



*Drive your heart,  
Power your life*

**VA8801**

**DUT (Device Under Test)**

**user guide v1.0**



# Outline

1. Create DUT Firmware
  - a. 3 targets available: Face Detection, Gesture, A+V
  - b. Vscode IDE build instructions
2. Flash download
  - a. Burn in FW using DFU
  - b. VA8801 HW Settings
  - c. Check UART log
3. DUT tool settings based on different targets
  - a. DUT settings for Face Detection, Gesture and A+V
4. Validate Face Detection Scenario
  - a. Instructions for Face Detection inference results using DUT and Inference python tool



# Create DUT Firmware

- 3 targets are available:
  - Face Detection, Gesture, A+V
- Build using Vscode IDE
- For Vscode build instructions, please refer to:
  - `SDK_ROOT_PATH\VA8801_BSPSDK_V3.000.00\Doc\Vscode\VSCode_Toolchain_Build System_user guide_v2.0.pdf`



# Flash download -1

## Burn in FW using DFU

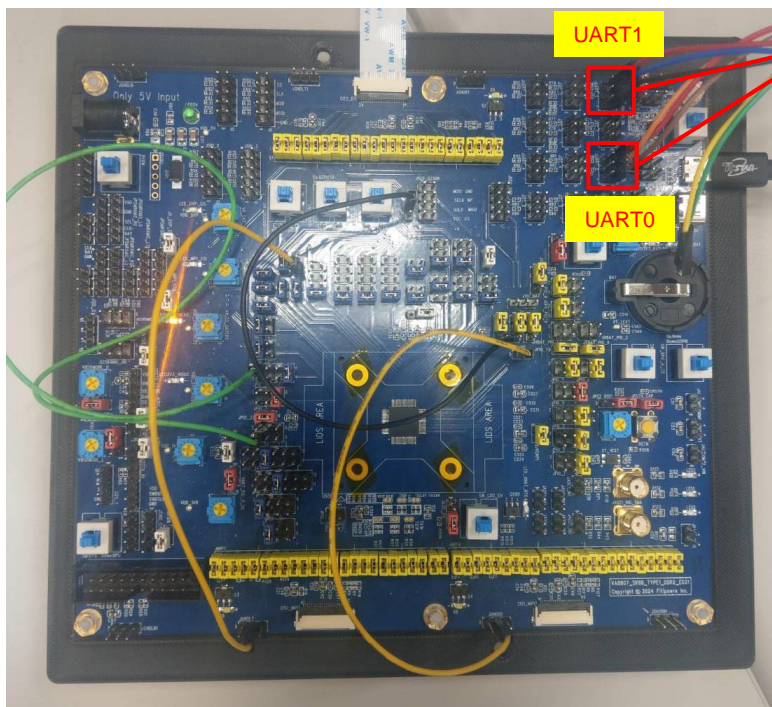
- To burn in VA8801 FW, please refer to:
  - SDK\_ROOT\_PATH\VA8801\_BSPSDK\_V3.000.000\DFU  
Tool\FITI\_VA8801\_DFU\_ToolKit\_v1.0.0.pdf



# Flash download -2

## VA8801 HW Settings

FT232\_RX connect to UART\_TX  
FT232\_TX connect to UART\_RX  
FT232\_GND connect to UART\_GND



