# UP 4000 EDGE

Edge System
UP-EDGE-APL03

**User's Manual 1st Ed**

## Copyright Notice

## Acknowledgement

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- ITE is a trademark of Integrated Technology Express, Inc.

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## Packing List

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

| Item | Quantity |
|------|----------|
| ● UP-EDGE-APL03 (UP 4000 EDGE) with heatsink | 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.**

## 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 Main Board/ Daughter Board/ Backplane

| 部件名称 | 有毒有害物质或元素 | | | | | |
|---|---|---|---|---|---|---|
| | 铅<br>(Pb) | 汞<br>(Hg) | 镉<br>(Cd) | 六价铬<br>(Cr(VI)) | 多溴联苯<br>(PBB) | 多溴二苯醚<br>(PBDE) |
| 印刷电路板<br>及其电子组件 | O | O | O | O | O | O |
| 外部信号<br>连接器及线材 | O | O | O | O | O | O |

O：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 | O | O | O | O | O | O |
| Wires & Connectors for External Connections | O | O | O | O | O | O |
| 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.<br><br>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.<br><br>**Note: The Environment Friendly Use Period as labeled on this product is applicable under normal usage only** | | | | | | |

# Table of Contents

# Chapter 1

Product Specifications

## 1.1 Specifications

| System | |
|---|---|
| CPU | Intel® Pentium® N4200/ Celeron® N3350/ Atom E3950™ |
| Memory | Onboard LPDDR4 Memory up to 8GB |
| Graphics | Intel® Gen 9 HD, supporting 4K Codec Decode and Encode for HEVC4, H.264, VP8 |
| Storage | Onboard eMMC Storage, up to 64GB |
| Ethernet | Gb Ethernet (full speed) RJ-45 x 1 |
| WIFI/BT | — |
| Expansion Slot | — |
| Security | TPM 2.0 |
| OS Support | Microsoft Windows 10 (full), Windows IOT Core Yocto project 3.1 Kernel 5.4 Ubuntu 18.04 |

| I/O Placements | |
|---|---|
| USB | USB 3.2 Gen 1 (Type A) x 3 USB 3.0 OTG via USB type C x 1 |
| Display Port | HDMI 1.4b x 1 DP via USB Type C |
| Ethernet | RJ45 x 1 |
| COM | — |
| Audio | Line out x 1 Mic in x 1 |
| GPIO | — |

## Power Supply

| | |
|---|---|
| **Power Requirement** | 12V DC-in @ 5A |
| **Power Supply Type** | DC Jack, 5.5-2.1mm/Phoenix Colay |
| **Power Consumption (Typical)** | 12V @ 1.25A (15W) |

## Mechanical

| | |
|---|---|
| **Mounting** | VESA Mounting |
| **Dimensions (W x H x D)** | 3.62" x 2.52" x 1.78" |
| | (92mm x 64mm x 45.2mm) |
| **Net Weight** | 0.64 lbs. (0.29kg) |
| **Gross Weight** | 1.21 lbs. (0.54kg) |

## Environmental

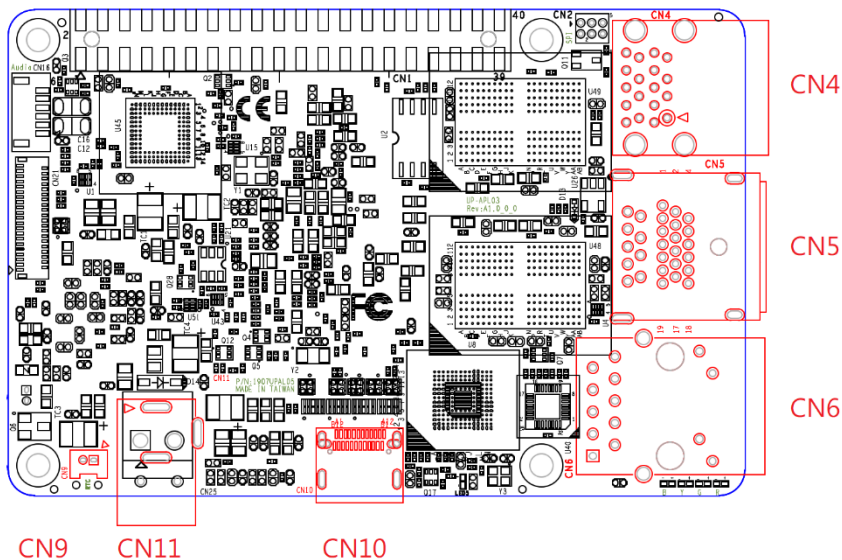| | |
|---|---|
| **Operating Temperature** | 32°F ~ 140°F (0°C ~ 60°C) with air flow 0.5m/s |
| **Operating Humidity** | 10% ~ 80% relative humidity, non-condensing |
| **Storage Temperature** | -4°F ~ 158°F (-20°C ~ 70°C) |
| **MTBF (Hours)** | 538,629 @ 30°C |
| **Certification** | CE/FCC Class A, RoHS Compliant, REACH |

