



UP CANBus Carrier Board

Carrier Board

User's Manual 1st Ed

Copyright Notice

This document is copyrighted, 2023. 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, AAEON assumes no liabilities resulting from errors or omissions in this document, or from the use of the information contained herein.

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

Acknowledgement

- Linux® is the registered trademark of Linus Torvalds in the U.S. and other countries.
- Ubuntu and Canonical are registered trademarks of Canonical Ltd.

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

Packing List

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

Item	Quantity
● CANBus Carrier Board	1
● Connection Cable	1
● CAN Connector	1
● Screw/Stud Pack	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. 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.
6. 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 AC 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.

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.**

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 Main Board/ Daughter Board/ Backplane

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	X	X	○	○	○	○
外部信号 连接器及线材	X	X	○	○	○	○

○：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 SJ/T 11363-2006 标准规定的限量要求以下。

X：表示该有毒有害物质至少在该部件的某一均质材料中的含量超出 SJ/T 11363-2006 标准规定的限量要求。

备注：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。

China RoHS Requirement (EN)

Poisonous or Hazardous Substances or Elements in Products
 AAEON Main Board/ Daughter Board/ Backplane

Component	Poisonous or Hazardous Substances or Elements					
	Lead (Pb)	Mercury (Hg)	Cadmium (Cd)	Hexavalent Chromium (Cr(VI))	Polybrominated Biphenyls (PBB)	Polybrominated Diphenyl Ethers (PBDE)
PCB & Other Components	X	X	O	O	O	O
Wires & Connectors for External Connections	X	X	O	O	O	O
<p>O: The quantity of poisonous or hazardous substances or elements found in each of the component's parts is below the SJ/T 11363-2006-stipulated requirement.</p> <p>X: The quantity of poisonous or hazardous substances or elements found in at least one of the component's parts is beyond the SJ/T 11363-2006-stipulated requirement.</p> <p>Note: The Environment Friendly Use Period as labeled on this product is applicable under normal usage only</p>						

Table of Contents

Chapter 1 - Product Specifications	1
1.1 Specifications.....	2
Chapter 2 – Hardware Information	3
2.1 Dimensions	4
2.2 Board Layout	5
2.3 List of Jumpers and Connectors.....	6
2.3.1 USB & UART (CN1).....	7
2.3.2 MCU Debug (CN2)	7
2.3.3 CANBus (CN3).....	8
2.3.4 LED Wafer (CN4).....	8
2.3.5 Reset Button (SW1)	9
2.3.6 DIP Switch (SW2)	9
2.3.7 MCU Bootloader (JP1).....	10
Chapter 3 –Hardware Installation	11
3.1 Hardware Installation	12
3.2 Ubuntu OS Driver Settings	15
3.2.1 Installing Ubuntu.....	15
3.2.2 System Setup.....	15
3.2.3 Update Firmware	17
Appendix A –Connectors	22
A.1 Connectors.....	23

Chapter 1

Product Specifications

1.1 Specifications

System

I/O	UP Board Connector x 1 6 pin Terminal Block x 1 6 pin LED Wafer x 1 Termination Resistor DIP Switch x 1 Reset Button x 1
Dimension	2.56" x 2.20" (65mm x 56mm)
Net Weight	0.066 lb. (0.03Kg)
Gross Weight	0.13 lb. (0.06Kg)
Operating Temperature	32°F ~ 140°F (0°C ~ 60°C)
Operation Humidity	0% ~ 90% relative humidity, non-condensing
Certification	CE/FCC Class A

