QUICK START GUIDE

VIA VAB-820

Android EVK v5.0.9

1.00-12202018-115700

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Revision History

Version	Date	Remarks
1.00	12/20/2018	Initial release

Table of Contents

1. Introduction 1
   1.1 EVK Package Contents 1
      1.1.1 Firmware Folder Contents 1
      1.1.2 Document Folder Contents 1
      1.1.3 Tools Folder Contents 1
   1.2 Version Information and Supported Features 2

2. Image Installation 3
   2.1 Booting from the SPI ROM with eMMC 3

3. Hardware Function 5
   3.1 Setting Up U-Boot Parameters 5
   3.2 Restoring Default U-Boot Parameters 7
   3.3 Using the Android Console 7
   3.4 Configuring Display Parameters 8
      3.4.1 Setting Up the HDMI U-Boot Display Parameter 8
      3.4.2 Setting Up the LVDS U-Boot Display Parameter 9
      3.4.3 Setting Up the Dual Display U-Boot Display Parameter 9
   3.5 Setting Up Video-in 10
   3.6 Smart ETK 11
      3.6.1 Installing Smart ETK 11
      3.6.2 Testing Watchdog Timer Function 12
      3.6.3 Testing GPIO Function 12
      3.6.4 Testing UART Function 14
      3.6.5 Testing FlexCAN Function 15
         3.6.5.1 Basic CAN Bus Function Testing 16
         3.6.5.2 Advanced CAN Bus Function Testing 17

4. Accessories 18
   4.1 Configuring the VIA VNT9271 USB Wi-Fi Dongle/VIA EMIO-1533 USB Wi-Fi Module 18
   4.2 Configuring the VIA EMIO-1541 MiniPCIe Wi-Fi Module 20
   4.3 Configuring the VIA EMIO-2531 MiniPCIe/VIA EMIO-5531 USB Wi-Fi & Bluetooth Module 21
      4.3.1 Connecting to the Internet 21
      4.3.2 Enabling Bluetooth 22
         4.3.2.1 Setting Up Bluetooth A2DP Profile 22
         4.3.2.2 Setting Up Bluetooth SPP Profile 23
   4.4 Configuring the VIA EMIO-2550 MiniPCIe Mobile Broadband Module 25
      4.4.1 Connecting to the Internet 25
      4.4.2 Enabling GPS 26

1. Introduction

This Quick Start Guide provides an overview of how to boot the Android EVK system image for the VIA VAB-820 board and configure the supported hardware function in the build.

The VIA VAB-820 Android EVK v5.0.9 is developed based on the NXP android_m6.0.1_1.0.0-ga (Android 6.0 Marshmallow) and enables the hardware features of the VIA VAB-820 board.

1.1 EVK Package Contents

There are three folders in the package as listed below.

Firmware folder	**Description**
Images_autoinstall_sd.zip	Android EVK system image and installation script files
Document folder	**Description**
VAB-820_Android_EVK_v5.0.9_Quick_Start_Guide _v1.00_20181220.pdf	Quick Start Guide
Tools folder	**Description**
VAB-820_Smart_ETK_Demo_v1.0.apk	Smart ETK demo program
BluetoothSPPTest.apk	Bluetooth SPP testing program

VIA VAB-820 Android EVK contents

1.1.1 Firmware Folder Contents

Images_autoinstall_sd.zip: contains installation script files and the precompiled U-Boot and Android image for evaluating the VIA VAB-820 board.

1.1.2 Document Folder Contents

VAB-820_Android_EVK_v5.0.9_Quick_Start_Guide _v1.00_20181220.pdf: The Quick Start Guide provides an overview of how to boot the Android EVK system image for the VIA VAB-820 board and configure the supported hardware functions in the build.

1.1.3 Tools Folder Contents

VAB-820_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 version: 2015.04
- Kernel version: 3.14.52
- Evaluation image: Android Marshmallow 6.0
- Development based on NXP android_M6.0.1_1.0.0-ga (Android 6.0 Marshmallow)
- Supports SPI with eMMC boot
- Supports HDMI display
- Supports HDMI audio output
- Supports AUO LVDS capacitive touch panels (through USB interface)
    - AUO 10.4" G104XVN01.0 (1024×768)
    - AUO 7" G070VW01 (800×480)
- Supports Dual Display (Clone Mode)
- Supports CVBS & S-Video
- Supports COM1 DTE mode, COM2 TX/RX only
- Supports two FlexCAN TX/RX
- Supports Gigabit Ethernet
- Supports Line-in, Line-out, and Mic-in
- Supports VIA VNT9271 USB Wi-Fi dongle
- Supports VIA EMIO-1533 USB Wi-Fi module
- Supports VIA EMIO-1541 miniPCIe Wi-Fi module
- Supports VIA EMIO-2531 miniPCIe Wi-Fi & Bluetooth module
    - Supports Bluetooth A2DP and SPP profile
- Supports VIA EMIO-5531 USB Wi-Fi & Bluetooth module
    - Supports Bluetooth A2DP and SPP profile
- Supports VIA EMIO-2550 miniPCIe Mobile Broadband module
- Supports Smart ETK v1.0: Watchdog timer, GPIO, UART, and FlexCAN
- Supports OTA (Over-The-Air technology)
- Supports shutdown option in Quick Settings
- Supports Ethernet configuration in Settings

2. Image Installation

The VIA VAB-820 board only provides booting from the SPI ROM with eMMC. This section explains the setup requirements for booting from the SPI ROM and eMMC.

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

2.1 Booting from the SPI ROM with eMMC

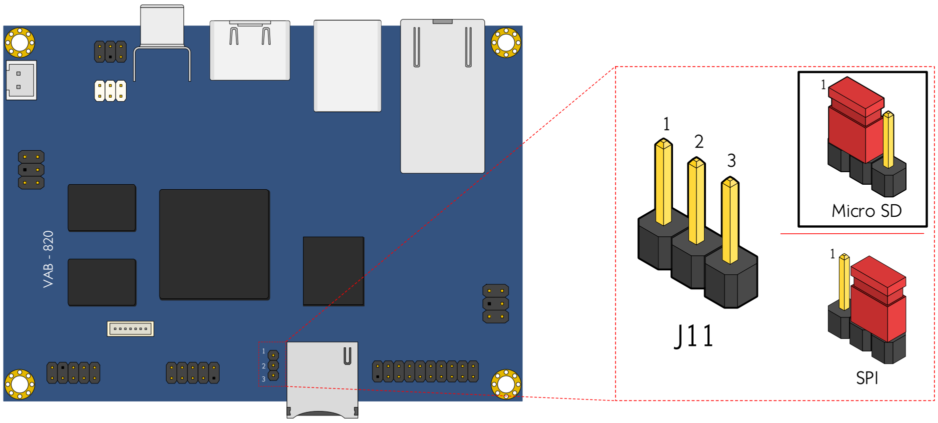
The **Images_autoinstall_sd.zip** includes two versions of the Android EVK system image (NXP i.MX6 Quad and i.MX6 Quad Plus) and the installation scripts files.

The first step is to extract the **Images_autoinstall_sd.zip** file to make a bootable Micro SD card into your Linux host machine and make sure it is not mounted. Open the terminal on your host machine. Select into the iMX6Q or iMX6QP folder to run the **mk_android6_install_sd.sh** as shown below, replacing <device name> with the correct value for the card, for example "sdb".

***Important:** Make sure you are writing to the correct device or the host system environment could be damaged.

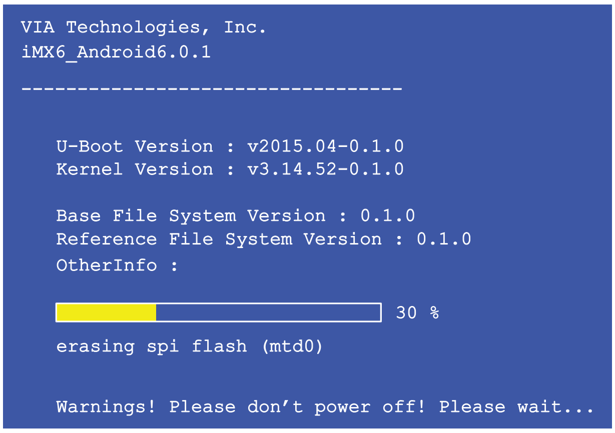
```
$ sudo ./mk_android6_install_sd.sh /dev/<device name>
```

Next, on the VIA VAB-820, set the boot flash jumper (J11) to the Micro SD position as shown below.



Boot flash jumper diagram

Insert the prepared Micro SD card into the VIA VAB-820, connect an HDMI display, and power on the VIA VAB-820 to initiate the update process automatically.

