

# AIOT-VKIT01

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## Intelligent Vending Development Kit

User's Manual 3<sup>rd</sup> Ed

## Copyright Notice

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## Packing List

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

Item	Product type	Quantity
● AAEON computing board – UP X5-Z8350, 2GB RAM, 32GB eMMC	Board	1
● AAEON Vending I/O board	Board	1
● USB interface camera	Module	1
● USB interface QR code device	Module	1
● 24V DC motor	Module	1
● 24V DC input power cable for vending I/O board	Cable	1
● 5V DC input power cable for UP-CHT01	Cable	1
● 24V DC output AC power adapter	Cable	1
● AC power cord (USA type)	Cable	1
● USB 2.0 cable, type A to type B	Cable	1
● Full size bridge motor cable	Cable	1
● Low side bridge motor cable	Cable	1

**Note:** There are two Intelligent Vending Development Kits – one without a Microsoft Azure / Power BI service, and one with. The two kits have different SDKs.

### Intelligent Development Kit without the Azure/BI service

● Pre-loaded Windows 10 IoT Enterprise 64-bit LTSC OS and AAEON Vending Demo API	Standalone SDK	1
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## Intelligent Development Kit with the Azure/BI service

- Pre-loaded Windows 10 IoT Enterprise 64-bit LTSC Azure service  
OS and AAEON Vending Demo API with Azure/BI SDK 1  
service

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

## About this Document

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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 contact their AAEON sales representative for the latest version of this document.

## Safety Precautions

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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	○	○	○	○	○	○
外部信号 连接器及线材	○	○	○	○	○	○

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	○	○	○	○	○	○
Wires & Connectors for External Connections	○	○	○	○	○	○
<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><b>Note:</b> The Environment Friendly Use Period as labeled on this product is applicable under normal usage only</p>						

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# Chapter 1

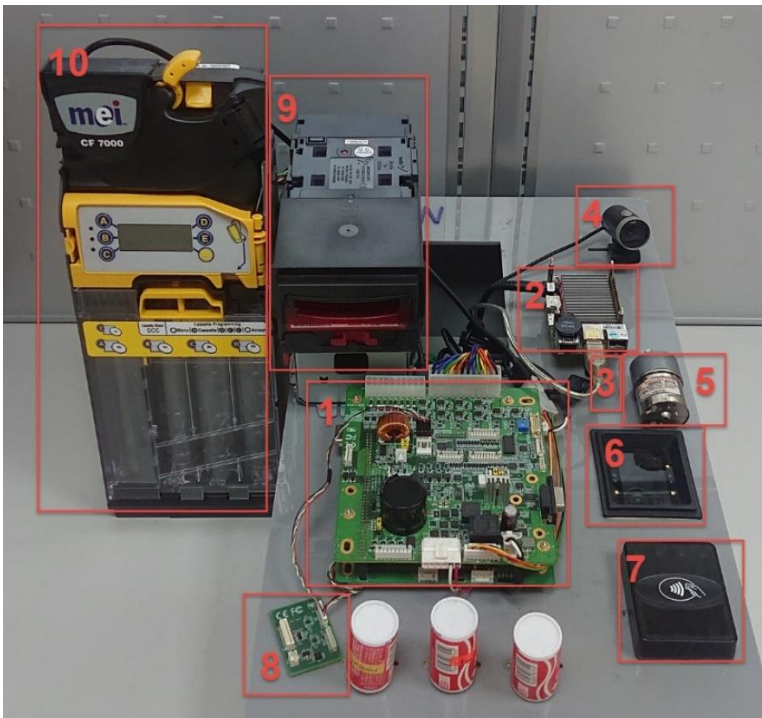
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Hardware Installation

## 1.1 Hardware Requirements

1. AAEON vending I/O board
2. AAEON computing board
3. USB 2.0 cable, type A to type B
4. USB interface camera
5. 24vDC Motor
6. USB interface QR Code device
7. Cashless RF ID device (optional)
8. Temperature (One-ware) (optional)
9. Bill machine (MEI NV9 USB) (optional)
10. Coin machine (MEI CF7000) (optional)

Display resolution supports 1080\*1920 (Full HD)



## 1.2 Intelligent Vending Development Kit Installation

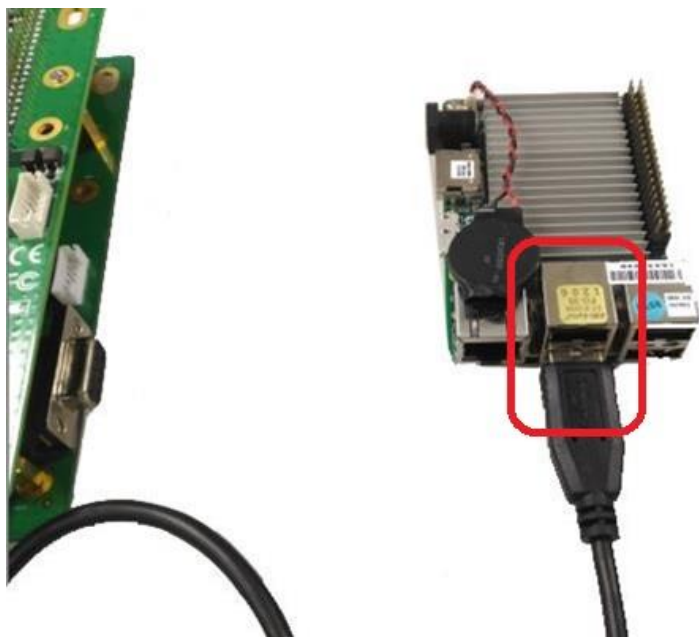
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**Step 1:** Connect the AAEON vending I/O board.

**Step 2:** Plug the type B end of the included USB cable in to the USB type B connector on bottom board of the AAEON vending I/O board.



**Step 3:** Plug the type A end of the included USB cable in to one of the USB type A connectors (any USB connector is fine) on the AA-EON computing board.

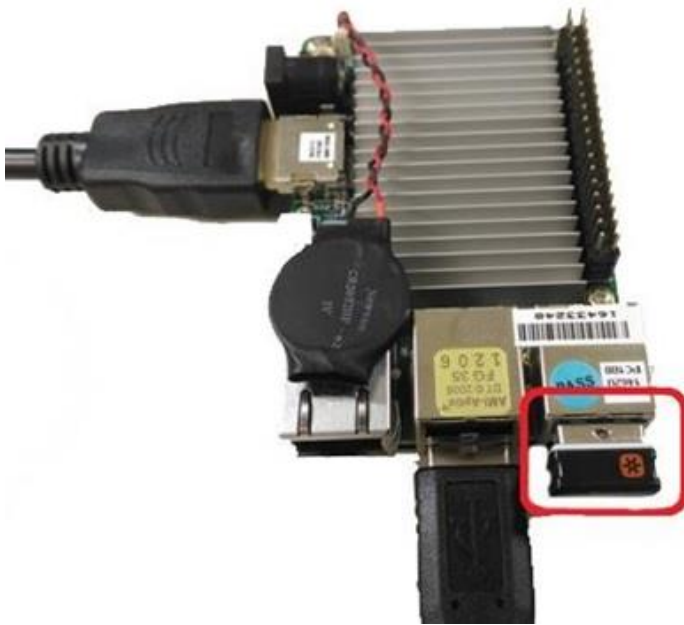




**Step 4:** Plug the HDMI cable \* from your monitor \* in to the HDMI connector on the AAEON computing board.



**Step 5:** Plug the Keyboard and Mouse USB cable(s)\* or dongle\* from your Keyboard and Mouse\* in to any USB connector on the AAEON vending computing board.