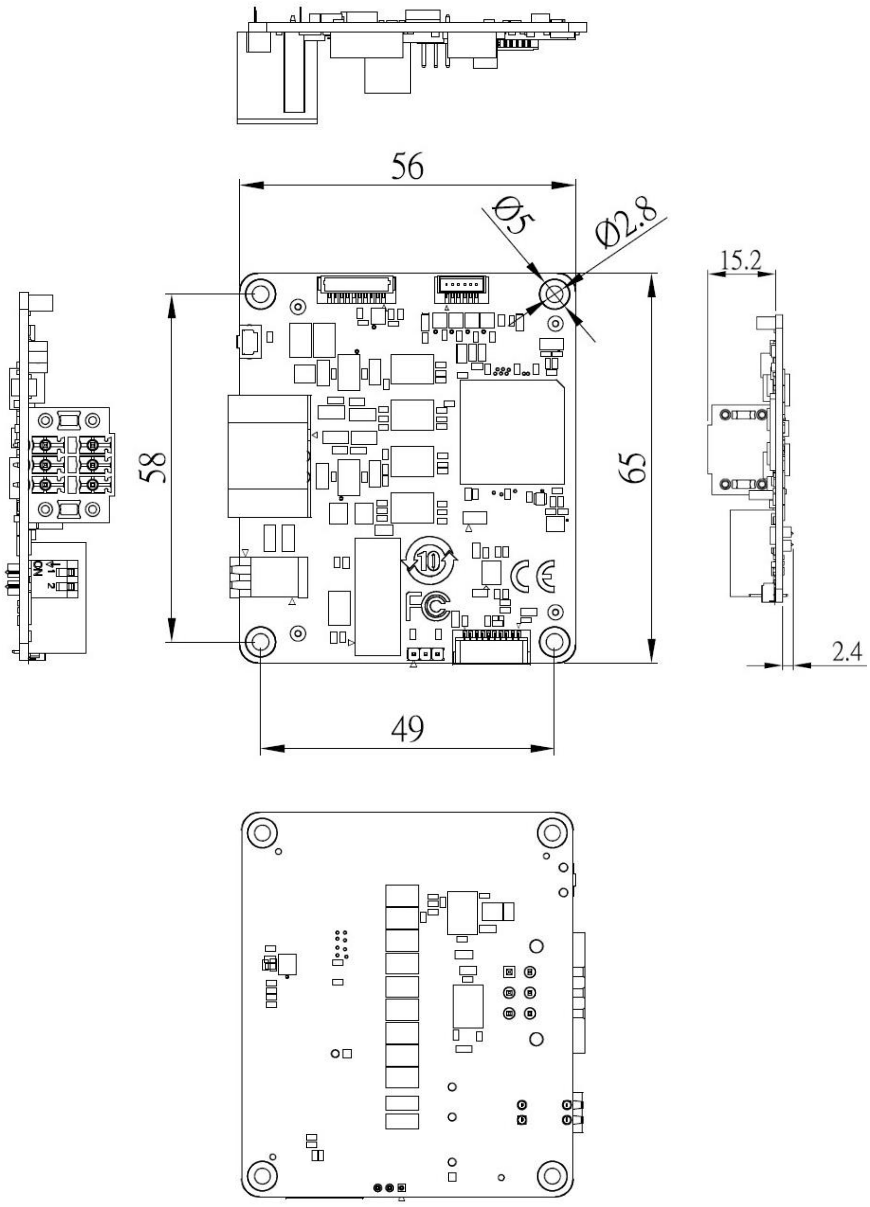
Chapter 2

Hardware Information

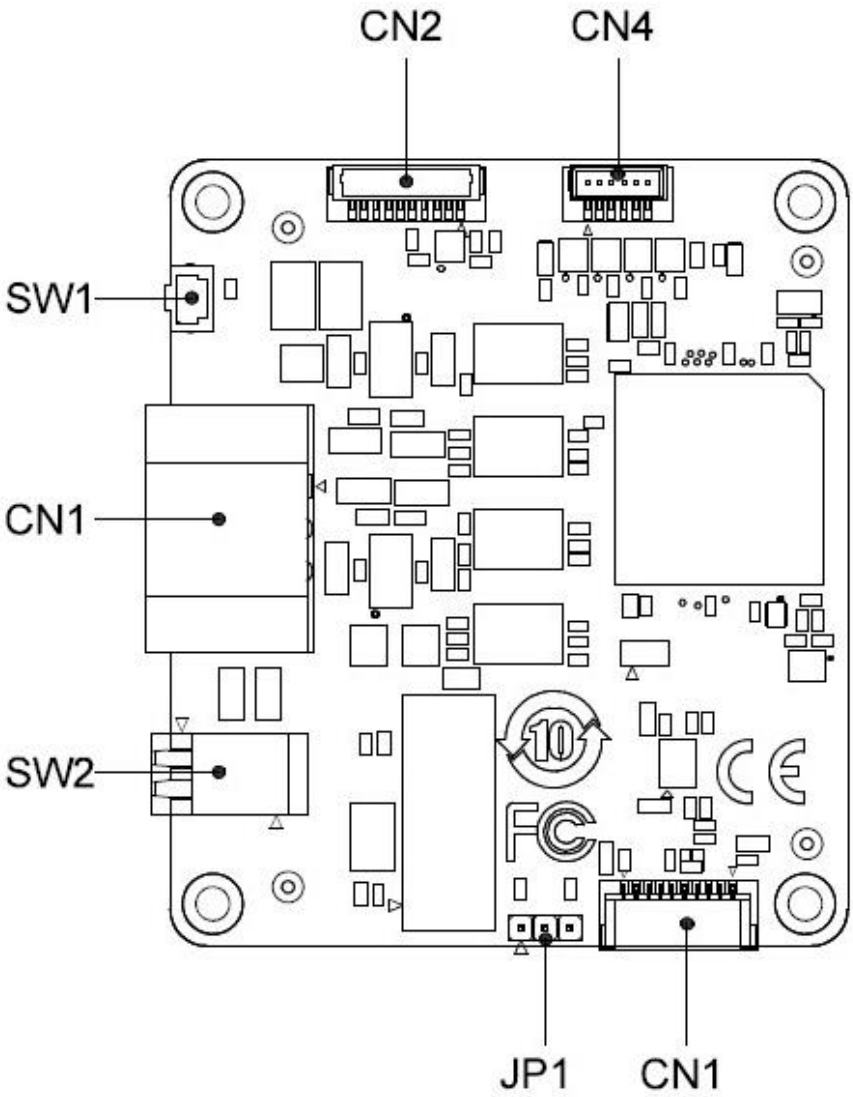
2.1 Dimensions

Carrier Board

CANBus Carrier Board



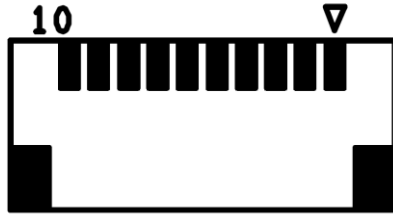
2.2 Board Layout



2.3 List of Jumpers and Connectors

Label	Functional Description
CN1	USB & UART
CN2	MCU Debug
CN3	CANBus
CN4	LED Wafer
SW1	Reset Button
SW2	DIP Switch
JP1	MCU Bootloader

2.3.1 USB & UART (CN1)



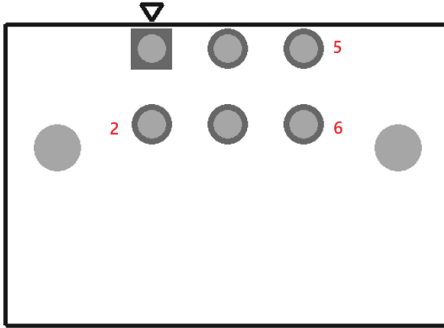
Pin	Signal Description	Pin	Signal Description
1	5V	2	USB2_DN
3	USB2_DP	4	GND
5	5V	6	NC
7	NC	8	GND
9	UART_RX	10	UART_TX

2.3.2 MCU Debug (CN2)



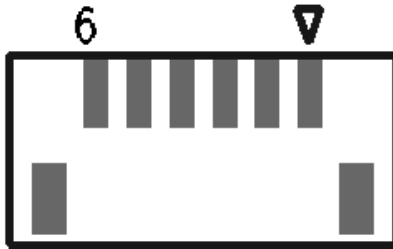
Pin	Signal Description	Pin	Signal Description
