LIBRE
WIRELESS TECHNOLOGIES

LIBRE SYNC

User Guide
Module: LS9-AC11DBT

Rev: 3.3.1

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Document Revision History

Revision	Date	Description of change
3.3	March 7, 2016	Updated Section 2.1 with Setup Button information.
3.2	February 10, 2016	Updated Section 3.1 “Firmware Upgrade Using USB Method”.
3.1	February 1, 2016	Updated section 5 “ Configuring Non-Volatile-Item” Updated section 6 “ Features” • DDMS • Libre APP • DLNA / DMR Playback • Device Name Configuration • Wi-Fi Scan Result • Music Services
3.0	January 22, 2016	Updated Section 3 “Firmware Upgrade” Added Section 3.1.3 and 3.2
2.9	January 18, 2016	Updated EVK setup procedure
2.8	December 4, 2015	Included SPDIF NV-Item
2.7	December 31, 2015	Updated Airplay, TCP / IP Tunneling sections
2.6	December 24, 2015	Fixed review comments
2.5	December 23, 2015	Fixed review comments

1. Introduction

Libre Wireless provides evaluation kit (EVK) for users to gain familiarity with our products and expedite their own design and development. User can connect to LS9 module through USB, or wireless interface to configure the module, manage the on board device on the module, and perform functional test.

1.1. User Guide Insight

This document provides information on the procedures to be followed while using LibreSync for various purpose such as,

- Firmware update
- Network Configuration
    - WAC / SAC Method
    - Webserver Method
        - Web page method
        - LS-Connect Method
        - Manual Configuration Method
- Configuring Non-Volatile Items
- Streaming Airplay / Cast For Audio / Spotify Connect
- Source Switching
- Software Security
- DDMS
- DLNA / DMR
- Wi-Fi Scan Results
- Music Services
- LUCI

- AUX Support
- Bluetooth Support
- TCP / IP Tunneling
- Device Name Configuration

2. Libre Wireless Technologies' EVK

Figure 2-1 Marks different components of the LS9 Module

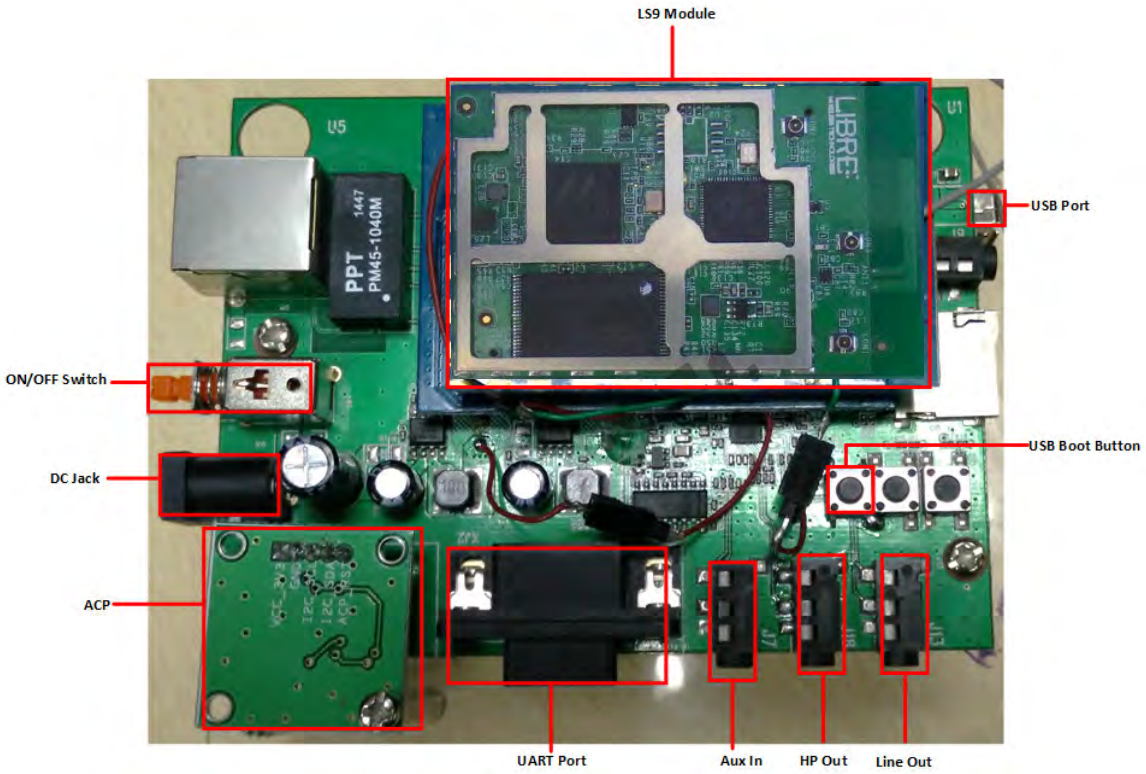


Figure 2-1: LS9 Module (v1.0) Interfaces

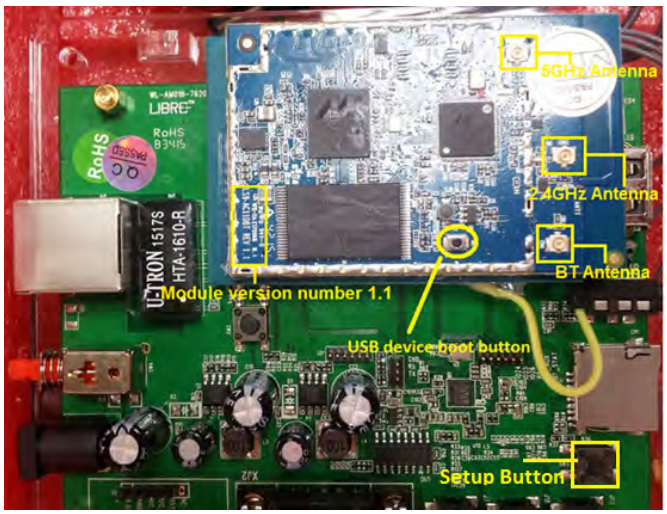


Figure 2-2: LS9 Module (v1.1) Interfaces

2.1. LS9 EVK Setup

To setup the LS9 EVK and Get Started proceed as below.

> **Note:** ACP is not provided along with Libre EVK. It is recommended to buy "**ACP-V2.0C"**. from Apple Inc.

Connect the LS9 module to LS9 Bridge-Board.

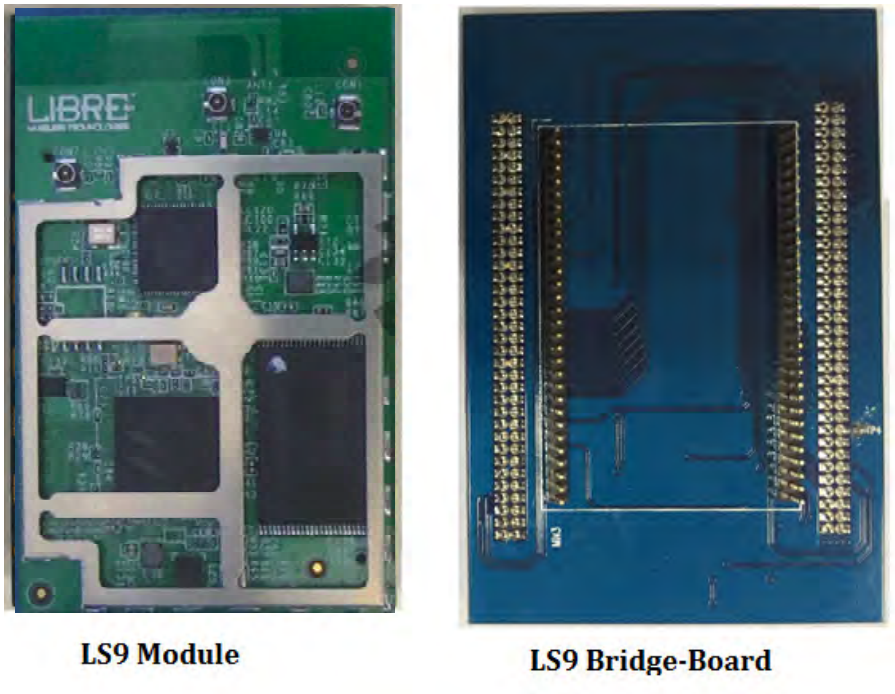


Figure 2.1-1: LS9 Module and LS9 Bridge-Board

Insert LS9 Bridge-Board and LS9 module on LS9-EVK.

