



QUICK START GUIDE

ALTA DS 4K

Android EVK v1.0.5



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Revision History

Version	Date	Remarks
1.00	07/05/2017	Initial release

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1. Introduction

This Quick Start Guide provides an overview on how to boot the Android EVK system image on the ALTA DS 4K system and configure the supported hardware functions in the build.

The ALTA DS 4K Android EVK v1.0.5 is developed based on Android 5.1.1 Lollipop and it enables the hardware features of the ALTA DS 4K system.

1.1. Package Contents

There are three folders in the package as listed below.

Firmware folder	Description
ALTA_DS_4K_Android5.1.1_EVK_v1.0.5_8G.zip	Android EVK system image and installation script files
Document folder	Description
ALTA_DS_4K_Android_EVK_v1.0.5_Quick_Start_Guide_v1.00_20170705.pdf	Quick Start Guide
Tools folder	Description
ALTA_DS_4K_Smart_ETK_Demo_v1.0.apk	Smart ETK demo program
BluetoothSPPTest.apk	Bluetooth SPP testing program

ALTA DS 4K Android EVK contents

1.1.1. Firmware Folder Contents

ALTA_DS_4K_Android5.1.1_EVK_v1.0.5_8G.zip: contains installation script files and the precompiled U-boot and Android image for evaluating the ALTA DS 4K system.

1.1.2. Document Folder Contents

ALTA_DS_4K_Android_EVK_v1.0.5_Quick_Start_Guide_v1.00_20170705.pdf: This Quick Start Guide provides an overview on how to boot the Android EVK system image on the ALTA DS 4K system and configure the supported hardware functions in the build.

1.1.3. Tools Folder Contents

ALTA_DS_4K_Smart_ETK_Demo_v1.0.apk: is the Smart ETK demo program.

BluetoothSPPTest.apk: is the Bluetooth SPP profile test program.

1.2. Version Information and Supported Features

- U-Boot base version: 2013.07
- U-Boot release version: 1.01
- Kernel version: 3.18.0
- Evaluation image: Android Lollipop 5.1.1
- Supports eMMC boot
- Supports SD Storage
- Supports HDMI display up to 3840x2160 resolution
- Supports HDMI CEC
- Supports HDMI audio output
- Supports USB 2.0 and USB 3.0 ports
- Supports Mini USB 2.0 port for COM (TX/RX)
- Supports Gigabit Ethernet
- Supports 10/100Mbps Ethernet
- Supports Line-out, and Mic-in
- Supports Onboard COM debug connector
- Supports CIR
- Supports EMIO-5531 USB Wi-Fi & Bluetooth module
 - Supports Bluetooth A2DP and SPP profile
- Supports 4K video hardware decoding for H.265. H.264
- Supports VP8 and MJPEG video hardware decoding up to 1080p
- Supports OTA (Over-The-Air technology)
- Supports Smart ETK v1.0: Watchdog Timer, Wake-On-LAN and COM

2. Image Installation

The ALTA DS 4K only supports booting Android from the eMMC. This section explains the setup requirements for booting from the eMMC.

The installation script files, the precompiled U-boot and image are provided in the "Firmware" folder.

2.1. Booting from the eMMC

The first step is to insert a Micro SD card into the host machine and create a FAT formatted partition. Extract the **ALTA_DS_4K_Android5.1.1_EVK_v1.0.5_8G.zip**. Next, copy the **bspinst** folder and **scriptcmd** file into the Micro SD card.

Insert the prepared Micro SD card into the ALTA DS 4K system, connect an HDMI display, and power on the device to initiate the installation process.

```
VIA Android BSP Installation
ALTA DS 4K_Android 5.1.1
-----

U_Boot Version : v1.01
Kernel Version : v3.18.0
File System Version : v1.0.5_8G
OtherInfo : S3G Version : v94.30.01

[Progress Bar] 100 %
Please remove installation media!

Warnings! Please don't power off! Please wait...
```

Update process screen

When the installation process is completed, remove the Micro SD card and then the system will reboot automatically.

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

2.2. Setting up U-Boot Parameters

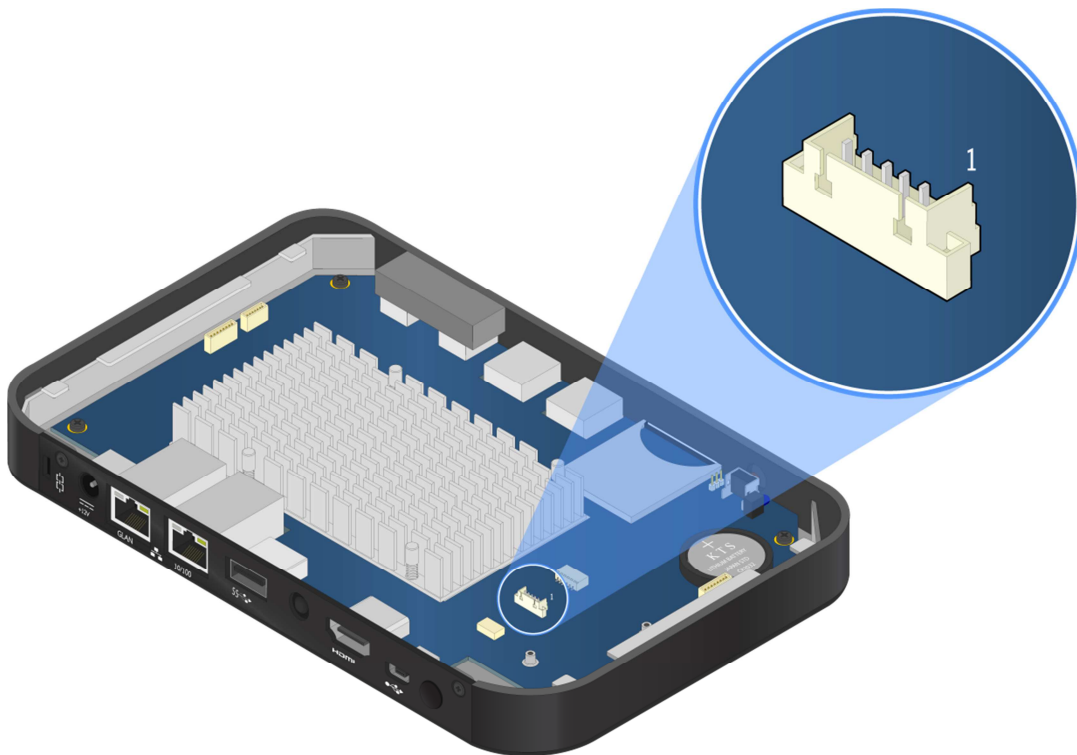
The first step is to connect the host machine and the ALTA DS 4K through the COM debug connector (CON1). Use a serial port communication program such as PuTTY, GtkTerm, or Minicom, to connect to the debug console. There you will be able to see the U-Boot boot log and adjust settings in the U-Boot console.

```

+-----+
| A  -   Serial Device           : /dev/ttyUSB0 |
| B  -   Lockfile Location       : /var/lock   |
| C  -   Callin Program          :             |
| D  -   Callout Program         :             |
| E  -   Bps/Par/Bits            : 115200 8N1  |
| F  -   Hardware Flow Control   : No         |
| G  -   Software Flow Control   : No         |
+-----+

