HSBUV Board with Nuvoton NPCM7mnx RunBMC module
Quick (Standalone) Setup Guide

This Quick Setup guide describes how to set up the NPCM7mnx HSBUV Board + Nuvoton RunBMC module.

A. HSBUV + Nuvoton RunBMC module Overview

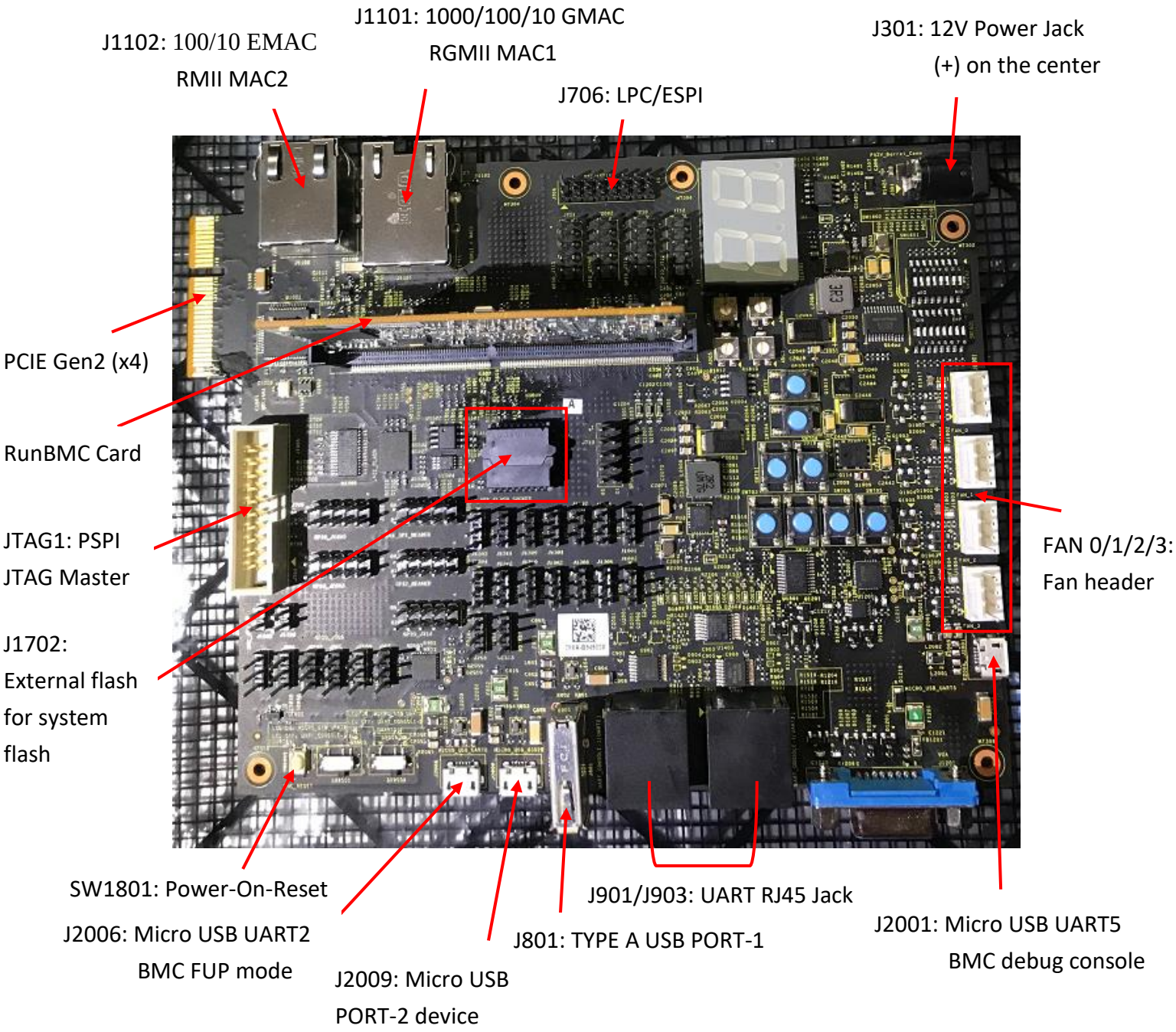


Figure 1: Connectors on the HSBUV Board

Note: Instruction refer to Figure 1.