Insert ACP on LS9 EVK.

See section 7.1 for more details on ACP Setup.

Connect USB-Type-A to USB-Type-A cable to, the Laptop USB port.

Install Marvell Windows USB Driver in your PC / Laptop.

See section 7.3 for procedure on installing Marvell Windows USB

Driver

Install Android Composite ADB Driver.

See section 7.4 for procedure on installing Android Composite ADB Driver

Insert the USB and the UART cable to Speaker and the Laptop / PC

Open the device terminal such as, Teraterm(for windows) / Zoc6 / CoolTerm (for Mac) and set the Baud rate to 115200 like shown below

Connect the Power adaptor to DC Jack on EVK

Power On the EVK, using ON/ OFF Switch

Open the ADB Shell on your laptop / PC

3. Firmware Upgrade

3.1. LS Firmware Upgrade

Note:

- To upgrade LS9 modules loaded with firmware version 9006 or before, follow the procedure as described in *section 0.*
- To upgrade LS9 modules loaded with firmware version 9006 or later, follow the procedure as described in *section 3.1.2.*

Firmware Upgrade on LS9 module can be done in three ways.

- PC / Laptop Method
- USB Method
- Network Method

To know the firmware version and Release date, execute the following command "#getprop" in the device terminal.

3.1.1 Firmware Upgrade Using PC / Laptop Method

To update the firmware on to the LS9 module using your PC / Laptop, proceed as below.

Download LS9 Basic Release Package (LS9_Release_9004) from

https://librewireless.sharefile.com/share#/view/scd4d08862784b26b

If you have already downloaded the 9004 release package ignore **Step 1**.

Download and unzip the latest firmware image (83_IMAGE) from Libre Portal.

https://librewireless.sharefile.com/d-s85ceb93437747d98

Copy the latest firmware image (83_IMAGE) into the Basic Release Package folder "usb_boot_bin_a0_m1_ACast_042715".

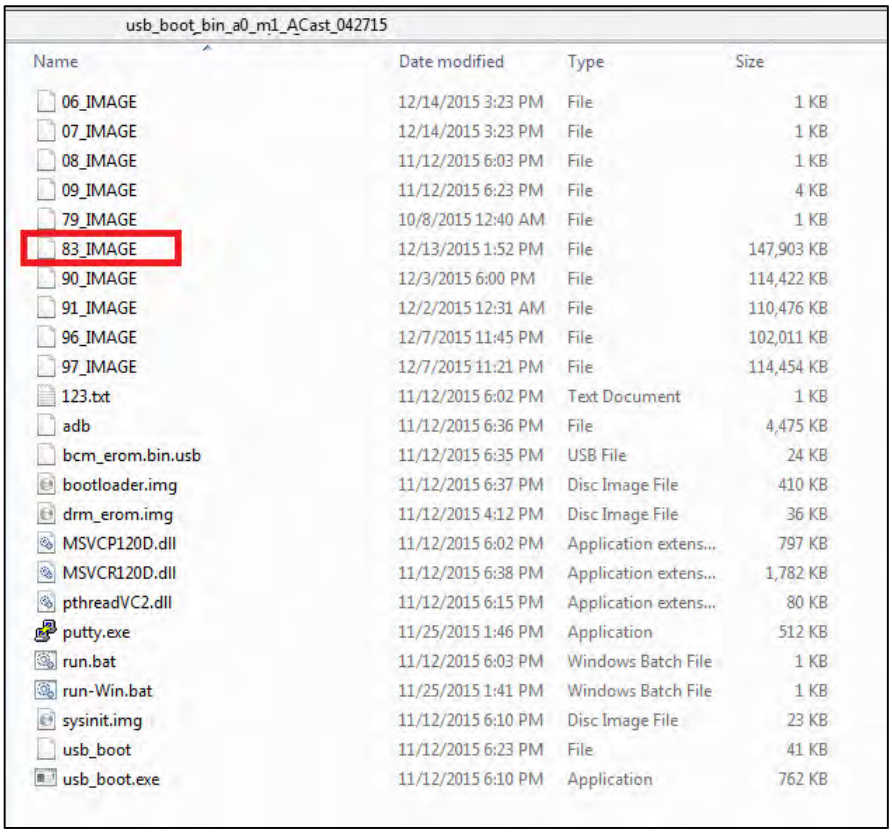


Figure 3.1-1: LS9 Firmware Folder Structure

Connect the Laptop to LS9 EVK with the USB type A to Type A connector

Download and install PuTTY Application

http://www.putty.org/

Connect the power adaptor, press and hold the USB-Boot button, and simultaneously connect the USB cable and power on the EVK.

execute the script *run.bat*

LS9 boots to bootloader.

Execute the command *#l2nand –m <image_number>* on debug shell.

Syntax
#l2nand –m <image_number>
Example
l2nand-m 83_IMAGE

LS flashes the image onto LS9.

On Successful Completion Reboot the Module.

End - -

3.1.2 Firmware Upgrade Using USB Method

To update the LS9 Firmware using USB proceed as below.

LS9 Firmware image is a Single-image binary file (File name: 83_IMAGE). The firmware image is upgraded by a trigger from Command-Shell or via Webpage.

Steps

Using Command Shell

Place the firmware image in the root directory of USB.

Ensure the binary filename is "83_IMAGE"

Note:	The Firmware image should not contain any extensions.

Insert the USB in LS9 EVK

Execute command #usb_update in the device terminal.

End--

Using Webpage

Place the firmware image in the root directory of USB.

Ensure the binary filename is "83_IMAGE"

Note: The Firmware image should not contain any extensions.

Insert the USB in LS9 EVK

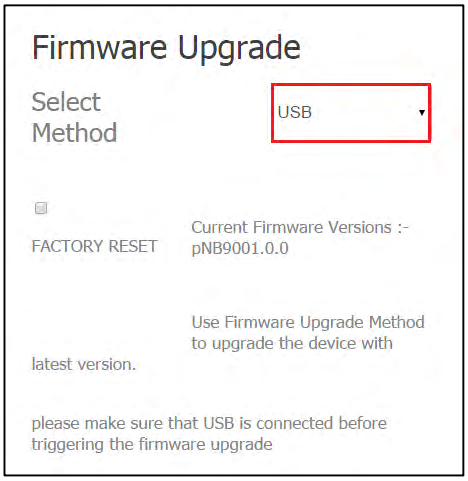
Execute command #netcfg in the device terminal to know the device IP.

For Example, *10.0.1.13*

```
root@android:/ # netcfg
lo       UP                                   127.0.0.1/8       0x00000049 00:00:00:00:00:00
p2p0     DOWN                                   0.0.0.0/0       0x00001002 cc:d2:9b:fe:d6:33
eth0     DOWN                                   0.0.0.0/0       0x00001002 00:0c:43:76:20:77
wlan0    UP                                  10.0.1.13/24       0x00001043 cc:d2:9b:fe:d6:32
root@android:/ #
```

Enter the IP address in the address bar of your browser.

In Firmware Upgrade section, select Method as USB, and Click Upgrade.



LS flashes the image onto LS9 module.

Module will reboot on completion of firmware upgrade.

End - -

3.1.3 Firmware Upgrade Using Network Method

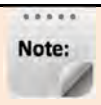
- At present firmware upgrade over Ethernet is supported.
- It takes about 2 minutes to complete the upgrade progress.

LS9 module does not support Ethernet port on the module. Hence it is recommended to use External USB Network adapter, to configure LS9 to Ethernet mode.

LS9 Supports below listed network adapters.

- XR22800 Hi-Speed USB to 10/100 Ethernet Bridge from EXAR
- RTL8150 USB 10/100 Fast Ethernet Adapter from REALTEK
- MAC book USB to Ethernet adapter.

To update the binary file (Application-Image or Single-Image) on the LS9 module, over network proceed as below.