```

Serial port setting of host machine



COM debug connector diagram

Next, power on the ALTA DS 4K to initiate the boot process. When prompted, press the space bar to stop the boot process, and enter the U-Boot console as illustrated by the screenshot below.

```

U-Boot 94.30.01-VT6091-00041-g3eedf9f-dirty (May 19 2017 - 18:13:42)

U-Boot version number is 1.01
Board: ZX2000 VT6091
I2C:   ready
monitor len: 000B2D8C
ramsize: 7E000000
TLB table from 7fff0000 to 7fff4000
Top of RAM usable for U-Boot at: 7fff0000
Reserving 715k for U-Boot at: 7ff3d000
Reserving 9406k for malloc() at: 7f60d800
Reserving 32 Bytes for Board Info at: 7f60d7e0
Reserving 160 Bytes for Global Data at: 7f60d740
New Stack Pointer is: 7f60d730
DRAM:  2 GiB
relocation Offset is: 7bfbd000
monitor flash len: 0006B054
Now running in RAM - U-Boot at: 7ff3d000
Begin init display adapter.
Success to reset mxu
[DISP]Detected  Edid
[DISP]HDMI detected, MonitorCaps = 0xf
.....
boot_method is 1
fbt_preboot: request for a normal boot
VT6091 #

```

Debug console view of boot process

To list the current U-Boot parameters, use the following command:

```
VT6091 # printenv
```

Make sure the printout message is as follows:

```

=> printenv
baudrate=115200
bootcmd=run bootcmd_sd; if iminfo 0x0; then source 0; else mmc dev 1 && run bootcmd_auto; fi
bootcmd_auto=ext4load mmc 1:e 0x22800000 uImage-dtb; if iminfo 0x22800000; then run
bootargs_mmc && bootm 0x22800000; else run bootcmd_emmc; fi;
bootcmd_sd=mmc dev 0; fatload mmc 0:1 0x0 scriptcmd; if iminfo 0x0; then source 0; else mmc
dev 0 && ext4load mmc 0:1 0x0 scriptcmd; fi;

```

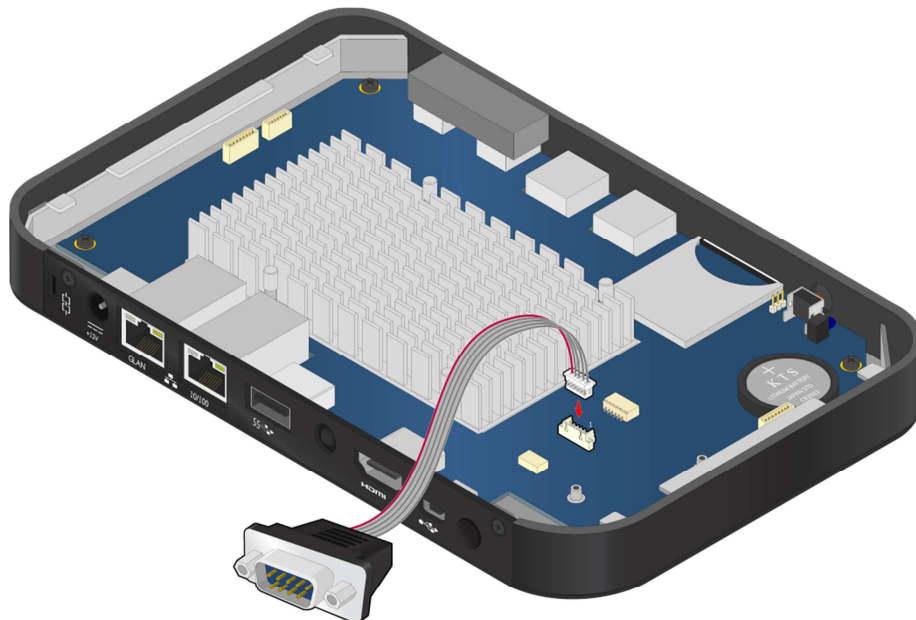
2.3. Restoring Default U-Boot Parameters

If the U-Boot parameters have been modified, the “env default -fa” command in the U-Boot console can restore the factory default settings. To restart the device, use the “reset” command.

```
=> env default -fa
=> saveenv
=> reset
```

2.4. Using the Android Console

The first step is to connect the debug cable to the ALTA DS 4K through COM debug connector (CON1), then connect the host machine and the ALTA DS 4K through the debug cable (P/N: **99G33-080297**). Use a serial port communication program such as PuTTY, GtTerm, or Minicom, to connect to the debug console.