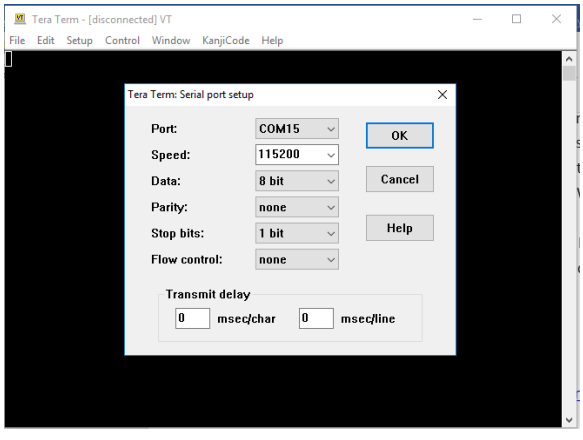
- Power-On and Reset:
  a. Connect the 12V power supply to power jack J301. The power supply should be 12V and at least 2A; the jack should be 2.5x 5.5 x9.5mm in diameter
  b. Press and release PWR-ON-RST (SW1801) push-button.

- USB-to-UART5 for BMC debug console:
  a. Download and install the USB-to-UART driver from:
  http://www.ftdichip.com/Drivers/VCP.htm
  according to the host OS.
  b. Connect a mini-USB cable between the PC host and HSBUV J2001. J2001 is Micro_USB_UART5.
  connector to the Serial Interface (SI2) of the BMC. Uboot and Linux terminal messages are sent though this port.
  c. Wait for the FTDI driver to be installed automatically. The COM port of number is assigned automatically.
  d. Verify that one green power LED (D2008) is ON.

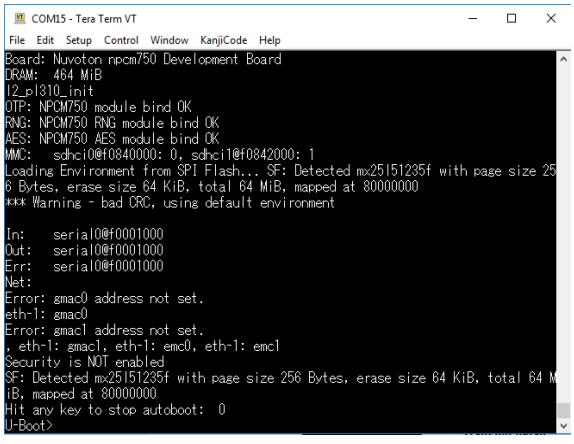
- Terminal:
  a. Open a terminal (e.g., Tera Term version 4.87) and set the correct COM port number assigned by the FTDI driver (in Step 2c).
  The COM port should be configured as follows:
  115200 Kbps, 8 bit, 1 stop-bit, no parity no flow control.
  b. Press and release the PWR-ON-RST (SW1801) push-button to issue a Power-On reset.
  c. Verify that the boot block, Uboot and Linux versions are up-to-date. Check with Nuvoton support for the most recent versions.

Figure 2: boot into boot block, Uboot

Tera Term Serial port setting:



boot into Uboot:

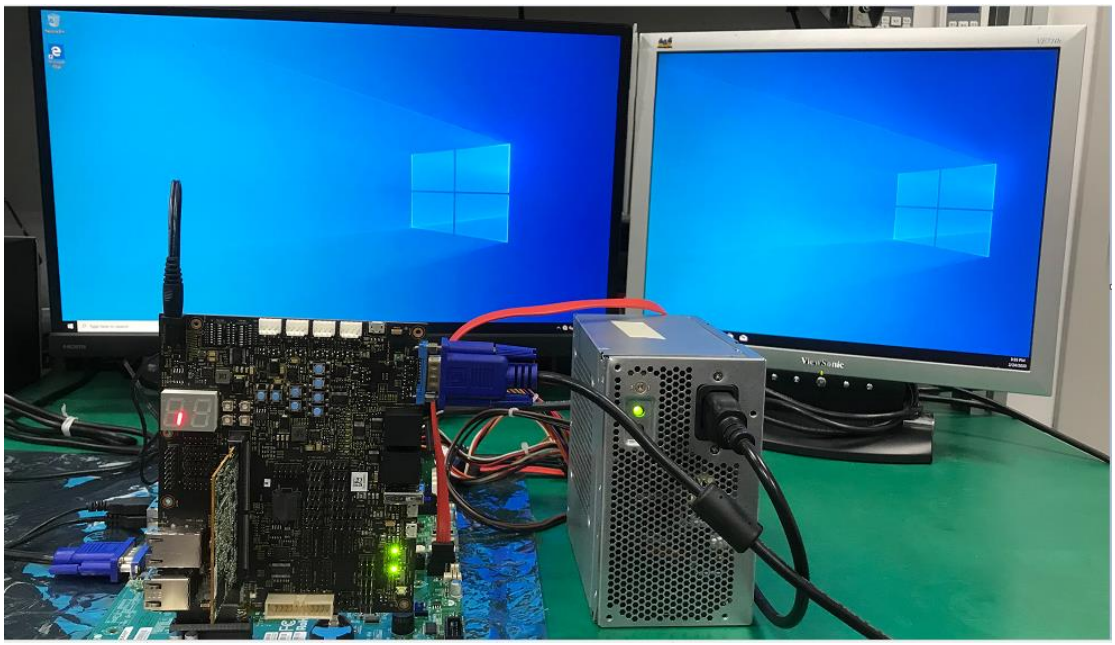


- The PCI-Express Interface which supports a PCIE Gen 2 (x4) connection (Note:). This interface shall be insert the system MB of PCIe slot for VGA display mailbox function. These signals are expected to be dedicated to PCIe functionality and should not offer a secondary function.

Note:

- Only x1 lane is been used.
- RunBMC can be used as a secondary video card since RunBMC card does not include on-board VGA BIOS and since MB does not include Matrox VGA BIOS.

Figure 3: HSBUV + RunBMC module boot into Win 10, the VGA display is ok



B. Build OpenBMC

https://github.com/Nuvoton-Israel/openbmc/tree/runbmc

➢ How to Build

- Ubuntu 18.04 as example

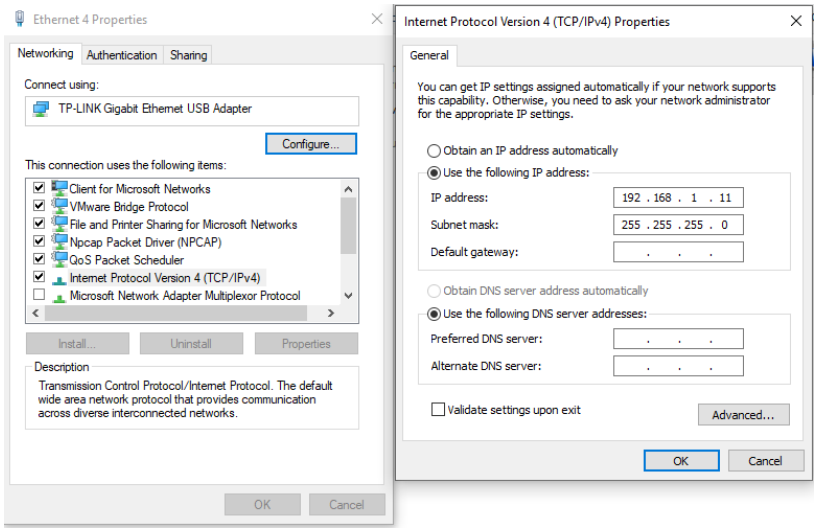
```
$ sudo apt-get install -y git build-essential libsdl1.2-dev texinfo gawk chrpath diffstat
$ git clone https://github.com/Nuvoton-Israel/openbmc.git
$ cd openbmc
$ . setup buv-runbmc
$ bitbake obmc-phosphor-image
```