**Step 6:** Please make sure the Camera cable and QR code cable are well connected as per following image.



USB2.0 cable, type A  
To type B

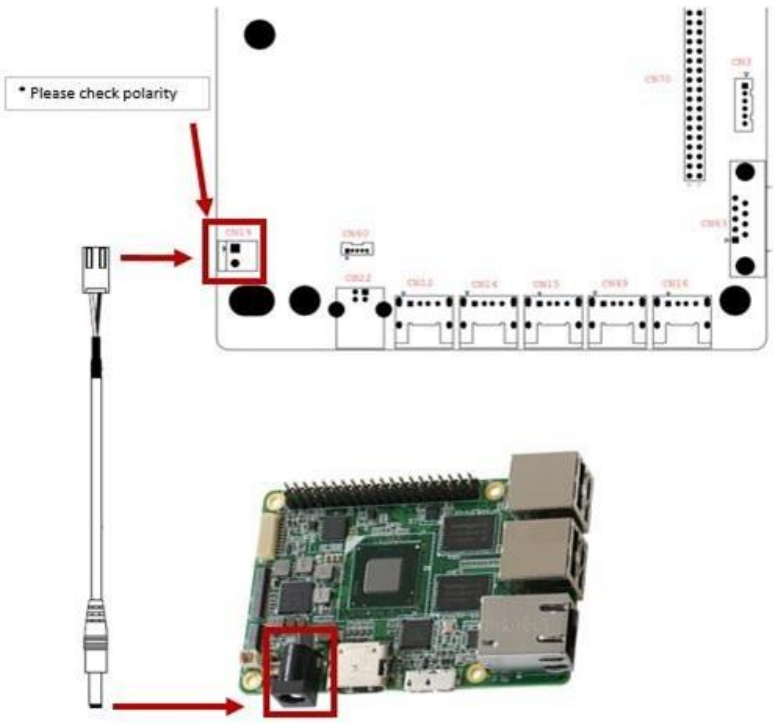
USB interface camera

USB interface  
QR code

**Step 7:** Plug the 5VDC power cable in to the CN10 connector on the AAEON vending I/O board.

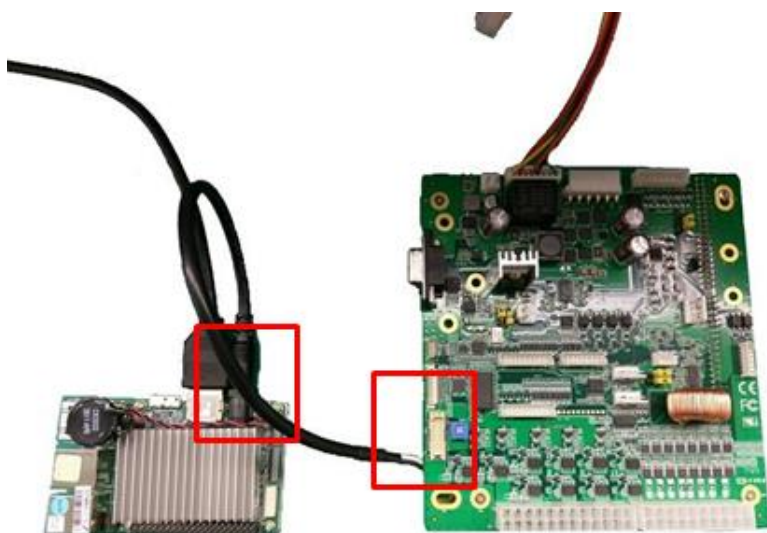


Wiring Diagram 4:

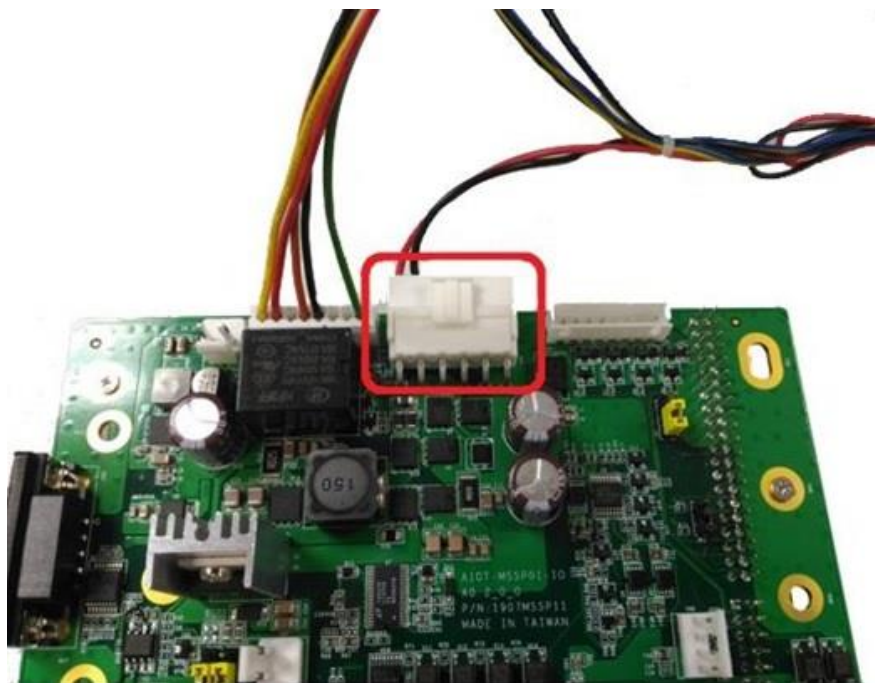


**Step 8:** Turn on the UP system and it will turn on the Intel vending API automatically.

**Step 9:** Plug the barrel end of the 5V power cable in to the power connector on the AAeon computing board.



**Step 10:** Plug the 6-pin in-line end of the 24V DC input power cable in to the CN4 connector on the AAEON vending I/O board.



**Step 11:** Plug the barrel plug of the 24V power supply to the barrel end of the 24V power cable that's connected to the AAEON computing board.