Make sure the LS9 EVK and your laptop / PC is connected to the same network.

Share the folder of the binary file (83_IMAGE) to be loaded onto the LS9 Module.

Make sure your laptop / PC is not password protected and is not binded to the work domain.

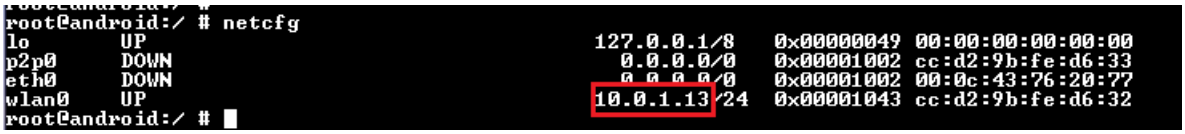
For information on procedure to disable password see below links

- Windows 10: http://www.isunshare.com/windows-10/turn-off-or-on-password-protected-sharing-in-windows-10.html
- Windows 8: http://www.eightforums.com/tutorials/9907-password-protected-sharing-turn-off-windows-8-a.html
- Windows 7: http://www.home-network-help.com/password-protected-file-sharing-in-windows-7.html

For the procedure to share the folder in Windows and Ubuntu see *section 7.5*.

Execute command #netcfg in the device terminal to know the device IP

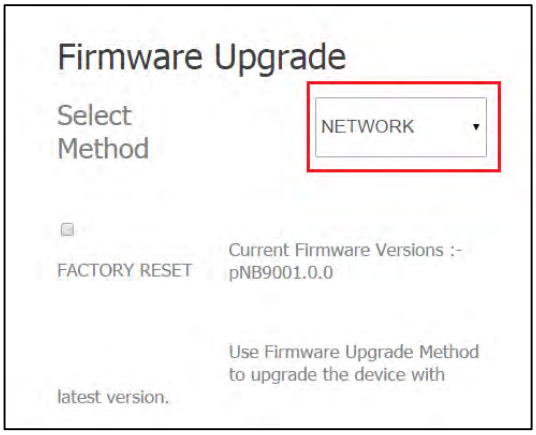
For Example, *10.0.1.13*



Enter the IP in the address bar of your browser.

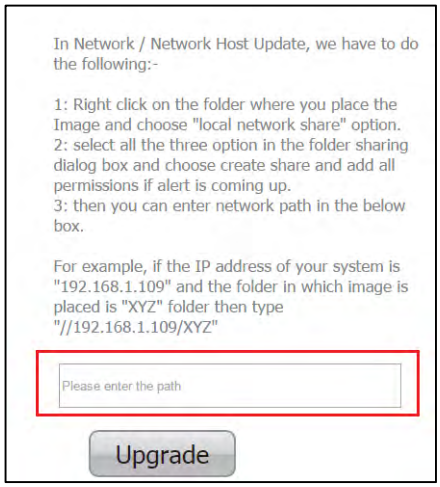
For Example, *10.0.1.13*

In the Firmware upgrade section, Select Method as *Network*

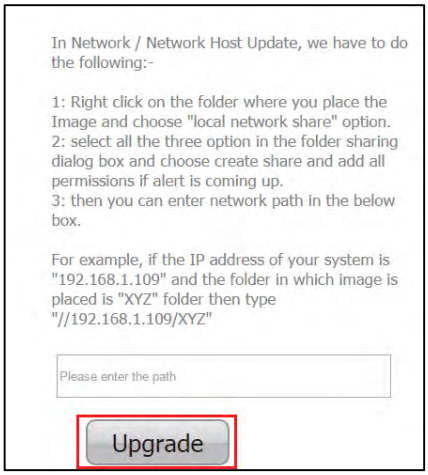


Enter the file path (IP address of the PC/Folder Name) in the text box.

For example, if the IP address of your PC is 192.168.1.109 and the folder name is XYZ, then the file path is "***//192.168.1.109/XYZ***".



Click Upgrade



On successful upgrade, LS9-Module reboots, with the updated application.

End --

3.2. HOST-Firmware Update

To update the HOST-MCU-Firmware binary file through LS9 module, over network proceed as below.

Note:

- Make sure the LS9 EVK and your laptop / PC is connected to the same network.
- At present firmware upgrade over Ethernet is supported.
- The HOST-MCU firmware must be in an X-Modem receive mode to receive the HOST-MCU firmware. Currently the X-Modem packet size is set to 128 bytes

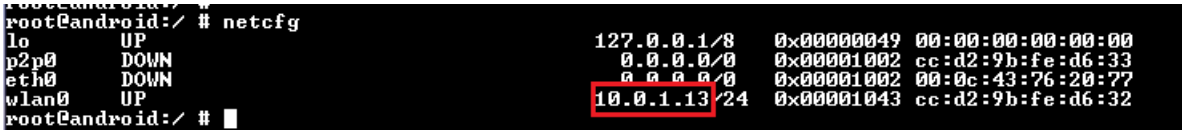
Share the HOST-MCU-Firmware binary file to be loaded through the LS9 Module.

The procedure to share the folder in Windows and Ubuntu see *section 7.5*.

> **Note:** Make sure your laptop / PC is not password protected and is not binded to the work domain.

Execute command #netcfg in the device terminal to know the device IP

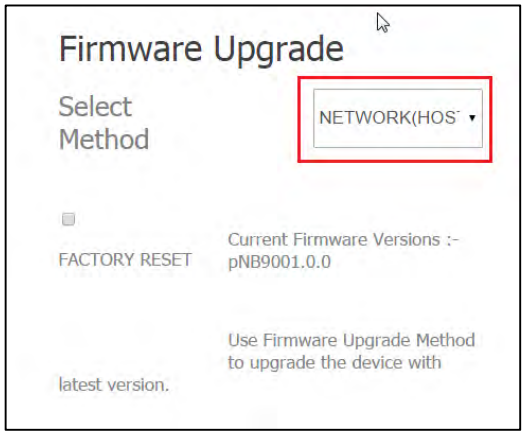
For Example, *10.0.1.13*



Enter the IP in the address bar of your browser.

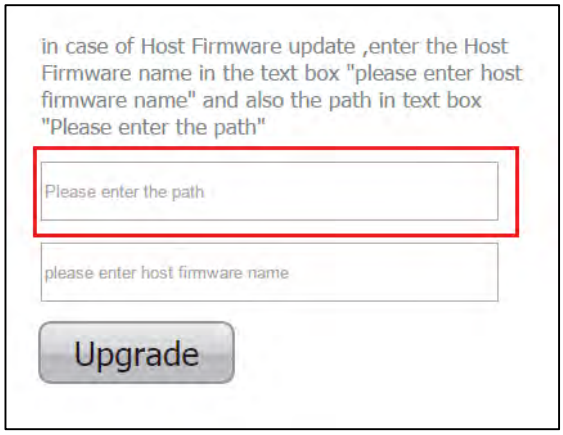
For Example, *10.0.1.13*

In the Firmware upgrade section, Select Method as *Network (HOST ONLY)*

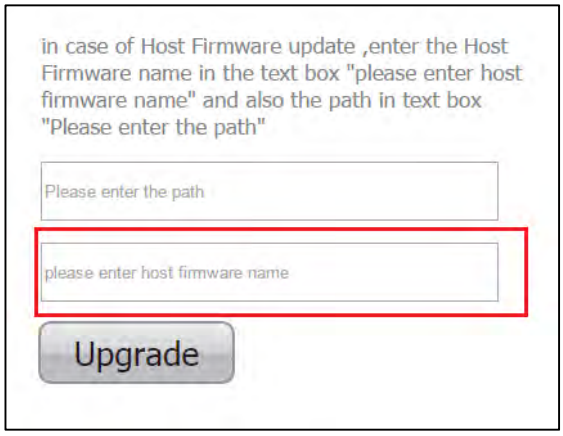


Enter the file path (IP address of the PC/Folder Name) in the text box.

For example, if the IP address of your PC is 192.168.1.109 and the folder name is XYZ, then the file path is "***//192.168.1.109/XYZ***".



Enter the file name in the text box.



Click Upgrade.

