D0_P	CSI3_D0+	CSI D Data 0+	Input
21	CDN_CSI_C_D0_N	CSI2_D0-	CSI C Data 0-	Input	22	CDN_CSI_D_D0_N	CSI3_D0-	CSI D Data 0-	Input
23	GND	-	Ground	Ground	24	GND	-	Ground	Ground
25	CDN_CSI_C_CLK_P	CSI2_CLK+	CSI C Clock+	Input	26	CDN_CSI_D_CLK_P	CSI3_CLK+	CSI D Clock+	Input
27	CDN_CSI_C_CLK_N	CSI2_CLK-	CSI C Clock-	Input	28	CDN_CSI_D_CLK_N	CSI3_CLK-	CSI D Clock-	Input
29	GND	-	Ground	Ground	30	GND	-	Ground	Ground
31	CDN_CSI_C_D1_P	CSI2_D1+	CSI C Data 1+	Input	32	CDN_CSI_D_D1_P	CSI3_D1+	CSI D Data 1+	Input
33	CDN_CSI_C_D1_N	CSI2_D1-	CSI C Data 1-	Input	34	CDN_CSI_D_D1_N	CSI3_D1-	CSI D Data 1-	Input
35	GND	-	Ground	Ground	36	GND	-	Ground	Ground
37	CDN_CSI_E_D0_P	CSI4_D0+	CSI E Data 0+	Input	38	CDN_CSI_F_D0_P	CSI5_D0+	CSI F Data 0+	Input
39	CDN_CSI_E_D0_N	CSI4_D0-	CSI E Data 0-	Input	40	CDN_CSI_F_D0_N	CSI5_D0-	CSI F Data 0-	Input
41	GND	-	Ground	Ground	42	GND	-	Ground	Ground
43	CDN_CSI_E_CLK_P	CSI4_CLK+	CSI E Clock+	Input	44	CDN_CSI_F_CLK_P	CSI5_CLK+	CSI F Clock+	Input
45	CDN_CSI_E_CLK_N	CSI4_CLK-	CSI E Clock-	Input	46	CDN_CSI_F_CLK_N	CSI5_CLK-	CSI F Clock-	Input
47	GND	-	Ground	Ground	48	GND	-	Ground	Ground
49	CDN_CSI_E_D1_P	CSI4_D1+	CSI E Data 1+	Input	50	CDN_CSI_F_D1_P	CSI5_D1+	CSI F Data 1+	Input
51	CDN_CSI_E_D1_N	CSI4_D1-	CSI E Data 1-	Input	52	CDN_CSI_F_D1_N	CSI5_D1-	CSI F Data 1-	Input
53	GND	-	Ground	Ground	54	GND	-	Ground	Ground
55	RSVD	-	Unused	Unused	56	RSVD	-	Unused	Unused
57	RSVD	-	Unused	Unused	58	RSVD	-	Unused	Unused
59	CAM_UART3_PSINT_L	-	Camera UART Present = Direction control for level shifter to prevent contention.	-	60	NC	-	Unused	Unused
61	CAM_UART3_TXD	-	Camera UART Transmit.	Output	62	SPI2_SCK	SPI2_CLK	SPI #2 Clock	Bidir
63	CAM_UART3_RXD	-	Camera UART Receive, Clear-to-Send & Request to Send = Cam	Input	64	SPI2_MISO	SPI2_MISO	SPI #2 MISO	Bidir
65	CAM_UART3_CTS	-	optionally be brought to Serial port connector (J13).	Input	66	SPI2_CS1	SPI2_CS1#	SPI #2 Chip Select	Bidir
67	CAM_UART3_RTS	-	optionally be brought to Serial port connector (J13).	Output	68	SPI2_MOSI	SPI2_MOSI	SPI #2 MOSI	Bidir