**Step 12:** Plug the AC power cord in to the 24V DC power supply's receptacle. Now plug the 24V DC power supply's AC cord plug in to an 110V AC outlet.



You have now completed connecting the AAEON Intelligent Vending Development Kit. The AAEON computing board and I/O board will power up. You should now see a blue LED on the AAEON computing board light up; the monitor will show an Up startup screen and then boot to Windows.

You have completed Chapter 1: setting up the hardware. Now that you have finished setting up the hardware, please proceed to Chapter 2 to set up the software configuration for the Intelligent Vending development kit

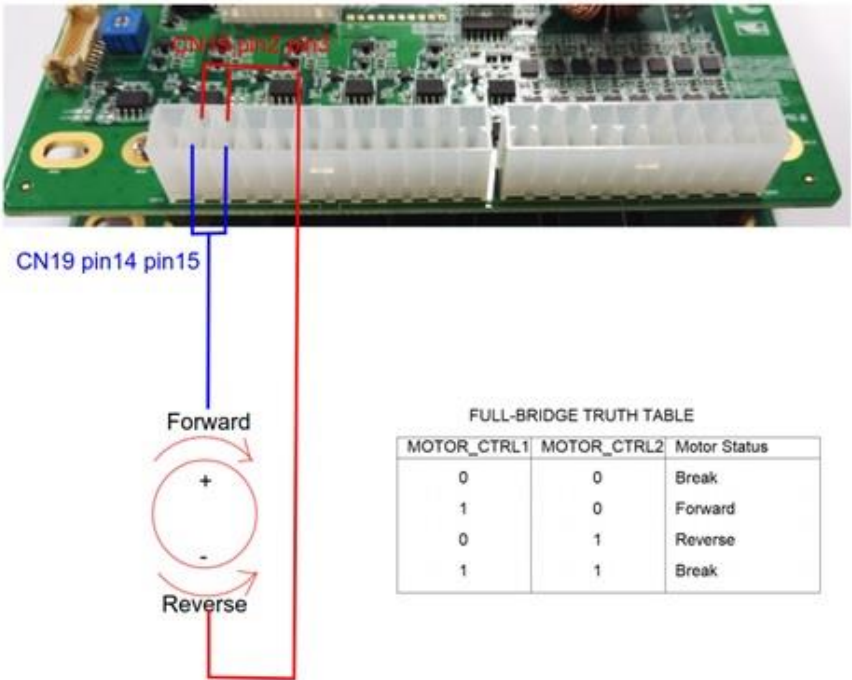
Note:

1. Please make sure all the adapters are well connected with the power cords.
2. Check the power cord is fully plugged into the power outlet.
3. Due to the power relay, it is completely normal to hear a small clicking sound when the machine is powered on.



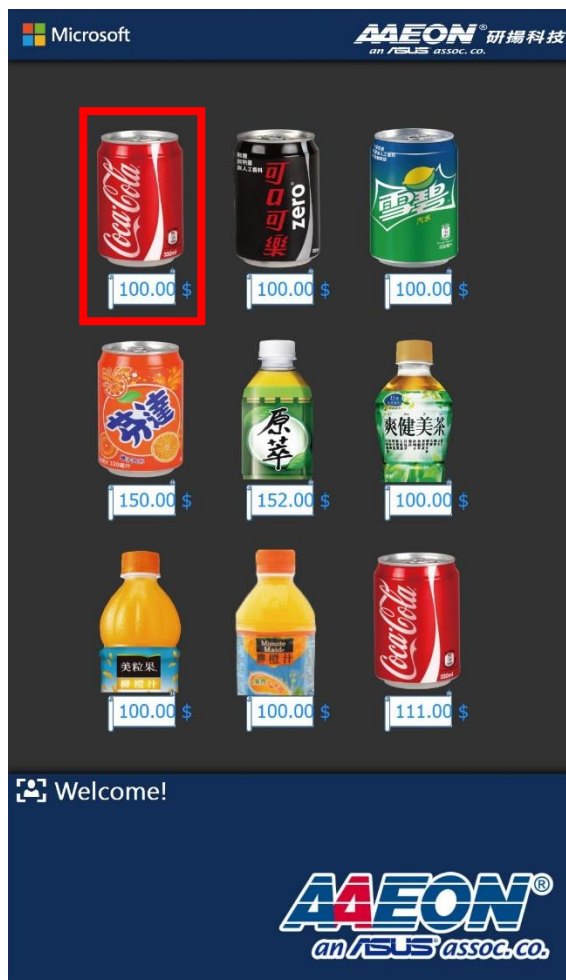
### 1.3 Intelligent Vending Development Installation - Motor setup

The AAEON Intelligent Vending Development Kit demos a motor with forward and reverse direction. Please use the cable in the packing list and follow the instructions to make a connection between 24Vdc motor and AAEON Vending I/O board.



## Remark

Please note that motor to drink item connections are one-to-one relationships (one drink item will only connect with one motor). For example, if the AAEON Vending Demo Kit program uses "Coke" mapping for the motor, only a selection of "Coke" can turn on this motor.



# Chapter 2

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Software Setup

## 2.1 Supporting Software

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- Microchip CDC driver

URL: <https://www.microchip.com/mplab/microchip-libraries-for-applications>

- QT 5.8

URL:

[https://aaeon365-my.sharepoint.com/:u:/g/personal/software\\_aaeon\\_eu/EZkbZgqjuWdBop0N4EP9D84Blqi\\_zs6Vn8JltL3yynenA?e=WkIDl1](https://aaeon365-my.sharepoint.com/:u:/g/personal/software_aaeon_eu/EZkbZgqjuWdBop0N4EP9D84Blqi_zs6Vn8JltL3yynenA?e=WkIDl1)

- AAEON VendingDemoKit\_v0.1.exe:

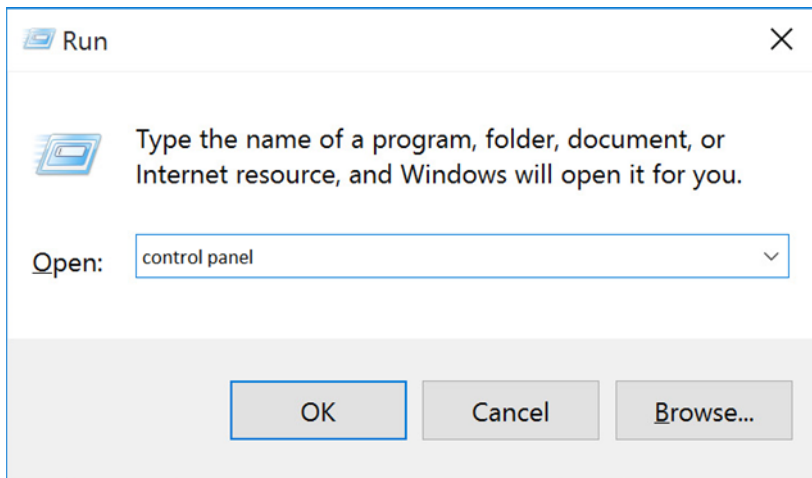
It is preloaded along with Windows 10 IoT Enterprise 64-bit LTSC OS.