- After running above commands and building image successfully, you will find a image under the following folder:
  - **../build/buv-runbmc/tmp/deploy/images/buv-runbmc/**
- which named:
  - **obmc-phosphor-image-buv-runbmc-<build id>.static.mtd**
    - 

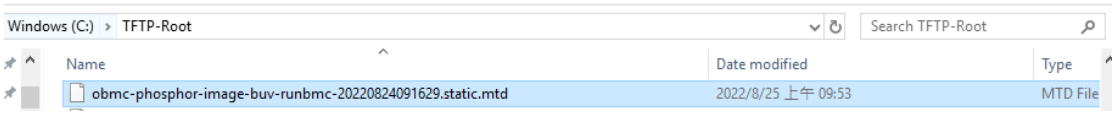
- This is the image (image-bmc) you will flash to runbmc card.

➢ How to flash image

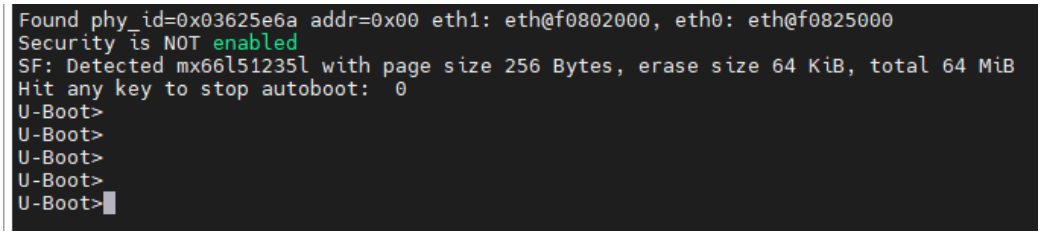
- Update BMC image via u-boot and TFTP.
- Setup IP for NB(TFTP server) and BUV(TFTP client):
  NB IP: 192.168.1.11
  HSBUV IP: 192.168.1.22



- Put image-bmc into your tftp server folder:



- Reboot BUV (power on or press SW1801 button) and enter UBoot:



- Setup u-boot env, please refer:
  - https://github.com/Nuvoton-Israel/nuvoton-info/blob/master/npcm7xx-poleg/evaluation-board/sw_deliverables/uboot_env_parameters.txt

e.g. (use J1101: 1000/100/10 GMACRGMII MAC1)

```
setenv mac_offset 01C0
setenv mac_base 00:00:F7:A0
setexpr byte ${mac_offset} / 100;setexpr nibh ${byte} / 10;setexpr nibl ${byte} % 10;setenv mac_base ${mac_base}:${nibh}${nibl}
setexpr byte ${mac_offset} % 100;setexpr nibh ${byte} / 10
setenv byte; setenv nibh; setenv nibl; setenv mac_base; setenv mac_offset
setenv eth_num 2
setenv gatewayip 192.168.1.254
setenv ipaddr 192.168.1.22
setenv serverip 192.168.1.11
setenv autostart no
setenv autoload    no
setenv ethact ETH${eth_num}
saveenv
ping 192.168.1.11
```

- Upload BMC image:

```
tftp 10000000 obmc-phosphor-image-buv-runbmc-tftp 10000000 obmc-phosphor-image-buv-runbmc-20220824091629.static.mtd
```

◆
```
U-Boot>tftp 10000000 obmc-phosphor-image-buv-runbmc-20220824091629.static.mtd
Speed: 1000, full duplex
Using eth@f0802000 device
TFTP from server 192.168.1.11; our IP address is 192.168.1.22
Filename 'obmc-phosphor-image-buv-runbmc-20220824091629.static.mtd'.
Load address: 0x10000000
Loading: #################################################################
         #################################################################
         #################################################################
         #################################################################
         #################################################################
         #################################################################
         #################################################################
         #################################################################
```

