NuMaker NuWicam

User Guide

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Introduction

With the rapid growth of wireless network technologies and bandwidth, the Wi-Fi audio and video streaming based products, such as Wi-Fi IP camera, video baby monitor, are getting popular. Nuvoton N329 series integrated the necessary functions Wi-Fi AV streaming application such as CMOS sensor interface, hardware video codec. These functions make the N329 series a cost effective solution for Wi-Fi A/V Streaming application. Moreover, the N329 stacks DRAM into a single package which can help the PCBA pass EMI and EMC testing easily.

NuMaker NuWicam[1] is an open-source Wi-Fi camera module. It is based on Nuvoton's N32905R3DN video MPU. N32905R3DN provides a powerful JPEG codec for encoding. NuWicam firmware provides audio and video streams over RTP. The format of video stream is Motion-JPEG with VGA resolution by default. The format of audio stream is G.711-alaw. It also provides virtual COM software for UART connective. For example, mobile APP can read LM75 temperature sensor data from Nudurino board (or Nu-mbed board) or light on LEDs on Nudurino board over Modbus RTU protocol. User also can modify configurations over HTTP. We wish the NuWicam can help you get A/V streams and do some data sampling between mobile devices and some low-end MCUs easily.

In this document, we will descript chapters as below:

- Hareware connective
- Firmware programming using Autowriter
- Mobile APP installation.
- NUC123 VCOM driver installation on window platform.

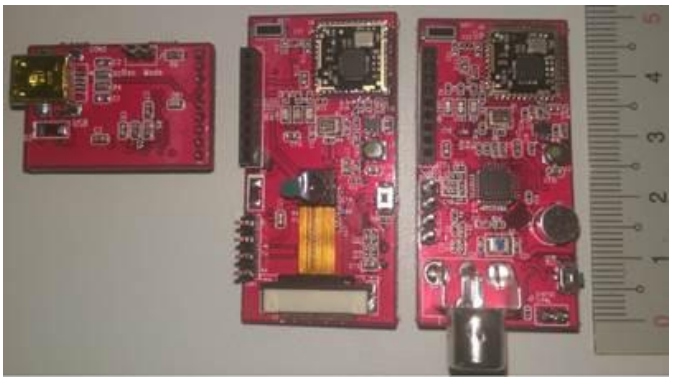

Figure 1 – NuWicam debug and main boards [2]

[1] NuWicam is short for NuMaker NuWicam.

[2] The figure is shown NuWicam-debug, NuWicam-GC0308 and NuWicam-GM7150 main board.

Hardware connective

Below figures are shown every interface on NuWicam debug and main board.

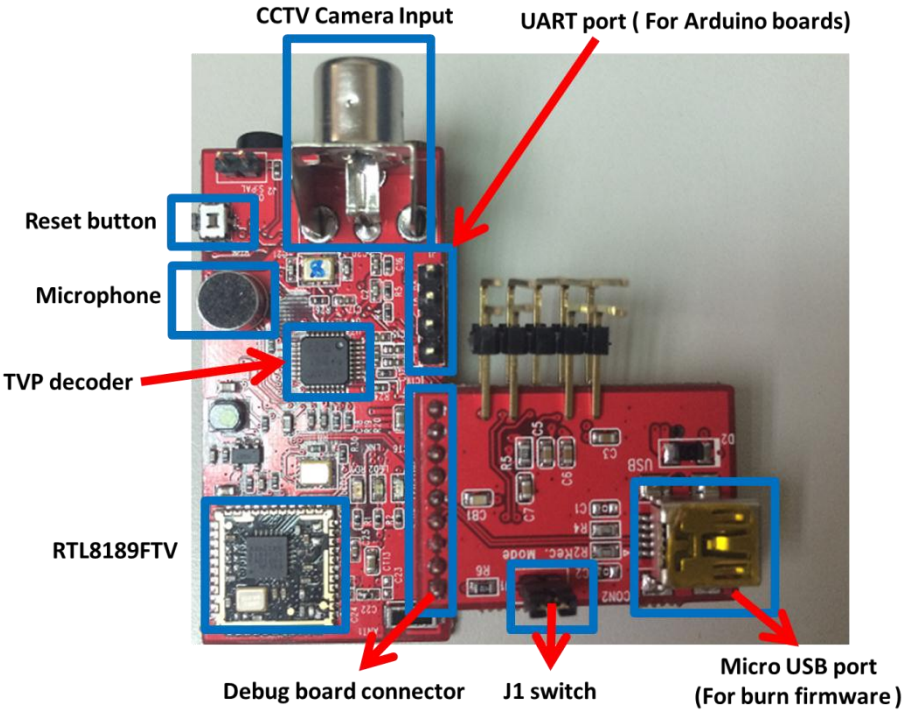

Figure 2 – Interfaces of NuWicam debug and main boards (Bottom view)