# Chapter 2

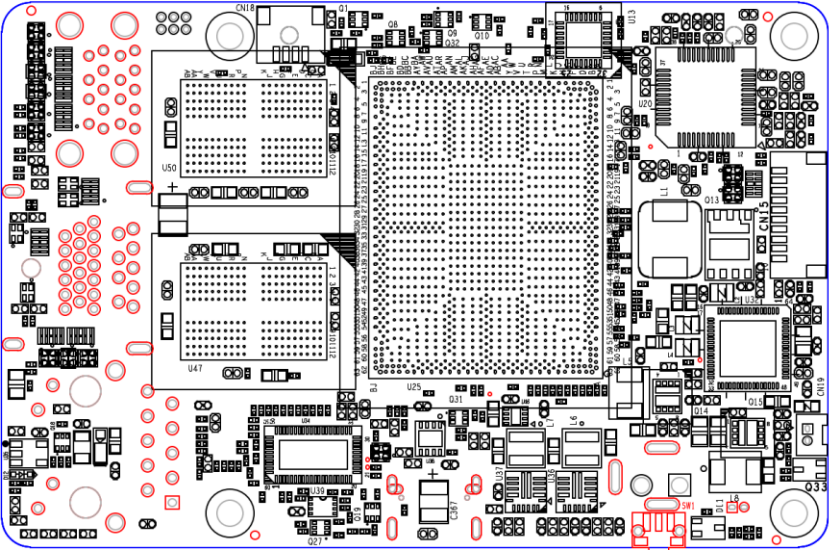Hardware  Information

## 2.1    Dimensions
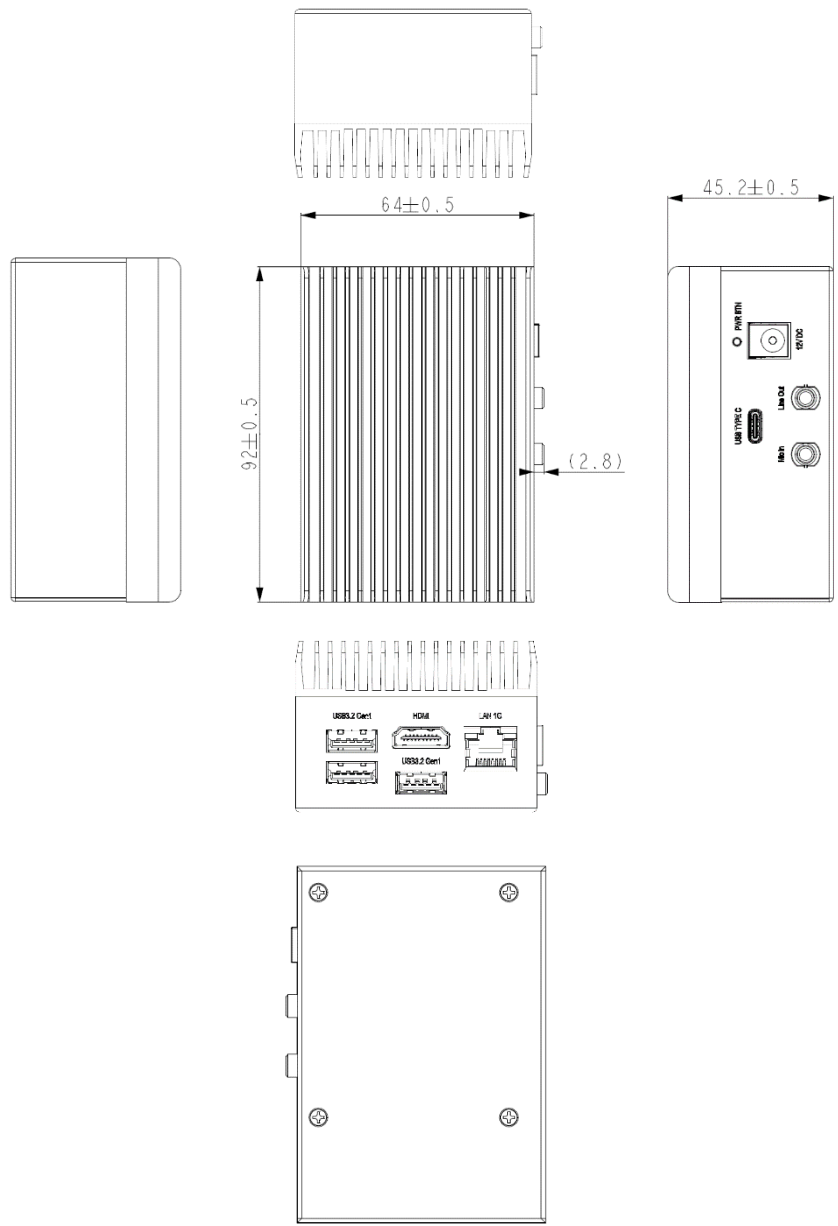
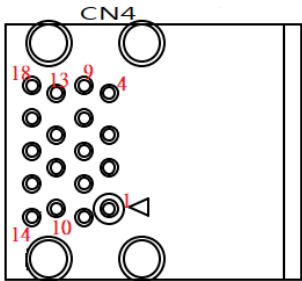## 2.2    Jumpers and Connectors

