Installing the eBUS SDK for Vision Components (VC) Nano3D-Z Smart Cameras

The following document outlines how to install the eBUS SDK on a VC Nano3D-Z camera as well as how to build and run a sample which transmits a 2D image and the associated 3D real-world coordinate information over a network using the GigE Vision multi-part payload type from the VC Nano3D-Z. This sample also includes GenICam control to toggle on and off laser, change the value of the Exposure Mode, Shutter and Gain. The documentation assumes that you have pre-installed the VC Linux Operating System as well as the VC processing libraries on the VC Nano3D-Z camera.

Specifically, the following Vision Components software packages/libraries are required:

- VC Linux Operating System
  - arm-linux-gnueabihf version 4.9 (or higher)
- VC processing libraries as below (or higher)
  - vclib.so.6.8.0
  - vcflib.so.5.1.0
  - vclinux.so.3.7.2
- VC Linux Camera I/O Configuration and Connection Setup
  - VCIO v.1.3.2

In addition, the following library is also required:

- libstdc++.so.6.0.25
  - This can be downloaded here: https://packages.debian.org/buster/all/libstdc++6-armhf-cross/download

Finally, for the eBUS SDK, the following package is required (or a higher version):

- eBUS_SDK_linux-gnueabihf-arm-6.2.0-5290.deb

NOTE: In order to access version 6.2.0.5290 of the eBUS SDK for 32-bit ARM (hard-float) platforms, please contact your Pleora support representative, support@pleora.com

1. OS Version and CPU of the VC Nano Camera

Linux VC-Z 3.14.79-vc-z #2 SMP PREEMPT Wed Apr 24 18:33:06 CEST 2019 armv7l GNU/Linux

2. Install the Kernel Header files

Make sure if the kennel header-3.14.79-vc-z is installed. If not, please install it

sudo apt-get install linux-headers-3.14.79-vc-z

3. Install the eBUS SDK

- Copy the eBUS SDK installation package to the VC Nano3D-Z Camera
- Install the eBUS SDK:
  sudo dpkg –i eBUS_SDK_linux-gnueabihf-arm-6.2.0-5290.deb

- Restart the VC Nano3D-Z Camera
- The ROOT PATH of eBUS SDK
  /opt/pleora/ebus_sdk/linux-gnueabihf-arm

***NOTE:** The installation of this version may fail at last stage and omit error:
CC [M] /opt/pleora/ebus_sdk/linux-gnueabihf-arm/module/ebUniversalProForEthernet/LFT_Module.o
*/usr/src/linux-headers-3.14.79-vc-z/scripts**/recordmcount:** 1: /usr/src/linux-headers-3.14.79-vc-z/scripts/recordmcount: Syntax error: end of file unexpected*
scripts/Makefile.build:308: recipe for target '/opt/pleora/ebus_sdk/linux-gnueabihf-arm/module/ebUniversalProForEthernet/LFT_Module.o' failed

The error above is obtained because the **recordmcount** file in the kernel is corrupted. Despite this error, the eBUS SDK has installed on your device and you can ssh into the device again.

4. Build SoftDeviceGEV3d_VC-3D-Nano for VC Nano3D-Z Cameras under the eBUS SDK Samples

- The SoftDeviceGEV3d_VC-3D-Nano sample is specifically for use with the Vision Components processing libraries on VC Nano3D-Z Cameras, can be found on github.

https://github.com/Pleora/eBUS-Device-Integration-Samples/tree/master/Vision-Components/Nano3D-Z

- More information about the sample itself and pre-requisites to be installed can be found in the ReadMe.txt file
- This sample should be copied to the following directory on the VC Nano3D-Z camera:
  /opt/pleora/ebus_sdk/linux-gnueabihf-arm/share/samples/
- Additional information on building the sample can be found in the eBUS SDK for Linux Quick Start Guide:

https://supportcenter.pleora.com/servlet/fileField?entityId=ka00y0000004fwpAAA&field=File__Body__s

5. Run the SoftDeviceGEV3d_VC-3D-Nano for VC Nano3D-Z Cameras

This Sample will stream an image with laser line points from the VC Nano3D-Z camera over Ethernet using the GigE Vision protocol using the multi-part payload type. The output includes two parts: part0 is 2D image, part1 is laser line points in world coordinates. Please prepare a receiver to receive output data before run the sample. You can find the IP address of the VC Nano3D-Z camera is 192.168.3.15.

Prior to running the sample, you must first run the following command:

```
/usr/bin/vcio -r 360
```

If you running eBUS Player as the receiver on PC, please choose the address of eth0 for connection after the steps below are performed on the VC Nano3D-Z camera.

In order to run the sample on the VC Nano3D-Z camera, navigate to: /opt/pleora/ebus_sdk/linux-gnueabihf-arm/share/samples/SoftDeviceGEV3d_VC-3D-Nano, run make to build the executable and then run ./SoftDeviceGEV3d_VC-3D-Nano

The Sample will show the selection for you to choose after running:

0) eth0 : xx:xx:xx:xx:xx:xx

NOTE: xx:xx:xx:xx:xx:xx represents the MAC address of eth0

Please select the 0 and press the Enter key.

"SoftDeviceGEV3d_VC-3D-Nano started" will be displayed. Now the receiver should be able to receive the images from the VC Nano3D-Z camera.

Push any key on the keyboard will stop the sample.

6. for VC Nano3D-Z Cameras at Camera Boot-up Time

In order to run the VC Nano3D-Z Run the SoftDeviceGEV3d_VC-3D-Nano camera specific SoftDeviceGEV3d_VC-3D-Nano camera application when the camera powers up, please refer to the "ReadMe_Boot Into Application.txt" file located on github: https://github.com/Pleora/eBUS-Device-Integration-Samples/tree/master/Vision-Components/Nano3D-Z

7. Licensing the SoftDeviceGEV3d_VC-3D-Nano application on your VC Nano3D-Z Cameras

In order to properly license the SoftDeviceGEV3d_VC-3D-Nano application running on your VC Nano3D-Z camera. You must first query the MAC address of eth0 on the VC-Nano3D-Z camera. This information is provided in Step 5 above. Once you have the MAC address of eth0 on your VC Nano3D-Z camera, please contact your Pleora sales representative while providing the MAC address obtained in Step 5, and also please ensure you indicate that you require an eBUS GEV-Tx runtime license (990-1023) for your VC Nano3D-Z camera. Once you receive the license file, you will need to place it in the ./opt/pleora/ebus_sdk/linux-gnueabihf-arm/licenses directory on your VC Nano3D-Z camera. After placing the file in the appropriate directory, reboot the camera.

Please note that the license file is important as without it, you will only be able to stream from your VC Nano3D-Z camera for a 15 minute time period. You can tell if your VC Nano3D-Z camera is licensed or not during the select/connect process using your receiver software, in eBUS Player for example, in the select/connect dialog, you will see the device appear as "eBUS Software Device Unlicensed".

NOTE: Please do not modify the file name of the license file, otherwise it will not work.