...

```
         #################################################################
         #################################################################
         #################################################################
         ####################
         2.8 MiB/s
done
Bytes transferred = 67108864 (4000000 hex)
U-Boot>
```

- Copy BMC image to flash and boot

cp.b 10000000 80000000 ${filesize} boot

◆
```
U-Boot>cp.b 10000000 80000000 ${filesize}
Copy 67108864 bytes from 0x10000000 to 0x80000000(bus:0 cs:0)
Copy 67108864 bytes to flash
...............####............##############################
#######################################.....................
#.........#############################################
#############################################################
#############################################################
#############################################################
###############################.............................
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...............#############################################

U-Boot>boot
Booting Kernel from flash
+++ uimage at 0x80200000
Using bootargs: earlycon=uart8250,mmio32,0xf0001000 root=/dev/ram console=ttyS0,115200n8 mem=464M ramdisk_size=48000 basemac=00:
oops=panic panic=20
## Loading kernel from FIT Image at 80200000 ...
   Using 'conf-nuvoton-npcm750-buv-runbmc.dtb' configuration
   Trying 'kernel-1' kernel subimage
     Description:  Linux kernel
     Type:         Kernel Image
     Compression:  uncompressed
     Data Start:   0x8020012c
     Data Size:    3720608 Bytes = 3.5 MiB
     Architecture: ARM
```

...

```
Phosphor OpenBMC (Phosphor OpenBMC Project Reference Distro) nodistro.0 buv-runbmc ttyS0

buv-runbmc login: using random self ethernet address
using random host ethernet address
ssif open
usb0: HOST MAC 1e:23:ac:59:8f:45
usb0: MAC d2:d8:ae:f8:6e:67
npcm-udc: bind to driver configfs-gadget

buv-runbmc login:
```

- When boot completed, login to OpenBMC:

Username: root Password: 0penBmc

◆
```
buv-runbmc login: root
Password:
root@buv-runbmc:~# ls
bmcweb_persistent_data.json
root@buv-runbmc:~#
```

C. OpenBMC WebUI

- Set BMC_IP before using
  - e.g.(use J1101: 1000/100/10 GMACRGMII MAC1)

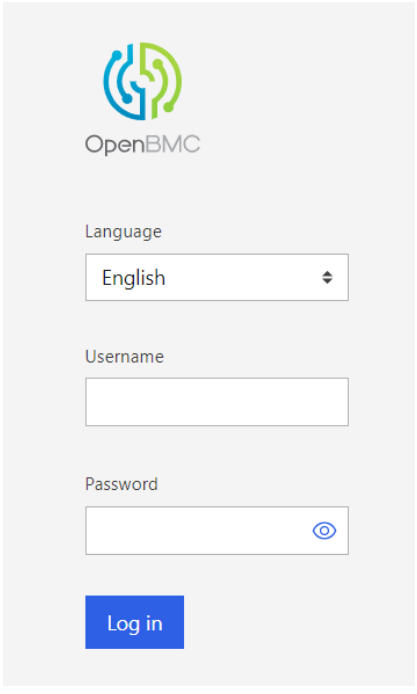
```
root@buv-runbmc:~# ifconfig eth1 192.168.1.22
root@buv-runbmc:~# ifconfig
eth0      Link encap:Ethernet  HWaddr 00:00:F7:A0:00:FC
          inet addr:169.254.1.129  Bcast:169.254.255.255  Mask:255.255.0.0
          inet6 addr: fe80::200:f7ff:fea0:fc/64 Scope:Link
          UP BROADCAST RUNNING MULTICAST  MTU:1500  Metric:1
          RX packets:0 errors:0 dropped:0 overruns:0 frame:0
          TX packets:26 errors:0 dropped:0 overruns:0 carrier:0
          collisions:0 txqueuelen:64
          RX bytes:0 (0.0 B)  TX bytes:2908 (2.8 KiB)

eth1      Link encap:Ethernet  HWaddr 00:00:F7:A0:00:FD
          inet addr:192.168.1.22  Bcast:192.168.1.255  Mask:255.255.255.0
          inet6 addr: fe80::200:f7ff:fea0:fd/64 Scope:Link
          UP BROADCAST RUNNING MULTICAST  MTU:1500  Metric:1
          RX packets:118 errors:0 dropped:3 overruns:0 frame:0
          TX packets:29 errors:0 dropped:0 overruns:0 carrier:0
          collisions:0 txqueuelen:1000
          RX bytes:12107 (11.8 KiB)  TX bytes:3371 (3.2 KiB)
          Interrupt:27
```