End--

4. Network Configuration

You can configure the network to LS9 module in the following ways.

- Wireless Network Setup Using WAC and SAC Method
- Wireless Network Setup Using Webserver Method

4.1. Wireless Network Setup Using WAC and SAC

WAC / SAC Trigger Commands

To setup wireless network using WAC proceed as below

4.1.1 Wireless Network Setup Using WAC

To setup a wireless network using Wireless Accessory Configuration (WAC) proceed as below:

Long press the Setup-Button on LS9 EVK to trigger SAC/WAC/LS-Configure mode.

On an iOS device running iOS, go to *Settings > Wi-Fi > SET UP NEW DEVICE*

The WAC speaker is listed. For example, Libre <MacID>.

Figure 4.1.-1: WAC Speaker Listed

Select the speaker / EVK and Tap NEXT

iOS device shares its Wi-Fi settings; that is SSID and Password with the WAC speaker and configures the device.

On successful configuration the device is configured to the Wi-Fi network to which the iOS device is connected.

End--

4.1.2 Wireless Network Setup Using SAC (Speaker Android Configuration) method

To setup a wireless network using Libre Android APP proceed as below

Long press the Setup-Button on LS9 EVK to trigger SAC/WAC/LS-Configure mode.

Step 1. Open the ***Libre APP***

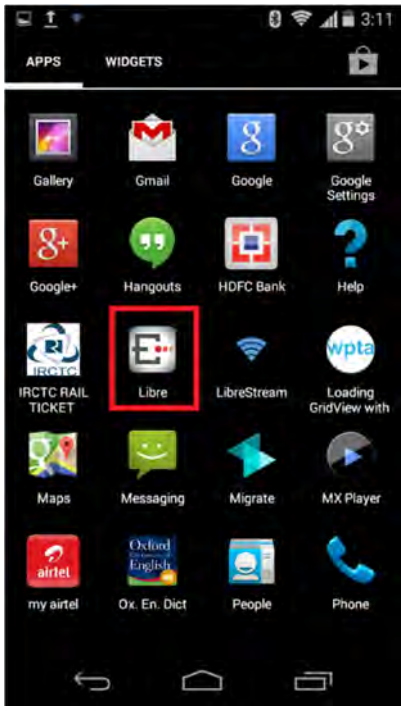
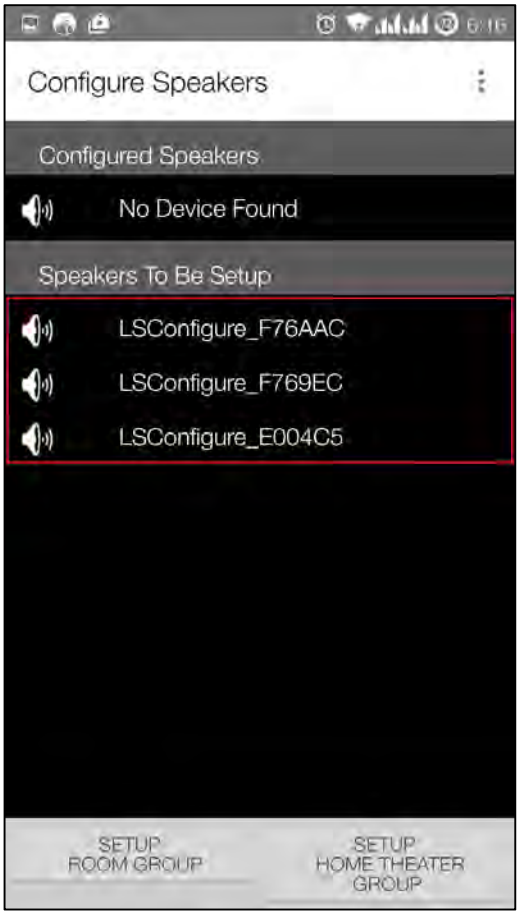


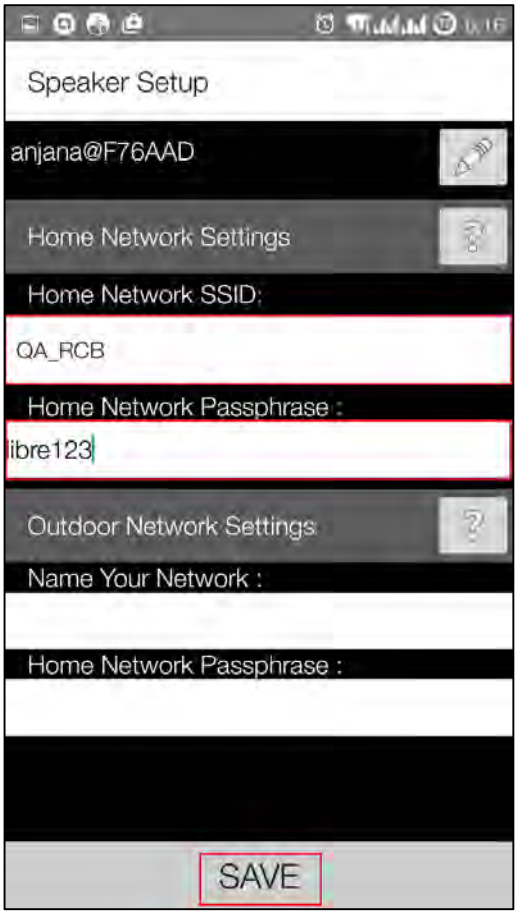
Figure 4.1.-2: Libre APP

Tap *Configure* in the menu

In Speakers To Be Setup section tap the Speaker name.



In Speaker Setup Page type the SSID and Passphrase of the Home AP, and Click Save.



Continue the configuration steps for all the speakers.

End--

4.2. Wireless Network Setup Using Webserver

4.2.1 LS-Connect Method

To setup wireless network using LS-Connect proceed as below

Long press the Setup-Button on Ls9 EVK to trigger LS-Connect

Device enters "AP" mode and is available in the Wi-Fi network list as LSConfigure_xxxxxx

From the network list **Select** LSConfigure_xxxxxx **and connect the laptop to the network.**

Enter the following URL in the address bar of your browser *192.168.43.1* webpage shows Network status as shown in Figure 6-4.

Select the Access Point (AP) to be connected to from Select Your Network drop-down list

Select Security Type from *Security* drop-down list, Enter the valid login credentials and Click *OK*

Device disconnects from laptop and connects to the network selected

To know the newly acquired IP execute command *#netcfg* in the device terminal

End--

4.2.2 Webpage Method

This method is used if the device is already connected to a network.

To setup wireless network via Webpage proceed as below

Execute command #netcfg in the device terminal to know the device IP

For Example, *10.0.1.13*

Enter the IP in the address bar of your browser with port number

For Example, *10.0.0.1.13*, the webpage shows the Network status of the currently connected Access Point.

In *Select Your Network* section, Select the Access Point (AP) to be connected, from Select your Network drop-down list and Click *Save*

End --

4.2.3 Manual Configuration Method

To connect the device to the network manually proceed as below.

In Select Your Network section, enable Configure Manually

Enter the Access Point *SSID* and Click *Save*.

Device reboots and connects to the network.

To know the newly acquired IP execute command #netcfg **in the device terminal**

Select Your Network
Enter SSID Manually
Static IP
ON/OFF
Configure
Manually
Setup your product to join your network of choice. Static IP ON
will help to configure with Static IP. Configure Manually will help
to configure with Hidden Network
Save

End –

5. Configuring Non-Volatile-Item

Non-Volatile (NV) item in LibreSync is configured through command line.

- To configure the NV-Item, type the below command in the command line and **Reboot** the LS-Module.

Syntax of the Command to set NV-Item

#setenv <NV_item_name> <<value>>

Syntax of the Command to Reboot

#reboot

- To know the value of the NV-Item set, type the below command in the command line.

Syntax of the Command to Know the Value of NV-Item

#getenv <NV_item_name>

- To reset all the NV-Items to factory default values, type the below command in the command line.

Syntax of the Command to Reset All NV-Items to Factory Default

#SetFacDefault

- To know all the NV-items set, type the below command in the command line.

Syntax of the Command to Know All NV-Items set

#GetAllENV

There should be space between setenv and <NV_item_name> and between the <NV_item_name> and <<value>>.