1	TARGET_RESETN	2	+VDD_DBG
3	GND	4	SWO
5	SWCLK	6	NC
7	NC	8	SWDIO
9	NC	10	NC

2.3.3 CANBus (CN3)



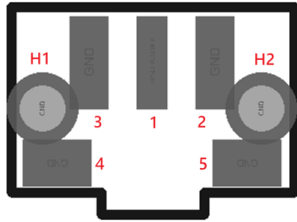
Pin	Signal Description	Pin	Signal Description
1	CAN1_H	2	CAN2_H
3	CAN1_L	4	CAN2_L
5	GND	6	GND

2.3.4 LED Wafer (CN4)



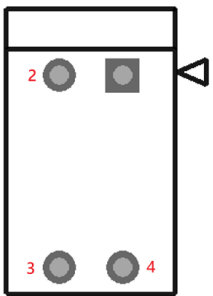
Pin	Signal Description	Pin	Signal Description
1	GND	2	CAN2_ST
3	CAN1_ST	4	CAN2_TXRX
5	CAN1_TXRX	6	5V

2.3.5 Reset Button (SW1)



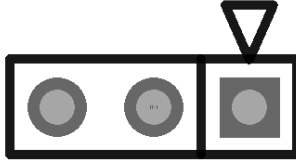
Pin	Signal Description	Pin	Signal Description
1	GND	2	PWR_SW#_CTL
3	GND	4	GND
5	GND		
H1	GND	H2	GND

2.3.6 DIP Switch (SW2)



Pin	Signal Description	Pin	Signal Description
1	CAN1_L	2	CAN2_L
3	CAN2_H (120 ohm)	4	CAN1_H (120 ohm)