Top:

**Bottom:**

SW1

## 2.3    List of Connectors

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

| Label | Function |
|-------|----------|
| **CN4** | Dual USB 3.0 |
| **CN5** | USB3.0 + HDMI |
| **CN6** | RJ45 |
| **CN9** | RTC Conn |
| **CN10** | Type-C 3.0 |
| **CN11** | DC Jack |
| **SW1** | Power Button |

### 2.3.1    Dual USB 3.0 (CN4)



| Pin | Signal | Pin | Signal |
|-----|--------|-----|--------|
| 1 | 5V@0.9A for USB 3.0 | 2 | USB2.0_DN0 |
| 3 | USB2.0_DP0 | 4 | GND |
| 5 | USB3.0_RXN _P0 | 6 | USB3.0_RXP _P0 |
| 7 | GND | 8 | USB3.0_TXN _P0 |
| 9 | USB3.0_TXP _P0 | 10 | 5V@0.9A for USB 3.0 |
| 11 | USB2.0_DN1 | 12 | USB2.0_DP1 |
| 13 | GND | 14 | USB3.0_RXN_P1 |
| 15 | USB3.0_RXP _P1 | 16 | GND |
| 17 | USB3.0_TXN _P1 | 18 | USB3.0_TXP _P1 |
| H1 | GND | H2 | GND |
| H3 | GND | H4 | GND |

## 2.3.2    USB3.0 + HDMI (CN5)
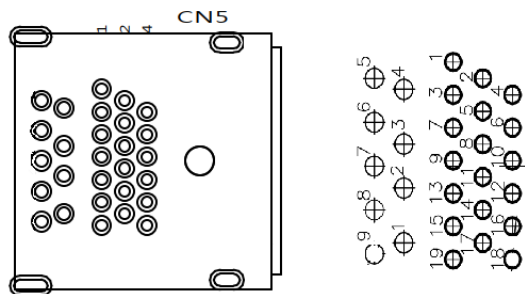


| Pin | Signal | Pin | Signal |
|-----|--------|-----|--------|
| A1 | HDMI_TMDS_TXP2 | A2 | GND |
| A3 | HDMI_TMDS_TXN2 | A4 | HDMI_TMDS_TXP1 |
| A5 | GND | A6 | HDMI_TMDS_TXN1 |
| A7 | HDMI_TMDS_TXP0 | A8 | GND |
| A9 | HDMI_TMDS_TXN0 | A10 | HDMI_TMDS_Clock_P |
| A11 | GND | A12 | HDMI_TMDS_Clock_N |
| A13 | NC | A14 | NC |
| A15 | HDMI_DDC_Clock | A16 | HDMI_DDC_Data |
| A17 | GND | A18 | 5V@1A for HDMI |
| A19 | HDMI Hot Plug detect pin | - | - |
| H1 | NC | H2 | GND |
| H3 | GND | H4 | GND |
| H5 | GND | - | - |
| B1 | 5V@0.9A for USB 3.0 | B2 | USB2.0_DN_P1 |
| B3 | USB2.0_DP_P1 | B4 | GND |
| B5 | USB3.0_RxN_P1 | B6 | USB3.0_RxP _P1 |
| B7 | GND | B8 | USB3.0_TxN_P1 |
| B9 | USB3.0_TxP_P1 | - | - |