After configuring NV-Item, to apply the NV-Item settings, **Reboot** the LS-Module.

For example,

To Configure NV-Item hostpresent

#setenv hostpresent <<1>>

To Know the value of the NV-item, hostpresent set

#getenv hostpresent

5.1. Host Communication Over UART

Host Present NV-item avoids Junk data/false triggers, in case of EVK's where UART1 communication is typically not required.

The Host communication NV-item should be set as 1, to enable the Host communication over UART1.

The syntax below provides the commands to enable and disable the Host Communication over UART1

Enable

#setenv hostpresent <<1>>

Disable

#setenv hostpresent <<0>>

5.2. Telnet

Telnet enables bidirectional interactive text-oriented communication with the LS-Platform Device. Telnet can be used from TCP port 23 (default). The 'telnet' NV-item should be set as 1, to enable the Telnet port.

The syntax below provides the commands to enable and disable Telnet.

Enable

#setenv telnet <<1>>

Disable

#setenv telnet <<0>>

5.3. Network Interface

Network Interface NV-item allows user to set the type of Network interface such as Ethernet, Wi-Fi or Auto.

Ethernet

The syntax below provides the commands to enable Ethernet.

#setenv netif <<eth0>>

Wi-Fi

The syntax below provides the commands to enable Wi-Fi.

#setenv netif <<wlan0>>

Auto

The Libre-Sync software detects the network interface automatically, based on the connection available. Once the Auto detection is enabled Ethernet would get priority as network interface on Boot-Up.

The syntax below provides the commands to enable auto detection of network interface.

#setenv netif <<auto>>

5.4. SSID of DDMS-Zone in SA-Mode

The default SSID for the DDMS-Zone in SA-Mode is "**Direct-LBLibreSync**". You can change the SSID of the DDMS-Zone by editing the NV-Item "**ddms_SSID**".

```
#setenv ddms_SSID <<NewName>>
```

Editing the NV-item changes the SA-Group SSID as "**Direct-LBNewName**".

5.5. DDMS-Zone Password

The default password for DDMS-Zone is **hello123**. The password for DDMS-Zone can be edited using the NV-item **ddms_password**.

Syntax below provides the commands to edit the password for DDMS-Zone.

```
#setenv ddms_password <<hello123>>
```

5.6. I2S LR-Clock

At present LR-Clock is supported at frequency of 44.1 KHz and 48KHz. LR-Clock by default is set to 44.1 KHz.

NV-Item **LRCK** is used to edit the frequencies of the I2S LR-Clock. The syntax below provides the commands to edit LRCK.

To set the LRCK at 44.1KHz

```
#setenv LRCK <<48000>>
```

To set the LRCK at 48KHz

```
# setenv LRCK <<48000>>
```

5.7. I2S M-Clock

M-Clock is supported at frequency of 12MHz and 12.288MHz. M-Clock by default is set to 12MHz.

NV-Item **MCLK** is used to edit the frequencies of the I2S M-Clock. The syntax below provides the commands to edit MCLK.

To set the MCLK at 12MHz

#setenv MCLK <<12000000>>

To set the MCLK at 12.288MHz

setenv MCLK <<12288000>>

5.8. ACP

NV-Item **ACPpresent** enables detection of the Apple Co-processor for ACP certificate validation. By default the NV-Item **ACPpresent** is set as 1.

The syntax below provides command to enable or disable ACP presence detection.

Enable

#setenv ACPpresent <<1>>

Disable

setenv ACPpresent <<0>>

5.9. Model Name

The NV-Item **Model** is used to set the model name for the Speaker or the device. The model name can be any name of the user choice. The Maximum length of the model name is 63 characters.

The default Model Name for LS-Enabled speakers is LibreSync. You can change the model name by editing the NV-Item **Model**.

```
#setenv Model <<ModelNewName>>
```

Editing the NV-item changes the Model Name as "**ModelNewName**".

The NV-Item Model Name should not contain, Space or special characters except underscore "_".

5.10. Manufacturer Name

The NV-Item **Manufacturer** is used to set the Manufacturer name for the Speaker or the device. The Manufacturer name can be any name of the user choice. The Maximum length of the Manufacturer name is 63 characters.

The default Manufacturer Name for LS-Enabled speakers is Libre. You can change the Manufacturer name by editing the NV-Item **Manufacturer**.

```
#setenv Manufacturer <<ManufacturerNewName>>
```

Editing the NV-item changes the Manufacturer Name as "**ManufacturerNewName**".

5.11. WAC SSID

The default SSID for WAC is "**LSConfigure_xxxxxx**". Where, *"xxxxxx"* stands for the MAC id of the LS-Enabled speaker or device.

You can change the SSID of the WAC by editing the NV-Item "**WAC_SSID**".

```
#setenv WAC_SSID <<NewSSIDName>>
```

Editing the NV-item changes the WAC SSID as "**NewSSIDName_xxxxxx**".

5.12. HOST BAUDRATE

HOST_BAUDRATE NV-Item is used to define different UART BAUDRATE. UART BAUDRATE supported in LS9 is 9600, 19200, 38400, 57600 (default) and 115200

Use the below syntax to set the UART NAUDRATE.

To Set UART BAUDRATE

#setenv HOST_BAUDRATE <<57600>>

5.13. Serial Number

NV-Item Serial_num indicates the serial number of the speaker device. Serial number can be of maximum length of 15 characters.

Use the syntax below to define the serial number of the speaker device.

To Define The Serial Number of The Speaker Device

#setenv Serial_num <<1234>>

5.14. Model Number

NV-Item Model_num indicates the Model of the speaker device. Model Number can be of maximum length of 15 characters.

Use the syntax below to define the model number of the speaker device.

To Define The Model Number of The Speaker Device

#setenv Model_num <<4567>>

5.15. Hardware Version

NV-Item Hardware_version indicates the hardware used in the speaker device. Hardware version can be of maximum length of 15 characters.

Use the syntax below to define the Hardware Version of the speaker device.

To Define The Serial Number of The Speaker Device

#setenv Hardware_version <<bncm>>

5.16. Firmware Version

NV-Item Firmware_version indicates the firmware used in the speaker device. Firmware version can be of maximum length of 15 characters.

Use the syntax below to define the Firmware version of the speaker device.

To Define The Firmware Version of The Speaker Device

#setenv Firmware_version <<tyio>>

5.17. Spotify APP Key

NV-Item SpotifyAppKey is used to store the unique application key to access the Spotify Library. LS-enabled speaker device has the Libre's application key as the default value. Replace the Application key with your own application key provided by Spotify.

The maximum size of the application key is 1024 characters.

Use the syntax below to store the Spotify Application Key.

To Store The Spotify Application Key

#setenv SpotifyAppKey <<
0147A183DEFC792085C3D545471BEF4127D2F23F12619CFDA11DAB7E1E6A86C8.... >>

5.18. SPDIF

SPDIF NV-Item allows the user to enable / disable SPDIF output. When SPDIF is disabled, output is from I2S. By default SPDIF output is disabled.

To enable SPDIF output, use the syntax below in the command line.

Enable SPDIF Output

```
# setenv spdif 1
```

Disable SPDIF Output (Default)

```
#setenv spdif 0
```

5.19.Current Volume

The NV-item **current_volume** enables the user to set the volume levels for LS enabled speakers. The possible Values for the NV-Item **Current Volume** is between **0-100**. The default value is **50.**

The syntax below provides the commands to edit the NV-Item.

```
#setenv current_volume <<50>>
```

5.20.X-MODEM Packet Size

X-Modem Packet Size for transferring the firmware to Host-MCU can be either 128 bytes or 1022 bytes. The X-MODEM Packet Size can be set using the NV-Item **xmodem_pkt_size.** By default the X-MODEM Packet Size is set to be 1024 bytes.

The syntax below provides commands to edit **xmodem_pkt_size**.

To set the X-MODEM Packet Size at 128bytes

```
#setenv xmodem_pkt_size <<128>>
```

To set the X-MODEM Packet Size at 1024 bytes

```
# setenv xmodem_pkt_size <<1024>>
```

5.21.Bluetooth

BT_CONTROLLER NV-Item is used to select the type of board or disable BT functionality in LS-Modules.