2.3.7 MCU Bootloader (JP1)



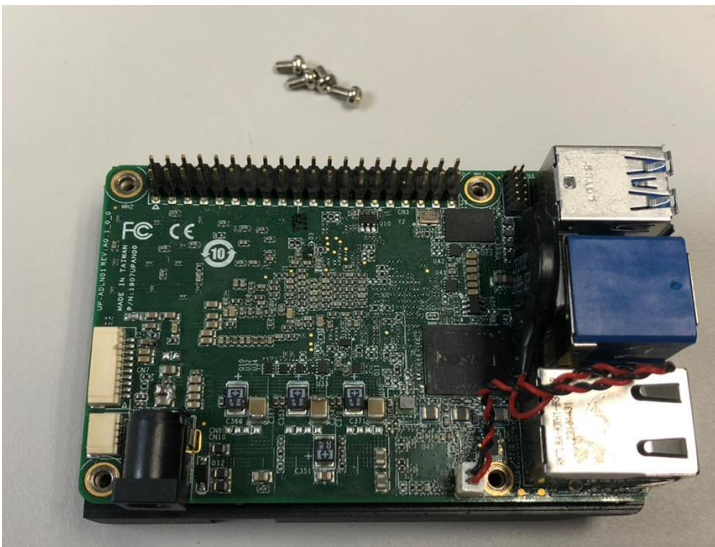
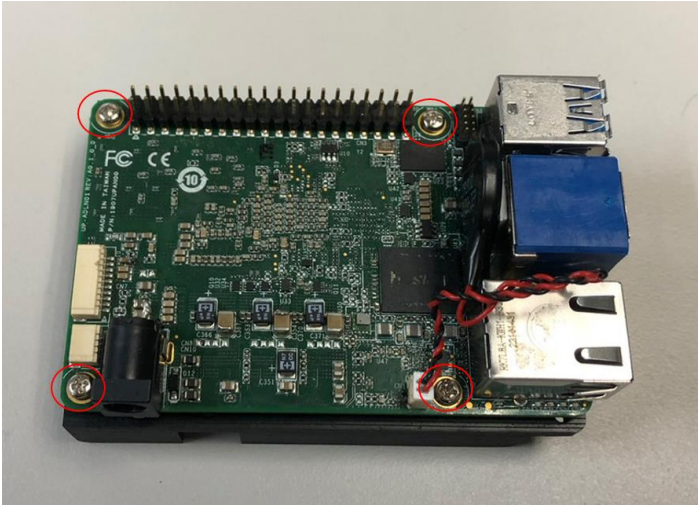
Pin	Signal Description	Pin	Signal Description
1	3.3V	2	INIT
3	GND		

Chapter 3

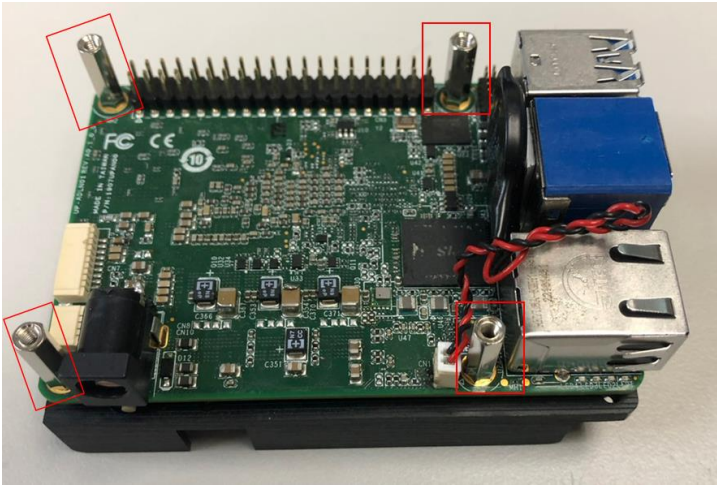
Hardware Installation

3.1 Hardware Installation

Step 1: Remove the four (4) screws from the outer edges of the board.

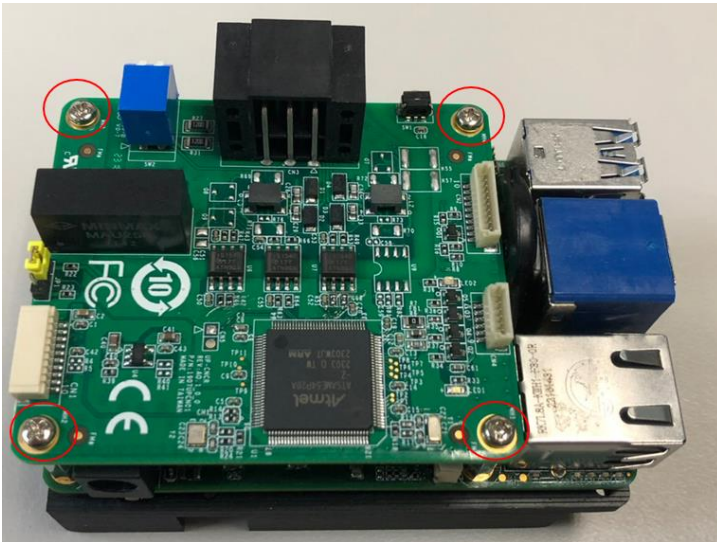


Step 2: Affix and lock the four (4) pillars to the board.