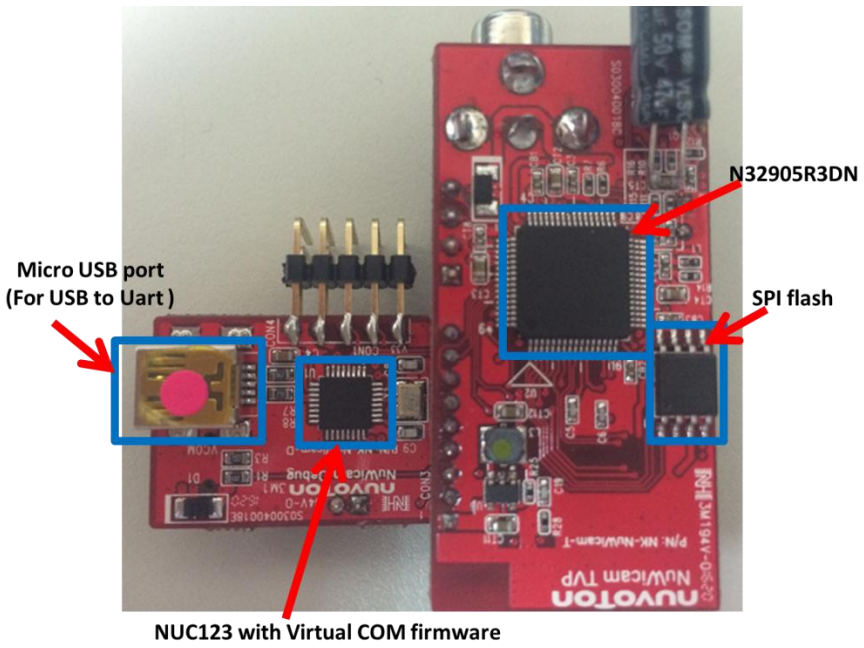

Figure 3 – Interfaces of NuWicam debug and main boards (Top view)

Firmware programming

In this chapter, we will step by step to guide you program NuWicam board firmware using AutoWriter. We released three versions firmware for NuWicam-GC0308, NuWicam-GM7150 and NuWicam-TVP5150 boards as shown figure. For expert, you can refer AutoWriter User Guide.pdf file in autowriter_xxxxxxx folder for more usage.