## 2.2 Power Option set up

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Please follow the steps below to change the power selection.

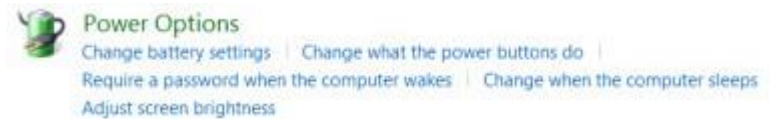
**Step 1:** Access the control panel.



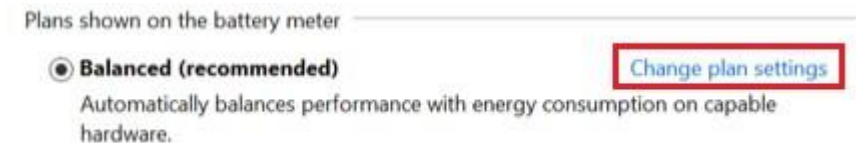
## Step 2: Select Hardware and Sound.



## Step 3: Select Power options.



## Step 4: Select Change plan setting.



Step 5: Modify Screen & Sleep setting to “Never”

## Power & sleep

### Screen

On battery power, turn off after

When plugged in, turn off after

### Sleep

On battery power, PC goes to sleep after

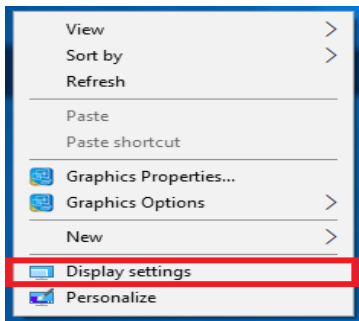
When plugged in, PC goes to sleep after

## 2.3 Display Setting set up

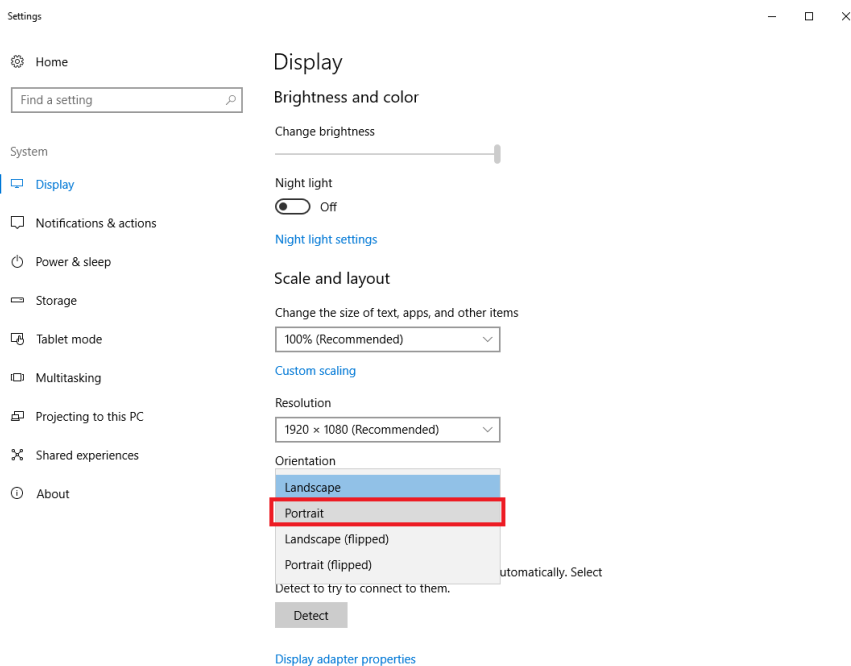
---

Please follow the steps below to change the display settings.

**Step 1:** Right click one the desktop and select Display settings.



## Step 2: Change the orientation from landscape to portrait.



Settings

Home

Find a setting

System

- Display
- Notifications & actions
- Power & sleep
- Storage
- Tablet mode
- Multitasking
- Projecting to this PC
- Shared experiences
- About

### Display

#### Brightness and color

Change brightness

Night light

Off

[Night light settings](#)

#### Scale and layout

Change the size of text, apps, and other items

100% (Recommended)

[Custom scaling](#)

Resolution

1920 × 1080 (Recommended)

Orientation

- Landscape
- Portrait**
- Landscape (flipped)
- Portrait (flipped)

Detect to try to connect to them. automatically. Select

Detect

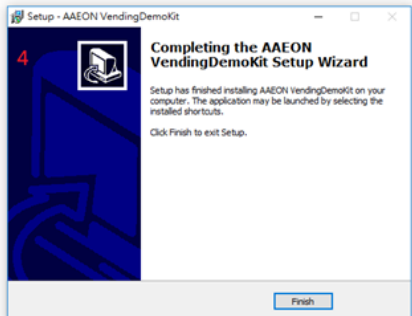
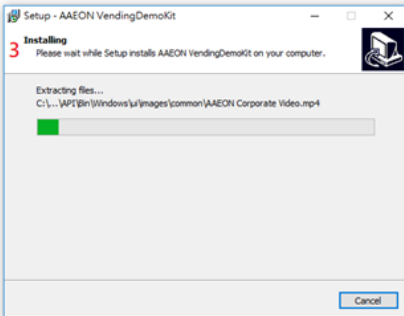
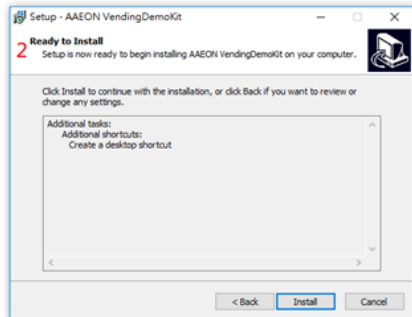
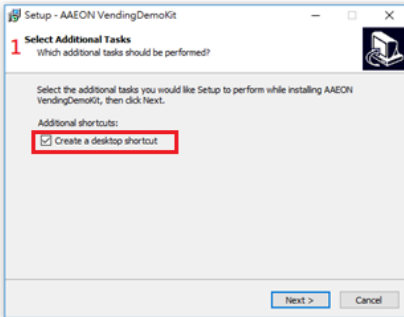
[Display adapter properties](#)



## 2.4 AAEON Vending Demo API package kit installation

Please follow the steps below to install the AAEON VendingDemoKit\_v0.1 software package kit.