Debug cable
(9-pin D-Sub male)

COM1 debug port diagram

Next, power on the ALTA DS 4K to initiate the boot process. When the boot process is completed, you will automatically log into an Android console.

```
shell@zx2000:/ $
```

3. Hardware Functions

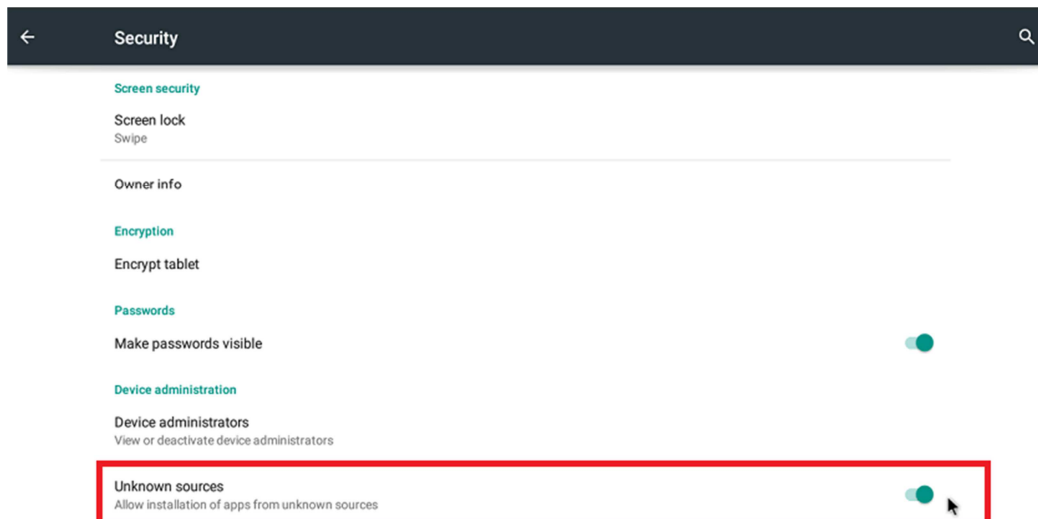
This section explains how to enable and test the Smart ETK package precompiled in the Android EVK.

3.1. Smart ETK

The ALTA DS 4K system Smart ETK supports Watchdog, Wake-On-LAN and COM functions. Please follow the procedures below to experiment with the Smart ETK functions on the ALTA DS 4K system.

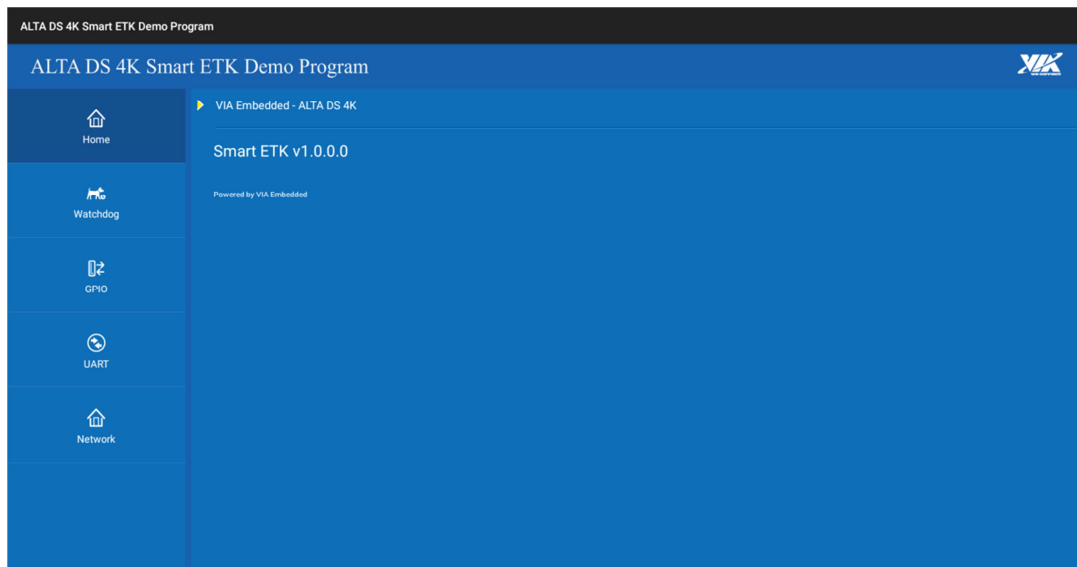
3.1.1. Installing Smart ETK

The first step is to copy the **ALTA_DS_4K_Smart_ETK_Demo_v1.0.apk** onto a mass storage device such as a USB thumb drive. Next, from the Settings screen, click Security, and then enable "Unknown sources" as shown in the diagram below.



Finally, insert the USB thumb drive into the ALTA DS 4K system and double click on the **ALTA_DS_4K_Smart_ETK_Demo_v1.0.apk** file to install.