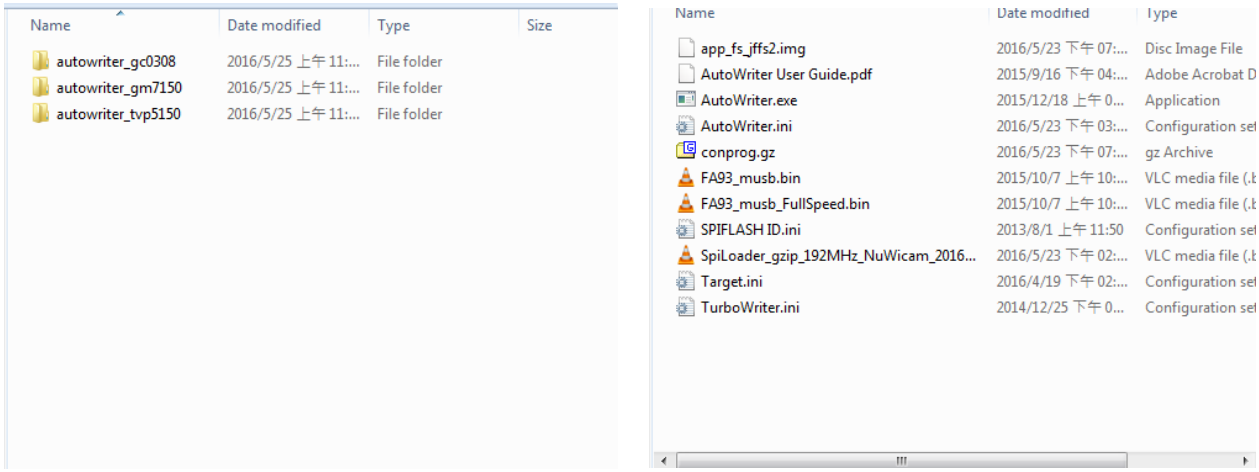

Figure 4 – Firmwares for verious NuWicam boards

After running AutoWriter.exe execution, the UI of tool is shown as follows. The '**Current Target' is SPI** by default. Please keep the setting and following below steps:

(1) To **short J1 switch with a jumper on NuWicam debug board** to **enter 'Recovery Mode'**.
(2) To mount NuWicam debug board to NuWicam main board's **CON2** connector.
(3) To plug in a USB line into micro USB port of NuWicam debug board.
Notice: **The micro USB port is for firmware programming, not VCOM USB port**.

(4) To **plug in USB line into PC**.
(5) To **execute AutoWriter.exe** to burn firmware automatically.
(6) After finishing firmware programming, the UI will show '**Burn Success .....** '.
(7) To Un-plug USB Line from PC.
(8) To leave 'Recovery Mode' on NuWicam debug board by **removing J1 switch jumper**.
(9) To **plug in USB line into a power adapter** is with USB port.
(10) After that, you will **see a heartbeat LED is lighted on RDY led of NuWicam main board**.
(11) Enjoy.