69	GND	-	Ground	Ground	70	GND	-	Ground	Ground
71	AD_DMIC_IN_CLK	CAN_GPIO1	Digital Mic Input Clock	Output	72	I2S3_CLK	I2S3_CLK	I2S #3 Clock	Bidir
73	AD_DMIC_IN_DAT	CAN_GPIO0	Digital Mic Input Data	Input	74	I2S3_LRCLK	I2S3_LRCLK	I2S #3 Left/Right Clock	Bidir
75	CAM_I2C_SCL	I2C_CAM_CLK	Camera I2C clock	Bidir	76	I2S3_SDIN	I2S3_SDIN	I2S #3 Serial Data In	Input
77	CAM_I2C_SDA	I2C_CAM_DAT	Camera I2C data	Bidir	78	I2S3_SDOUT	I2S3_SDOUT	I2S #3 Serial Data Out	Bidir
79	GND	-	Ground	Ground	80	GND	-	Ground	Ground
81	AVDD_CAM	-	1.8V Camera supply (LDO)	Power	82	AVDD_CAM	-	2.8V Camera supply (LDO)	Power
83	AVDD_CAM	-	1.8V Camera supply (LDO)	Power	84	VDD_3V3_SLP	-	3.3V rail - off in Deep Sleep	Power
85	CAM_AF_PWDN	-	Camera auto-focus powerdn	Output	86	CAM_VSYNC	CAM_VSYNC	Camera Vertical Sync	Output
87	I2C_PM_CLK	I2C_PM_CLK	Power Monitor I2C Clock	Bidir/JOD	88	CAM1_MCLK	CAM1_MCLK	Camera #1 Master Clock	Output
89	I2C_PM_DAT	I2C_PM_DAT	Power Monitor I2C Data	Bidir/JOD	90	CAM1_PWDN	GPIOD1_CAM1_PWDR	Camera #1 Powerdown	Output
91	CAM0_MCLK	CAM0_MCLK	Camera #0 Master Clock	Output	92	CAM1_RST_L	GPIOD3_CAM1_RST	Camera #1 Reset	Output
93	CAM0_PWDN	GPIOD0_CAM0_PWDR	Camera #0 Powerdown	Output	94	CAM2_MCLK	CAM2_MCLK	Camera #2 Master Clock	Output
95	CAM0_RST_L	GPIOD0_CAM0_RST	Camera #0 Reset	Output	96	CAM2_PWDN	-	Camera #2 Powerdown	Output
97	FLASH_EN	GPIOD5_CAM_FLASH_EN	Flash Enable	Output	98	CAM2_RST	-	Camera #2 Reset	Output
99	GND	-	Ground	Ground	100	GND	-	Ground	Ground
101	DVDD_CAM_IO_1V2	-	1.2V digital Camera supply	Power	102	DVDD_CAM_IO_1V8	-	Switched 1.8V Camera supply.	Power
103	FLASH_INHIBIT	-	Flash Inhibit	Output	104	TORCH_EN	-	Torch Enable (GPIO exp. POS)	Output
105	I2C_GPO_CLK_1V8	I2C_GPO_CLK	General I2C #0 Clock	Bidir/JOD	106	FLASH_STROBE	GPIOD4_CAM_STROBE	Flash Strobe	Output
107	I2C_GPO_DAT_1V8	I2C_GPO_DAT	General I2C #0 Data	Bidir/JOD	108	VDD_3V3_SLP	-	3.3V supply - off in Deep Slp	Power
109	VDD_SVD_IO_Sys	-	Main 5.0V Supply (Switcher)	Power	110	VDD_3V3_SLP	-	3.3V supply - off in Deep Slp	Power

