QUICK START GUIDE

VIA ARTiGO A3000

Android 12.0 EVK

1.00-18092023

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Revision History

Version	Date	Remarks
1.00	18/09/2023	Initial release

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1. Introduction

This Quick Start Guide provides an overview of how to boot the Android image for the VIA ARTiGO A3000 starter kit and configure the supported hardware functions in the build.

The VIA ARTiGO A3000 Android 12.0 EVK is developed based on the MediaTek Android 12.0 BSP, and it enables the hardware features of the VIA ARTiGO A3000.

1.1 EVK Package Contents

There are three folders in the package listed as below.

Firmware folder	Description
VIA_ARTiGO_A3000_Android_12.0_EVK.zip	Android evaluation image
Document folder	**Description**
VIA_ARTiGO_A3000_Android_12.0_EVK_Quick_Start_Guide.pdf	Quick Start Guide
Tool folder	**Description**
VIA_Android_USB_Driver.zip	VIA USB driver
PoseDetector_Image.apk	Sample test program

1.1.1 Firmware Folder Contents

VIA_ARTiGO_A3000_Android_12.0_EVK.zip: Contains the precompiled Android image for evaluating the VIA ARTiGO A3000.

1.1.2 Document Folder Contents

VIA_ARTiGO_A3000_Android_12.0_EVK_Quick_Start_Guide.pdf: This Quick Start Guide provides an overview on how to boot the Android image for the VIA ARTiGO A3000 and configure the supported hardware functions in the build.

1.1.3 Tool Folder Contents

VIA_Android_USB_Driver.zip: The VIA driver for ADB-over-USB.

PoseDetector_Image.apk: A sample program to test MTK NeuroPilot AI APU hardware acceleration.

1.2 Version Information and Supported Features

- Kernel version: 5.10.101
- Evaluation image: Android 12.0
- Development based on MediaTek Android 12.0 BSP
- Supports eMMC boot
- Supports HDMI display
- Supports HDMI audio output
- Supports COM port as RS-232 mode (TX/RX)
- Supports 10/100Mbps Ethernet port
- Supports MediaTek MT6357 Line-out and Mic-in
- Supports MediaTek MT6631 Wi-Fi 802.11ac and Bluetooth 5.0
- Supports VIA EMIO-2573 (EC25) 4G LTE mobile broadband miniPCIe module
- Supports MediaTek NeuroPilot AI APU hardware acceleration

2. Image Installation

This section explains the setup requirements for installing the Android evaluation image on the VIA ARTiGO A3000.

The precompiled images are provided in the "Firmware" folder.

2.1 Installing with the Fastboot Mode

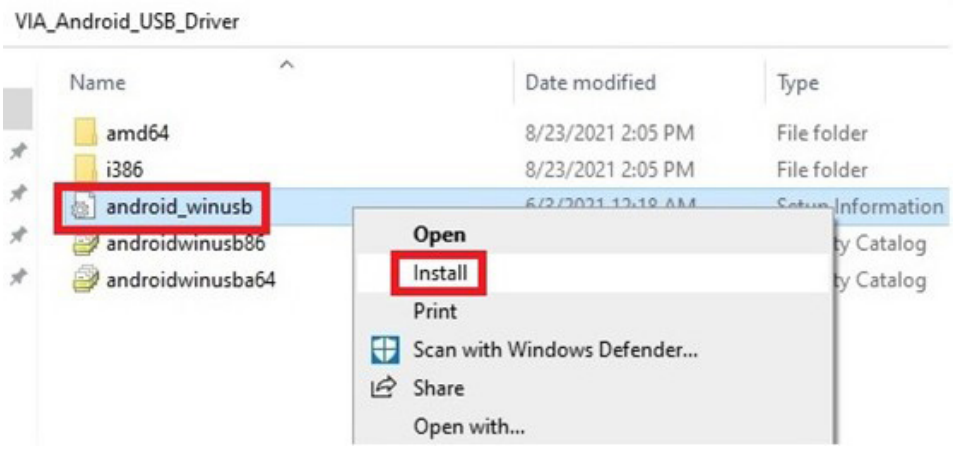
Follow the steps below to install Android EVK image:

Step 1

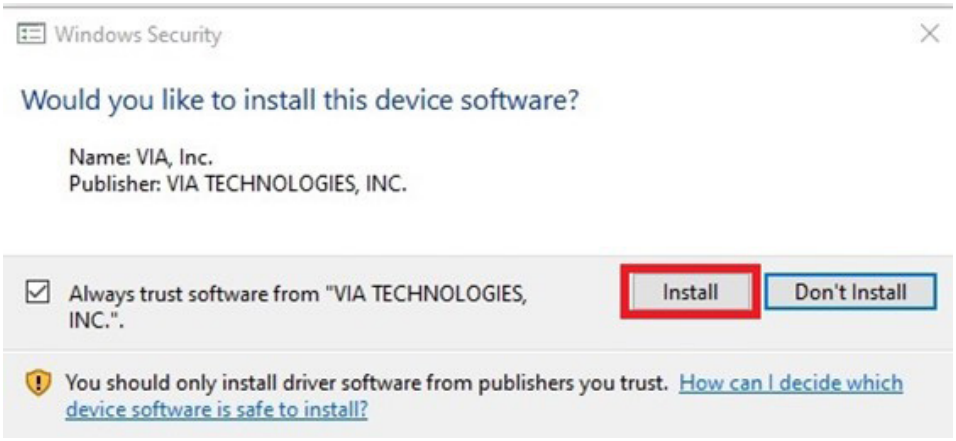
Prepare the "fastboot tool" and install the "VIA USB driver" into your Windows 10 host machine.

To get the "fastboot tool" for Windows, please refer to the "SDK Platform Tools release notes" chapter on the Android developer website https://developer.android.com/studio/releases/platform-tools.

To install the "VIA USB driver", right-click "android_winusb" and select "Install".



Then click "Install" when the installer opens.



When the installer finishes, it will show a confirmation message "The operation completed successfully".

Step 2

Connect the Windows 10 host machine and the VIA ARTiGO A3000 through the Micro USB 2.0 port using the Micro USB cable.

Micro USB 2.0 port diagram

Step 3

Plug in the AC-to-DC power adapter to power on the VIA ARTiGO A3000 .

If the EVK image is not installed, the VIA ARTiGO A3000 will stop at "fastboot: processing commands" as shown in the debug console below. Proceed to step 4 directly.

```
[4714] [USB] Unrecognized Speed 0
[4881] [USB] [INTR] Speed Change
[4881] [USB] HS is detected
[4882] [USB] [INTR] Reset
[5419] fastboot: processing commands
[5419] usb_read: remaining len 64, xfer len 64
```

Fastboot Mode

If the EVK image is already installed, use the following command to enter the Fastboot Mode on your Windows 10 host machine.

```
D:\platform-tools>adb shell reboot bootloader
```

Note:
After powering on the VIA ARTiGO A3000, make sure the Windows 10 host machine detects it as an ADB device.

Step 4

Extract the VIA_ARTiGO_A3000_Android_12.0_EVK.zip file on your Windows 10 host machine.

To install the image, use the following command:

```
D:\VIA_ARTiGO_A3000_Android_12.0_EVK>set PATH=D:\platform-tools;%PATH%
D:\VIA_ARTiGO_A3000_Android_12.0_EVK>viaflash.exe --android
VIA: Operating system is Android12
VIA: installing preloader.img
VIA: installing GPT.img
VIA: erasing proinfo partition
VIA: erasing boot_para partition
VIA: installing cam_vpu1.img
VIA: installing cam_vpu2.img
VIA: installing cam_vpu3.img
VIA: erasing cam_vpu1_b partition
VIA: erasing cam_vpu2_b partition
VIA: erasing cam_vpu3_b partition
VIA: erasing nvram partition
VIA: installing protect1.img
VIA: installing protect2.img
VIA: installing persist.img
VIA: installing nvcfg.img
VIA: erasing seccfg partition
VIA: installing lk.img
VIA: erasing lk_b partition
VIA: installing boot.img
VIA: erasing boot_b partition
VIA: installing vendor_boot.img
```

```
VIA: erasing vendor_boot_b partition
VIA: erasing para partition
VIA: installing logo.bin
VIA: installing dtbo.img
VIA: erasing dtbo_b partition
VIA: erasing expdb partition
VIA: erasing frp partition
VIA: installing tee.img
VIA: erasing tee_b partition
VIA: erasing kb partition
VIA: erasing dkb partition
VIA: erasing metadata partition
VIA: installing nvdata.img
VIA: erasing md_udc partition
VIA: installing vbmeta.img
VIA: erasing vbmeta_b partition
VIA: installing vbmeta_system.img
VIA: erasing vbmeta_system_b partition
VIA: installing vbmeta_vendor.img
VIA: erasing vbmeta_vendor_b partition
VIA: installing super.img
VIA: installing userdata.img
VIA: rebooting target system

D:\VIA_ARTiGO_A3000_Android_12.0_EVK>
```