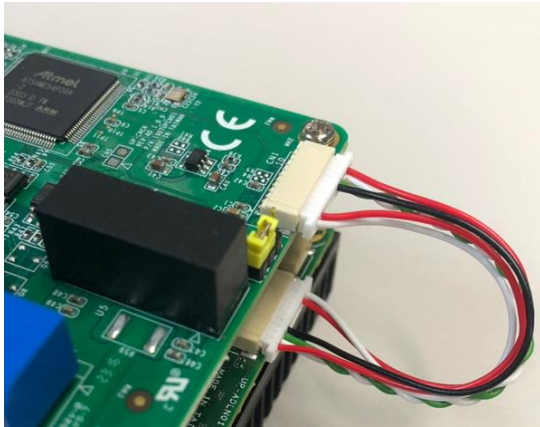
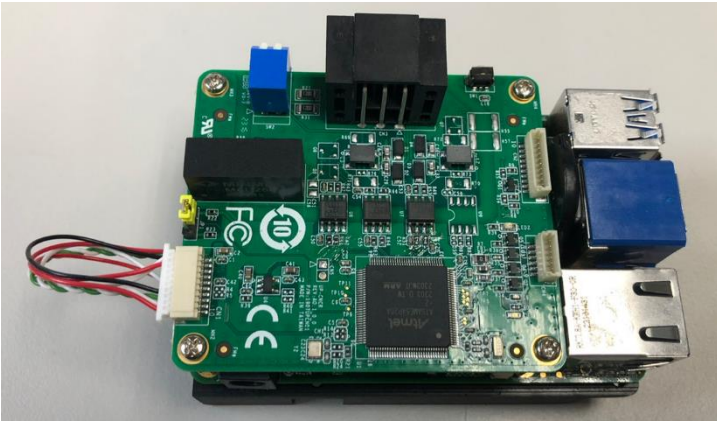


Step 3: Put CANBus Board on top of the pillars and affix and lock screws.

Board assembly direction reference photo:



Step 4: Plug in cable with the board.



3.2 Ubuntu OS Driver Settings

3.2.1 Installing Ubuntu

Ubuntu can be downloaded from the official website here:

<https://ubuntu.com/download/desktop> and navigating to the Downloads section.

3.2.2 System Setup

Download and install the CAN driver, and follow the below commands.

```
$ sudo apt-get update
$ sudo apt-get install can-utils
```

Commands for CAN and examples:

For UART:

```
$ sudo slcand -S 2000000 -s6 -o ttyS4 can1
```

For USB:

```
$ sudo slcand -S 2000000 -s6 -o ttyACM0 can2
```

*s6 please follow below

To change Bitrates, edit `./runcanx.sh`

Supported	Bitrates
10000	s0
20000	s1
50000	s2
100000	s3
125000	s4
250000	s5
500000	s6
800000	s7
1000000	s8

*ttyS"4"

Project	Number
UPX, UP 4000, UPX 7100	4
UP 7000	5

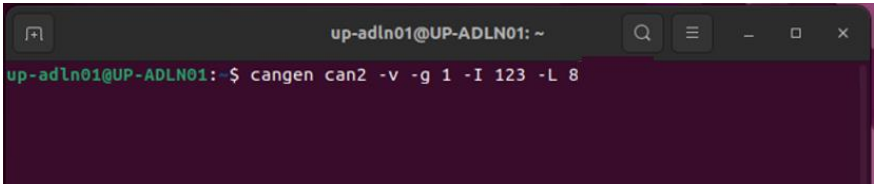
To active CAN:

```
$ sudo ip link set can1 up
```

Use `cansend` or `cangen` to send data:

```
$ cansend can1 123#112233445566778
```

```
$ cangen can2 -v -g 1 -I 123 -L 8
```



```
up-adln01@UP-ADLN01: ~  
up-adln01@UP-ADLN01:~$ cangen can2 -v -g 1 -I 123 -L 8
```

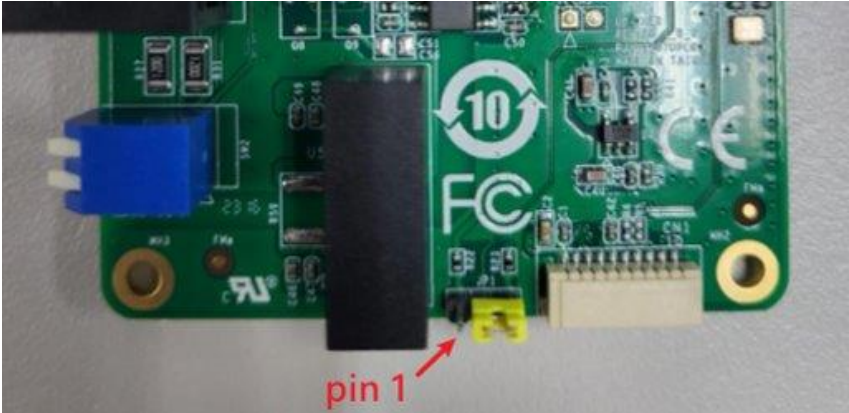
Use `candump` to show received data

```
$ candump can1 -x
```