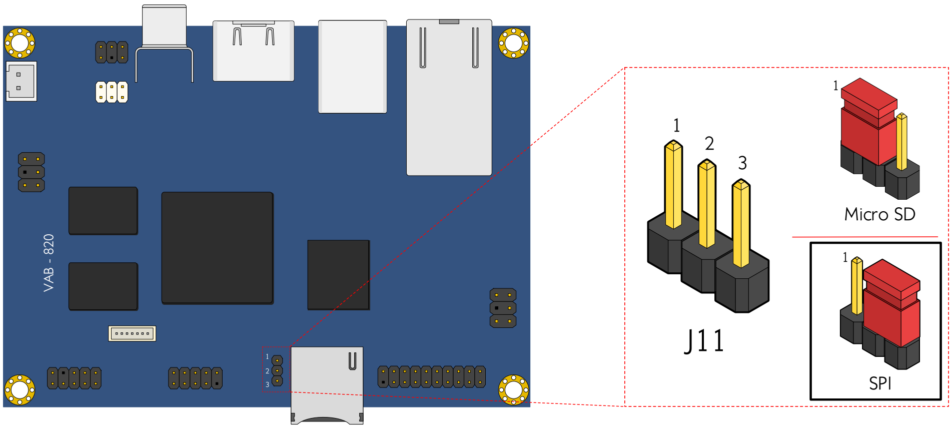


```
VIA Technologies, Inc.
iMX6_Android6.0.1

----------------------------------


   U-Boot Version : v2015.04-0.1.0
   Kernel Version : v3.14.52-0.1.0

   Base File System Version : 0.1.0
   Reference File System Version : 0.1.0
   OtherInfo :

                                 30 %

   erasing spi flash (mtd0)


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

Update process screen

When the install process is completed, unplug the power cable and remove the Micro SD card.

In order to boot from the SPI ROM make sure the boot flash jumper (J11) is set to SPI ROM boot.



Boot flash jumper diagram

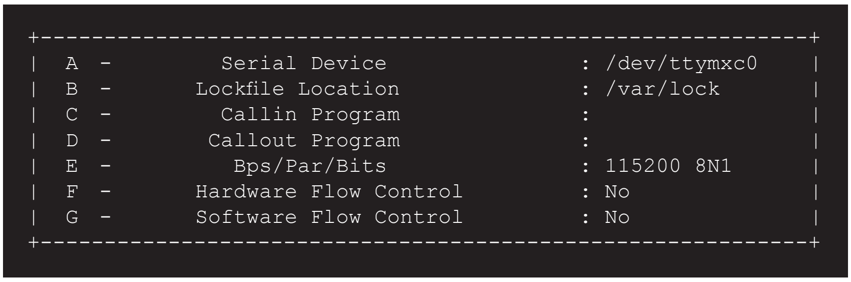
Next, power on the device to initiate the boot process. When the boot process is completed, you will see the Android desktop.

3. Hardware Function

This section explains how to enable and test the hardware functions precompiled in the VIA VAB-820 Android EVK including setting up U-Boot parameters, restoring default U-Boot parameters, using the Android console, configuring display parameters, setting up the video-in, as well as installing and applying the different functions included in the VIA Smart ETK sample program.

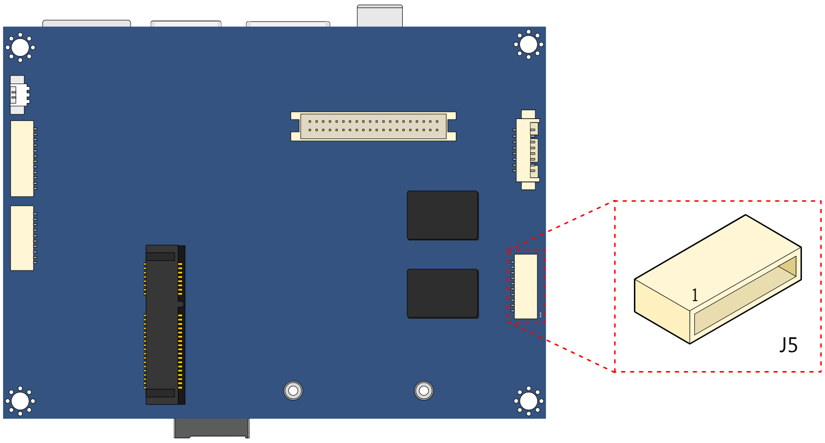
3.1 Setting Up U-Boot Parameters

When setting up the U-Boot parameters, the first step is to connect the host machine and the VIA VAB-820 through the onboard COM connector (J5). Use a serial port communication program such as PuTTY, GtkTerm, or Minicom to configure the serial port setting and 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.



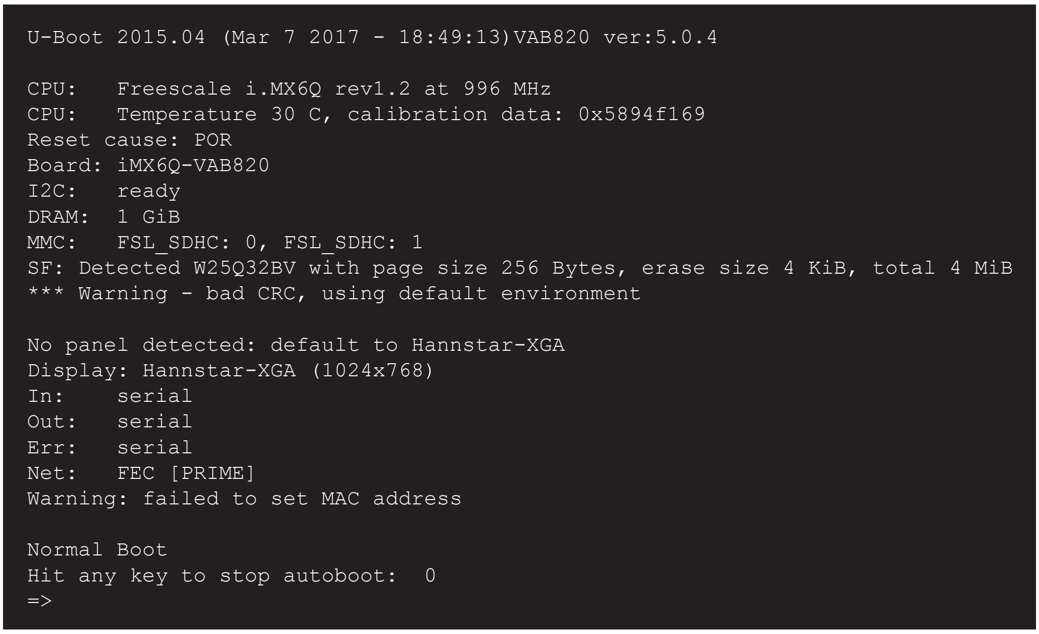
```
+-----------------------------------------------------------+
| A -          Serial Device                 : /dev/ttymxc0  |
| B -        Lockfile Location               : /var/lock     |
| C -          Callin Program                :               |
| D -         Callout Program                :               |
| E -           Bps/Par/Bits                 : 115200 8N1    |
| F -        Hardware Flow Control           : No            |
| G -        Software Flow Control           : No            |
+-----------------------------------------------------------+
```

Serial port setting of host machine



COM connector (J5) diagram

Next, power on the VIA VAB-820 to initiate the boot process. When prompted, press any key to stop the boot process and enter the U-Boot console as illustrated by the screenshot below.



```
U-Boot 2015.04 (Mar 7 2017 - 18:49:13)VAB820 ver:5.0.4

CPU:   Freescale i.MX6Q rev1.2 at 996 MHz
CPU:   Temperature 30 C, calibration data: 0x5894f169
Reset cause: POR
Board: iMX6Q-VAB820
I2C:   ready
DRAM:  1 GiB
MMC:   FSL_SDHC: 0, FSL_SDHC: 1
SF: Detected W25Q32BV with page size 256 Bytes, erase size 4 KiB, total 4 MiB
*** Warning - bad CRC, using default environment

No panel detected: default to Hannstar-XGA
Display: Hannstar-XGA (1024x768)
In:    serial
Out:   serial
Err:   serial
Net:   FEC [PRIME]
Warning: failed to set MAC address

Normal Boot
Hit any key to stop autoboot:  0
=>
```

Debug console view of boot process

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

```
=> printenv
```

Make sure the printout message is as follows:

```
=> printenv

baudrate=115200
boot_emmc_root=mmc dev ${root_media_uboot};ext2load mmc
${root_media_uboot}:${root_partition} ${loadaddr} uImage;ext2load  mmc
${root_media_uboot}:${root_partition} ${dtbaddr} imx6q-vab820.dtb;bootm ${loadaddr} -
${dtbaddr};
boot_media=booti mmc1
```

3.2 Restoring Default U-Boot Parameters

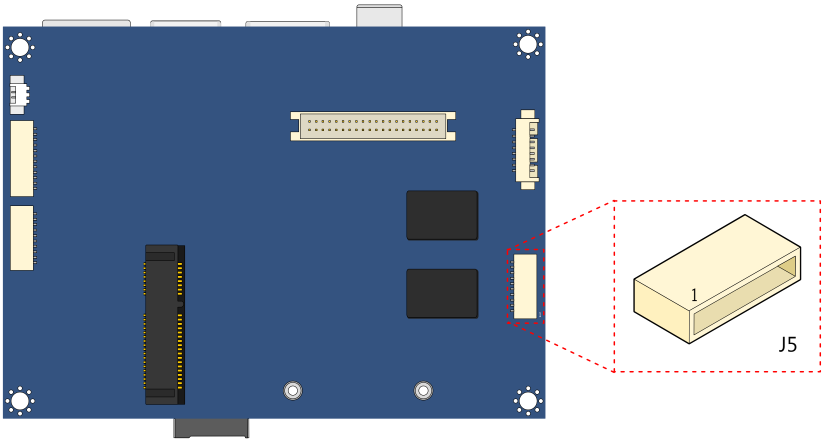
If the U-Boot parameters have been modified, the "destroyenv" command in the U-Boot console can restore the factory default settings.

To restart the device, use the “reset" commands:

```
=> destroyenv
=> saveenv
=> reset
```

3.3 Using the Android Console

The first step is to connect the host machine and the VIA VAB-820 through the onboard COM connector (J5). Use a serial port communication program such as PuTTY, GtkTerm, or Minicom to connect to the debug console.



COM connector (J5) diagram

Next, power on the VIA VAB-820 to initiate the boot process. When the boot process is completed, you will automatically log in to an Android console.

```
root@vab820_6dq:/ #
```

3.4 Configuring Display Parameters

The VIA VAB-820 Android EVK v5.0.9 supports the following display devices:

- HDMI monitor (default)
- AUO 10.4" G104XVN01.0 LVDS panel (1024x768)
- AUO 7" G070VW01 V0 LVDS panel (800x480)

3.4.1 Setting Up the HDMI U-Boot Display Parameter

To set HDMI as the display output, use the following commands:

```
=> setenv display ‘run hdmi’
=> saveenv
```

HDMI only supports CEA modes as shown in the table below.

Width	Height	Frame rate
640	480	60
720	480	60
1280	720	60
1440	240	60
1440	480	60
1920	1080	60
720	576	50
1280	720	50
1440	288	50
1440	576	50
1920	1080	50
1920	1080	24
1920	1080	25
1920	1080	30
1280	720	100
1280	720	120

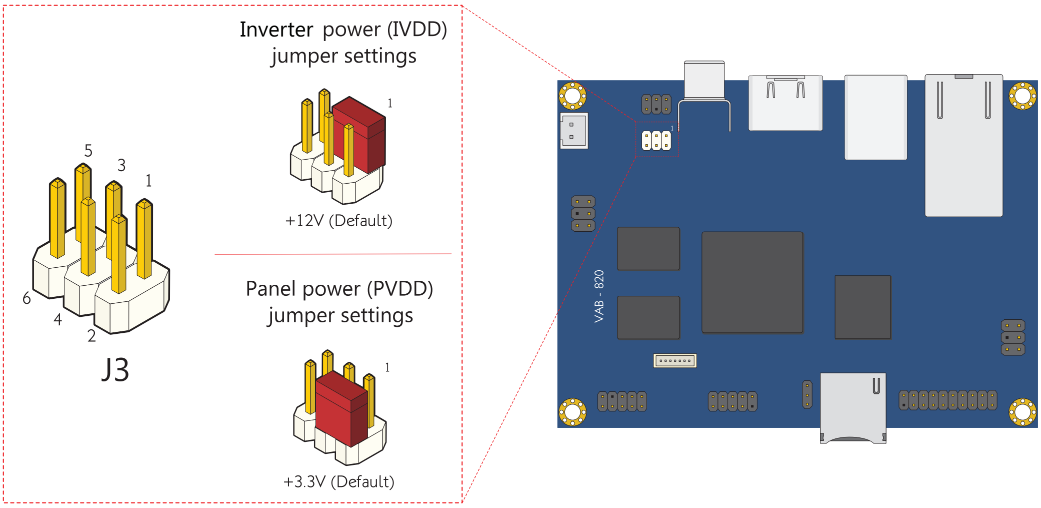
CEA modes table

For example, if you would like to set the HDMI resolution to 1280x720@60Hz, use the following commands:

```
=> setenv hdmi_timing ‘1280x720M@60,bpp=32’
=> saveenv
```

3.4.2 Setting Up the LVDS U-Boot Display Parameter

Before setting an LVDS panel as the display output, make sure the LVDS power jumper is set to +12V for LVDS inverter (backlight) power and +3.3V for LVDS panel power as shown below.



LVDS power jumper diagram

To set the AUO 10.4" G104XVN01.0 LVDS panel as the display output, use the following commands:

```
=> setenv display ‘run lvds_auo_g104’
=> saveenv
```

In order to confirm that the settings are correct, use the following command to list the new U-Boot parameters:

```
=> printenv lvds_auo_g104
lvds_auo_g104=video=mxcfb0:dev=ldb,LDB-XGA, if=RGB24 ldb=sin0
```

To set the AUO 7" G070VW01 V0 LVDS panel as the display output, use the following commands:

```
=> setenv display ‘run lvds_auo_g007’
=> saveenv
```

In order to confirm that the settings are correct, use the following command to list the new U-Boot parameters:

```
=> printenv lvds_auo_g070
lvds_auo_g070=video=mxcfb0:dev=ldb,480C60,if=RGB24 ldb=sep0
```

3.4.3 Setting Up the Dual Display U-Boot Display Parameter

The VIA VAB-820 supports clone mode with an HDMI monitor and LVDS panel. Clone mode will allow the same content to be shown on both display devices.

To set an HDMI monitor and the AUO 10.4" G104XVN01.0 (1024x768) LVDS panel, use the following commands:

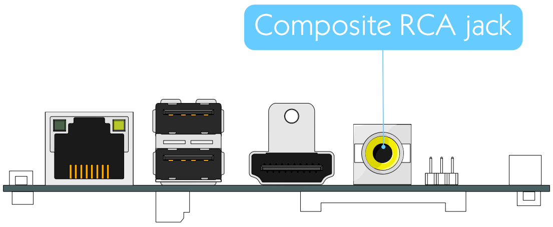
```
=> setenv display ‘run hdmi_lvds_g104’
=> saveenv
=> reset
```

To set an HDMI monitor and the AUO 7" G070VW01 V0 (800x480) LVDS panel, use the following commands:

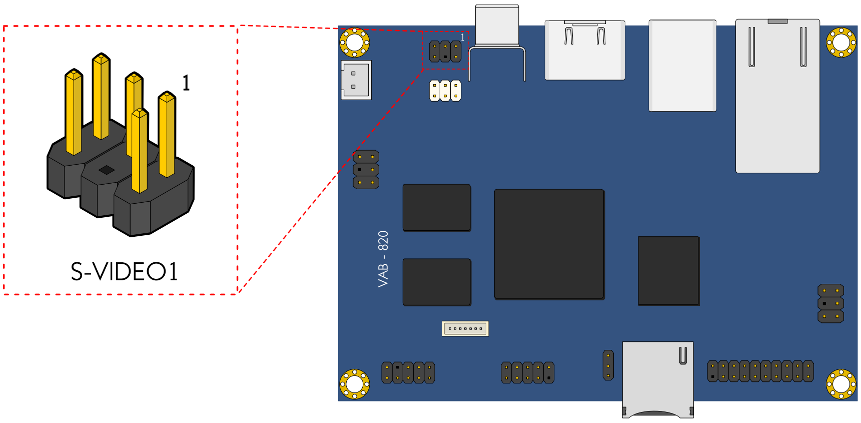
```
=> setenv display ‘run hdmi_lvds_g007’
=> saveenv
=> reset
```

3.5 Setting Up Video-in

The VIA VAB-820 supports two video inputs. The composite RCA jack is a CVBS signal input and the S-VIDEO1 pin header is an S-Video signal input. The following steps are for video-in function verification.



Composite RCA jack diagram



S-Video pin header diagram

The CVBS is the default video input.

To set the CVBS as video input source, use the following command:

```
root@vab820_6dq:/ # setprop adv7180_src 1
```

To set the S-Video as video input source, use the following command:

```
root@vab820_6dq:/ # setprop adv7180_src 2
```

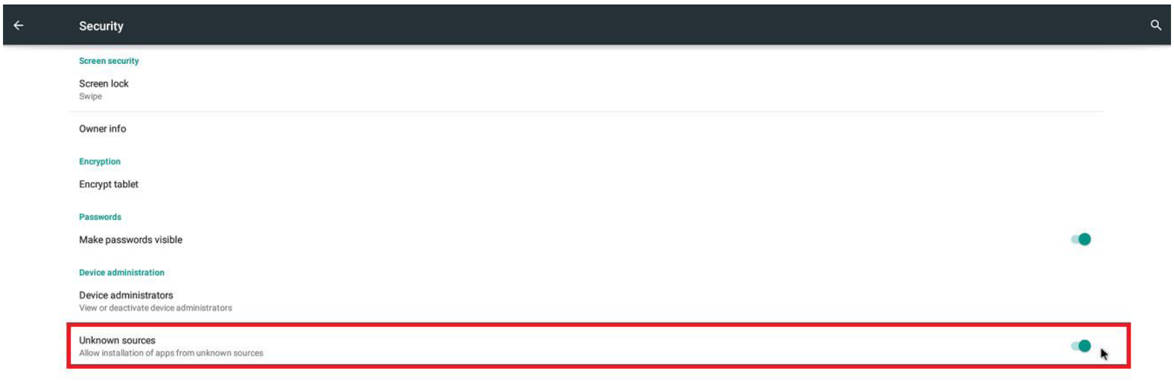
Please note that after the setup is complete, you will need to restart the camera program for the settings to be applied.

3.6 Smart ETK

The VIA VAB-820 Smart ETK supports Watchdog timer, GPIO, UART and CAN bus functions. Please follow the procedures below to experiment with the Smart ETK functions on the VIA VAB-820 board.

3.6.1 Installing Smart ETK

The first step is to copy the **VAB-820_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 switch on the "Unknown sources" as shown in the diagram below.



Security

Screen security

Screen lock
Swipe

Owner info

Encryption

Encrypt tablet

Passwords

Make passwords visible

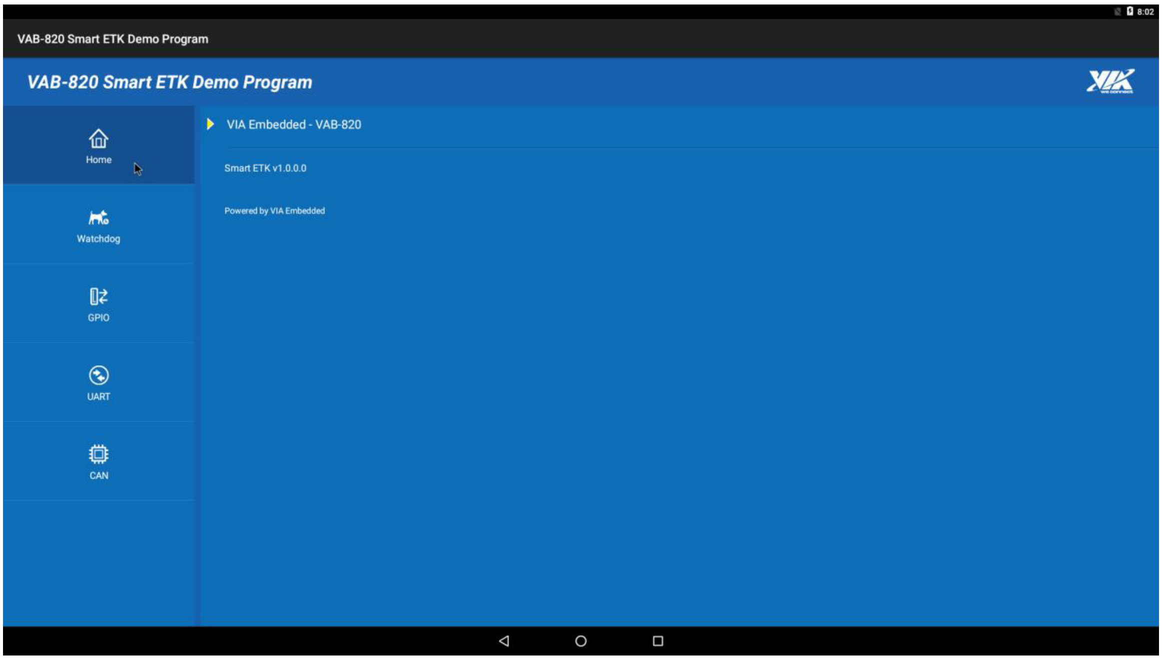
Device administration

Device administrators
View or deactivate device administrators

Unknown sources
Allow installation of apps from unknown sources

Finally, insert the USB thumb drive into the VIA VAB-820 and double click on the VAB-820_Smart_ETK_Demo_v1.0.apk file to install.

When the installation process has been completed, run the VAB-820_Smart_ETK_Demo_v1.0.apk and start to test the different functions with it.


8:02
VAB-820 Smart ETK Demo Program
VAB-820 Smart ETK Demo Program
Home
Watchdog
GPIO
UART
CAN

VIA Embedded - VAB-820

Smart ETK v1.0.0.0

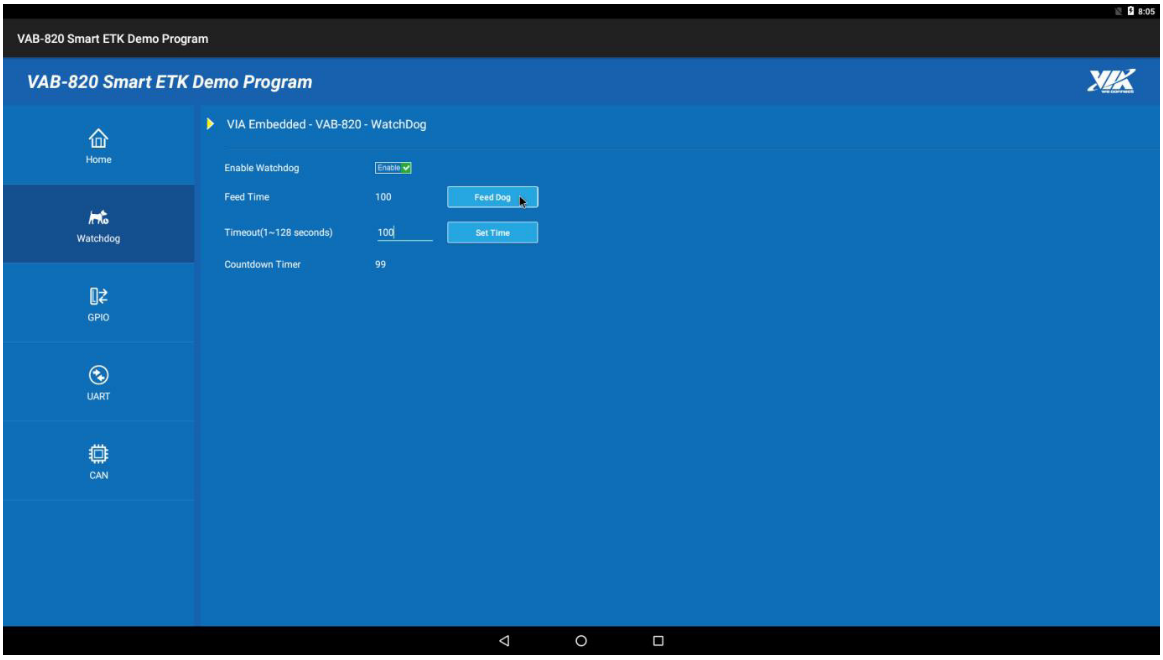
Powered by VIA Embedded

Smart ETK SDK sample screen

3.6.2 Testing Watchdog Timer Function

The Watchdog timer is an electronic timer that is used to detect and recover from system malfunctions.

The Watchdog timer includes Enable/Disable, Set Timeout, Keep Alive, and Countdown Timer functions.



VAB-820 Smart ETK Demo Program

VAB-820 Smart ETK Demo Program

VIA Embedded - VAB-820 - WatchDog

Enable Watchdog ☑ Enable

Feed Time 100

Timeout(1~128 seconds) 100

Countdown Timer 99

Smart ETK Watchdog timer diagram

A list of options will appear on the Smart ETK Demo Program page, select the appropriate option to start testing.

To test the Watchdog timer function, the first step is to enter the time value (1~128 seconds) in the Timeout setting.

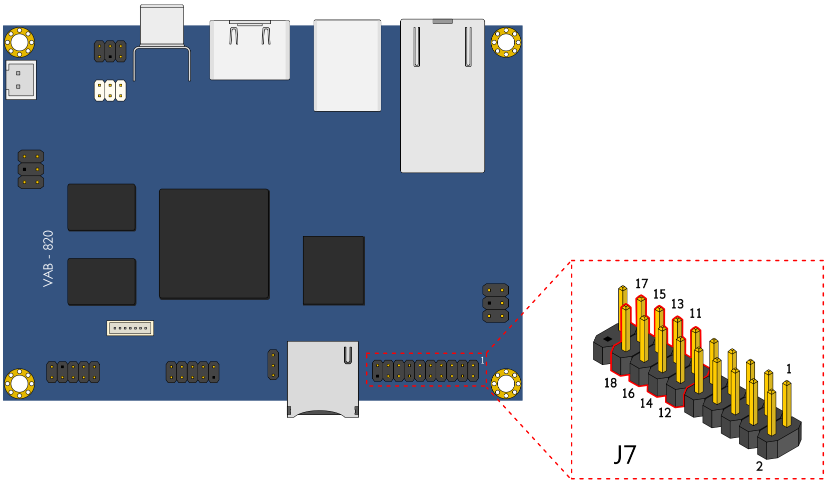
Click on the Enable/Disable button to start the Watchdog timer function.

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

Click on the STOP button to stop the Watchdog timer function.

3.6.3 Testing GPIO Function

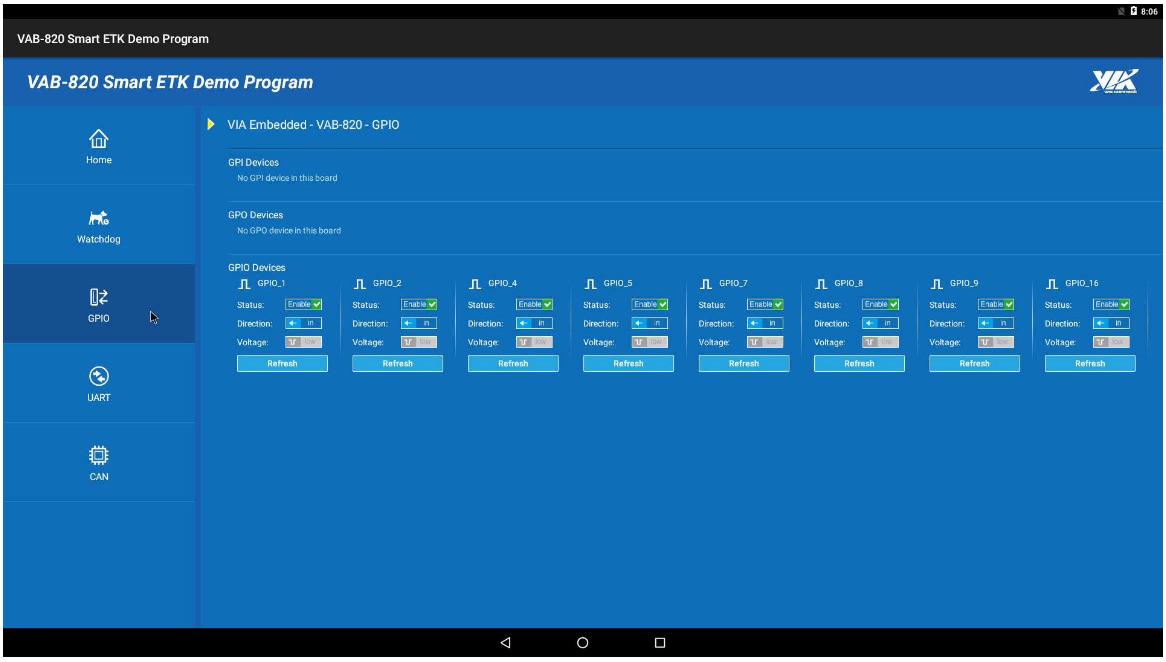
The GPIO pin header (J7) on the VIA VAB-820 consists of 19 pins. Pins 11~18 are active. The following section explains how to set up these pins for input/output communication.



GPIO pin header diagram

Pin	Signal	Pin	Signal
1	RESET_N	2	P_LED+
3	GND	4	P_LED-
5	12C3_SCL	6	W_LED+
7	12C3_SDA	8	W_LED-
9	5VIN	10	GND
11	GPIO_1	12	GPIO_7
13	GPIO_2	14	GPIO_8
15	GPIO_4	16	GPIO_9
17	GPIO_5	18	GPIO_16
19	GND	20	-

GPIO pin header pinouts table



VAB-820 Smart ETK Demo Program

VIA Embedded - VAB-820 - GPIO

GPI Devices
No GPI device in this board

GPO Devices
No GPO device in this board

GPIO Devices

	GPIO_1	GPIO_2	GPIO_4	GPIO_5	GPIO_7	GPIO_8	GPIO_9	GPIO_16
Status:	Enable ✓	Enable ✓	Enable ✓	Enable ✓	Enable ✓	Enable ✓	Enable ✓	Enable ✓
Direction:	in	in	in	in	in	in	in	in
Voltage:	low	low	low	low	low	low	low	low

Smart ETK GPIO interface diagram

First, please open the Smart ETK sample program, then from the left side select GPIO to start testing. In the demo program, pins 11~18 have been set as programmable GPIO pins.