Pin from top  
to bottom:  
UART\_RX  
UART\_TX  
UART\_GND

FT232



FT232 connect to PC/NB



# Flash download -3

## Check UART log

After burn in FW, check the camera detection results via both UART0 and UART1

```
COM5 - PuTTY
[prvVdoIpcRxTask][1] 101, 81, 184, 164, 89, 0
[prvVdoIpcRxTask][1] 91, 86, 161, 156, 89, 0
[prvVdoIpcRxTask][1] 128, 48, 211, 143, 89, 0
[prvVdoIpcRxTask][1] 152, 54, 223, 134, 91, 0
[prvVdoIpcRxTask][1] 131, 63, 201, 143, 91, 0
[prvVdoIpcRxTask][1] 148, 79, 229, 160, 91, 0
[prvVdoIpcRxTask][1] 150, 46, 269, 152, 84, 0
[prvVdoIpcRxTask][1] 180, 56, 261, 137, 85, 0
[prvVdoIpcRxTask][1] 175, 52, 256, 149, 89, 0
[prvVdoIpcRxTask][1] 166, 52, 260, 147, 87, 0
[prvVdoIpcRxTask][1] 164, 49, 259, 144, 87, 0
[prvVdoIpcRxTask][1] 170, 53, 256, 140, 87, 0
[prvVdoIpcRxTask][1] 164, 49, 259, 144, 89, 0
[prvVdoIpcRxTask][1] 170, 55, 253, 138, 90, 0
[prvVdoIpcRxTask][1] 168, 58, 251, 141, 90, 0
[prvVdoIpcRxTask][1] 168, 49, 251, 144, 90, 0
[prvVdoIpcRxTask][1] 168, 49, 251, 144, 90, 0
[prvVdoIpcRxTask][1] 170, 60, 251, 141, 91, 0
[prvVdoIpcRxTask][1] 170, 55, 253, 138, 90, 0
[prvVdoIpcRxTask][1] 171, 59, 252, 140, 91, 0
[prvVdoIpcRxTask][1] 171, 60, 252, 141, 91, 0
[prvVdoIpcRxTask][1] 168, 55, 251, 138, 90, 0
[prvVdoIpcRxTask][1] 174, 60, 244, 141, 91, 0
[prvVdoIpcRxTask][1] 168, 55, 251, 138, 90, 0
```

UART0 System log

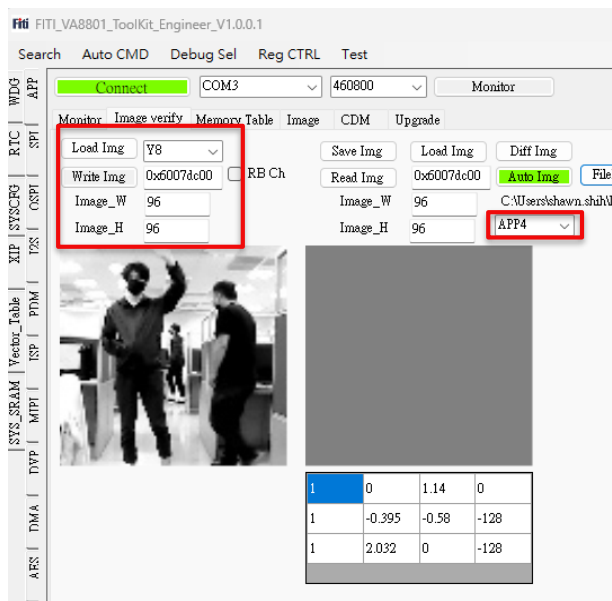
```
COM5 - PuTTY
[post_process] 0x80500008 - 139 - 163 - 157 - 177 - 61 - 0
[post_process] 0x80500028 - 140 - 162 - 155 - 177 - 61 - 0
[post_process] 0x80500048 - 140 - 163 - 154 - 177 - 69 - 0
[post_process] 0x80500068 - 139 - 162 - 154 - 177 - 69 - 0
[post_process] 0x80500088 - 138 - 161 - 155 - 178 - 61 - 0
result[0]: x1: 140, y1: 163, x2: 154, y2: 177, confidence: 69, class: 0
[prvSmileTask] IPC done, input addr: 0x60035000
[prvSmileTask] - 46
[post_process] 0x80500008 - 138 - 159 - 155 - 177 - 61 - 0
[post_process] 0x80500028 - 137 - 159 - 156 - 178 - 61 - 0
[post_process] 0x80500048 - 139 - 159 - 157 - 177 - 69 - 0
[post_process] 0x80500068 - 140 - 161 - 155 - 176 - 69 - 0
[post_process] 0x80500088 - 139 - 160 - 157 - 177 - 66 - 0
[post_process] 0x805000a8 - 140 - 161 - 154 - 175 - 66 - 0
[post_process] 0x805000c8 - 139 - 161 - 154 - 176 - 61 - 0
[post_process] 0x805000e8 - 234 - 173 - 256 - 194 - 73 - 0
[post_process] 0x80500108 - 235 - 174 - 255 - 193 - 73 - 0
[post_process] 0x80500128 - 235 - 173 - 255 - 194 - 69 - 0
[post_process] 0x80500148 - 235 - 173 - 257 - 194 - 79 - 0
[post_process] 0x80500168 - 237 - 174 - 256 - 193 - 81 - 0
[post_process] 0x80500188 - 236 - 173 - 256 - 194 - 75 - 0
[post_process] 0x805001a8 - 235 - 175 - 257 - 193 - 62 - 0
result[0]: x1: 237, y1: 174, x2: 256, y2: 193, confidence: 81, class: 0
result[1]: x1: 139, y1: 159, x2: 157, y2: 177, confidence: 69, class: 0
```