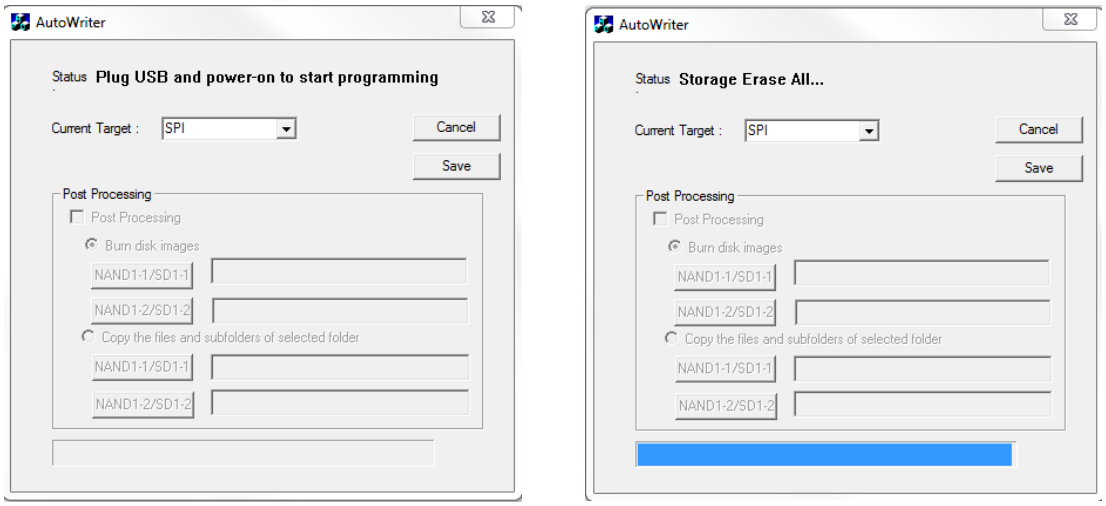

Figure 5 – AutoWriter progressing

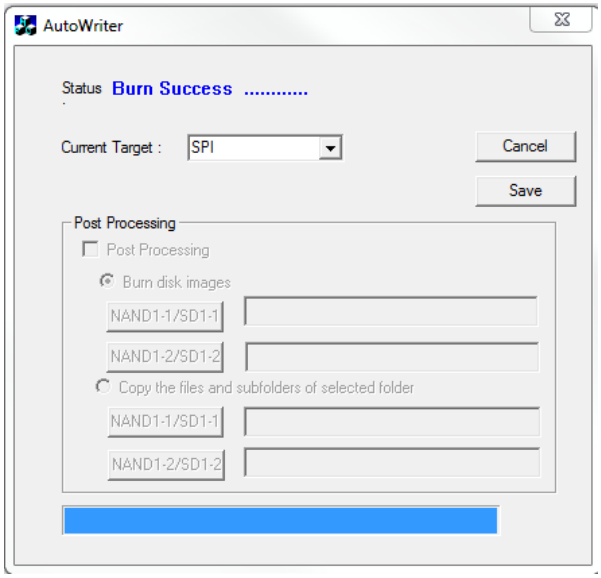

Figure 6 – Programming done

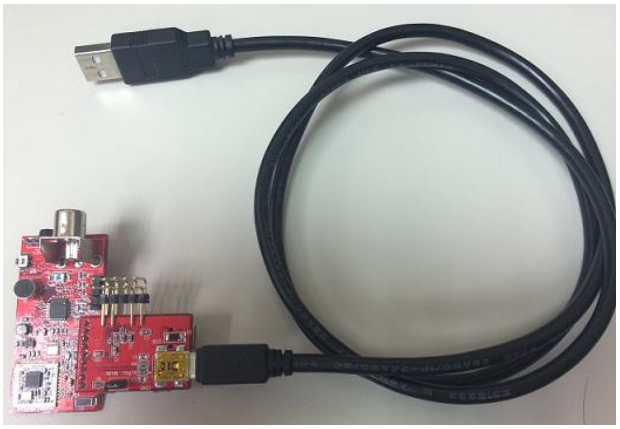

Figure 7 – N32905R3DN Boot setting in recovery mode, with USB Line

Mobile APP installation

NuWicam player is an audio and video stream player is designed to connect NuWicam boards. You can download APP on IOS APP store. Please visit below URL for more details.

URL: https://itunes.apple.com/cn/app/nuwicam-player/id1114711093?mt=8

NuWicam player gives you:

- **Real-time audio and video streaming** - NuWicam player provides a movie window. It will get A/V stream from NuWicam automatically if your IOS device is associated with NuWicam board successfully.
- **Flexible streaming adjustment and Wi-Fi network configuration** - you can adjust view resolution and Wi-Fi configuration.
- **Supervisory control and data acquisition** - You can get temperature sensor data and light on LEDs.

At first, you need associate to NuWicam's SSID, its SSID string is shown '**NuWicam** XX-XX-XX-XX-XX-XX' by default. Its password is **'12345678'**. Once associting with NuWicam board successfully, your IOS device will get an IP address by DHCP protocol.

After associating with NuWicam device, you can execute NuWicam player APP. In Live page, you can play real-time A/V streaming in fully screen and get LED status and temperature sensor data from another NuEdu board.