### 2.3.3 RJ45 (CN6)
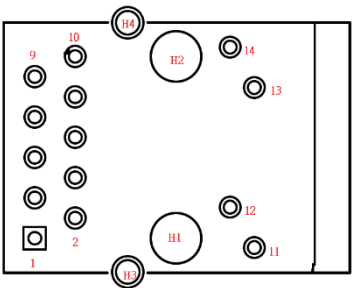


| Pin | Signal | Pin | Signal |
|-----|--------|-----|--------|
| **1** | LAN1_MDI0+(TXD+) | **2** | LAN1_MDI0-(TXD-) |
| **3** | LAN1_MDI1+(RXD+) | **4** | LAN1_MDI1-(RXD-) |
| **5** | CT_GND | **6** | CT_GND |
| **7** | LAN1_MDI2+ | **8** | LAN1_MDI2- |
| **9** | LAN1_MDI3+ | **10** | LAN1_MDI3- |
| **11** | LAN Link LED 1000# | **12** | LAN Link LED 100# |
| **13** | LAN Active LED_N | **14** | LAN Active LED_P |
| **H1** | NC | **H2** | NC |
| **H3** | Chassis_GND | **H4** | Chassis_GND |

### 2.3.4    RTC Connector (CN9)



| Pin | Signal | Pin | Signal |
|-----|--------|-----|--------|
| 1 | 3.3V for RTC | 2 | GND |

### 2.3.5    USB Type-C 3.0 (with Alt Mode) (CN10)
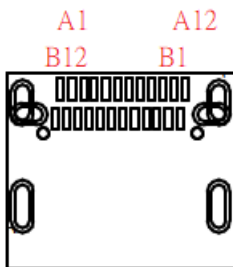


| Pin | Signal | Pin | Signal |
|-----|--------|-----|--------|
| A1 | GND | A2 | USB3.0_ Type-C_TxP_P1 |
| A3 | USB3.0_ Type-C_TxN_P1 | A4 | 5V@3A for USB Type-C |
| A5 | USB Type-C CC pin1 | A6 | USB2.0_ Type-C_DP_P1 |
| A7 | USB2.0_ Type-C_DN_P1 | A8 | USB Type-C SBU1 |
| A9 | 5V@3A for USB Type-C | A10 | USB3.0_ Type-C_RxP_P2 |
| A11 | USB3.0_ Type-C_RxN_P2 | A12 | GND |
| B1 | GND | B2 | USB3.0_ Type-C_TxP_P2 |

| Pin | Signal | Pin | Signal |
|-----|--------|-----|--------|
| B3 | USB3.0_ Type-C_TxN_P2 | B4 | 5V@3A for USB Type-C |
| B5 | USB Type-C CC pin2 | B6 | USB2.0_ Type-C_DP_P1 |
| B7 | USB2.0_ Type-C_DN_P1 | B8 | USB Type-C SBU2 |
| B9 | 5V@3A for USB Type-C | B10 | USB3.0_ Type-C_RxP_P1 |
| B11 | USB3.0_ Type-C_RxN_P1 | B12 | GND |
| H1 | NC | H2 | NC |
| H3 | GND | H4 | GND |
| H5 | GND | H6 | GND |
| H7 | GND | H8 | GND |

### 2.3.6    DC Jack (5.5-2.1mm) (CN11)
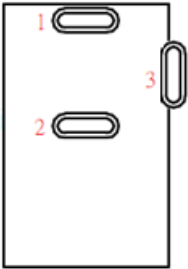


| Pin | Signal | Pin | Signal |
|-----|--------|-----|--------|
| 1 | 12V@7A Input | 2 | GND |
| 3 | GND | - | - |

## 2.3.7    Power Button (SW1)
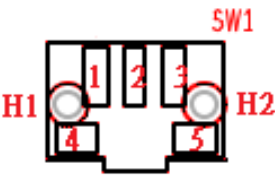


| Pin | Signal | Pin | Signal |
|-----|--------|-----|--------|
| 1   | GND    | 2   | Power Button# |
| 3   | GND    | 4   | GND |
| 5   | GND    | -   | - |
| H1  | GND    | H2  | GND |

# Chapter 3

Drivers  Installation

## 3.1    Driver Download and Installation

Please access https://www.up-community.org and go to the Downloads section > UP 4000 EDGE to find the relevant drivers.