UART1 NPU log

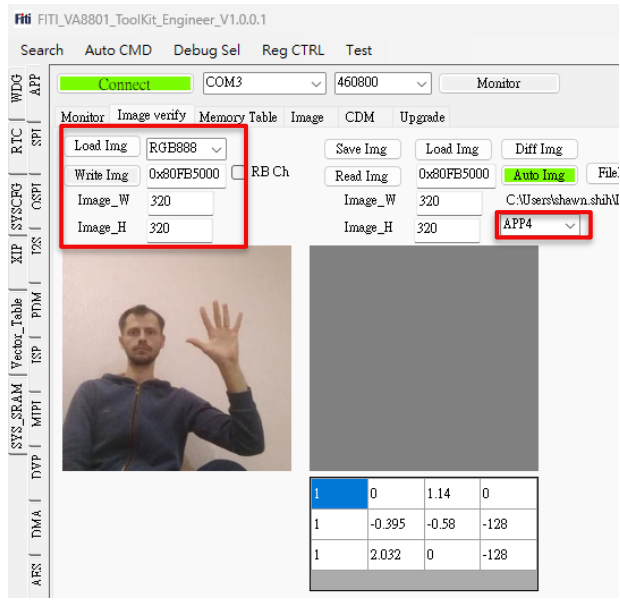


# DUT tool settings based on different targets

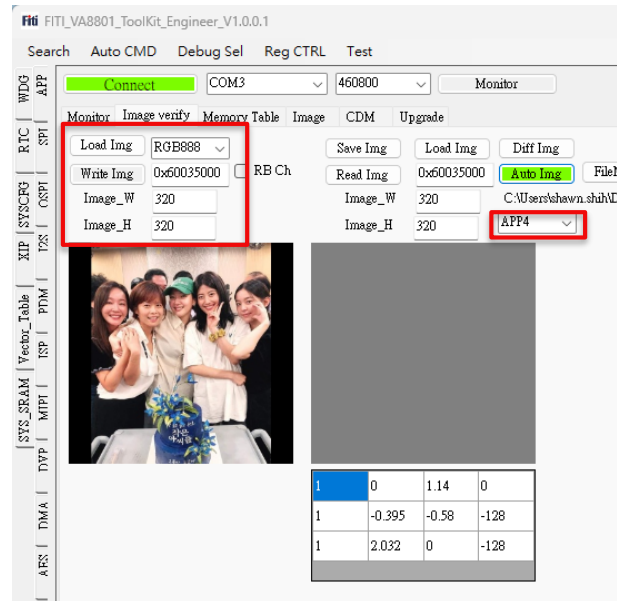
- For DUT, every target has its own settings, note that **96\*96\*1** image size is for **A+V**, and **320\*320\*3** is for **Gesture & Face Detection**
- The instructions in p.8~p.11 are based on target Face Detection, for other targets, please change DUT tool settings as follow.