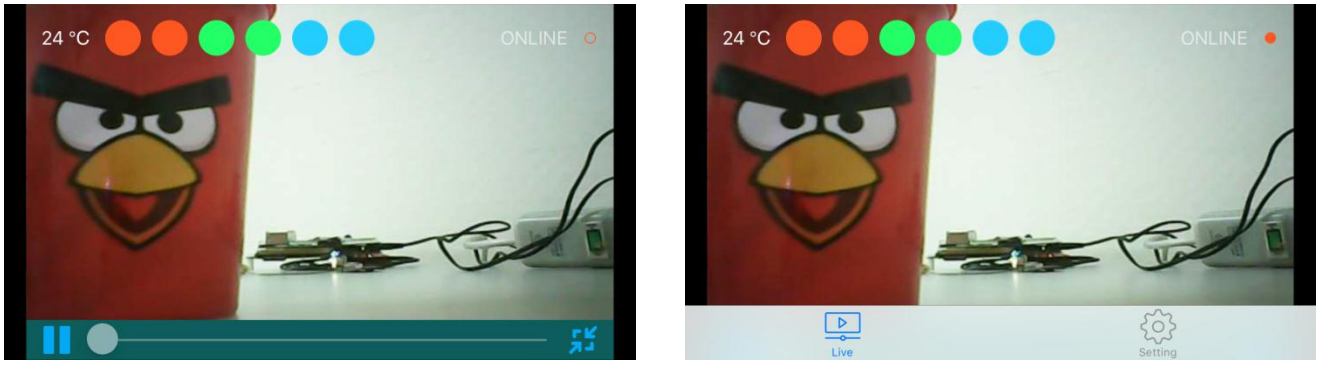

Figure 8 –NuWicam player screenshots

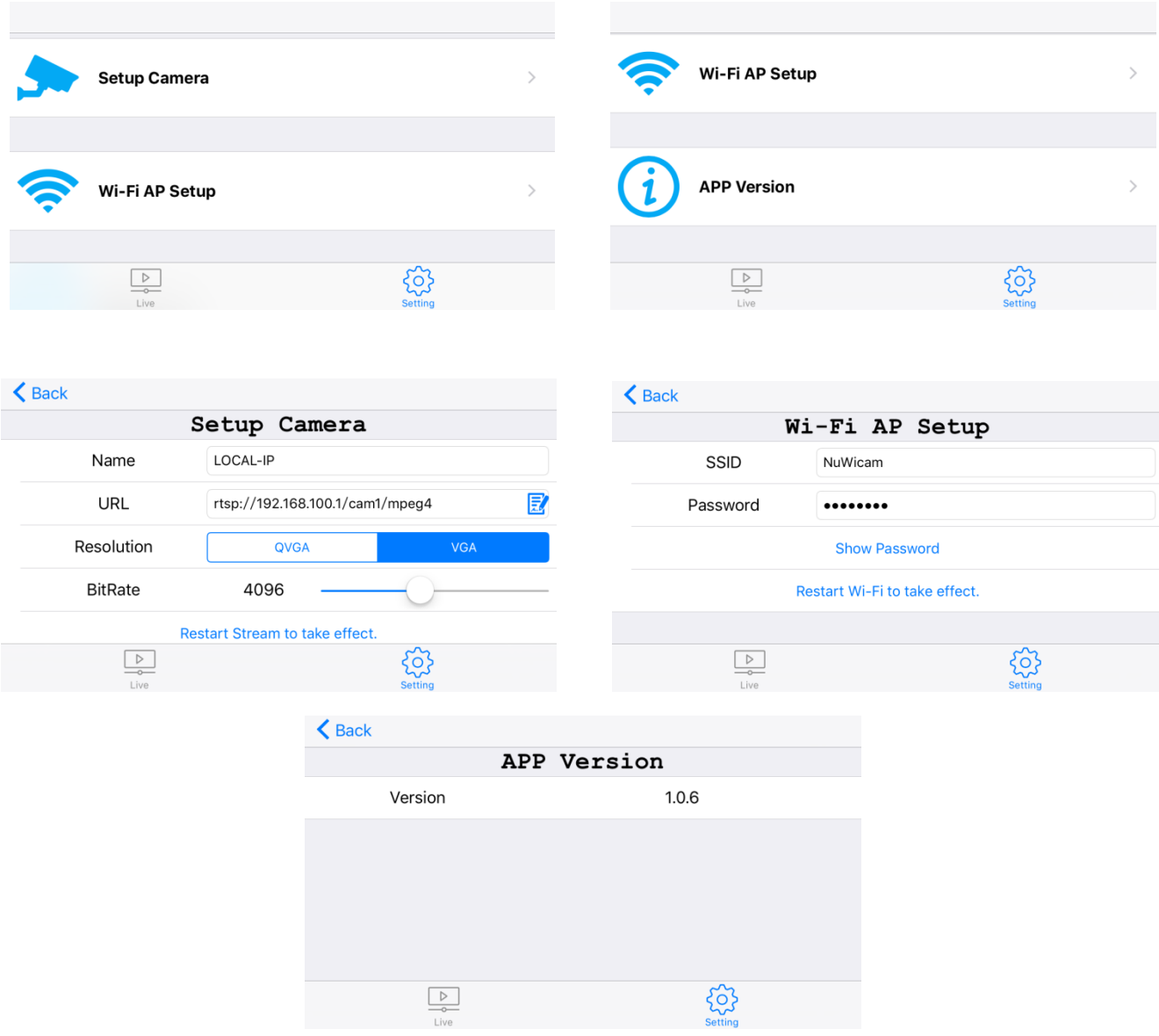

Figure 9 –NuWicam player functional pages

In Setting page, it has 2 items - Setup Camera and Wi-Fi AP Setup. In Setup Camera item, you can specify this camera name, MRL, Resolution and streaming bitrate. After modifying these stream parameters, please remember to click ‘Restart Stream’ button to restart NuWicam stream subsystem.