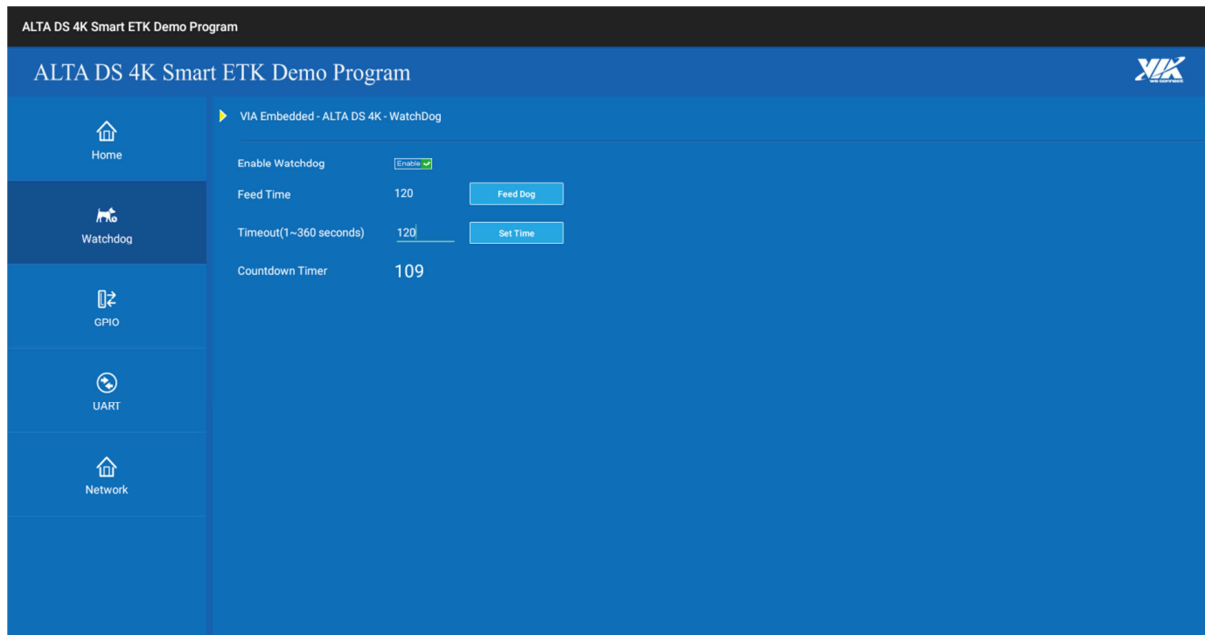
When the installation process has completed, run the **ALTA_DS_4K_Smart_ETK_Demo_v1.0.apk** and start to test the different functions with it.



Smart ETK Home page screen

3.1.2. Testing Watchdog Function

The Watchdog timer includes Enable/Disable, Set Timeout, Feed Dog, Feed Time and Countdown Timer functions.



Smart ETK Watchdog timer screen

First, please open the Smart ETK sample program then, from the left side select Watchdog.

To test the Watchdog function, the first step is to select Enable to active the Watchdog function.

Next, enter the time value (1~360 seconds) in the Timeout setting section.

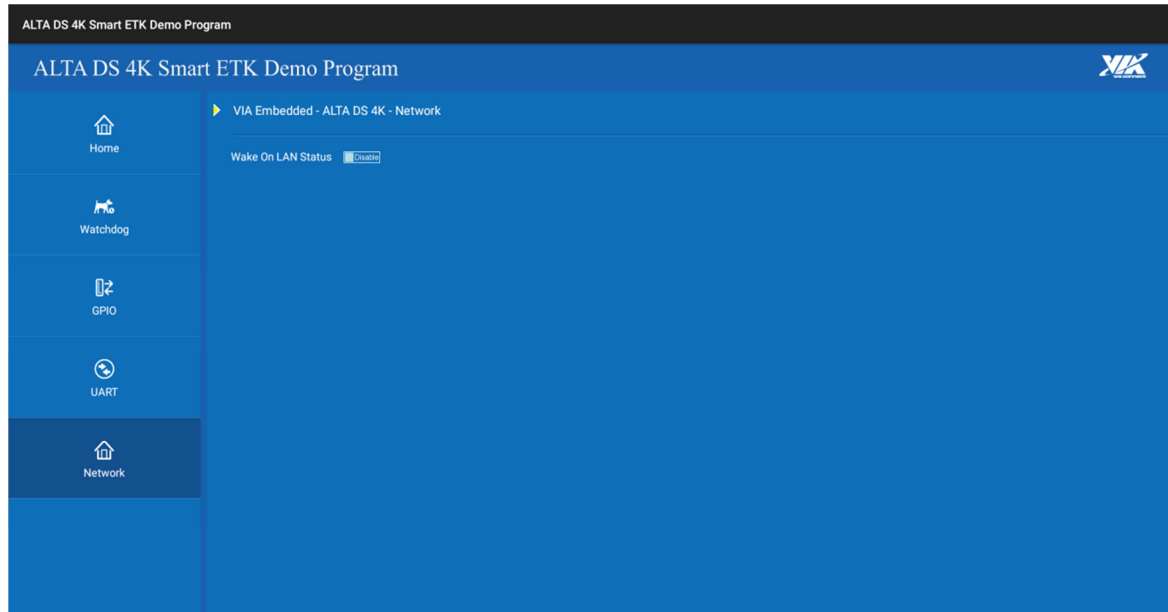
Click on the Feed Dog button to refresh the countdown time value back to the beginning.

The Feed Time section shows the Timeout setting start value.

The Countdown time section shows the countdown time value.

3.1.3. Testing Wake-On-LAN Function

The Gigabit Ethernet port on ALTA DS 4K System supports Wake-On-LAN.



Smart ETK WOL screen

First, please open the Smart ETK sample program, then from the left side select Network.

Next, click "Enable" from the Wake On LAN Status to allow the ALTA DS 4K system to be woken from suspend mode over Ethernet.

Click on the **Disable** button to disable this function.

3.1.4. Testing COM Function

The ALTA DS 4K is equipped with a Mini USB 2.0 port that supports COM (TX/RX).