## 3.2    Unknown Device Troubleshooting

After installing the drivers on Windows 10, you may see five unknown devices in the device manager. Follow the steps below to resolve each issue:
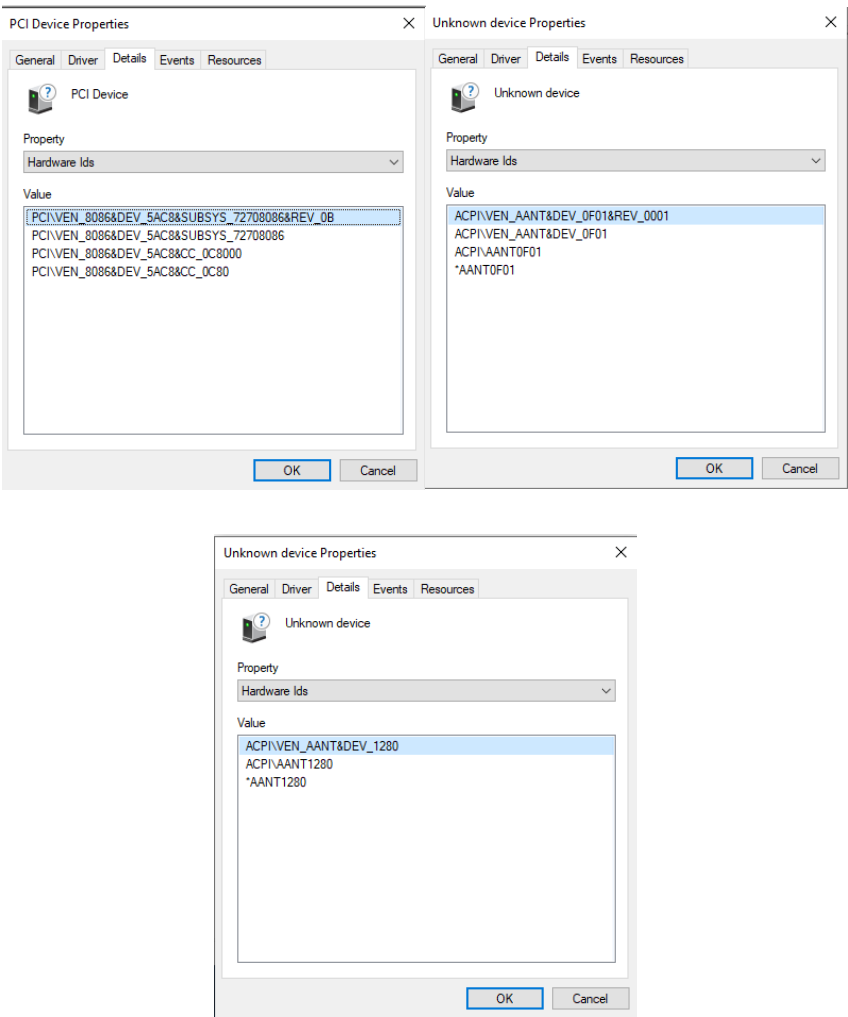
**Multimedia Audio Controller**
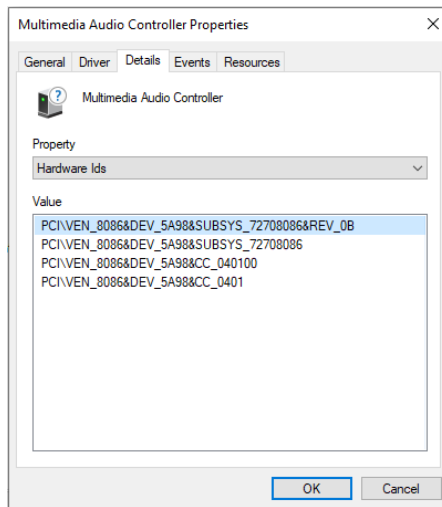


Go into the device BIOS Settings. Navigate the menus as follows:

**Chipset -> South Bridge -> HD-Audio Configuration**

Find **HD-Audio DSP** and change the setting to "disable."