The toggles under each pin can be used to set the desired configuration.

Enable/Disable: Sets whether the pin function is enabled or disabled.

IN/OUT: Sets whether the pin is defined as input (in) or output (out).

If you have set a GPIO pin as an input (in), the Voltage value will show whether the input voltage signal is high or low.

Voltage low: the input voltage signal is low.

Voltage high: the input voltage signal is high.

If you have set the GPIO pin as an output (out), you can then set the output voltage to high or low with the Value setting.

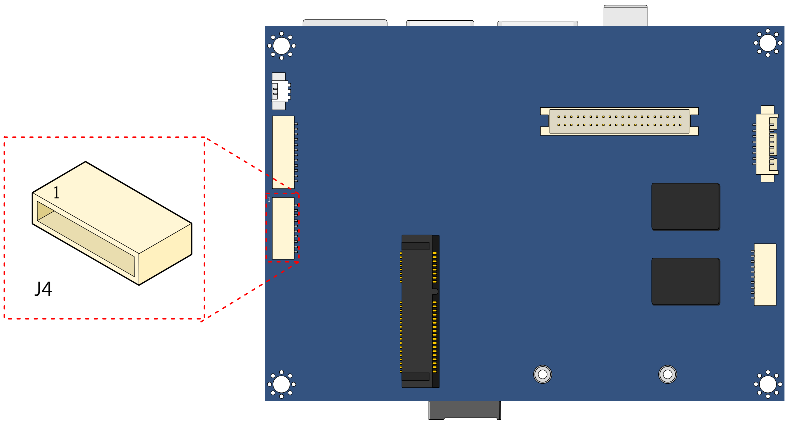
Voltage low: the output voltage signal is low.

Voltage high: the output voltage signal is high.

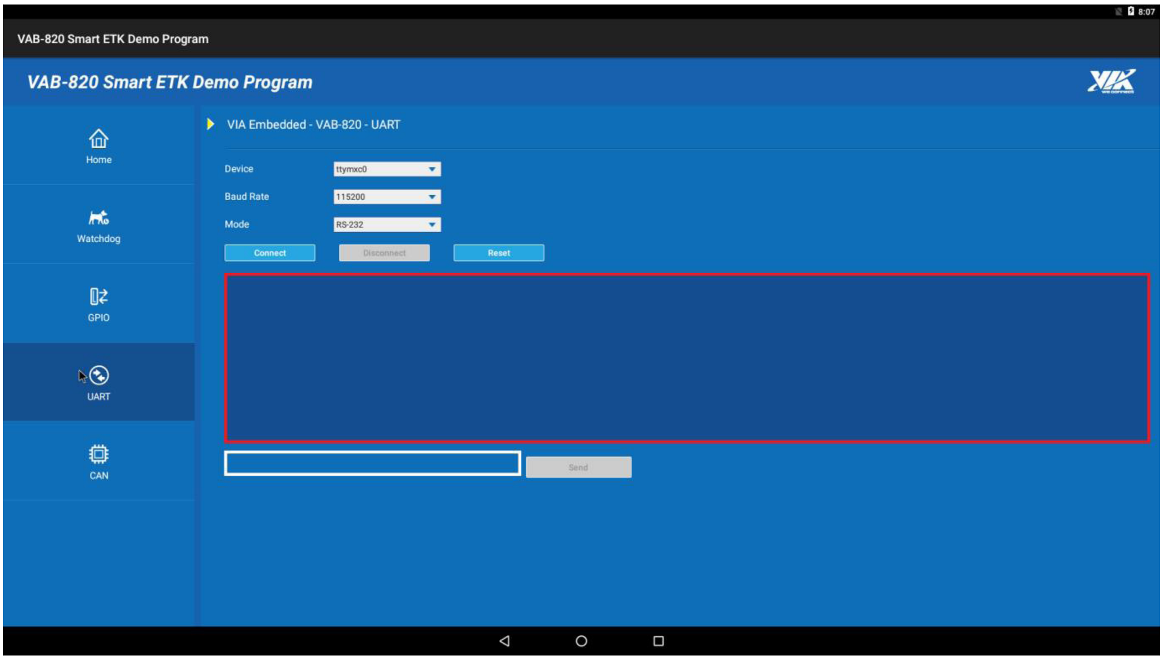
3.6.4 Testing UART Function

The VIA Smart ETK UART function supports TX/RX communication with other devices.

The first step is to connect the host machine to the COM connector (J4) on the VIA VAB-820. Next on the host machine start a serial communication program such as Putty, GtkTerm or Minicom with the same serial port setting using the appropriate serial device.



COM connector (J4) diagram



VAB-820 Smart ETK Demo Program

VAB-820 Smart ETK Demo Program

VIA Embedded - VAB-820 - UART

Device: ttymxc0

Baud Rate: 115200

Mode: RS-232

Smart ETK UART diagram

Then, please open the Smart ETK sample program. From the left side of the Smart ETK sample page, select UART.

To begin, select "ttymxc0" from the device drop-down menu and a Baud rate of "115200" for the Baud Rate drop-down menu. The VIA VAB-820 only supports "RS-232" mode.

Next, click on the Connect button to enable the UART function and start communication between the host machine and VIA VAB-820 board.

When the host machine transfers data to the VIA VAB-820, the data will be displayed inside the red frame.

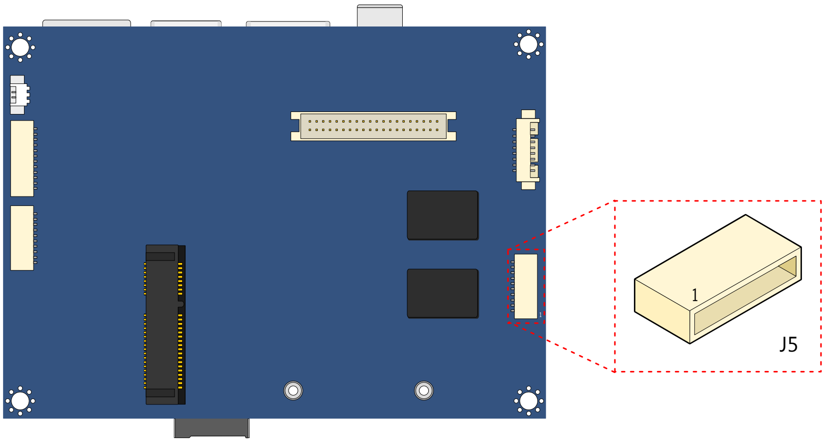
To send data from the host machine to the VIA VAB-820, you need to type the data inside the white frame and click the Send button.

Click on the Disconnect button to disable this function.

Click on the Reset button to reset this function.

3.6.5 Testing FlexCAN Function

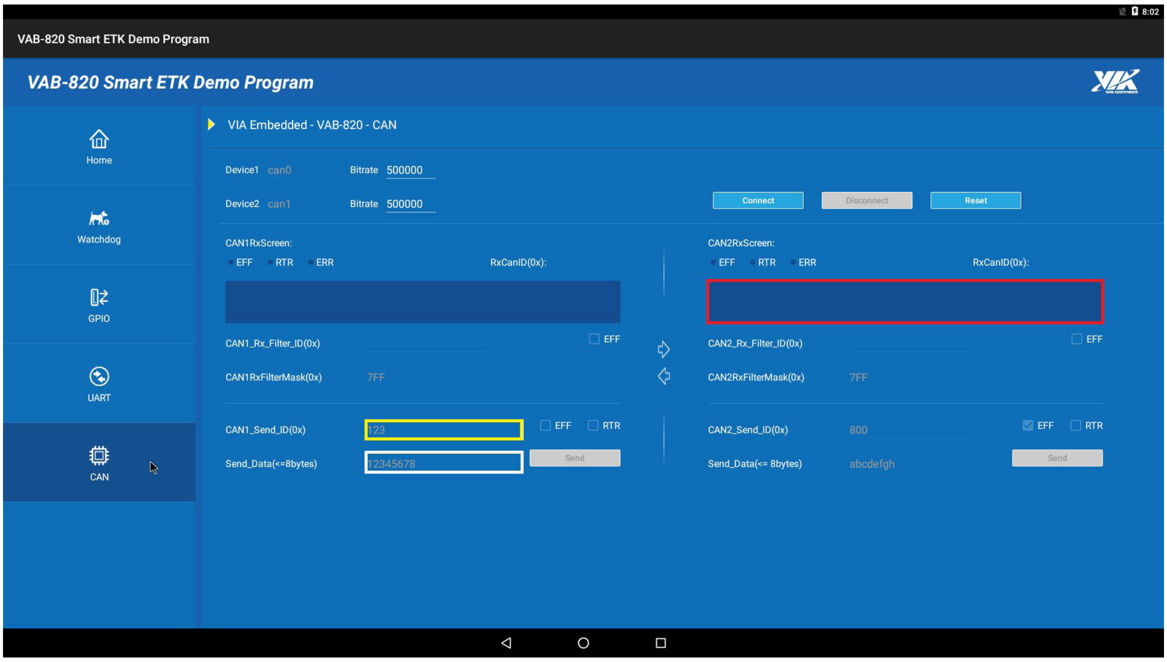
The CAN/COM connector (J5) of the VIA VAB-820 supports two CAN bus ports with FlexCAN protocol specification Version 2.0B.



CAN/COM connector (J5) diagram

Pin	Signal
1	5VIN
2	COM2 RX
3	COM2 TX
4	NC
5	NC
6	GND
7	CAN RX2
8	CAN TX2
9	CAN TX1
10	CAN RX1

CAN/COM connector (J5) pinouts table


8:02
VAB-820 Smart ETK Demo Program
VAB-820 Smart ETK Demo Program
Home
Watchdog
GPIO
UART
CAN
VIA Embedded - VAB-820 - CAN
Connect
Disconnect
Reset
CAN1RxScreen:
EFF
RTR
ERR
RxCanID(0x):
CAN2RxScreen:
EFF
RTR
ERR
RxCanID(0x):
Send
Send

Device1 can0
Bitrate 500000
Device2 can1
Bitrate 500000
CAN1_Rx_Filter_ID(0x) ☐ EFF
CAN1RxFilterMask(0x) 7FF
CAN1_Send_ID(0x) 123 ☐ EFF ☐ RTR
Send_Data(<=8bytes) 12345678
CAN2_Rx_Filter_ID(0x) ☐ EFF
CAN2RxFilterMask(0x) 7FF
CAN2_Send_ID(0x) 800 ☑ EFF ☐ RTR
Send_Data(<= 8bytes) abcdefgh

Smart ETK FlexCAN diagram

To begin, open the Smart ETK sample program and select CAN from the left side to access the Smart ETK CAN test interface.

The CAN ID frame structure is 32 bits. One frame includes: 1-bit EFF flag, 1-bit RTR flag, 1-bit ERR flag, an 18-bit extension ("identifier extension") and 11-bit identifier ("base identifier").

In order to use the identifier extension, you need to click "EFF".