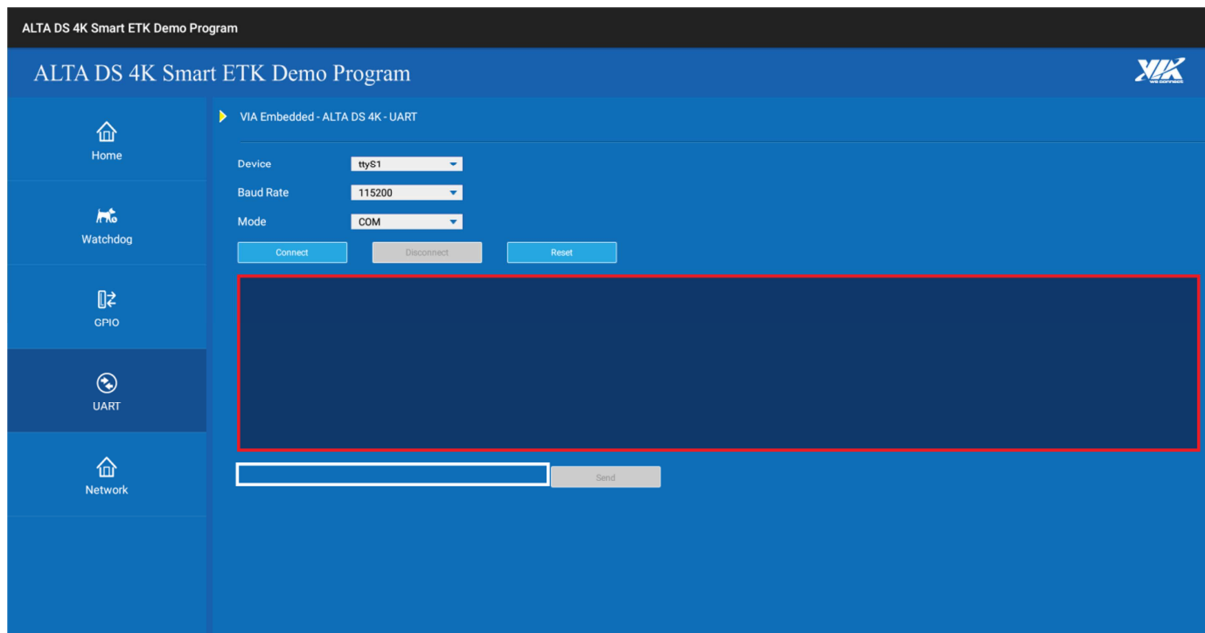
The first step is to connect the host machine to the ALTA DS 4K system through the Mini USB 2.0 port. We suggest using the optional accessory Mini USB 2.0 to 9-pin D-SUB cable (P/N: **99G33-192458**). Next on the host machine start a serial communication program such as Putty, GtTerm or Minicom with the same serial port setting using the appropriate serial device.



COM (TX/RX) cable diagram

Pin	Signal
1	VCC
2	RXD1
3	TXD1
4	GND
5	GND

COM (TX/RX) port pinout table



Smart ETK UART diagram

First, please open the Smart ETK sample program, then from the left side of the Smart ETK sample page; select UART.

To begin, select “ttyS1” from the device drop-down menu and a Baud rate of “115200” for the Baud Rate drop-down menu. The ALTA DS 4K system only supports mode “RS-232”. Next, click on the Connect button to enable the UART function and start communication between the host machine and the ALTA DS 4K system.

When the host machine transfers data to the ALTA DS 4K, the data will be displayed inside the red frame.

To send data from the ALTA DS 4K to the host machine, you need to type the data inside the white frame and click the Send button.

Click on the Disconnect button to disable this function.

Click on the Reset button to reset this function.

4. Accessories

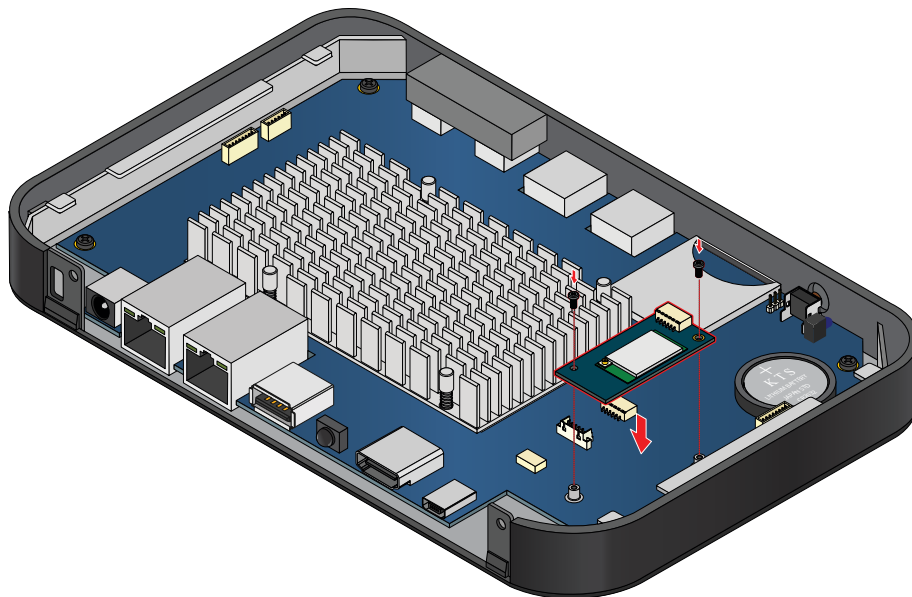
This section explains how to install and configure the EMIO wireless module available for the ALTA DS 4K.