In Wi-Fi AP Setup item, you can specify prefix name of SSID, Wi-Fi password. After you modifying these stream parameters, please remember to click ‘Restart Wi-Fi’ button to restart NuWicam Wi-Fi networking subsystem and re-associting with NuWicam’s SSID you preferred.

In APP version item, it shows NuWicam APP version for your information.

NUC123 VCOM driver installation

NuWicam tool board provides a NUC123 VCOM function. In this chapter, we will guide VCOM driver installation step by step. After connecting with NUC123 VCOM port, your device management will show it is an unknown device.

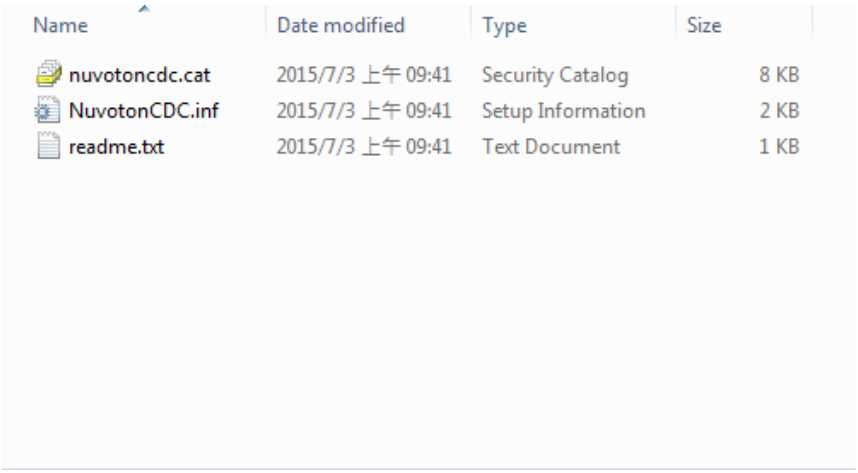

Figure 10 – NUC123 VCOM driver for window platform

On this unknown device item, click right button of mouse to install the driver.