### Step 1: Install AAEON VendingDemoKit\_v0.1.exe



## Step 2: Download and install the “Microchip CDC” driver

(microchip-libraries-for-applications-v2013-06-15-windows-installer.exe) from

<https://www.microchip.com/mplab/microchip-libraries-for-applications>.

1

**Archive**

The software in this section is subject to the U.S. Export Administration Regulations and other U.S. law, and may not be exported or re-exported to certain countries or to persons or entities prohibited from receiving U.S. exports (including Denied Parties, entities on the Bureau of Export Administration Entity List, and Specially Designated Nationals).

**Filter by Version**

Version: All Versions

Version	Operating System	Title	Download
<b>Version: v2016-11-07</b>			
v2016-11-07	Windows	Microchip Libraries for Applications	
v2016-11-07	Mac OS X	Microchip Libraries for Applications	

2

<b>Version: v2013-06-15</b>			
v2013-06-15	Windows	Microchip Libraries for Applications	
v2013-06-15	Mac OS X	Microchip Libraries for Applications	
v2013-06-15	Linux	Microchip Libraries for Applications	
v2013-06-15		Release Notes <sup>1</sup>	
v2013-06-15		Help Files	
<b>Version: v2013-02-15</b>			

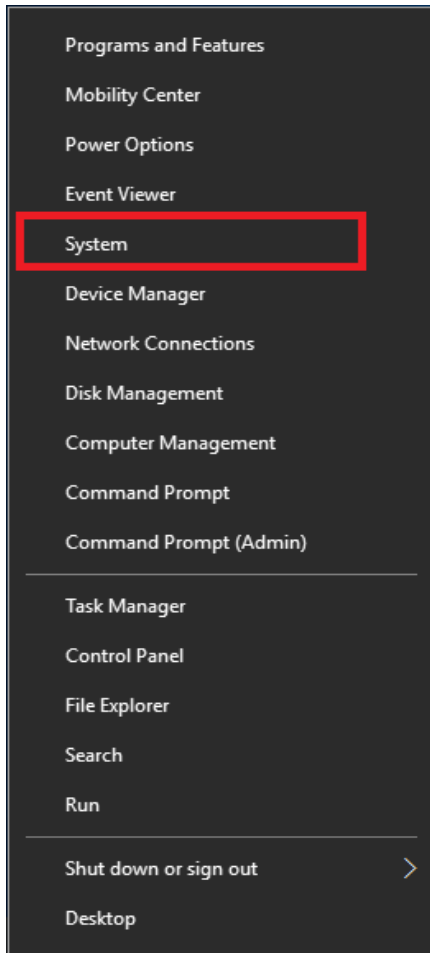
**Step 3:** Download and install QT 5.8

[https://aaeon365-my.sharepoint.com/:u:/g/personal/software\\_aaeon\\_eu/EZkbZqgiuWdBop0N4EP9D84Blqi\\_zs6Vn8JltL3yyrnenA?e=WkIDl1](https://aaeon365-my.sharepoint.com/:u:/g/personal/software_aaeon_eu/EZkbZqgiuWdBop0N4EP9D84Blqi_zs6Vn8JltL3yyrnenA?e=WkIDl1)

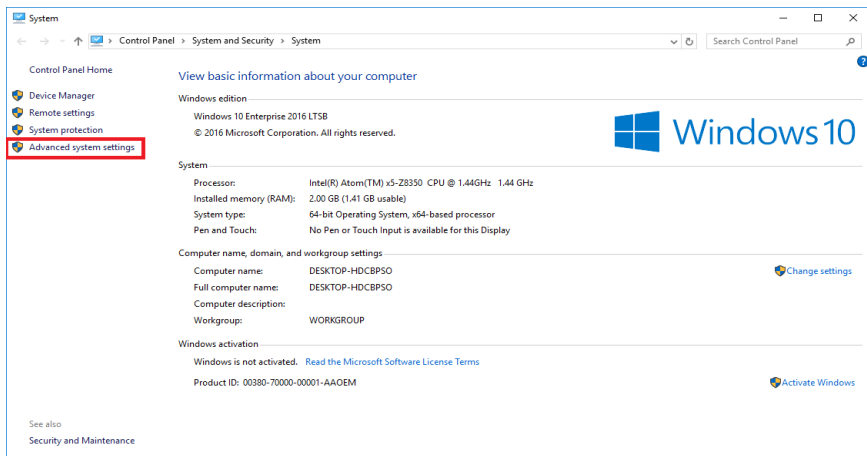
**Step 4:** Update the environment variable PATH in Windows 10:

\* Right click the Windows start button in the lower left-hand corner

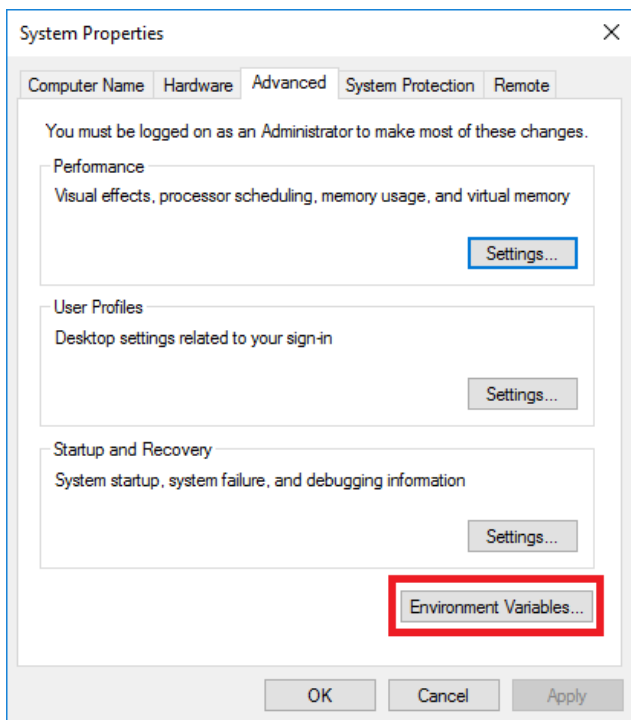
\* Click System from the menu



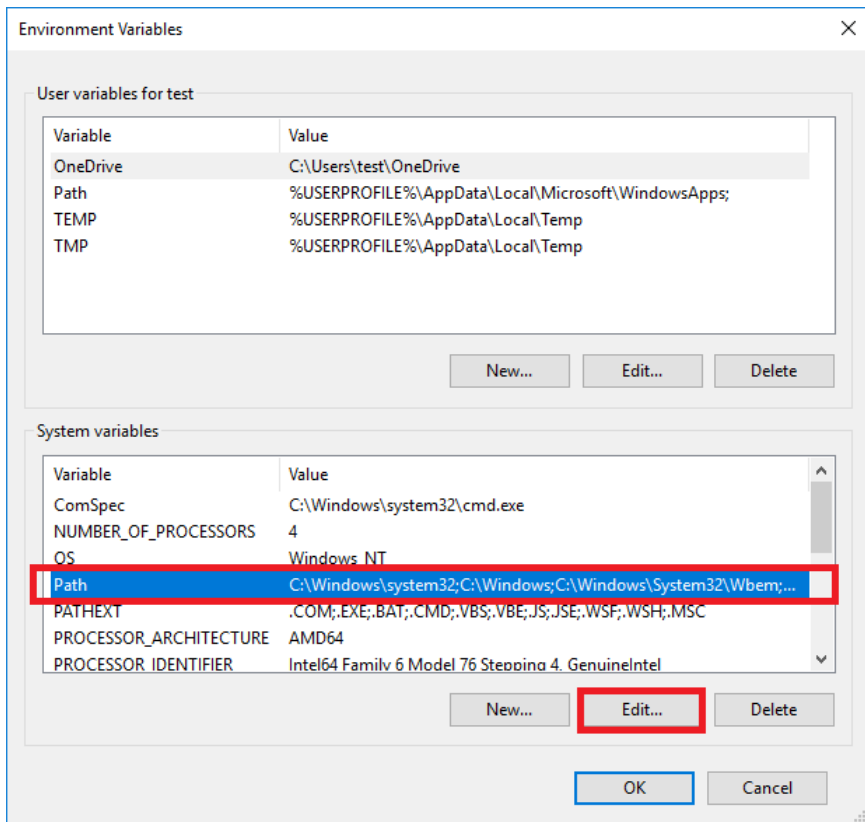
\* Click Advanced System Settings from the left panel



\* Click the Environment Variables buttons in the popup



\* In the System Variables section scroll to PATH and click the edit button



\* In the popup, add the above paths and click the New button for each line:

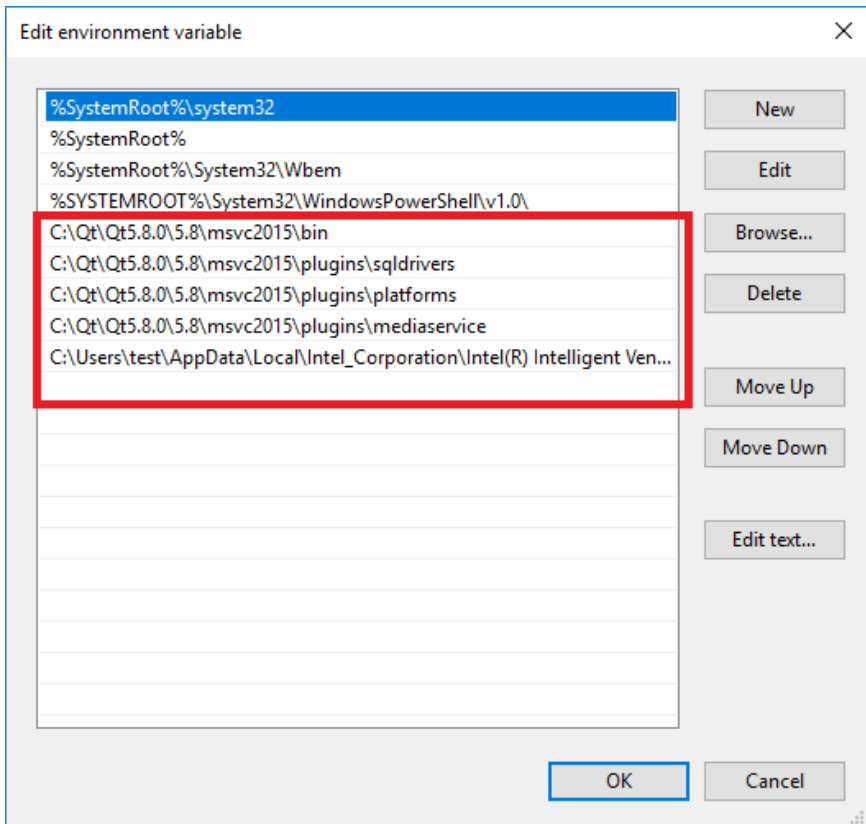
c:\Qt\Qt5.8.0\5.8\msvc2015\bin

c:\Qt\Qt5.8.0\5.8\msvc2015\plugins\sqldrivers

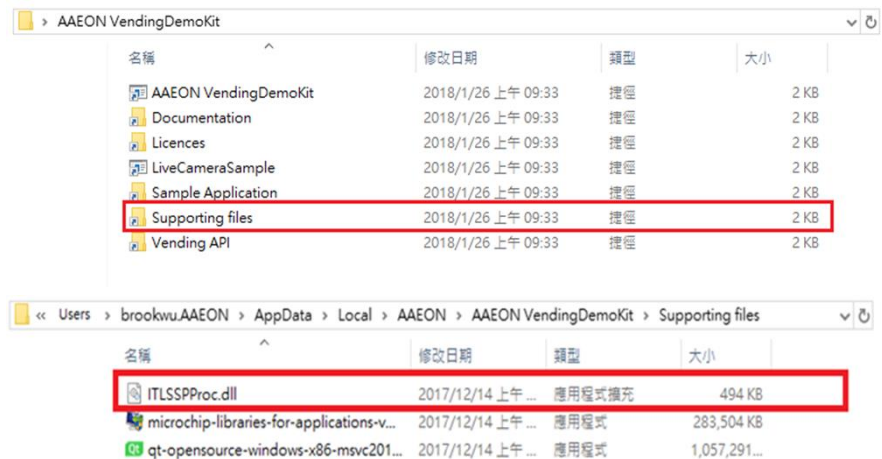
c:\Qt\Qt5.8.0\5.8\msvc2015\plugins\mediaservice

c:\Qt\Qt5.8.0\5.8\msvc2015\plugins\platforms

c:\Users\<TODO\_ADD\_WINDOWS\_USER\_NAME\_HERE>\AppData\Local\AAEON  
N\AAEON VendingDemoKit\API\Bin\Windows\axis2c\lib



**Step 5:** Copy "ITLSSPProc.dll" to c:\windows\ (Dll path : Desktop\AAEON VendingDemoKit\Supporting files)



**Step 6:** Edit the channel\_type and corresponding com\_name in SPM\_MachineConfiguration.xml. Go to the VendingDemo directory and locate SPM\_MachineConfiguration.xml. Open this file with any XML editor. (Path : Desktop\AAEON VendingDemoKit\API\Bin\Windows\SPM\_MachineConfiguration.xml)



名稱	修改日期	類型	大小
AAEON VendingDemoKit	2018/1/26 上午 09:33	捷徑	2 KB
Documentation	2018/1/26 上午 09:33	捷徑	2 KB
Licences	2018/1/26 上午 09:33	捷徑	2 KB
LiveCameraSample	2018/1/26 上午 09:33	捷徑	2 KB
Sample Application	2018/1/26 上午 09:33	捷徑	2 KB
Supporting files	2018/1/26 上午 09:33	捷徑	2 KB
Vending API	2018/1/26 上午 09:33	捷徑	2 KB