3.2.3 Update Firmware

Jumper Settings

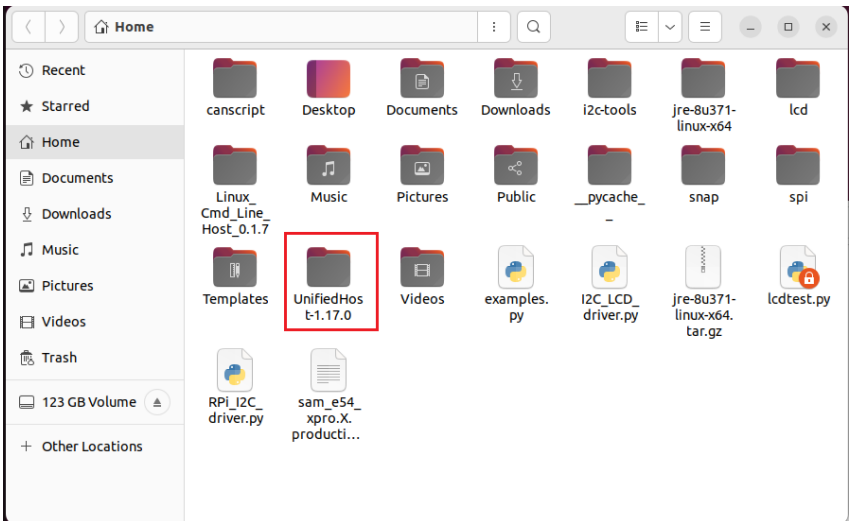
Set the jumper to pin 2-3 (as marked below) on JP1 and power up the board. (Jumper default configuration: pin 1-2).



Step 1: Linux - Update Firmware - 1

Copy the UnifiedHost-1.19.1 GUI tool folder to your PC.





Download Link: <https://up-shop.org/media/productattach/u/n/unifiedhost-1.19.1.zip>



Step 2: Linux - Update Firmware – 2

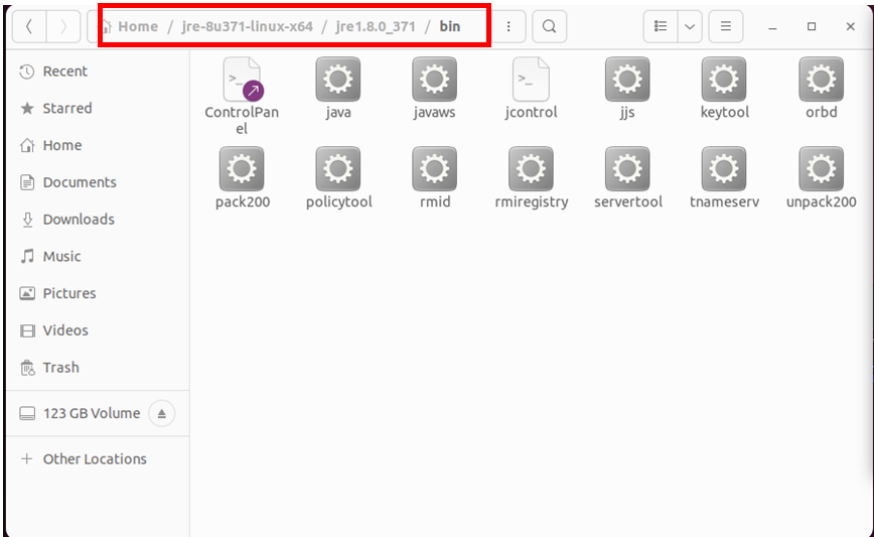
Download Java for Linux

Download Link: <https://www.java.com/download/manual.jsp>

Linux			
	Linux RPM filesize: 98.33 MB	Instructions	After installing Java, you will need to enable Java in your browser.
	Linux filesize: 96.36 MB	Instructions	
	Linux x64 filesize: 93.00 MB	Instructions	
	Linux x64 RPM filesize: 95.07 MB	Instructions	

Step 3: Linux - Update Firmware – 3

Open Terminal in "bin" folder.



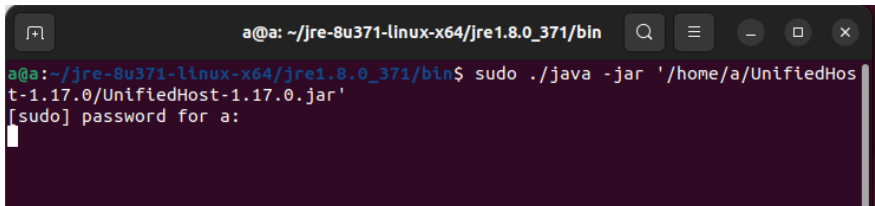
Step 4: Linux - Update Firmware – 4

Type the following command:

```
sudo ./java -jar '/home/a/UnifiedHost-1.19.1/UnifiedHost-1.19.1.jar'
```