If you select RTR, the RTR-bit is transmitted as a dominant bit in the Data Frame and the Data Field will be empty in the Remote Field.

3.6.5.1 Basic CAN Bus Function Testing

In order to connect the CAN bus port for testing, you need to add an additional transceiver circuit. Please visit the Texas Instruments website (**https://www.ti.com**) to search Information on "TI SN65HVD1050 CAN Bus Transceiver".

After adding an additional transceiver circuit, the next step is to connect the corresponding signals between CAN1 and CAN2 as follows:

CAN1L to CAN2L and CAN1H to CAN2H

Next, in the Smart ETK program, set a Bit rate value between 5000 and 1000000 and then press "Connect" to establish a connection.

To test if the data can be transmitted, enter an ID in the CAN1_Send_ID block and data in the Send_Data block and then click "Send".

When CAN1 transfers data to CAN2, the data will be displayed in the red block under the CAN2RxScreen section.

Click on the Reset button to reset this CAN bus function.

Click on the Disconnect button to disable this function.

3.6.5.2 Advanced CAN Bus Function Testing

For advanced testing, you will need to use the Filter_ID and FilterMask functions.

The FilterMask is used to determine which bits in the identifier of the received frame are compared with the filter. The Filter_ID is used to limit the data being sent and received through the CAN bus.

***Note:** The Filter_ID and FilterMask must be typed in hexadecimal values.

If a mask bit is set to zero, the corresponding ID bit will automatically be accepted, regardless of the value of the filter bit.

If a mask bit is set to one, the corresponding ID bit will be compared with the value of the filter bit.

If they match, it is accepted otherwise the frame is rejected.

There are four examples using hexadecimal values below.

Example 1

You wish to only accept frames with an ID number of 00001567.

Set the Filter_ID to 00001567 and the FilterMask to 1FFFFFFF.

When a frame arrives, its ID is compared with the filter and all bits must match; any frame that does not match ID 00001567 is rejected.

Example 2

You wish to only accept frames with ID numbers 00001560 thru to 0000156F.

Set the Filter_ID to 00001560 and the FilterMask to 1FFFFFF0.

When a frame arrives, its ID is compared with the filter and all bits except bits 0 to 3 must match; any other frame is rejected.

Example 3

You wish to only accept frames with ID numbers 00001560 thru to 00001567.

Set the Filter_ID to 00001560 and the FilterMask to 1FFFFFF8.

When a frame arrives its ID is compared with the filter and all bits except bits 0 to 2

must match; any other frame is rejected.

Example 4

You wish to accept any frame.

Set the Filter_ID to 0 and FIlterMask to 0.

All frames are accepted.

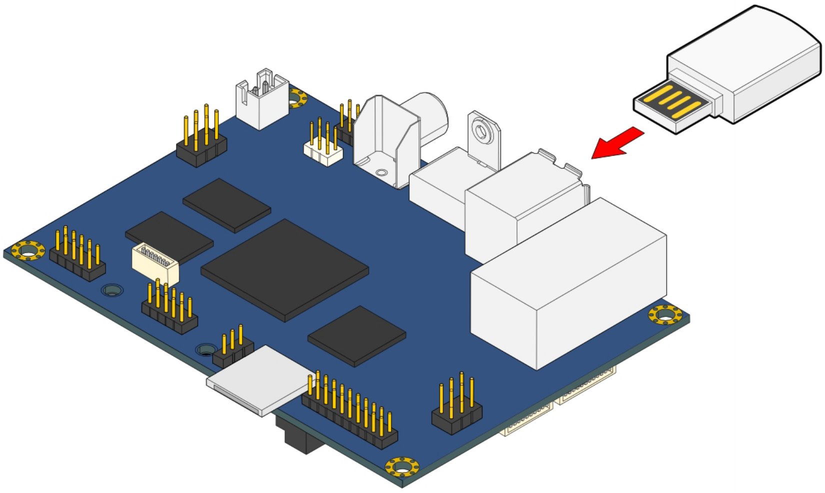
4. Accessories

This section explains how to install and configure the various USB dongle and EMIO modules available for the VIA VAB-820 board.

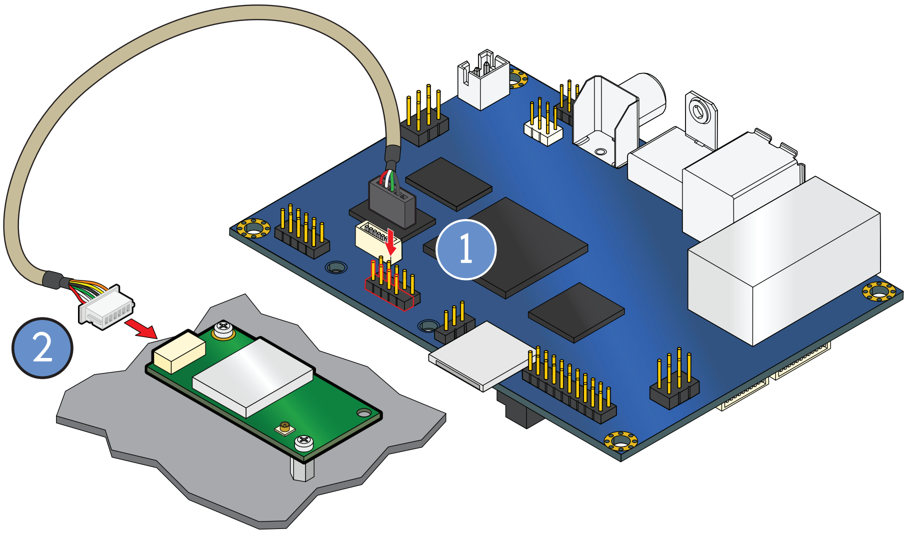
4.1 Configuring the VIA VNT9271 USB Wi-Fi Dongle/ VIA EMIO-1533 USB Wi-Fi Module

The VIA VNT9271 dongle and VIA EMIO-1533 module supports Wi-Fi functionality through a USB port or onboard USB pin header connection respectively.