**PCI Device (8086&DEV_5AC8), Unknown Device (AANT0F01), and**

**VEN_AANT&DEV_1280**





Go into the device BIOS Settings. Navigate to the **Boot** menu. Change **OS Selection** to "Windows."

**PCI Device**: The unknown PCI device is the PWM signal. It is provided directly from the Apollo Lake chipset, but Intel has not released a Windows driver for this device. This PCI device is not available for Windows 10, it is only supported by Linux.

**VEN_AANT&DEV_1280:** This is the ADC for Linux, there is no Windows driver. This can be ignored. (Note: error only occurs with Atom E3950 processor SoC)

**AANT0F04:** This is the FPGA device for Linux.

**USB OTG (Linux Only)**
This refers to the USB OTG functionality on the USB Type-C port. There is no driver available for Windows 10. The function is only available on Linux.

- Go into the device BIOS Settings. Navigate the menus as follows:
  **Chipset** -> **South Bridge** -> **USB Configuration**
- Find USB VBUS and change setting to "Off", and change the XDCI Support setting to "PCI Mode".
- When the OTG function is enabled, Windows will have an unknown USB control (VEN_8086&DEV5AAA).

# Appendix A

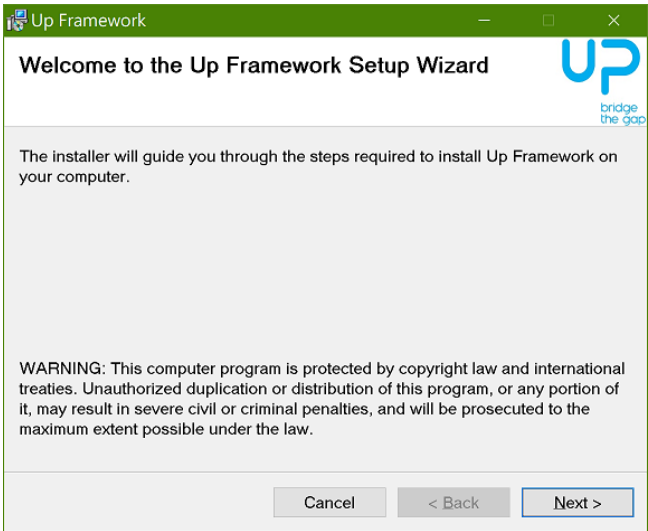UP Framework SDK Installation

## A.1    Introduction

This section provides instructions for the installation of the UP Framework SDK. Instructions are provided for Windows 10 and Windows IoT Core. You can download the latest version of UP Framework SDK from the UP community:

https://downloads.up-community.org/download/up-sdk-for-windows-10-and-windows-iot/