'/home/a/UnifiedHost-1.19.1/=> File path

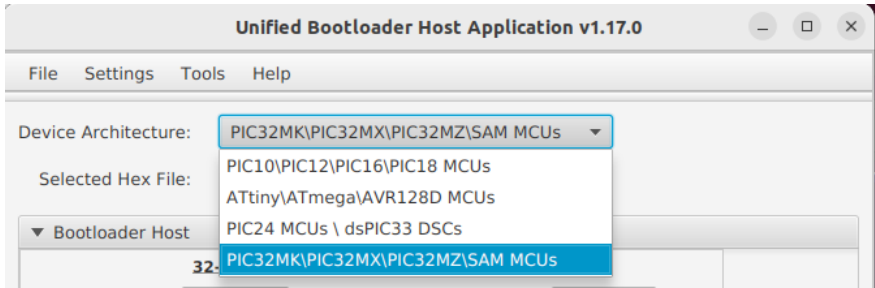
UnifiedHost-1.19.1.jar'=> GUI tool

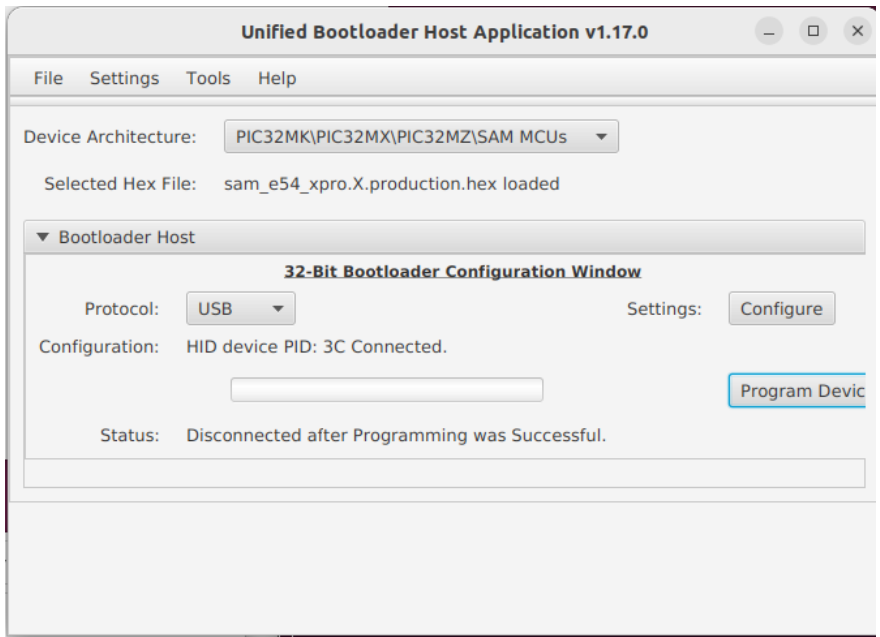
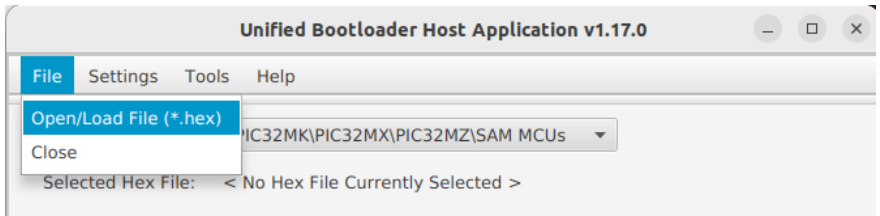
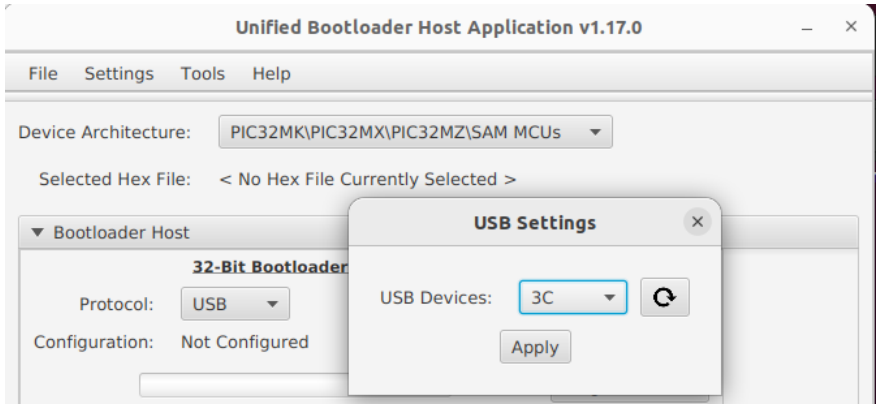
**Step 5:** Linux - Update Firmware – 5