4.1. Configuring the EMIO-5531 USB Wi-Fi & Bluetooth Module

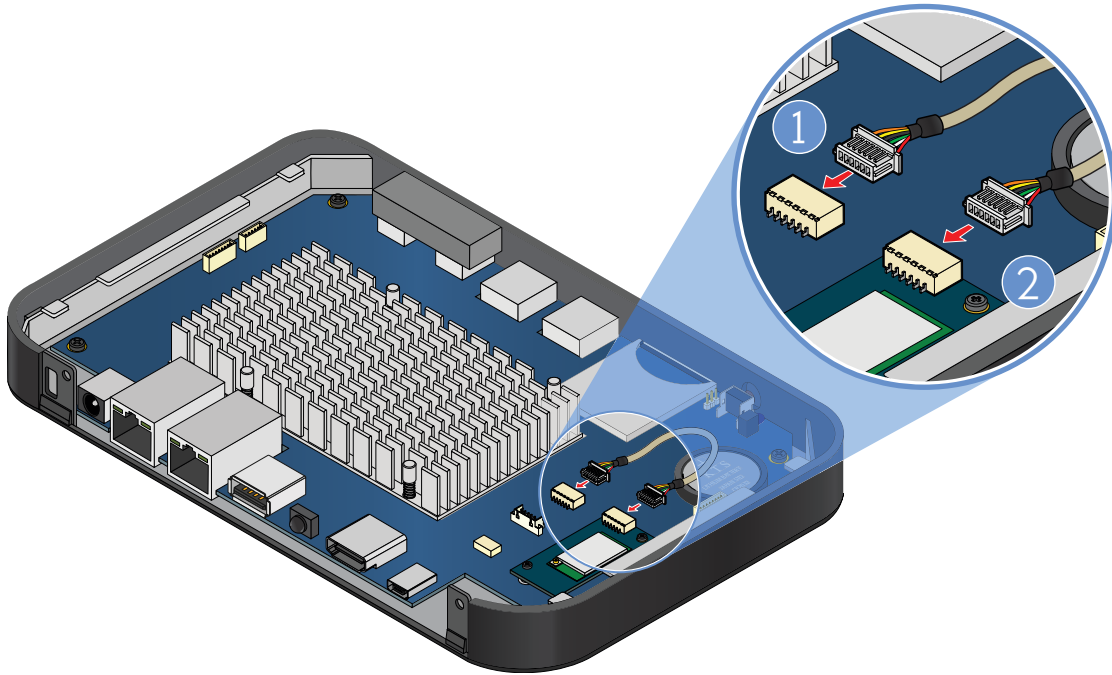
The EMIO-5531 USB Wi-Fi & Bluetooth module supports Wi-Fi and Bluetooth functions.

4.1.1. Connecting to the Internet

The first step is to mount the EMIO-5531 module, then connect the module to the onboard USB 2.0 connector (WIFI1) using the USB cable (P/N: 99G3-190042). After installing the module connect the provided antenna to the module. Next, make sure to unplug any LAN cables or other Wi-Fi modules you have installed. Finally, power on the ALTA DS 4K.

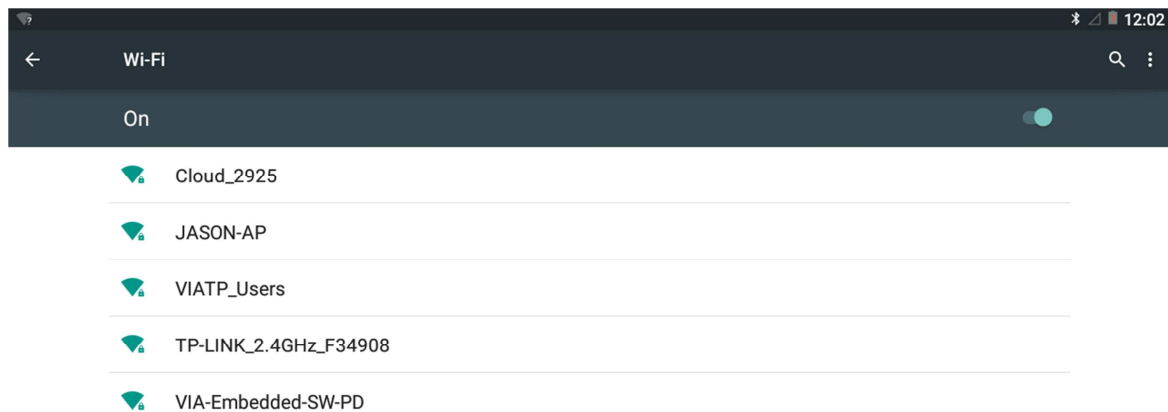


Inserting the EMIO-5531 module



Connecting the USB Wi-Fi & Bluetooth cable

To enable Wi-Fi, power on the ALTA DS 4K, go to Settings -> Wi-Fi -> On



A list of available Wi-Fi connection will appear on the screen. Select the appropriate device to complete the Wi-Fi connection.

When the connection is created, connect to the internet through your web browser.