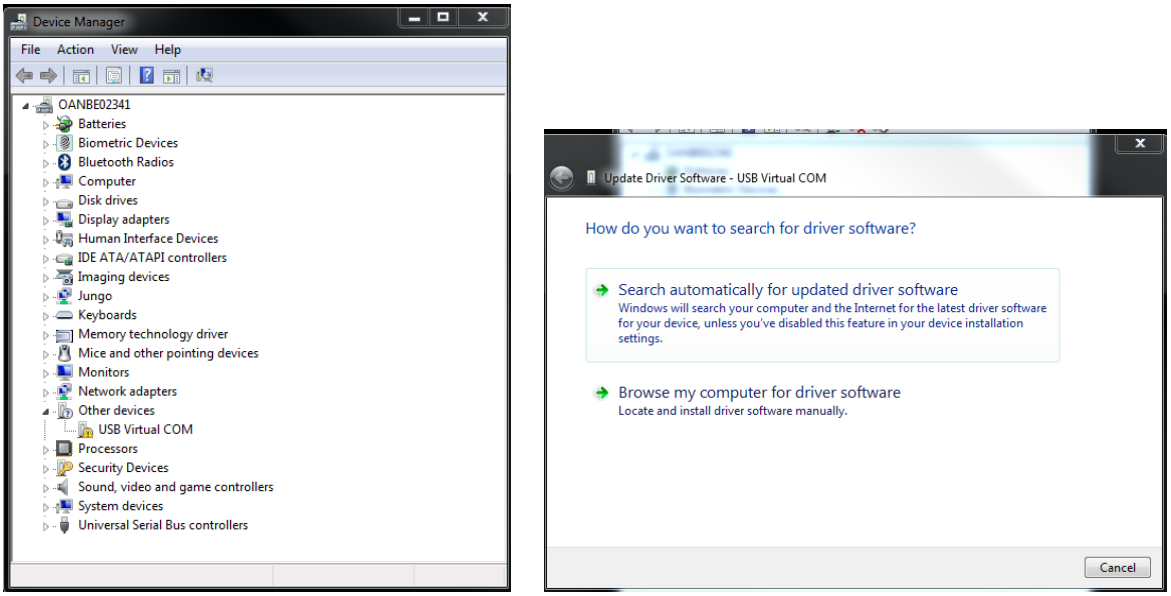

Figure 11 – Unknown device and installing driver

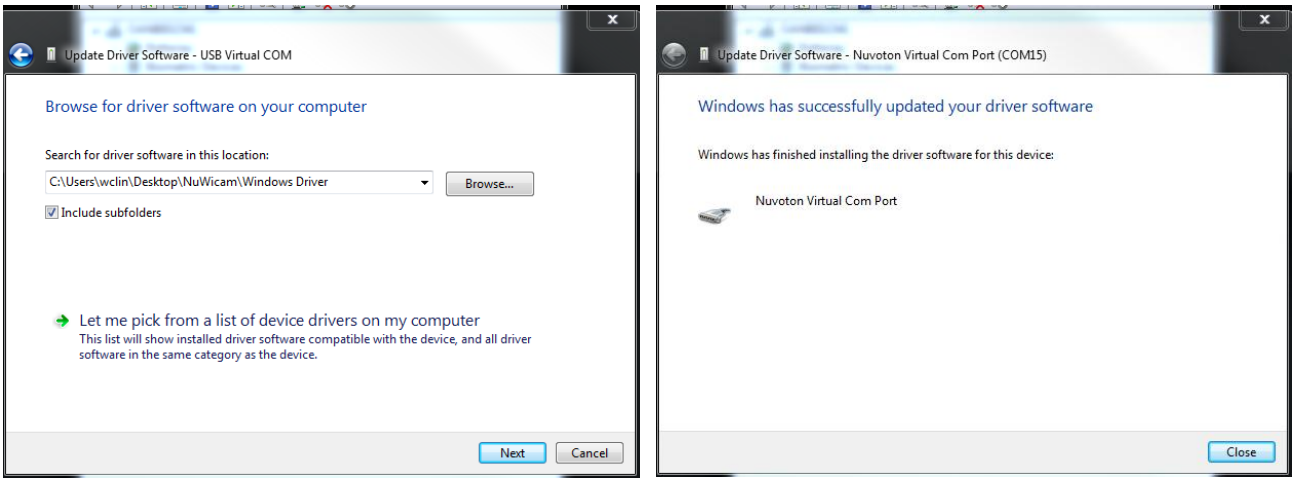

Figure 12 – Select driver path and installed driver

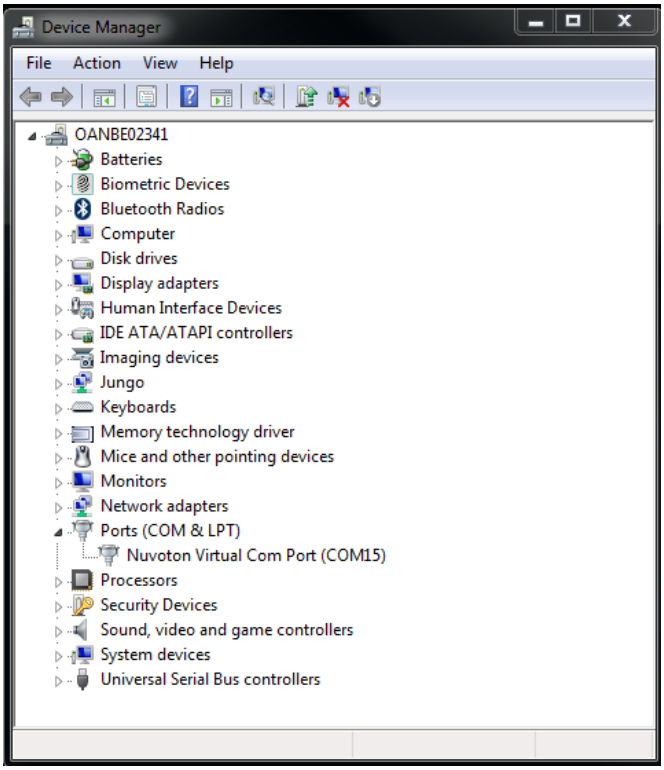

Figure 13 – NUC123 VCOM ready

History

Date	Description
2016/05/31	a) First version.
2016/06/22	a) Update APP screenshot images. b) Update board photos. c) Update 'Mobile APP installation' chapter
2016/06/29	a) Append 'NuMaker' as prefix name.

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