## A.2    Installation for Windows 10
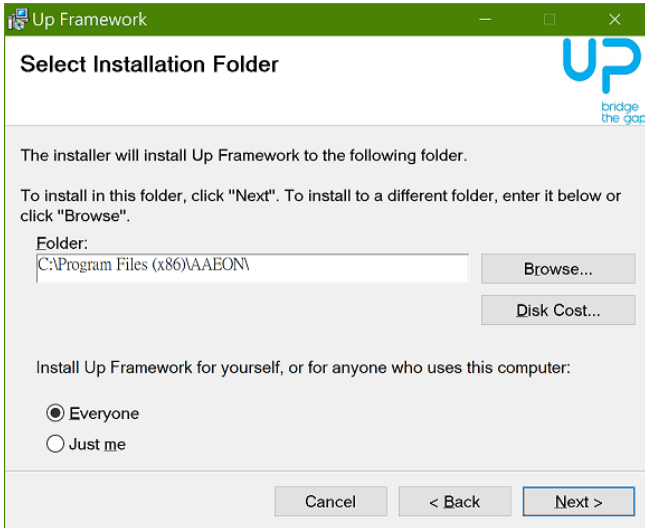
### Step 1

Locate the downloaded file UpFrameworkSetup.msi and run the installer. Press "Next" to begin the setup process.
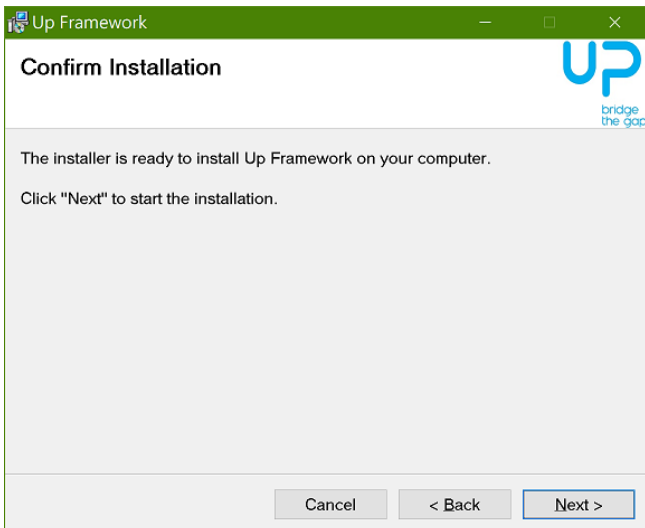
**Step 2**

Select the installation folder. Default destination path is C:\Program Files(x86)\AAEON\

You may also choose to install the UP Framework SDK for all users or only the current

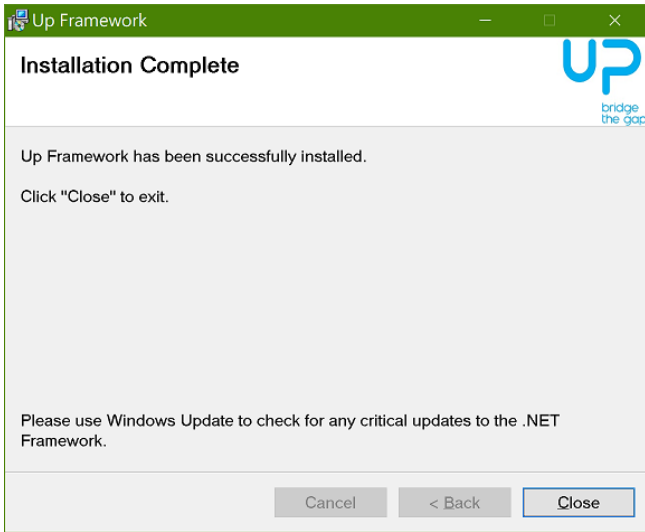user. Press "Next" to continue installation.



**Step 3**

Press "Next" to confirm the installation.

**Step 4**

Press "Close" to exit once setup is complete.

## A.3    Installation for Windows IoT Core

Before you begin, make sure you have downloaded and installed the latest version of the Windows IoT Core image from the UP community.

Installation requires using a connected PC with the UP Framework SDK software downloaded and saved. **Note:** Make sure the UP IoT Core device is connected to the same network as the PC you are using to install the software from.