Pin #	Signal Name	Jetson Module Pin Name	Usage/Description	Type/Dir Default	Pin #	Signal Name	Jetson Module Pin Name	Usage/Description	Type/Dir Default
111	NC	–	Unused	Unused	112	MOTION_INT_AP_L	GPIO9_MOTION_INT	Motion Sensor Interrupt	Input
113	NC	–	Unused	Unused	114	NC	–	Unused	Unused
115	GND	–	Ground	Ground	116	GND	–	Ground	Ground
117	MDM2AP_READY_1V8	GPIO17_MDM2AP_READY	Modem to Tegra Ready	Input	118	VDD_5V0_IO_SYS	–	Main 5.0V Supply (Switcher)	Power
119	VDD_SYS_EN	–	System power enable	Output	120	VDD_5V0_IO_SYS	–	Main 5.0V Supply (Switcher)	Power

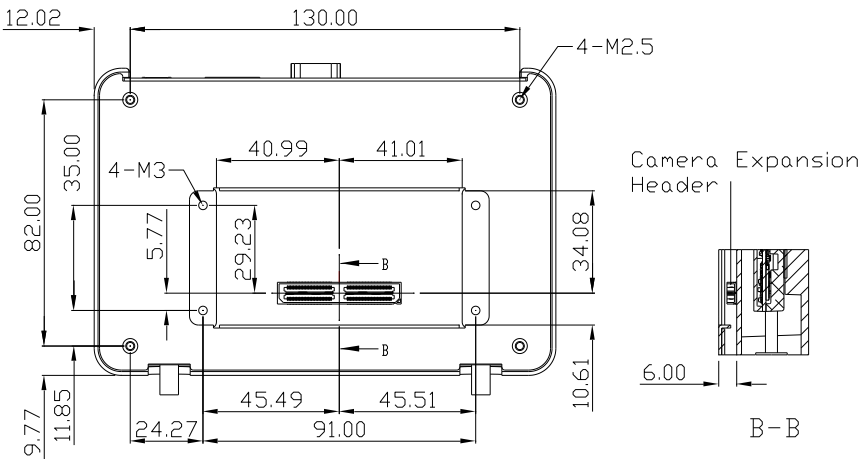
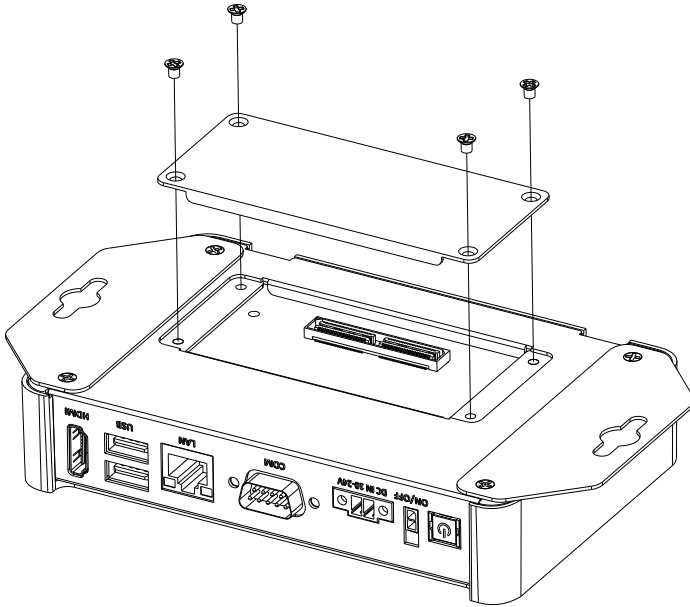
Legend

Ground	Power	Not available on Jetson TX1	Not available on Jetson TX2	Reserved	Unassigned on carrier board
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2.5 Wall Mount Assembly



2.6 MIPI-CSI 2 Camera



2.7 Supported MIPI Camera Vendors

This is a list of MIPI camera vendors/suppliers the BOXER-8130AI supports. Included are links to webpages with information about the specific product(s) supported.

APPRO.PH

http://www.appropho.com/products_ii.html?id=185&type=36

D3 Engineering

<https://www.d3engineering.com/designcore-platforms/nvidia-jetson/>

e-con Systems

https://www.e-consystems.com/nvidia-jetson-camera.asp?utm_expId=bjPKJuu6QyWsQAWppyCmMg.0&utm_referrer=https%3A%2F%2Fdeveloper.nvidia.com%2Fembedded%2Fcommunity%2Fecosystem

Chapter 3

OS Flash guide

3.1 Force USB Recovery Mode

To place system in Force USB Recovery Mode:

1. Power down the device. If connected, remove the AC adapter from the device. The device MUST be powered OFF, not in a suspend or sleep state.
2. Connect the Micro-B plug on the USB cable to the Recovery (USB Micro-B) Port on the device and the other end to an available USB port on the host PC.
3. Connect the power adapter to the device.
4. Press and release the POWER button to power on device. Press and hold the FORCE RECOVERY button: while pressing the FORCE RECOVERY button, press and release the RESET button; wait two seconds and release the FORCE RECOVERY button.; For the location of the buttons, refer to Chapter 2 Hardware Information.
5. When device is in recovery mode, lsusb command on host will list a line of "Nvidia Corp"

3.2 Software & BSP

Please follow the steps below to install the test image.

(1) Download the image folder from the official AAEON website at:

<https://www.aaeon.com/en/p/ai-edge-computing-fanless-box-pc-boxer-8130ai#downloads>

(2) Unzip the Image file

```
unzip [Image File Name]
```

For example:

```
unzip ACLinux_4.9_ACLNX49D.NV02.BOXER-8110-8120-8130AI.6.2.tar
```

(3) Enter bootloader folder

```
cd bootloader
```

(4) Enter Force USB Recovery Mode. Refer to previous section **3.1 Force USB Recovery Mode** for instructions.

(5) Execute the following command to install image:

```
sudo /flashall.sh
```