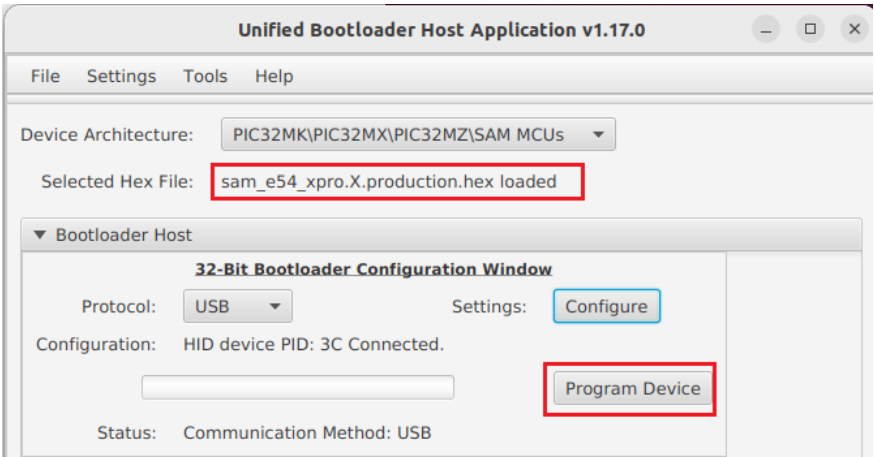
Please follow below figures to select the right MCU.

Select **Device Architecture**-> **Protocol:USB**-> **Select USB settings:3C**-> **Selected File**->

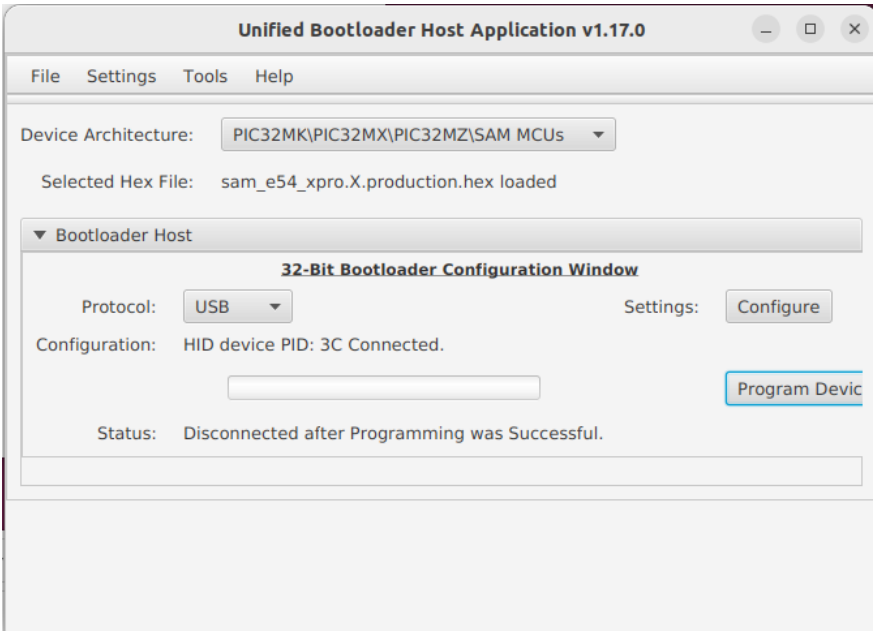
Click **"Program Device"** to flash.







When the programming is done, the status will show as the picture indicated.



Power off the board and remove AC power. Set the jumper back to pin 1-2 on JP1 for the next boot.

Appendix A

Connectors

A.1 Connectors

This table provides detailed information about the cables and connectors used by the CAN Bus Carrier Board. If you have any questions about the configuration of your board, please contact your AAEON sales representative.

Label	Description	Connector Type
CN1	USB & UART	Wafer.SMD.Pitch=1.0mm.10P90D.MALE.BOX NON LOCK.PINREX.710-74-10TWRG.NY9T
CN2	MCU Debug	Wafer Box.10P180D(M).SMD.1.0mm.w/ CAPCATCH.1204-700-10SMR
CN3	CAN Bus	Phoenix Connector.DIP90D.3*2PPitch=3.50mm.H=15.2 mm.MALE.BLACK.W/ Screw Flange.DINKLE.0221-3506L
CN4	LED Wafer	Wafer.SMD.1.0mm.6P180D.MALE.BOX W/LOCK.CAPCATCH.1204-700-06SMR
SW1	Reset Button	Push Button Switch.3P12VDC.50mA.500mohm.Black.SMD.HCH.PTS-099
SW2	DIP Switch	DIP Switch.DIP.4P.90D.Standard.2S.SPST.ECE.EPG102A
JP1	MCU Bootloader	PIN HEADER.3*1P180D(M).DIP.2.0mm.PINREX.220-96-03GB01