### Step 1

Turn on your UP IoT Core device and note the IP address at the home screen.
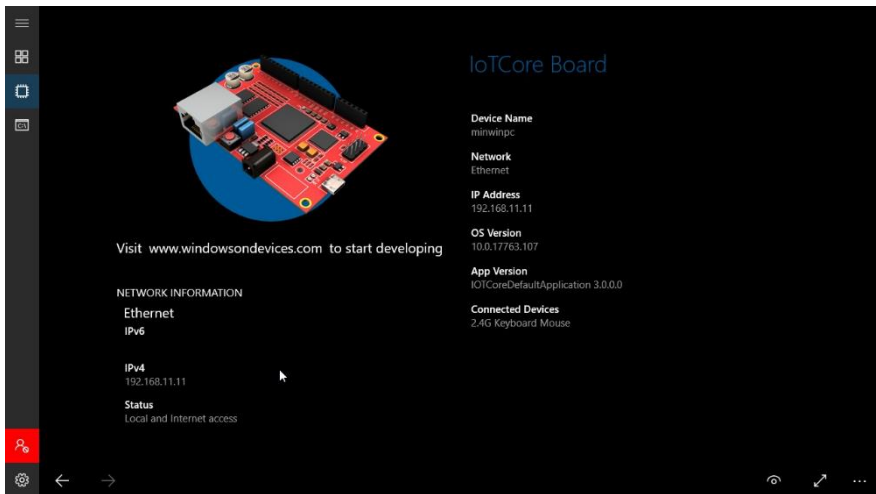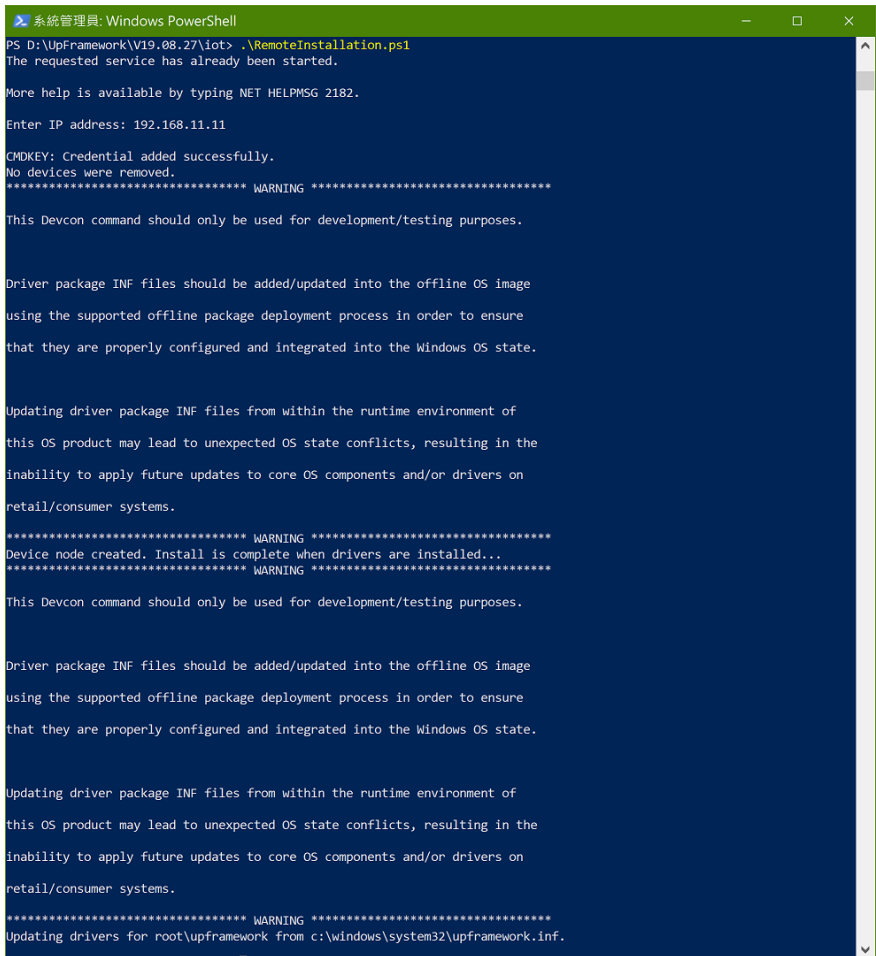
**Step 2**

Download the UP Framework SDK to your PC and unzip the files.

Open PowerShell as an Administrator. Run the command **RemoteInstallation.ps1** to install the UP Framework SDK.

Enter the IP address of the UP IoT Core device when prompted.

```
系統管理員: Windows PowerShell                                    —    □    ×
PS D:\UpFramework\V19.08.27\iot> .\RemoteInstallation.ps1
The requested service has already been started.

More help is available by typing NET HELPMSG 2182.

Enter IP address: 192.168.11.11

CMDKEY: Credential added successfully.
No devices were removed.
******************************** WARNING ********************************

This Devcon command should only be used for development/testing purposes.


Driver package INF files should be added/updated into the offline OS image

using the supported offline package deployment process in order to ensure

that they are properly configured and integrated into the Windows OS state.


Updating driver package INF files from within the runtime environment of

this OS product may lead to unexpected OS state conflicts, resulting in the

inability to apply future updates to core OS components and/or drivers on

retail/consumer systems.
******************************** WARNING ********************************
Device node created. Install is complete when drivers are installed...
******************************** WARNING ********************************
This Devcon command should only be used for development/testing purposes.


Driver package INF files should be added/updated into the offline OS image

using the supported offline package deployment process in order to ensure

that they are properly configured and integrated into the Windows OS state.


Updating driver package INF files from within the runtime environment of

this OS product may lead to unexpected OS state conflicts, resulting in the

inability to apply future updates to core OS components and/or drivers on

retail/consumer systems.
******************************** WARNING ********************************
Updating drivers for root\upframework from c:\windows\system32\upframework.inf.
```

Edge System

UP-EDGE-APL03          UP 4000 EDGE