File Explorer path: > BrookWu 吳承書 > AppData > Local > AAEON > AAEON VendingDemoKit > API >

名稱	修改日期	類型	大小
Bin	2018/1/19 下午 0...	檔案資料夾	
Lib	2018/1/19 下午 0...	檔案資料夾	
SampleVendingApp	2018/1/26 上午 0...	檔案資料夾	
VendingDB	2018/1/19 下午 0...	檔案資料夾	
CMakeLists.txt	2017/2/1 下午 08...	文字文件	2 KB

File Explorer path: > BrookWu 吳承書 > AppData > Local > AAEON > AAEON VendingDemoKit > API > Bin >

名稱	修改日期	類型	大小
VendingCamera	2018/1/26 上午 0...	檔案資料夾	
Windows	2018/2/5 下午 05...	檔案資料夾	

File Explorer path: brookwu.AAEON > AppData > Local > AAEON > AAEON VendingDemoKit > API > Bin > Windows >

名稱	修改日期	類型	大小
RealSensePeopleCounter.dll	2017/11/6 下午 03:43	應用程式擴充	56 KB
SecureHeadMSRLibrary.dll	2017/11/6 下午 03:43	應用程式擴充	13 KB
SecureHeadTranslationLibrary.dll	2017/11/6 下午 03:43	應用程式擴充	32 KB
SensorTelemetryController.dll	2017/11/6 下午 03:44	應用程式擴充	48 KB
SPM_DeviceConfiguration.xml	2017/10/16 上午 09:56	XML Document	319 KB
SPM_MachineConfiguration.xml	2018/1/19 下午 02:31	XML Document	52 KB
SPM_Schema.xsd	2017/10/16 上午 09:56	XML Schema File	135 KB
ssleay32.dll	2017/11/2 上午 10:43	應用程式擴充	272 KB
Telemetry.exe	2017/11/6 下午 03:46	應用程式	230 KB
TelemetryConfiguration.xml	2017/2/3 上午 09:04	XML Document	14 KB
TelemetryConfiguration.xsd	2017/2/3 上午 09:05	XML Schema File	12 KB
VDIProxy.dll	2017/11/6 下午 03:44	應用程式擴充	31 KB
VendiLibrary.dll	2017/11/6 下午 03:44	應用程式擴充	21 KB
VendingDemo.exe	2018/1/19 下午 02:51	應用程式	175 KB
VendiTranslationLibrary.dll	2017/11/6 下午 03:44	應用程式擴充	34 KB

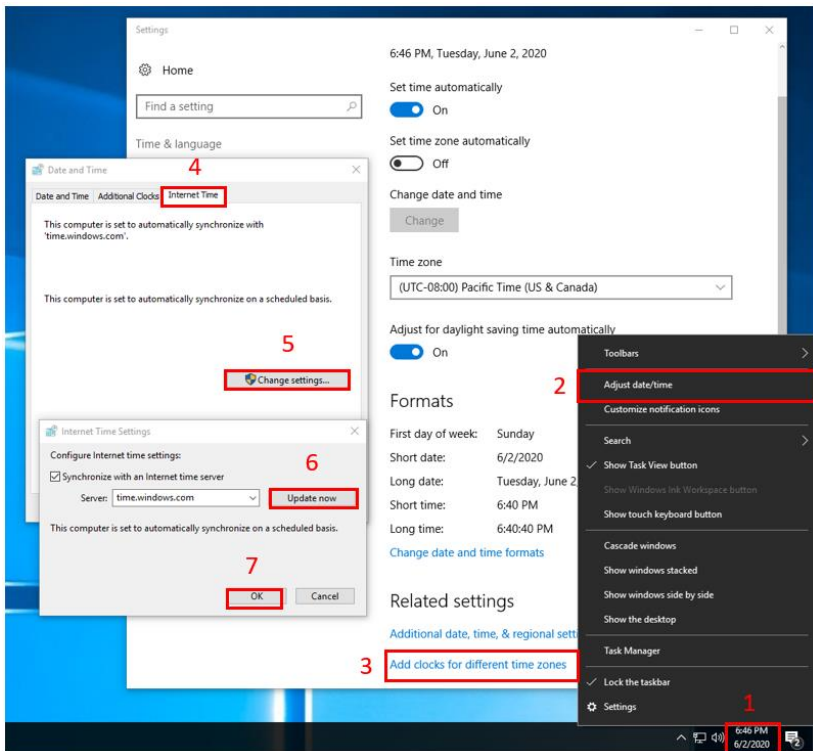
**Step 7:** Open the device manager and expand the “Ports (COM and LPT)” section. The device manager shows COM3 as the port. Then edit the XML file. The text in bold in the picture below shows the edits made in this particular instance.

```
<system_config>
  <communication_channel_config>
    <channel_type>USB</channel_type>
    <com_name>COM3</com_name>
  </communication_channel_config>
  <port_shared>
    <protocol>MDB</protocol>
    <protocol>PROTOCOL_A</protocol>
  </port_shared>
  <port_shared>
    <protocol>CCTALK</protocol>
    <protocol>DEX</protocol>
  </port_shared>
  <sysfs_path>
    <gpio_path>/sys/class/gpio</gpio_path>
    <pwm_path>/sys/class/pwm/pwmchip0</pwm_path>
    <adc_path>/sys/bus/iio/devices/iio:device</adc_path>
  </sysfs_path>
</system_config>
```

**Step 8:** Synchronize internet time server by following these steps:

1. Right click the clock in the lower right-hand corner (Windows System Tray)
2. Select "Adjust date/time" and the Settings menu will open
3. Click "Add clocks for different time zones"
4. Open the "Internet Time" tab
5. Click "Change settings"
6. Click "Update Now"
7. Click "OK" to accept settings. The system will automatically synchronize on a regular basis.

**Note:** Make sure the system is connected to the internet before attempting internet time server synchronization.



# Chapter 3

---

## Camera Facial Recognition Setup

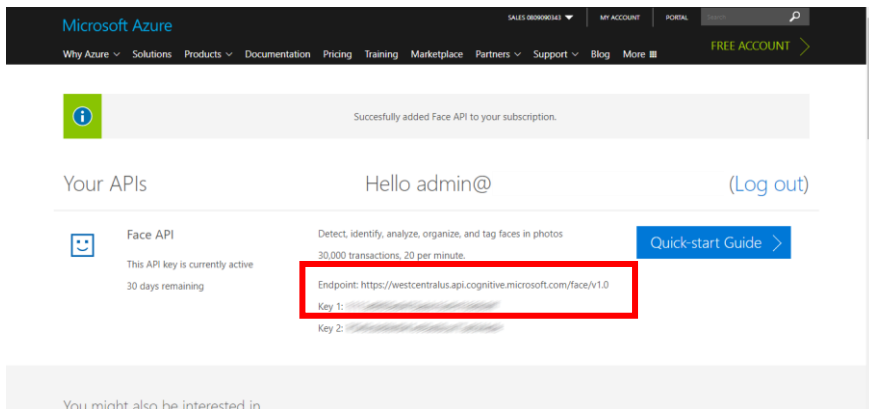
## 3.1 Installation

**Pre-step:** Please follow this link

<https://azure.microsoft.com/en-us/try/cognitive-services/>, then choose “Get API Key” and click on “Next” to receive the API Key.