- Setting the value to **0** disables BT functionality
- Setting the value to **1** enables BT functionality **(Default)**

Use the below syntax to define the BT Controller Functionality.

To Enable Bluetooth

#setenv BT_CONTROLLER <<1>> **(Default)**

To Disable Bluetooth

#setenv BT_CONTROLLER <<0>>

5.22. BT Device Name

BT_DeviceName NV-Item is used to modify the Bluetooth name of the speaker device. By default the Bluetooth name for the speaker device is LS_BT_Speaker. The maximum length of the device name is 20 characters.

Use the below syntax to set the BT Device Name

To Set BT Device Name

#setenv BT_DeviceName <<LS_BT_Speaker>>

5.23.DLNA Connection Close

DLNA_ConnClosed NV-Item is used to enable / disable the time gap between play-pause trigger.

- Setting DLNA_ConnClosed to '0' will trigger Play-Pause instantaneously.
- Setting DLNA_ConnClosed to '1' will provide a time gap (negligible) between Play-Pause trigger.

Note: Setting DLNA_Conn_Closed NV-Item to '0' will **FAIL** the DLNA Certification.

Use the syntax below to enable / disable the time gap between play-pause trigger in DLNA.

To Enable Time Gap Between Play-Pause Trigger (Default)

#setenv DLNA_ConnClosed <<1>>

To Disable Time Gap Between Play-Pause Trigger

#setenv DLNA_ConnClosed <<0>>

5.24.Tidal User Name

NV-Item TidalUserName is used to set the login credentials to access Tidal music service.

Use the syntax below to configure the login credentials for Tidal.

User Name

#setenv TidalUserName <<xyz@test.com>>

Password

#setenv TidalUserPassword <<abcd123>>

5.25.Dezeer User Name

NV-Item DezeerUserName is used to set the login credentials to access Dezeer music service.

Use the syntax below to configure the login credentials for Dezeer.

User Name

#setenv DezeerUserName <<xyz@test.com>>

Password

#setenv DezeerUserPassword <<abcd>>

5.26.Current Volume

The NV-item **current_volume** enables the user to set the volume levels for LS enabled speakers. The possible Values for the NV-Item **Current Volume** is between **0-100**. The default value is **50.**

The syntax below provides the commands to edit the NV-Item.

```
#setenv current_volume <<50>>
```

5.27.DDMSOOHmode

NV-Item DDMSOOHmode is used to set the LS-Enabled device to SA-Mode.

Use the syntax below to set DDMSOOHmode to LibreSync Speaker.

Default

```
#setenv DDMSOOHmode <<disabled>>
```

To enable DDMSOOHmode

```
#setenv DDMSOOHmode <<enabled>>
```

5.28.p2p_state

NV-item p2p_state is used to define if the LS-enabled speaker should be GO or Cli by default.

Use syntax below to define the default p2p state for the speaker.

To set as GO (Default)

```
#setenv p2p_state <<GO>>
```

To set as Cli

#setenv p2p_state <<Cli>>

5.29.PlayerState

NV-item PlayerState is used to define if the LS-enabled speaker is in Free state, or is a Master, or is a Slave, .

Use syntax below to define the Player State for the speaker.

To set as Free

#setenv PlayerState <<0>>

To set as Master

#setenv PlayerState <<1>>

To set as Slave

#setenv PlayerState <<2>>

5.30.Scene Name

NV-Item Scene_Name is used to edit the default name of the scene created. By Default the name of the scene is **MyScene**.

SCENE NAME

#setenv Scene_Name <<MyScene>>

6. Features

6.1. Libre APP for Android

LUCI enables user to remotely, control the LibreSync LS9 enabled product using the Libre Application for android. The application can be used to browse DLNA-DMS in the network, SD Card connected to device and other online radio stations such as vTuner and TuneIn , and stream music using the DMP feature supported by LS9.

For more information on using Libre APP refer

LibreWireless-Usability_Guide_Dynamic_Direct_Multi-Node_Streaming

6.2. DDMS

A Wireless Dynamic Direct Multi-Node Streaming (DDMS) Zone is a group of nodes, (DDMS enabled speakers) chosen dynamically by an end user to synchronously play audio from a given content source.

This group of speakers can play music from any Audio Source synchronously without any delay between the nodes. Each group can consists of two or more nodes.

For information on setting up devices for DDMS, and Using Libre App refer to

LibreWireless-Usability_Guide_Dynamic_Direct_Multi-Node_Streaming

The device webpage provides interface to update DDMS SSID and password.

Figure 6.2-1: DDMS Setup in webpage

6.3. Source Switching

LibreSync enables user to switch the playback sources without any hitches. User can choose to stream music either from Cast-For-Audio (C4A) Spotify connect and the music streams on the selected device from the source.

For example, A LS Device streaming Cast-For-Audio (C4A) starts streaming music from Spotify connect when, the user selects music from Spotify APP to be played on the device.

6.4. Software Security

LibreSync software is secured using Crypto IC. Crypto IC is embedded either in the LS9 module or the ACP. Crypto IC authenticates and allows only the valid LS9 software to boot on the LS9 modules.

6.5. Airplay®

After the speaker or device is configured to the network, it is discovered by the iOS device and iTunes, and is available for AirPlay streaming.

To stream AirPlay proceed as below

Open the Control Centre or Music APP on iOS device

Or

Open iTunes installed on any machine

Tap the AirPlay icon

AirPlay enabled LibreSync device is listed

Select the device and select Play

AirPlay starts streaming on the LibreSync enabled device.

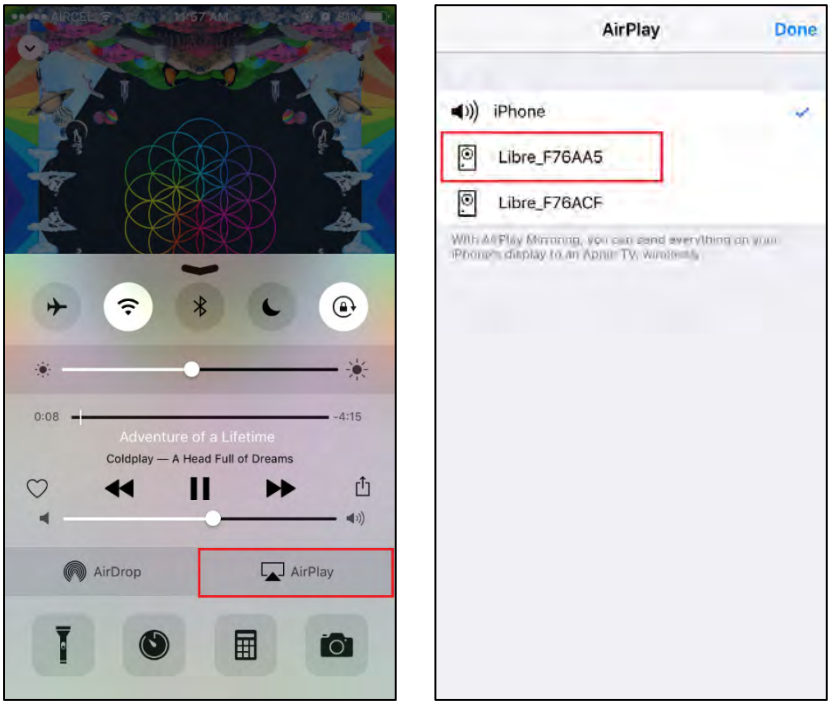


Figure 6.5-1 AirPlay Stream

End --

Password for Airplay Playback

You can either enable or disable a password, to start Airplay playback on the LS enabled device through a webpage.

Enable

To enable a password for Airplay Playback proceed as below.

Execute command #netcfg in the device terminal to know the device IP

For Example, *10.0.1.13*

```
root@android:/ # netcfg
lo       UP                                   127.0.0.1/8       0x00000049 00:00:00:00:00:00
p2p0     DOWN                                   0.0.0.0/0       0x00001002 cc:d2:9b:fe:d6:33
eth0     DOWN                                   0.0.0.0/0       0x00001002 00:0c:43:76:20:77
wlan0    UP                                  10.0.1.13/24       0x00001043 cc:d2:9b:fe:d6:32
root@android:/ #
```

Enter the IP in the address bar of your browser with port number

For Example, *10.0.1.13*

In *Your Device Name* section, Enter the *Airplay Password* in the white box below and Click *Apply*

Device reboots automatically.