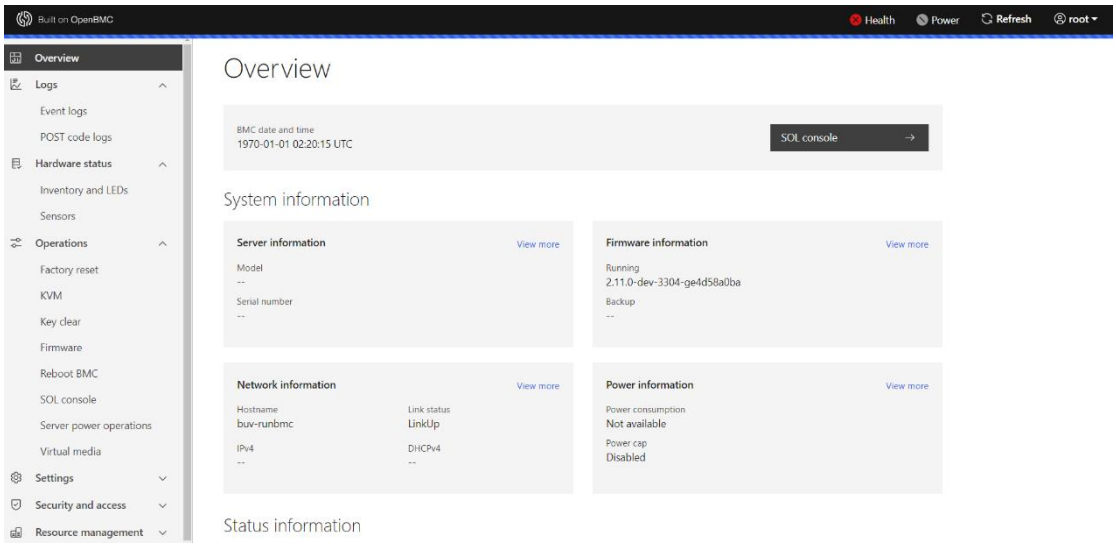
■

https://<BMC_IP>

Username: root

Password: 0penBmc





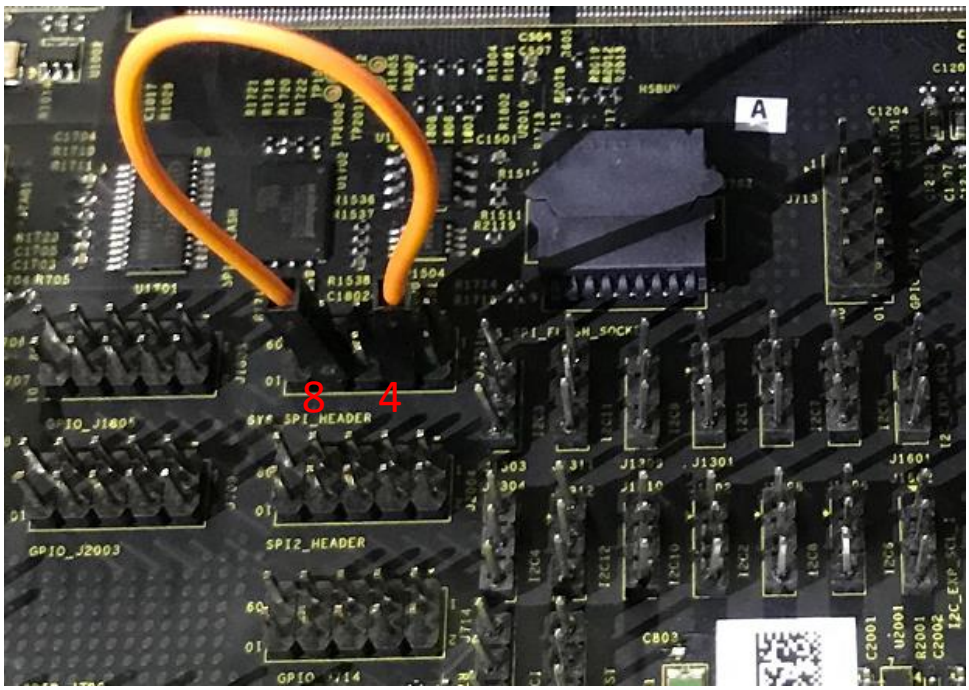
- BMC FW update over OpenBMC

https://github.com/Nuvoton-Israel/openbmc/tree/runbmc/meta-quanta/meta-olympus-nuvoton#bmc-firmware-update