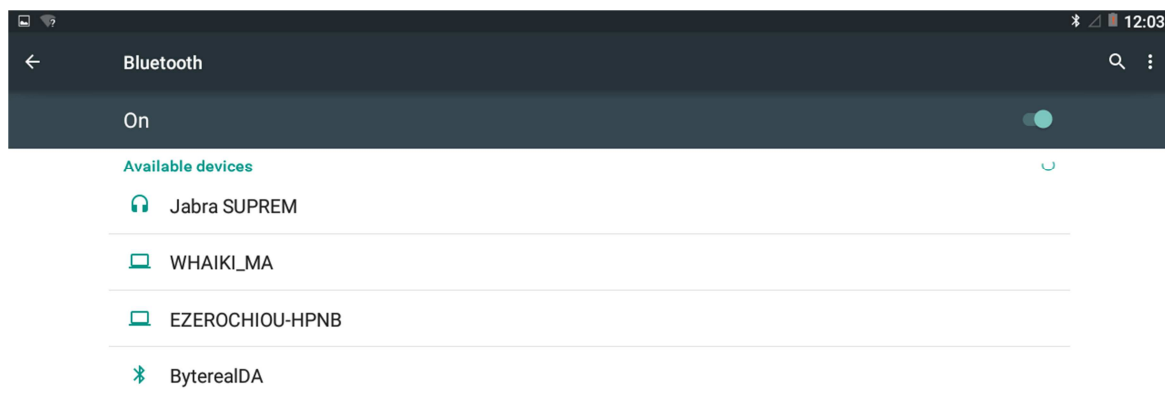
4.1.2. Enabling Bluetooth

The following sections show how to enable the Bluetooth Advanced Audio Distribution Profile (A2DP) to allow audio playback through a connected Bluetooth device as well as how to configure the Bluetooth Serial Port Profile (SPP).

4.1.2.1. Setting Up Bluetooth A2DP Profile

First, put the accessory you want to use into discovery mode. The exact way to do this depends on the accessory. If you have a headset, you may need to hold a button down on the headset for several seconds until a light starts flashing. It will only stay discoverable for a few minutes.

If you are not sure how to put your accessory into discovery mode, please refer to its manual, check the manufacturer's website, or perform a web search for instructions. To enable the Bluetooth A2DP function, go to Settings -> Bluetooth and set the switch to On to enable the Bluetooth function.



A list of local devices will appear on the screen, select the appropriate device to complete the Bluetooth pairing.

4.1.2.2. Setting Up Bluetooth SPP Profile

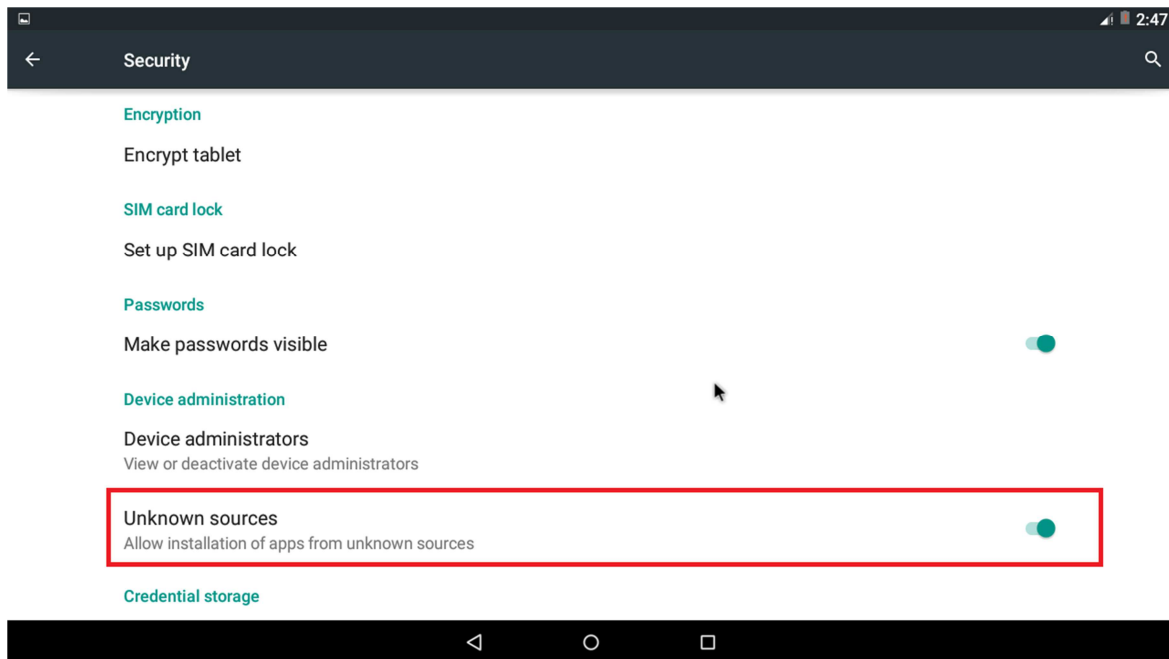
The ALTA DS 4K implements the Bluetooth Serial Port Profile allowing serial port communication between two Android devices.

Included in the ALTA DS 4K Tools folder is the BluetoothSPPTest.apk which is a simple communication application which utilizes the Bluetooth SPP Profile to transmit and receive data between two paired Android devices.

The first step is to copy the **BluetoothSPPTest.apk** onto a mass storage device such as USB thumb drive. Next, from the Settings screen, click Security -> Unknown sources to allow installation of non-Market apps.