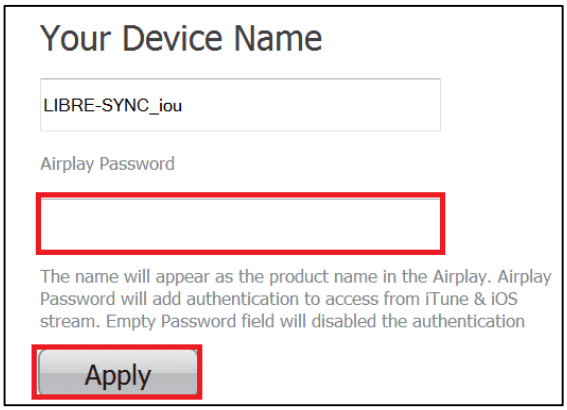


Figure 6.5-2: Password for Airplay

Open the Control Centre or Music App on iOS device

Or

Use iTunes installed on any machine

Tap the AirPlay icon

AirPlay enabled LibreSync device is listed

Select the device and Select Play

In the pop screen enter the password entered in the webpage

AirPlay starts streaming.

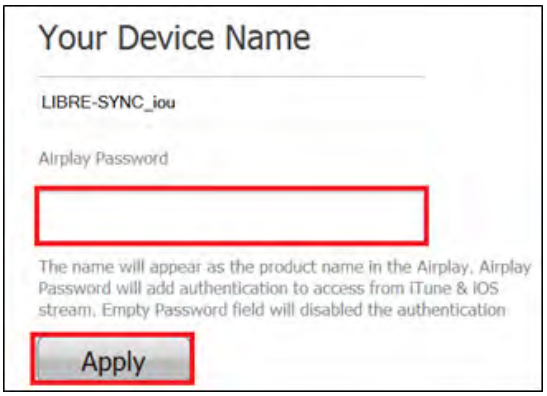


Figure 6.5-3: Enter Password for Streaming

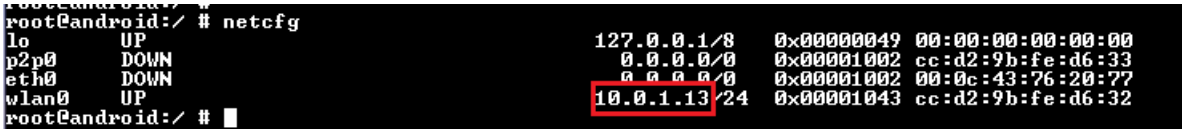
End--

Disable

To disable a password for Airplay Playback proceed as below.

Execute command #netcfg in the device terminal to know the device IP

For Example, *10.0.1.13*



Enter the IP in the address bar of your browser with port number

For Example, *10.0.1.13*

In *Your Device Name* section, Clear the previous Password and leave the white space blank and Click *Apply*

A pop-up message appears Click *OK* Click *Apply*

Figure 6.6-1: Disable Airplay Password

Device reboots automatically.

End --

6.6. Cast For Audio

Once the speaker or device is configured to the network, it is discovered by *Cast For Audio* supported iOS / Android Application (i.e. Cast for Audio Application), and is available for *Cast For Audio* streaming.

To stream *Cast For Audio* proceed as below

Connect the iOS / Android device in same network as your LS-Device.

Open the *Cast for Audio Application* on iOS / Android device

Tap the Cast icon on Cast for Audio Application

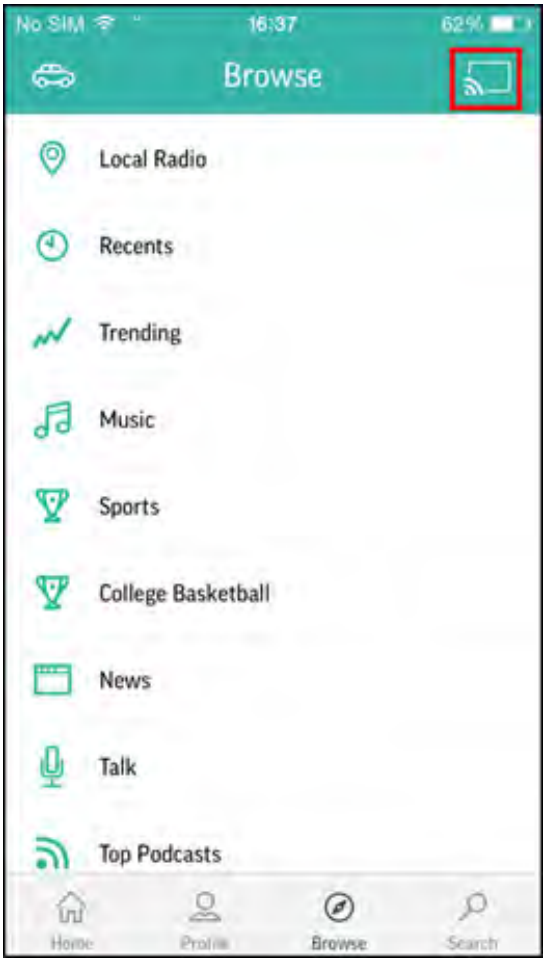


Figure 6.6-1: Cast for Audio Application Menu

Cast For Audio enabled LS-Device is listed

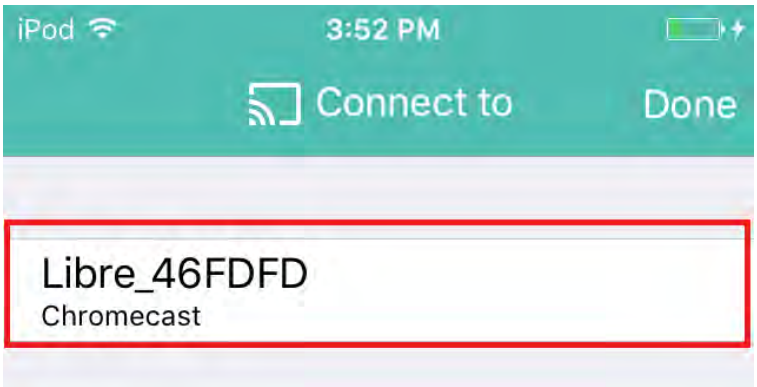


Figure 6.6-2: Device list

Select the device and start Cast For Audio streaming

Figure 6.6-3: Cast for Audio Enabled Device Selected

End --

6.7. Spotify Connect

LibreSync enables you to stream music via Spotify connect.

To use the Spotify connect APP proceed as below.

Register for Spotify premium account and get the Username and Password for the account

Download the Spotify app from the APP store/Play Store.

To stream music from Spotify connect proceed as below.

Reboot the LS enabled device and connect to the network.

Connect iOS device/Android phone to the same network.

Open the Spotify APP

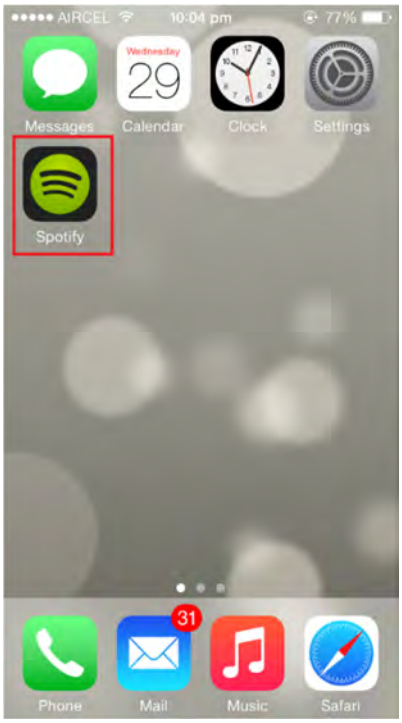


Figure 6.7-1: Spotify APP

Login to Spotify, using the Username and Password received, during registration.