Step 5

Unplug the AC-to-DC power adapter to power off the VIA ARTiGO A3000.

Step 6

Unplug the Micro USB cable, press the Power Button for 2 seconds and release it to power on the VIA ARTiGO A3000.

When the boot process has completed, you will see the Android 12.0 desktop.

3. Hardware Functions

This section explains how to enable and test the hardware functions precompiled in the VIA ARTiGO A3000 Android 12.0 EVK.

3.1 Enabling ADB Debugging

Follow the steps below to enable ADB debugging:

Step 1

Connect the Windows 10 host machine and the VIA ARTiGO A3000 through the Micro USB 2.0 port using the Micro USB cable.

Micro USB 2.0 port diagram

Step 2

Power on the VIA ARTiGO A3000 to initiate the boot process.

Step 3

When the VIA ARTiGO A3000 has completed booting, use the following command to open ADB debugging:

```
E:\platform-tools>adb shell
```

3.2 Changing the Kernel Debug Level

To disable the kernel messages, modify the debug level using the following command:

```
console:/ # su
console:/ # echo 3 > /proc/sys/kernel/printk
```

3.3 Checking the BSP Version

To check the BSP version, use the following command:

```
console:/ # cat /proc/version
```

3.4 DVFS

To verify the DVFS (Dynamic Voltage Frequency Scaling) function and list all the supported features, use the following commands:

```
console:/ # ls -l /sys/devices/system/cpu/cpu0/cpufreq/
total 0
-r--r--r-- 1 root   root   4096 2022-02-24 18:16 affected_cpus
-r-------- 1 root   root   4096 2022-02-24 18:16 cpuinfo_cur_freq
-r--r--r-- 1 root   root   4096 2022-02-24 18:16 cpuinfo_max_freq
-r--r--r-- 1 root   root   4096 2022-02-24 18:16 cpuinfo_min_freq
-r--r--r-- 1 root   root   4096 2022-02-24 18:16 cpuinfo_transition_latency
-r--r--r-- 1 root   root   4096 2022-02-24 18:16 related_cpus
-r--r--r-- 1 root   root   4096 2000-01-01 00:00 scaling_available_frequencies
-r--r--r-- 1 root   root   4096 2022-02-24 18:16 scaling_available_governors
-r--r--r-- 1 root   root   4096 2022-02-24 18:16 scaling_cur_freq
-r--r--r-- 1 root   root   4096 2022-02-24 18:16 scaling_driver
-rw-r--r-- 1 root   root   4096 2022-02-23 15:46 scaling_governor
-rw-rw---- 1 system system 4096 2000-01-01 00:00 scaling_max_freq
-rw-rw-r-- 1 system system 4096 2000-01-01 00:00 scaling_min_freq
-rw-r--r-- 1 root   root   4096 2022-02-24 18:16 scaling_setspeed
drwxr-xr-x 2 root   root      0 2022-02-24 18:16 schedutil
drwxr-xr-x 2 root   root      0 2000-01-01 00:00 stats
console:/ #
```

To check the supported and current CPU frequency, use the following commands:

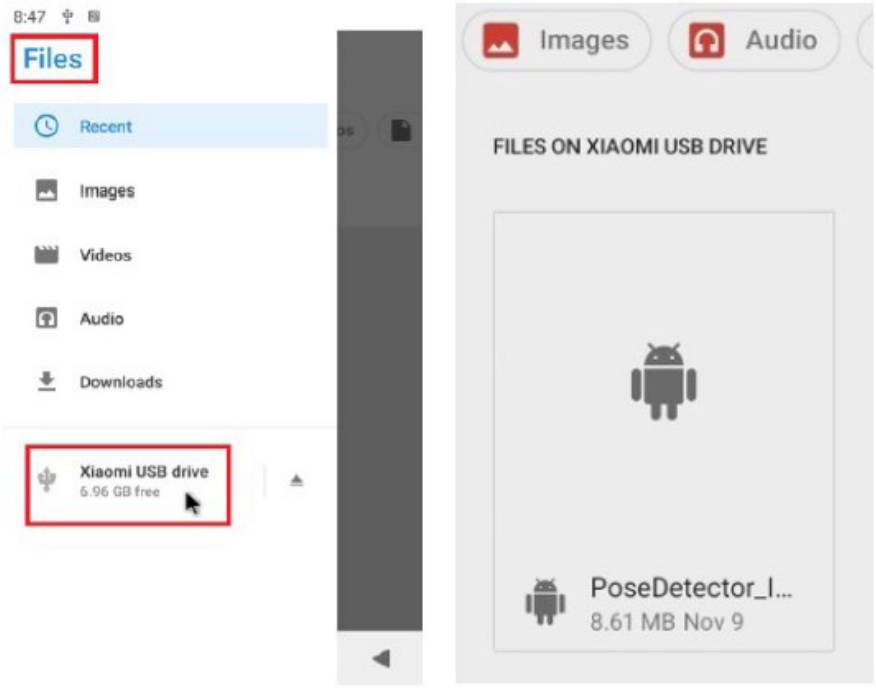
```
console:/ # cat /sys/devices/system/cpu/cpu0/cpufreq/scaling_available_frequencies
850000 918000 987000 1056000 1125000 1216000 1308000 1400000 1466000 1533000 1633000 1700000
1767000 1834000 1917000 2001000
console:/ # cat /sys/devices/system/cpu/cpu0/cpufreq/cpuinfo_cur_freq
1633000
```

3.5 MTK NeuroPilot AI APU Hardware Acceleration

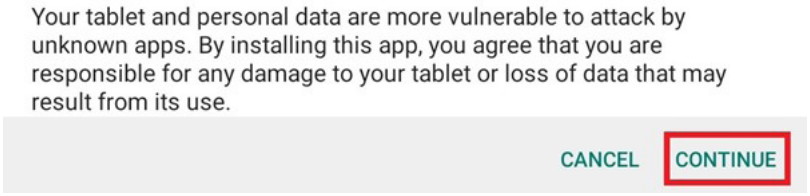
We recommend running the "PoseDetector_Image.apk" sample program for testing MTK NeuroPilot AI APU hardware acceleration. To install the program, follow the steps below:

1. Copy the "PoseDetector_Image.apk" file to a USB drive and connect the USB drive to the VIA ARTiGO A3000.

2. Next, navigate to "Files" and click on the USB drive's name to find "PoseDetector_Image.apk" as shown below. Double-click the program



3. When the program opens, it will display a dialog box as shown below. Click "Continue" to confirm.



4. After installation, double-click "PoseDetector" to run the program.

5. Check the Pose Detection inference time on the bottom left corner of the program:
   - If the inference time is less than 200 ms, MTK NeuroPilot AI APU hardware acceleration is enabled and running correctly.
   - If the inference time is greater than 200 ms, MTK NeuroPilot AI APU hardware acceleration is disabled.

Taiwan Headquarters

1F, 531 Zhong-zheng Road,
Xindian Dist., New Taipei City 231
Taiwan

Tel: 886-2-2218-5452
Fax: 886-2-2218-9860
Email: embedded@via.com.tw

USA

940 Mission Court
Fremont, CA 94539,
USA

Tel: 1-510-687-4688
Fax: 1-510-687-4654
Email: embedded@viatech.com

Japan

3-15-7 Ebisu MT Bldg. 6F,
Higashi, Shibuya-ku
Tokyo 150-0011
Japan

Tel: 81-3-5466-1637
Fax: 81-3-5466-1638
Email: embedded@viatech.co.jp

China

Tsinghua Science Park Bldg. 7
No. 1 Zongguancun East Road,
Haidian Dist., Beijing, 100084
China

Tel: 86-10-59852288
Fax: 86-10-59852299
Email: embedded@viatech.com.cn

Europe

Email: embedded@via-tech.eu