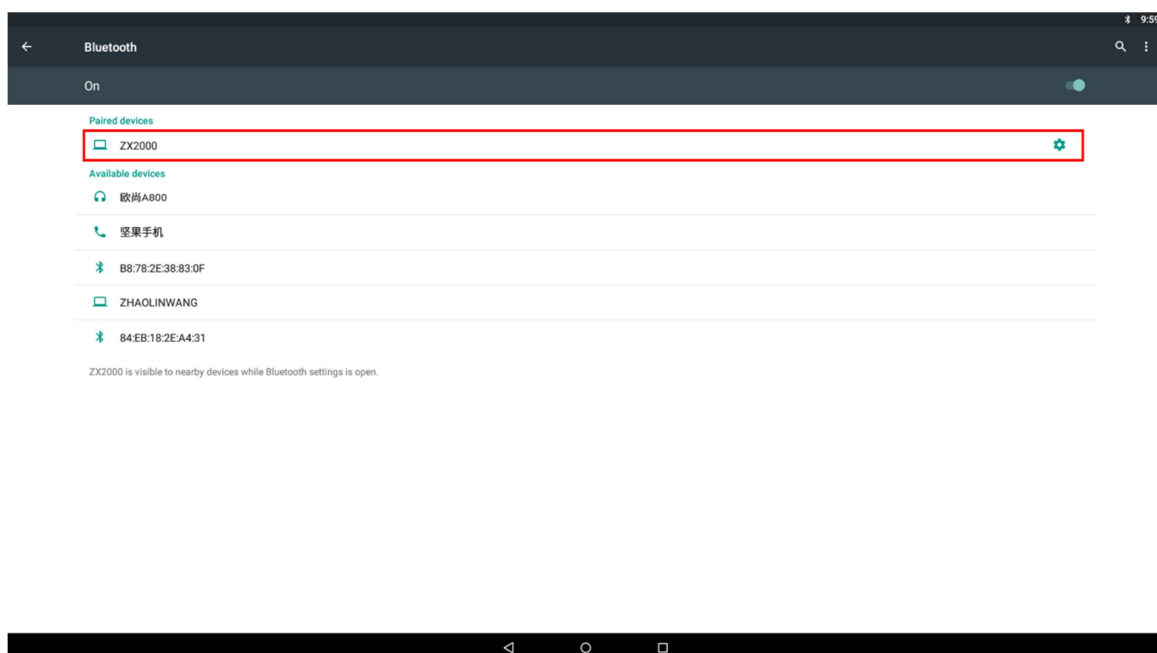
The following example will demonstrate how to use the BluetoothSPPTest.apk to communicate over the Bluetooth SPP Profile between two ALTA DS 4K systems.

First, the **BluetoothSPPTest.apk** must be installed onto each ALTA DS 4K systems. From the Settings screen, click Security -> Unknown sources and then switch on the "Unknown sources. Next, copy the **BluetoothSPPTest.apk** onto a mass storage device, such as USB thumb drive, and install the BluetoothSPPTest.apk onto both ALTA DS 4K systems.



After the installation process has completed, go to Settings -> Bluetooth -> On to enable the Bluetooth function on both ALTA DS 4K systems.

A list of local devices will then appear on each screen. From either screen, select the ALTA DS 4K device (**ZX2000**, which is the Bluetooth device name for the ALTA DS 4K system) from the list to complete the pairing process as seen in the figure below.

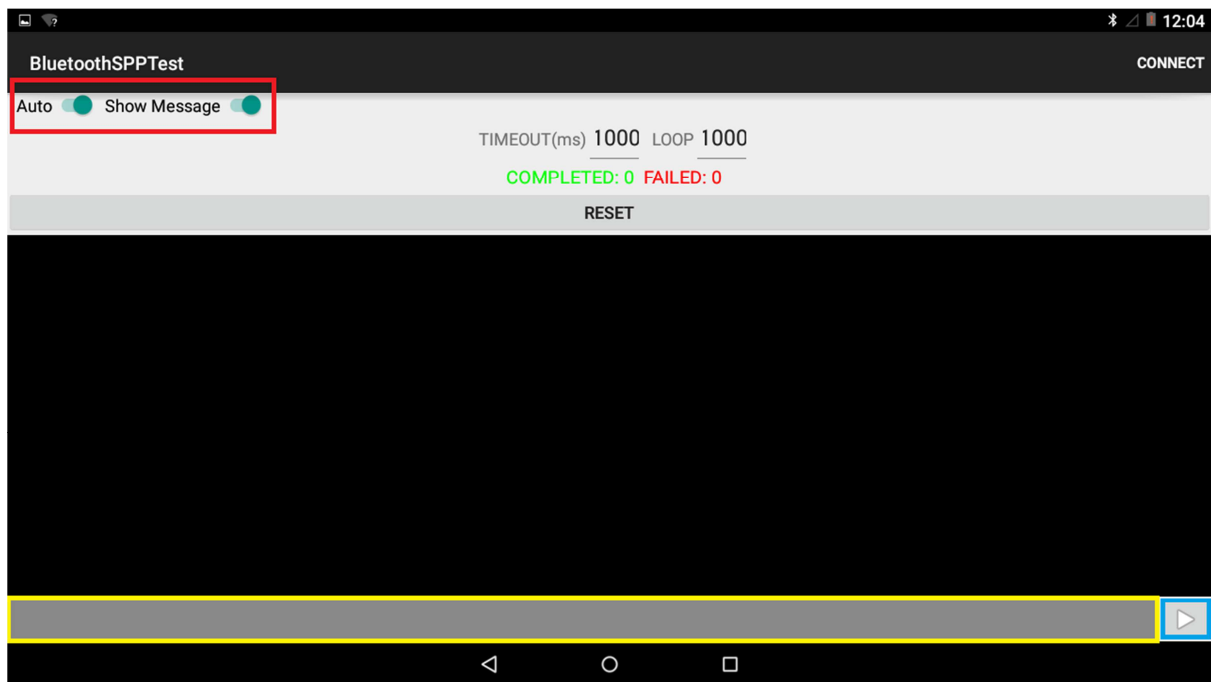


After the devices have paired, open the BluetoothSPPTest.apk on both ALTA DS 4K system systems and configure the settings as follows in both apps.

“Auto” – enabled

“Show Message” – enabled

Select **CONNECT** from either ALTA DS 4K system to create the connection between the two.



BluetoothSPPTest diagram

At the bottom of the screen, enter the data inside the bar (highlighted in the yellow frame above) and then click the play button (highlighted in the blue frame above) to send the data. The data will then be received and displayed on the other ALTA DS 4K system.



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