The first step is to insert the VIA VNT9271 dongle into a USB port or connect the VIA EMIO-1533 module to the onboard USB pin header (J8) using the USB cable (P/N: 99G3-190042). After installing the module, connect the provided antenna. Next, make sure to unplug any LAN cables or other Wi-Fi/3G modules you have installed. Finally, power on the VIA VAB-820.

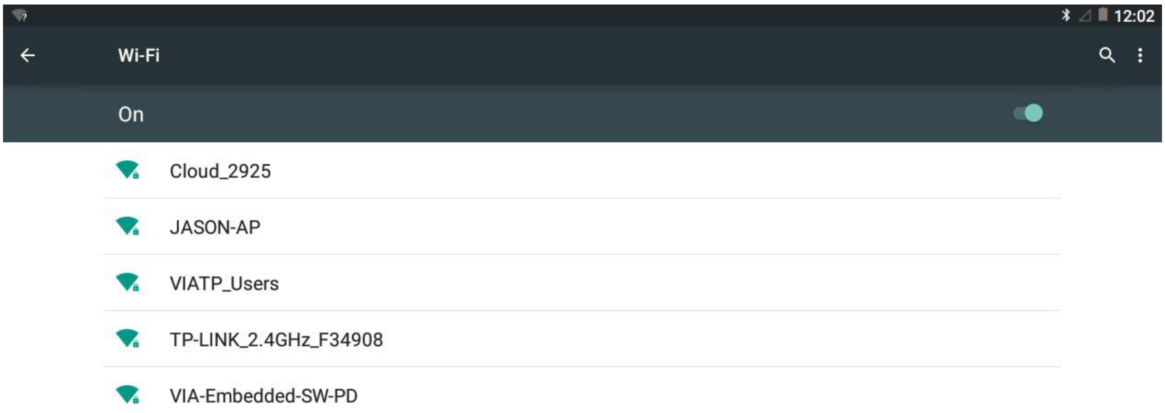


Inserting the VIA VNT9271 dongle



Connecting the VIA EMIO-1533 module

To enable the Wi-Fi, go to Settings -> Wi-Fi-> On.


12:02
Wi-Fi
On
Cloud_2925
JASON-AP
VIATP_Users
TP-LINK_2.4GHz_F34908
VIA-Embedded-SW-PD

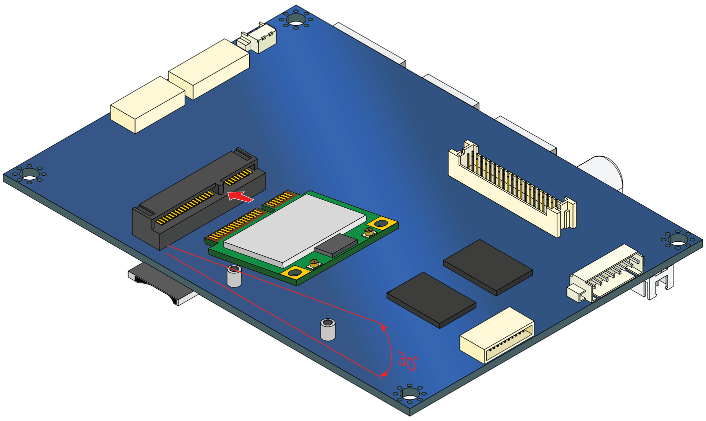
A list of Wi-Fi connections will appear on the screen. Select the appropriate device to complete the Wi-Fi connection.

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

4.2 Configuring the VIA EMIO-1541 MiniPCIe Wi-Fi Module

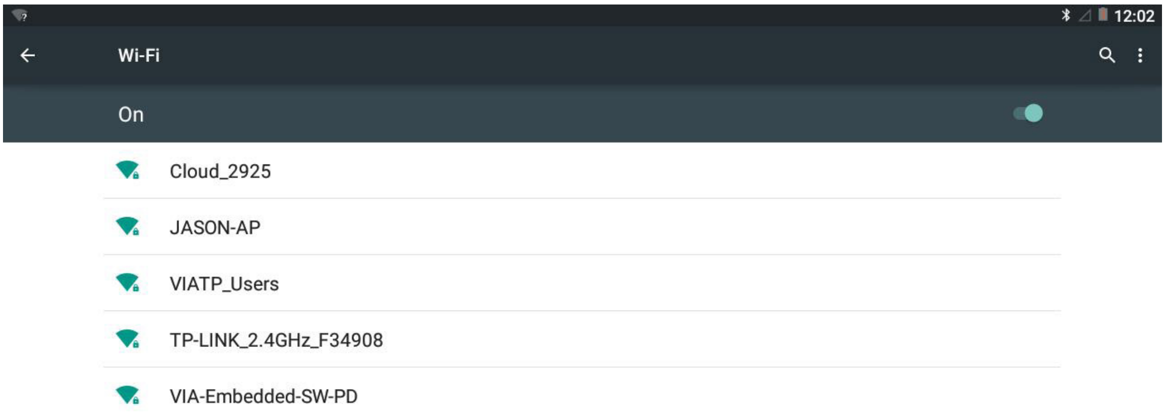
The VIA EMIO-1541 module supports Wi-Fi through the onboard miniPCIe slot.

The first step is to insert the VIA EMIO-1541 module into the miniPCIe slot. After installing the module, connect the provided antenna to the module. Next, make sure to unplug any LAN cables or USB Wi-Fi dongles you have installed. Finally, power on the VIA VAB-820.



Inserting the VIA EMIO-1541 module

To enable Wi-Fi, go to Settings -> Wi-Fi-> On.



On

Cloud_2925

JASON-AP

VIATP_Users

TP-LINK_2.4GHz_F34908

VIA-Embedded-SW-PD

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

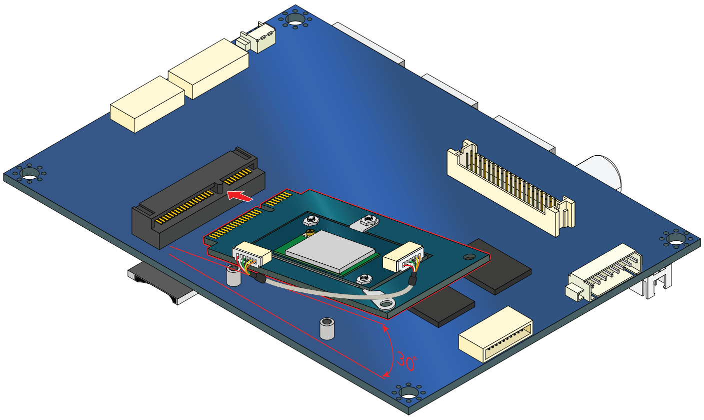
When the connection is created, connect to the internet through your web browser

4.3 Configuring the VIA EMIO-2531 MiniPCIe/VIA EMIO-5531 USB Wi-Fi & Bluetooth Module

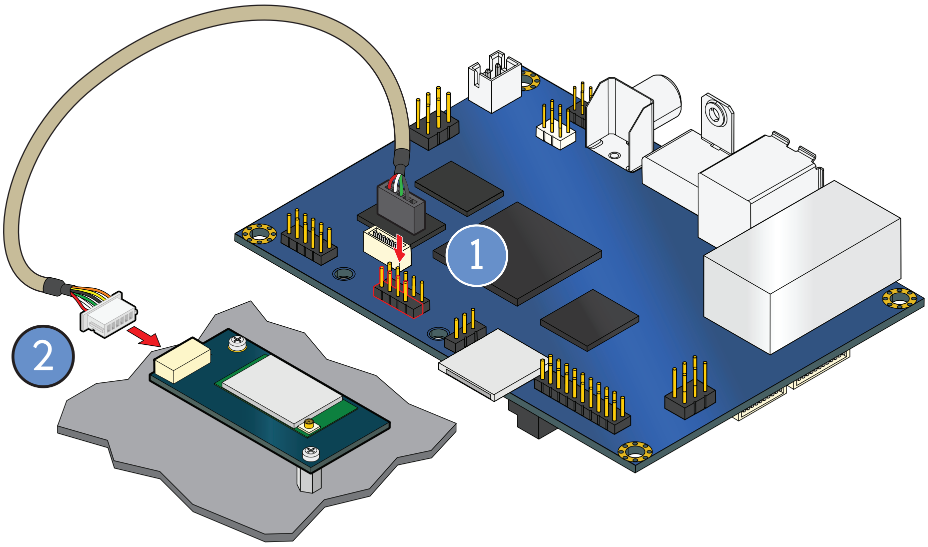
The VIA EMIO-2531 module and VIA EMIO-5531 module supports Wi-Fi and Bluetooth functions.

4.3.1 Connecting to the Internet

The first step is to insert the VIA EMIO-2531 module into the miniPCIe slot or connect the VIA EMIO-5531 module to the onboard USB pin header (J8) 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/3G modules you have installed. Finally, power on the VIA VAB-820.

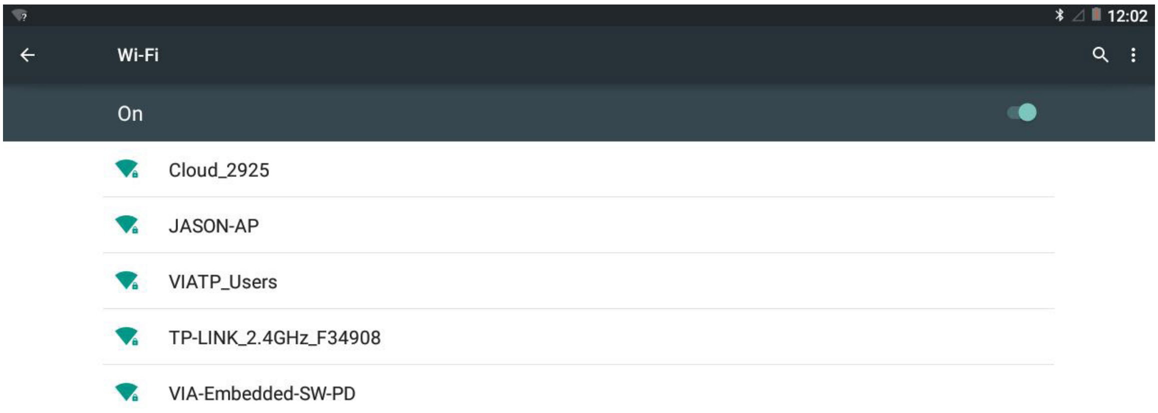


Inserting the VIA EMIO-2531 module



Connecting the VIA EMIO-5531 module

To enable Wi-Fi, go to Settings -> Wi-Fi-> On.



Cloud_2925

JASON-AP

VIATP_Users

TP-LINK_2.4GHz_F34908

VIA-Embedded-SW-PD

A list of Wi-Fi connections 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.

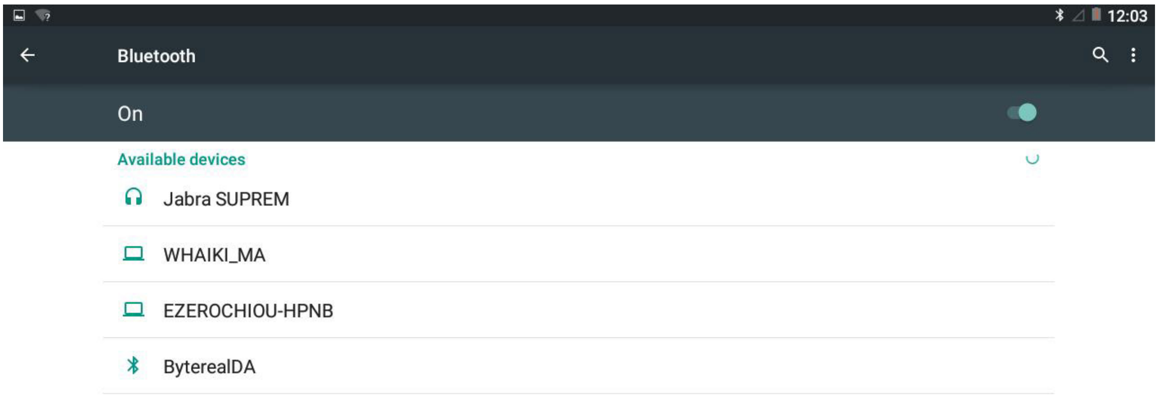
4.3.2 Enabling Bluetooth

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).

4.3.2.1 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.



Jabra SUPREM

WHAIKI_MA

EZEROCHIOU-HPNB

ByterealDA

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

4.3.2.2 Setting Up Bluetooth SPP Profile

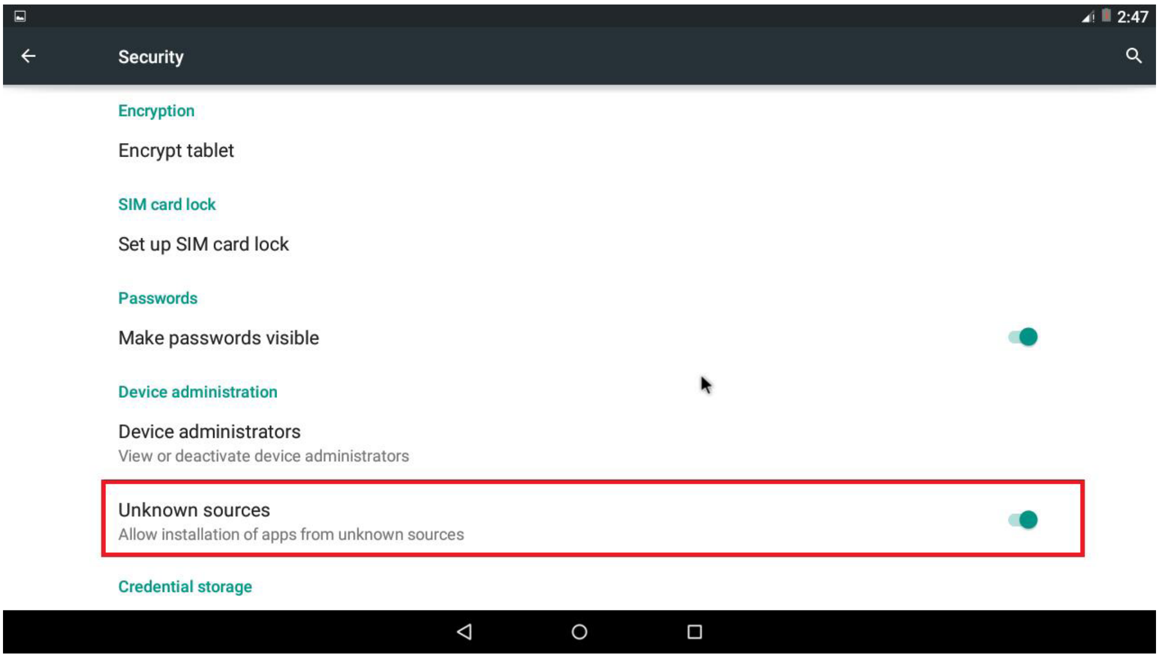
The VIA VAB-820 implements the Bluetooth Serial Port Profile allowing serial port communication between two Android devices.

Included in the VIA VAB-820 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 VIA VAB-820 boards.

First, the **BluetoothSPPTest.apk** must be installed onto each VIA VAB-820 board. 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 VIA VAB-820 boards.



Encryption

Encrypt tablet

SIM card lock

Set up SIM card lock

Passwords

Make passwords visible

Device administration

Device administrators

View or deactivate device administrators

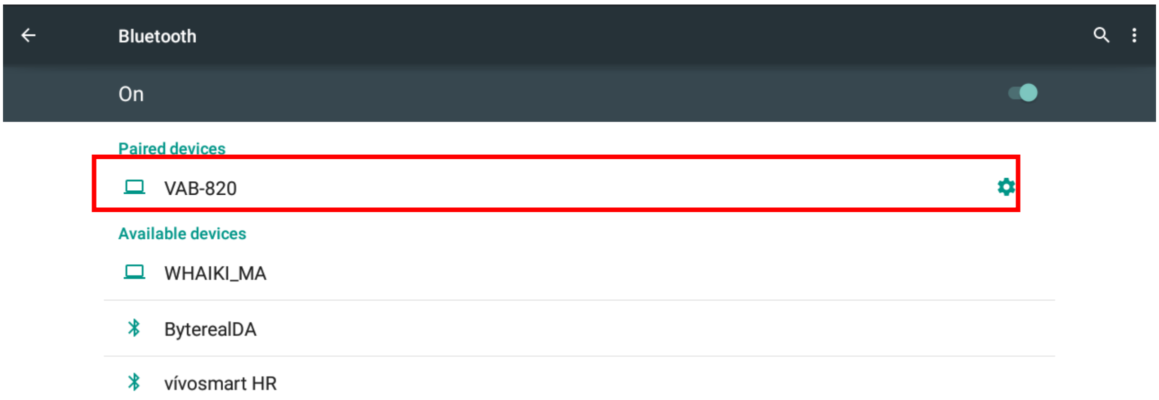
Unknown sources

Allow installation of apps from unknown sources

Credential storage