When you finish the sign-in process, the image below will show on your screen. Copy Key 1 to and Endpoint link as seen in the image below.

**Note** Free Facial recognition service is limited to a maximum of 30,000 transactions, 20 per minute.



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Successfully added Face API to your subscription.

Your APIs Hello admin@ (Log out)

Face API

Detect, identify, analyze, organize, and tag faces in photos

This API key is currently active  
30 days remaining

30,000 transactions, 20 per minute.

Endpoint: <https://westcentralus.api.cognitive.microsoft.com/face/v1.0>

Key 1:   
Key 2:

Quick-start Guide

You might also be interested in

Please follow the steps below to set up the camera API in order to enable facial recognition.

**Step 1:** Go to the VendingCamera directory and open LiveCameraSample.exe. and then configure LiveCameraSample

**Step 2:** Start "LiveCameraSample"

**Step 3:** Show settings

**Step 4:** Paste Key 1 in Face API Key field and Endpoint link in FaceEndpoint field.

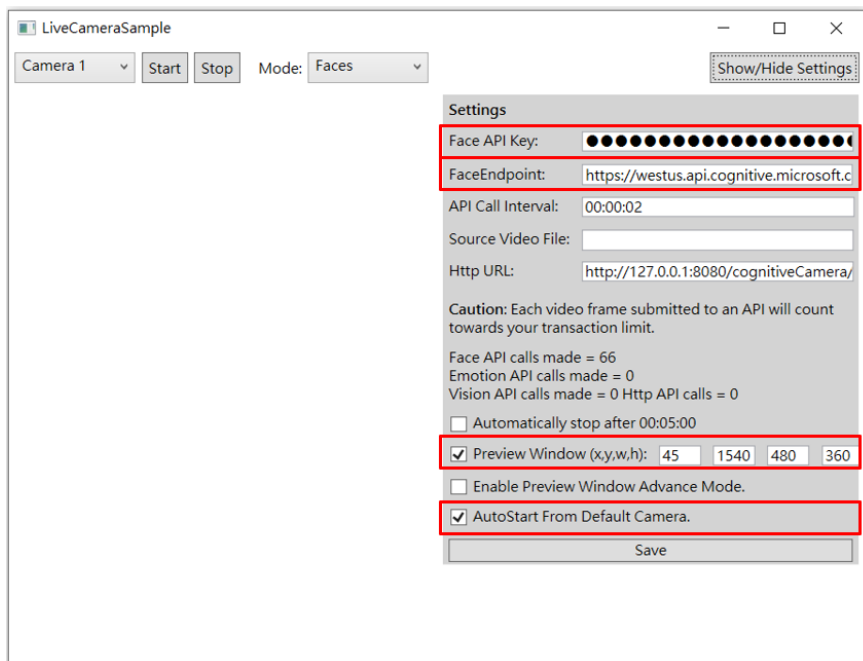
**Step 5:** Enable "Preview Window"

**Step 6:** Set (x,y,w,h) values for preview window.

**Step 7:** Enable "AutoStart From Default Camera"

**Step 8:** Press "Save" to save the settings.

**Step 9:** Restart Face API program before running VendingDemo.exe



After changing the settings, please go to the VendingDemo kit directory and double-click VendDemo.exe. This file loads the sample vending application.

\* For transaction logs with facial recognition, please access to link to download `C:\Users\<TODO_ADD_WINDOWS_USER_NAME_HERE>\AppData\Local\AAEON\AAEON VendingDemoKit\API\Bin\Windows\Face_info.txt`

**Note:**

1. Please make sure the Internet cable is connected before running facial recognition
2. A face must be detected within the green column, and the camera API will count for 2 seconds to make sure the USB interface camera is detecting properly as per the image below.



After the camera has detected a face, the Vending Demo API will make a recommendation based on detection result.





# Chapter 4

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Power BI Pro Setup

## 4.1 Power BI Pro Setup Instructions

If you purchase the Azure version of the Intelligent Vending Development Kit, you will also need to follow the steps below during the setup process.

**Step 1:** Click on the following link: <https://powerbi.microsoft.com/en-us/get-started>

**Step 2** – Click on the TRY FREE button as shown in the picture below.

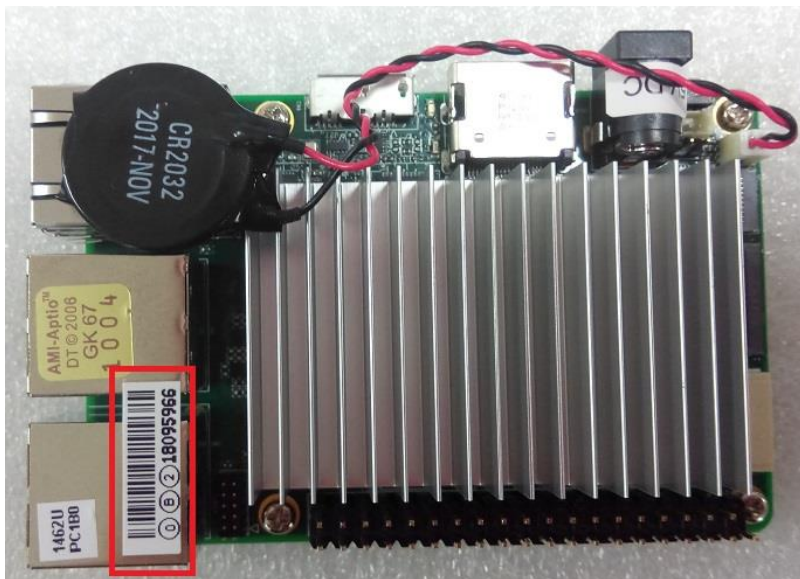
**POWER BI**

### Cloud collaboration and sharing

Use Power BI Pro to share and distribute reports with others, without any complicated setup. Get started now with a free 60-day trial of Power BI Pro.

TRY FREE >

**Step 3** – After completing the process, please contact your AAeon sales representative with your Power BI account and your AAeon computing board serial number (shown below in the red box) for further assistance.



**Note:** Avoid using a corporate email address to ensure that you can apply for the application successfully.