A+V



Gesture



Face Detection





# Validate Face Detection Scenario

Fitipower VA8801\_ToolKit\_Engineer\_V1.0.0.1

Search Auto CMD Debug Sel Reg CTRL Test

Connect 460800 Monitor

Monitor Image verify Memory Table Image CDM Upgrade

Load Img RGB888 Save Img Load Img Diff Img

Write Img 0x50035000 RB Ch Read Img 0x50035000 Auto Img File Name

Image\_W 320 Image\_W 320 File Name APP4

Image\_H 320 Image\_H 320

Settings for different targets please refer to p.7

UART0 Step\_1

Note: A+V requires additional command: audio stop

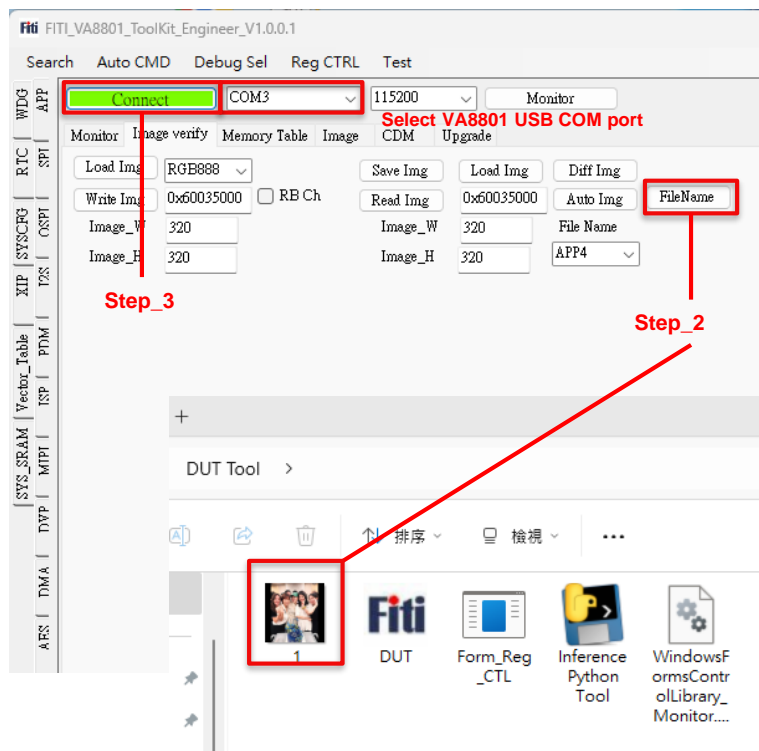
```
[prvVdoIpcRxTask] [1] 125, 118, 171, 172, 85, 0
[prvVdoIpcRxTask] [1] 125, 118, 171, 172, 85, 0
[prvVdoIpcRxTask] [1] 125, 118, 171, 172, 85, 0
[prvVdoIpcRxTask] [1] 125, 118, 171, 172, 85, 0
[prvVdoIpcRxTask] [1] 125, 123, 173, 170, 84, 0
[prvVdoIpcRxTask] [1] 115, 119, 175, 179, 83, 0
[prvVdoIpcRxTask] [1] 116, 120, 169, 180, 79, 0
[prvVdoIpcRxTask] [1] 110, 118, 165, 180, 85, 0
[prvVdoIpcRxTask] [1] 123, 128, 163, 180, 66, 0
[prvVdoIpcRxTask] [1] 110, 118, 165, 180, 73, 0
[prvVdoIpcRxTask] [1] 116, 124, 171, 177, 83, 0
[prvVdoIpcRxTask] [1] 109, 120, 164, 181, 66, 0
[prvVdoIpcRxTask] [1] 111, 125, 166, 179, 81, 0
[prvVdoIpcRxTask] [1] 123, 125, 165, 168, 89, 0
[prvVdoIpcRxTask] [1] 132, 122, 169, 171, 89, 0
[prvVdoIpcRxTask] [1] 140, 127, 177, 169, 91, 0
[prvVdoIpcRxTask] [1] 124, 248, 216, 317, 69, 0
[prvVdoIpcRxTask] [1] 95, 41, 160, 124, 83, 0
[prvVdoIpcRxTask] [1] 116, 69, 226, 179, 66, 0
video stop
[cmd] camera stop.
[Press ENTER to execute the previous command again]
>
```

- **Step1.** Open UART0 and type command: “video stop” to close camera, then open DUT tool and adjust settings.
- **Step2.** Put an Image\_W\*Image\_H image in the tool’s root directory. Click “FileName” button and specify that image.
- **Step3.** Select VA8801 USB COM port and Click “Connect” button to establish USB connection with VA8801.
- **Step4.** Click “Auto Img” button, the image located at filepath specified in Step2 will be send to VA8801, and the image itself will be deleted immediately. Check the detection result in UART0, and then **be sure to disconnect UART0 from your serial tool.**
- **Step5.** Run Inference python tool, this tool will copy the images from source directory to tool’s root directory, rename it to the image specified in Step2, then the image will be send to VA8801 and be deleted by DUT tool automatically as in Step4. The inference result will be parsed from UART0 and can be found in folder: “inference result” and “inference\_result.txt”.