After the installation process has been completed, go to Settings -> Bluetooth -> On to enable the Bluetooth function on both VIA VAB-820 boards.

A list of local devices will then appear on each screen. From either screen, select the VIA VAB-820 board from the list to complete the pairing process as seen in the figure below.



On

Paired devices

VAB-820

Available devices

WHAIKI_MA

ByterealDA

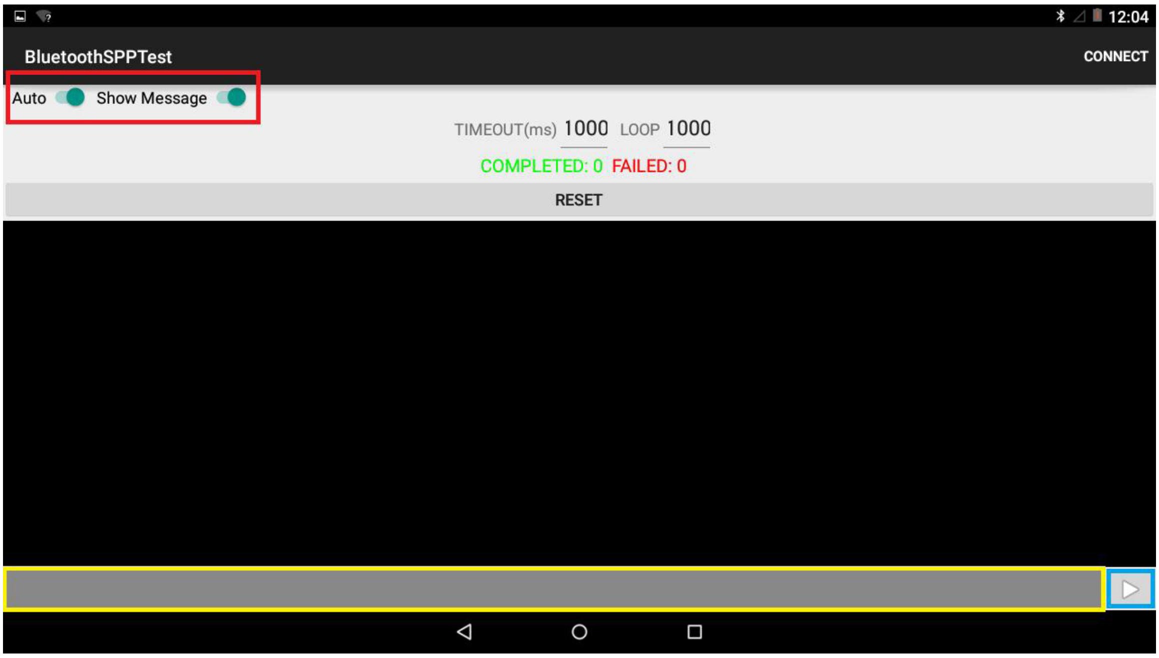
vívosmart HR

After the devices have paired, open the BluetoothSPPTest.apk on both VIA VAB-820 boards and configure the settings as follows in both apps.

"**Auto**" – enabled

"**Show Message**" – enabled

Select **CONNECT** from either VIA VAB-820 board to create the connection between the two. Both VIA VAB-820 boards can communicate over the Bluetooth SPP Protocol.



12:04
BluetoothSPPTest
CONNECT
Auto
Show Message
TIMEOUT(ms) 1000
LOOP 1000
COMPLETED: 0
FAILED: 0
RESET

BluetoothSPPTest diagram

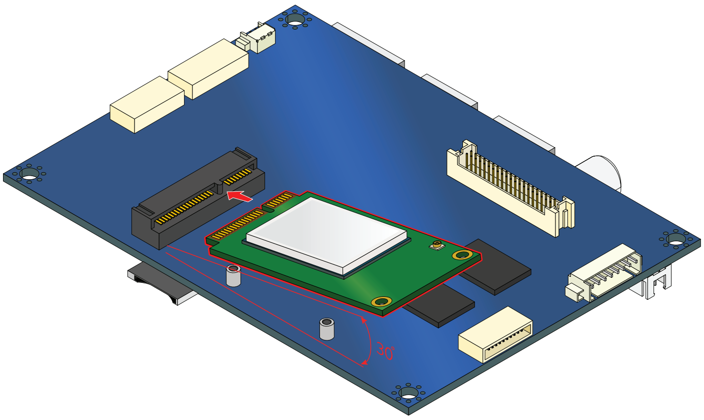
At the bottom of the screen, enter the data inside the bar (highlighted in the yellow frame above) and then click the play button (highlighted in the blue frame above) to send the data. The data will then be received and displayed on the other VIA VAB-820 board.

4.4 Configuring the VIA EMIO-2550 MiniPCIe Mobile Broadband Module

The VIA EMIO-2550 miniPCIe Mobile Broadband module supports 3G and GPS functions.

4.4.1 Connecting to the Internet

The first step is to insert an active SIM card into the VIA EMIO-2550 module, and then insert the VIA EMIO-2550 module into the miniPCIe slot. After installing the module, connect the provided antenna to the module. Next, make sure to unplug any LAN cables or USB Wi-Fi dongles you have installed. Finally, power on the VIA VAB-820.



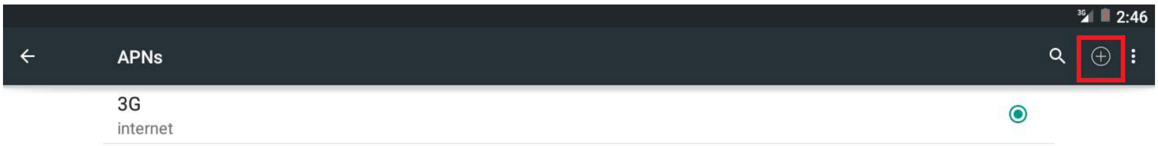
Inserting the VIA EMIO-2550 module

To check that the system has been correctly detected the VIA EMIO-2550 module, use the following command:

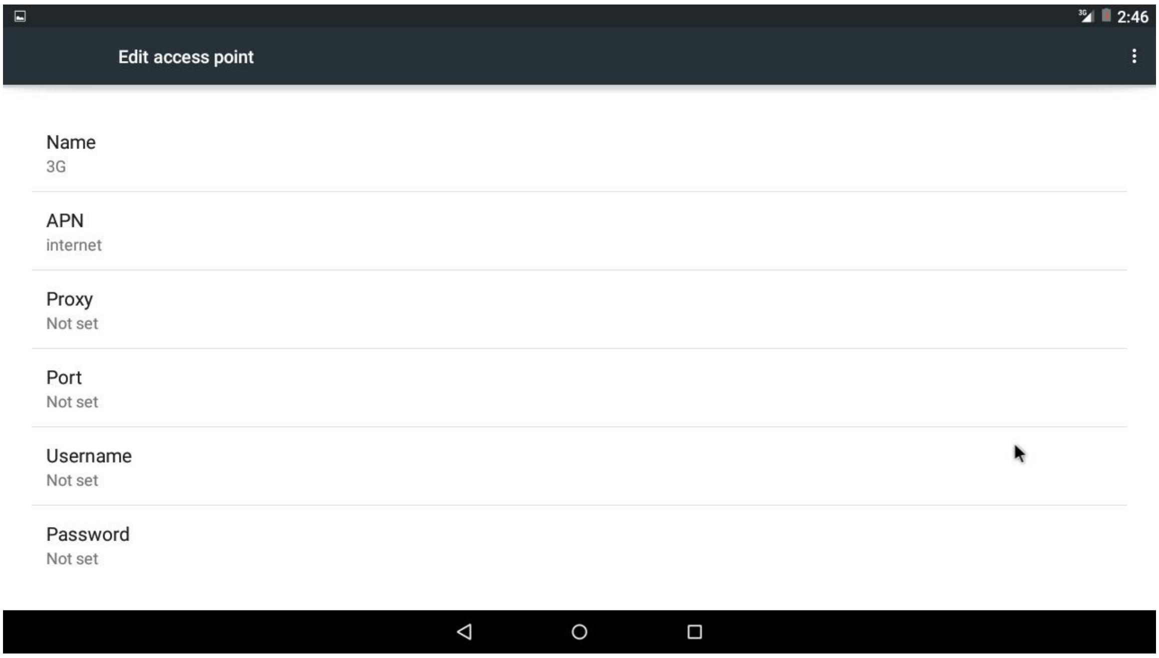
```
root@vab820_6dq:/ # busybox ifconfig
```

Make sure the printout message includes "ppp0 Link encap: Point-to-Point Protocol".

To enable 3G, go to Settings->Wireless & networks-> More -> Cellular network ->Access Point Names. Next, click the plus button to add your APNs setting.



Fill in the required fields for the APNs setting. If you are unsure of what the required fields and value are, check with your Mobile Broadband provider.


2:46
Edit access point

Name
3G

APN
internet

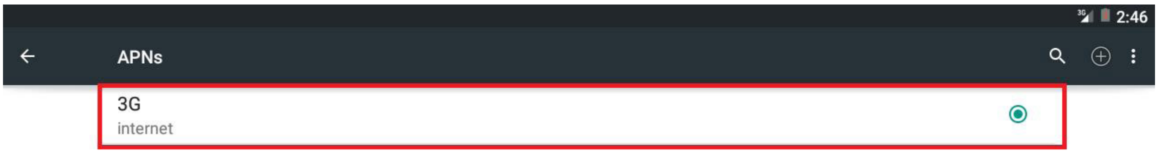
Proxy
Not set

Port
Not set

Username
Not set

Password
Not set

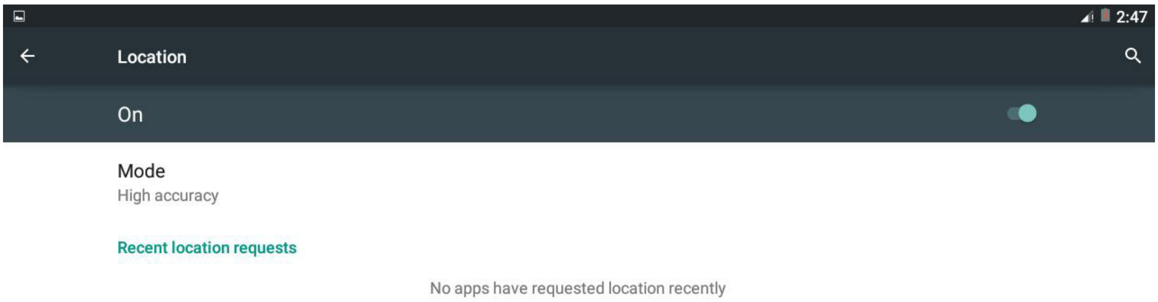
When the APNs setting is completed, click your APNs to enable the 3G network. Next, open the browser to connect to the internet.



3G
internet ●

4.4.2 Enabling GPS

To enable GPS, go to Settings-> Location -> On.

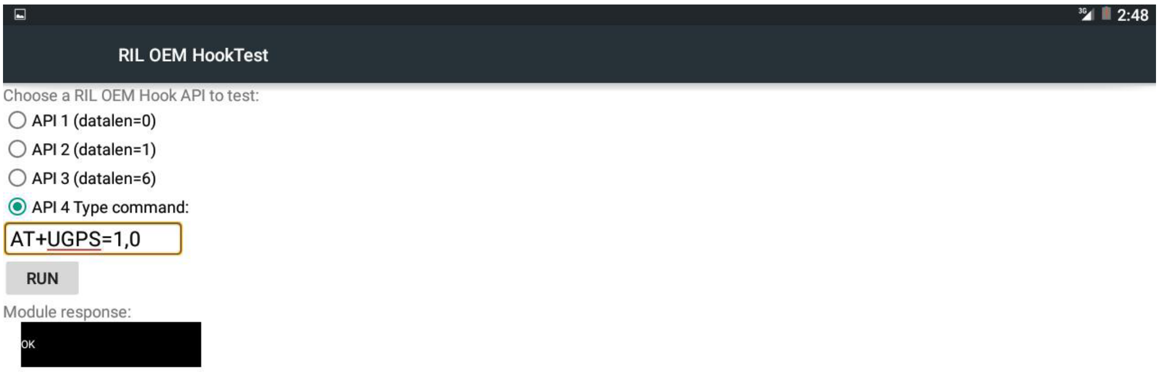

2:47
Location
On
Recent location requests

Mode
High accuracy

No apps have requested location recently

Next, go to Settings-> Wireless & networks-> More -> RIL OEM Hook Test -> API 4 Type command. Full in "AT+UGPS=1.0" and click RUN button.

Wait for the "OK" message and open the GPS program.



2:48
RIL OEM HookTest
RUN

Choose a RIL OEM Hook API to test:

○ API 1 (datalen=0)

○ API 2 (datalen=1)

○ API 3 (datalen=6)

● API 4 Type command:

AT+UGPS=1,0

Module response:

```
OK
```

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