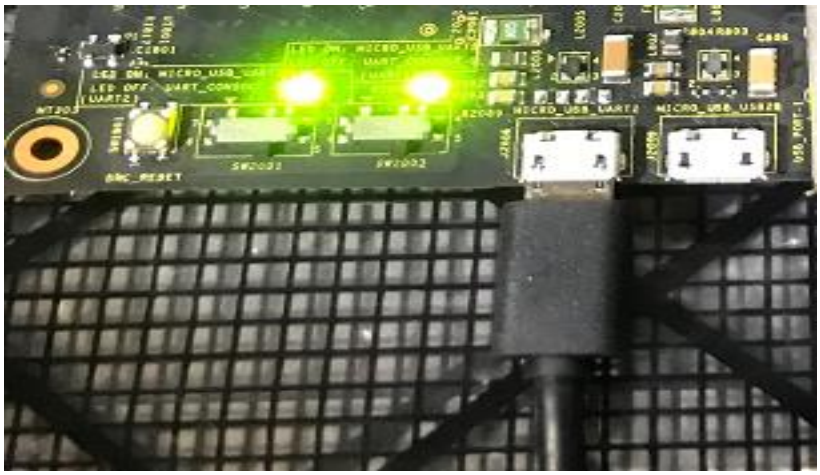
D. FUP mode for emergency firmware update (Boot-Block and Uboot)

Steps:

1. Remove HSBUV board AC Power 12V(J301) and Micro USB UART - BMC Debug UART (J2001)
2. Connects pin8 and pin4 of J1701 header