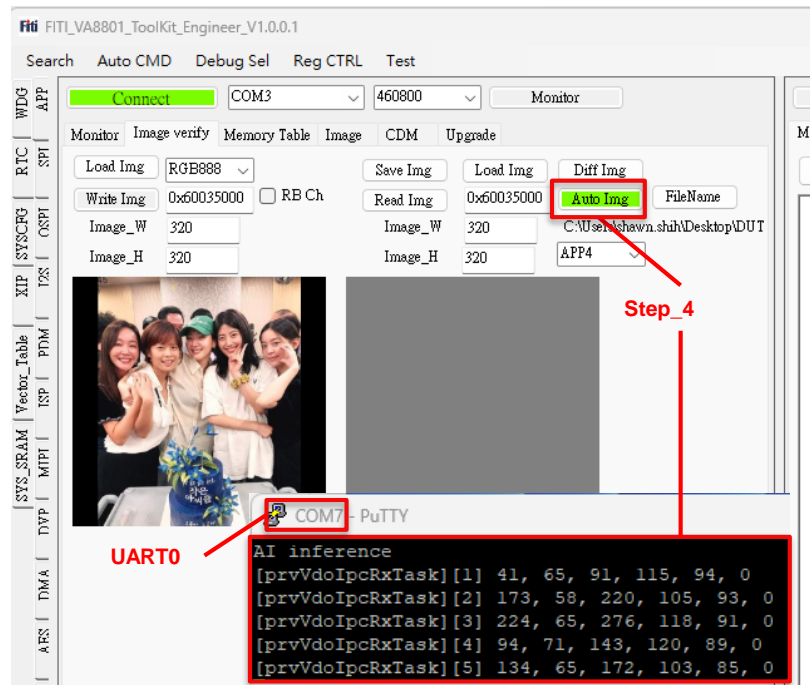
# Validate Face Detection Scenario



- **Step1.** Open UART0 and type command: “video stop” to close camera, then open DUT tool and adjust settings.
- **Step2.** Put an Image\_W\*Image\_H image in the tool’s root directory. Click “FileName” button and specify that image.
- **Step3.** Select VA8801 USB COM port and Click “Connect” button to establish USB connection with VA8801.
- **Step4.** Click “Auto Img” button, the image located at filepath specified in Step2 will be send to VA8801, and the image itself will be deleted immediately. Check the detection result in UART0, and then **be sure to disconnect UART0 from your serial tool.**
- **Step5.** Run Inference python tool, this tool will copy the images from source directory to tool’s root directory, rename it to the image specified in Step2, then the image will be send to VA8801 and be deleted by DUT tool automatically as in Step4. The inference result will be parsed from UART0 and can be found in folder: “inference result” and “inference\_result.txt”.



# Validate Face Detection Scenario



UART0

Step 4

Inference result will be listed under "AI inference" in the form: x1, y1, x2, y2, confidence, class

\*disconnect uart0 serial from your serial tool after checking the results

- **Step1.** Open UART0 and type command: "video stop" to close camera, then open DUT tool and adjust settings.
- **Step2.** Put an Image\_W\*Image\_H image in the tool's root directory. Click "FileName" button and specify that image.
- **Step3.** Select VA8801 USB COM port and Click "Connect" button to establish USB connection with VA8801.
- **Step4.** Click "Auto Img" button, the image located at filepath specified in Step2 will be send to VA8801, and the image itself will be deleted immediately. Check the detection result in UART0, and then **be sure to disconnect UART0 from your serial tool.**
- **Step5.** Run Inference python tool, this tool will copy the images from source directory to tool's root directory, rename it to the image specified in Step2, then the image will be send to VA8801 and be deleted by DUT tool automatically as in Step4. The inference result will be parsed from UART0 and can be found in folder: "inference result" and "inference\_result.txt".



# Validate Face Detection Scenario

## Step\_5

1. Open Python tool

2. Enter uart0 COM port

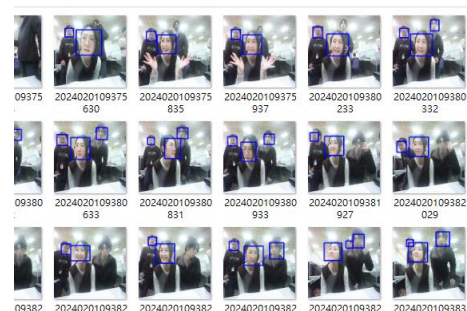
```
Input uart0 port number: com7
Connecting to com7 ...
com7 connected!
Input test image source directory: D:\test_img_a
Enter filename of the image passed to VA8801 by DUT tool: 1.jpg
Start removing files in directory ".\\inference result"...
Finish removing files in directory ".\\inference result"...
Inference Result: D:-test_img_a-2024020115040322.bmp - [(116, 122, 182, 205)]
Inference Result: D:-test_img_a-2024020115040611.bmp - [(120, 121, 181, 208)]
Inference Result: D:-test_img_a-20240418135932526.bmp - No object detected!
```

3. Enter path of your test image directory

4. Enter the image name specified in Step2

> DUT Tool > inference result (image)

inference\_result.txt  
(x1, y1, x2, y2)



```
inference_result.txt
1 Office200-multi-20240201093753118.bmp-[(53, 43, 86, 116)]
2 Office200-multi-20240201093753201.bmp-[(57, 43, 86, 116)]
3 Office200-multi-20240201093753284.bmp-[(64, 72, 11, 116)]
4 Office200-multi-20240201093753368.bmp-[(64, 66, 11, 116)]
5 Office200-multi-20240201093753450.bmp-[(63, 73, 11, 116)]
6 Office200-multi-20240201093753535.bmp-[(64, 70, 11, 116)]
7 Office200-multi-20240201093753618.bmp-[(60, 70, 11, 116)]
8 Office200-multi-20240201093754286.bmp-[(65, 77, 11, 116)]
9 Office200-multi-20240201093754370.bmp-[(23, 39, 63, 116)]
10 Office200-multi-20240201093754454.bmp-[(19, 39, 66, 116)]
11 Office200-multi-20240201093754540.bmp-[(16, 39, 57, 116)]
12 Office200-multi-20240201093754621.bmp-[(14, 39, 54, 116)]
13 Office200-multi-20240201093754704.bmp-[(81, 78, 14, 116)]
14 Office200-multi-20240201093754786.bmp-[(85, 78, 15, 116)]
15 Office200-multi-20240201093754872.bmp-[(92, 82, 15, 116)]
16 Office200-multi-20240201093754954.bmp-[(98, 87, 16, 116)]
17 Office200-multi-20240201093755204.bmp-[(120, 108, 108, 116)]
18 Office200-multi-20240201093755287.bmp-[(118, 103, 108, 116)]
```

\*If no object detected, inference\_result.txt will show [(0, 0, 0, 0)]

- **Step1.** Open UART0 and type command: “video stop” to close camera, then open DUT tool and adjust settings.
- **Step2.** Put an Image\_W\*Image\_H image in the tool’s root directory. Click “FileName” button and specify that image.
- **Step3.** Select VA8801 USB COM port and Click “Connect” button to establish USB connection with VA8801.
- **Step4.** Click “Auto Img” button, the image located at filepath specified in Step2 will be send to VA8801, and the image itself will be deleted immediately. Check the detection result in UART0, and then **be sure to disconnect UART0 from your serial tool.**
- **Step5.** Run Inference python tool, this tool will copy the images from source directory to tool’s root directory, rename it to the image specified in Step2, then the image will be send to VA8801 and be deleted by DUT tool automatically as in Step4. The **inference result** will be parsed from UART0 and can be found in **folder: “inference result” and “inference\_result.txt”.**



# REVISION HISTORY

Revision	Date	Author	Description
1.0	2024/05/27	Shawn Shih	New issued



# THANKS