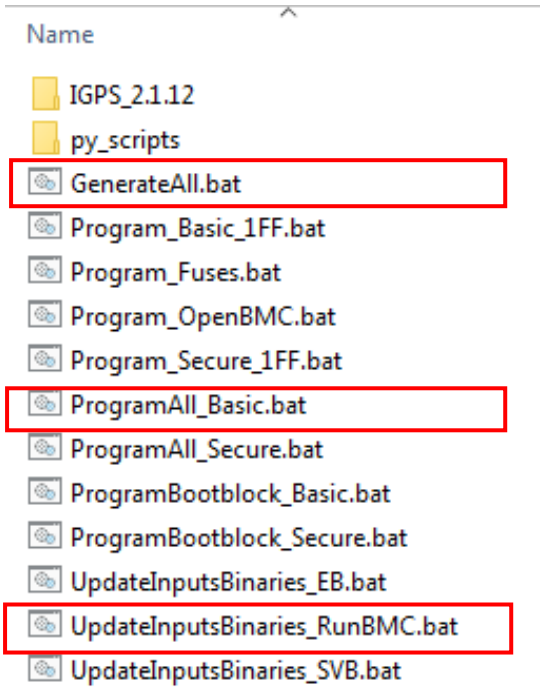


3. Connects USB cable to Micro USB UART - BMC FUP mode (J2006)



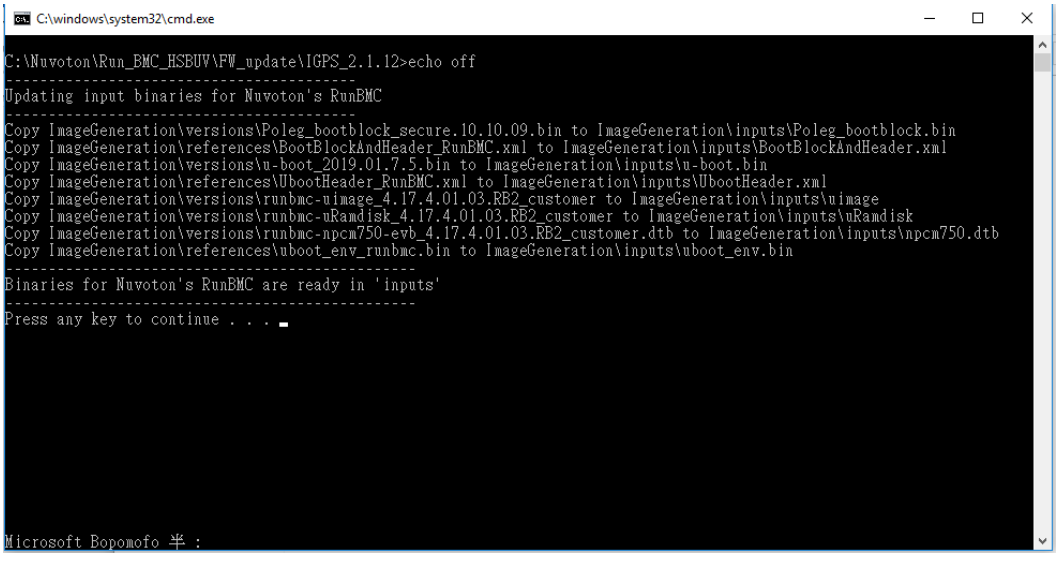
4. Recovery BMC over IGPS:
   https://github.com/Nuvoton-Israel/igps

Programmer fw list (.bat file)

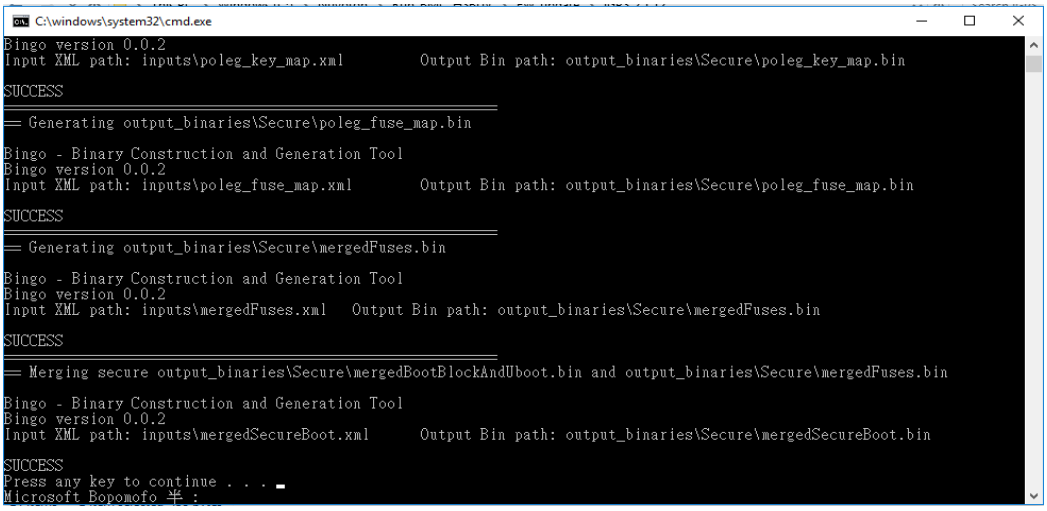


Steps:

(1) Run UpdateInputsBinaries_RunBMC.bat



(2) Run GenerateAll.bat



(3) Run ProgramAll_Basic.bat