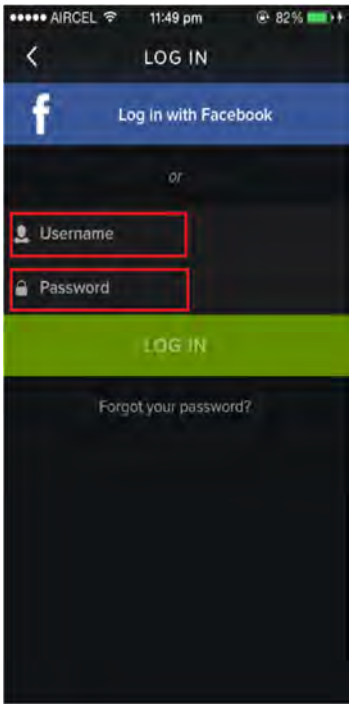


Figure 6.7-2: Spotify Login Screen

Browse for songs in the Spotify Server

In Now playing screen, select Speaker in right bottom

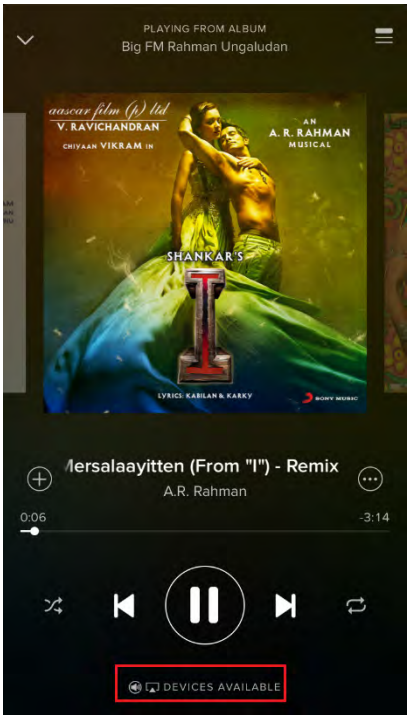


Figure 6.7-3: Device Selection

Select the LS enabled device

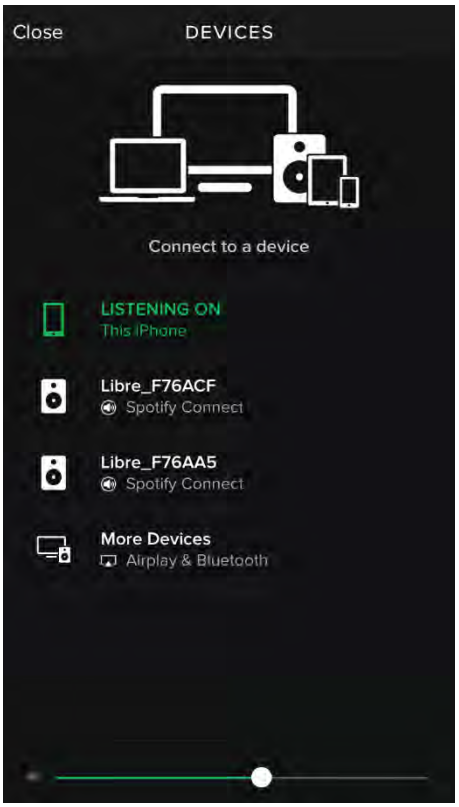


Figure 6.7-4: Device List

LS enabled device starts streaming music from Spotify Connect

End --

6.8. AUX-In Support

Users can connect Audio Source to AUX-In jack of EVK and select the source from Libre-APP.

6.9. DLNA ® / DMR

After the device is configured to the network, device is discoverable over UPnP®. Any Universal Plug and Play (UPnP) / Digital Living Network Alliance (DLNA) certified controller can be used to stream music to the device.

To test ***Play To*** functionality proceed as below

Open Media Player on Windows 7

In the play list, Click *Play To* and select the LS enabled speaker or device

Or

Right click on the song and Click *Play To*

Music starts streaming.

If the speaker / device is not visible on the Windows 7 Media Player, go to ***Stream > More streaming options***, ensure speaker is in Allowed state.

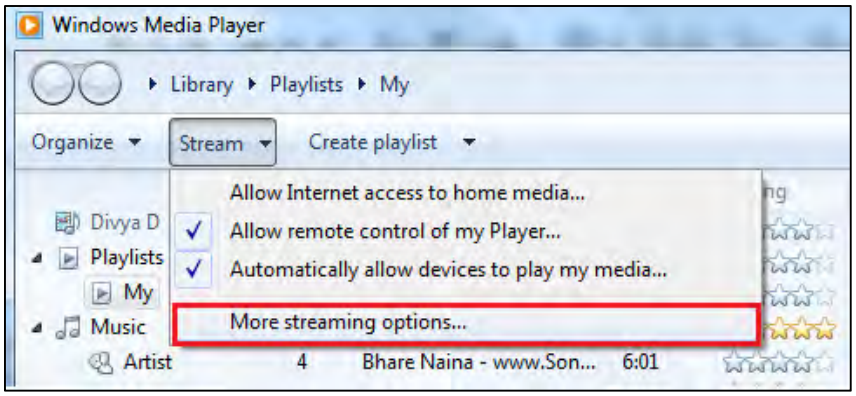


Figure 6.9-1: Media Player Stream Menu

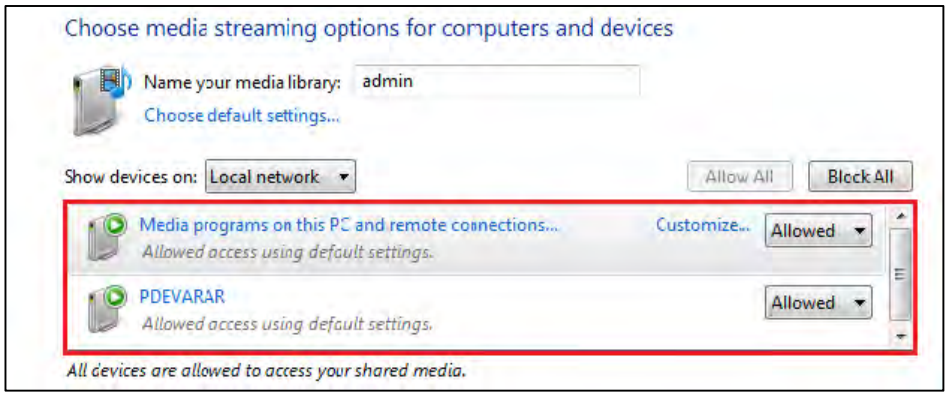


Figure 6.9-2: Media Streaming Options

> **Note:** Digital Media Renderer (DMR) functionality can be verified using any app on the Android / iOS devices as well. For example, the native audio player on Samsung Galaxy devices can be used.

End--

6.10. LUCI Over UART

LibreSync enabled devices provides a set of Message-Boxes for Control and Status Indications to, remote control itself. LUCI Architecture is designed to enable developers to remote control LibreSync products using a common light weight protocol.

LUCI provides control for status indications such as

- Play Control
- Browse Control
- Device Attachment / Detachment Status (USB)
- User Interface, Time Stamp, Volume Control
- Firmware Upgrade Process
- Multi-Room Audio Status, Multi-Room Audio Modes
- Network Configuration Status
- Bluetooth Control

For more information on LUCI and Message-Box used refer to LUCI Tech-Note available in Libre Portal.

6.11.Switch between Wired and wireless modes

You can switch between wired and wireless mode using the Webserver

Switching to Wired Mode

To switch to wired mode from Wi-Fi mode proceed as below

> **Note:** Make Sure device is connected to an Wi-Fi Network

Execute command #netcfg in the device terminal to know the device IP

For Example, *10.0.1.13*

```
root@android:/ # netcfg
lo       UP                                   127.0.0.1/8       0x00000049 00:00:00:00:00:00
p2p0     DOWN                                   0.0.0.0/0       0x00001002 cc:d2:9b:fe:d6:33
eth0     DOWN                                   0.0.0.0/0       0x00001002 00:0c:43:76:20:77
wlan0    UP                                  10.0.1.13/24       0x00001043 cc:d2:9b:fe:d6:32
root@android:/ #
```

Enter the IP in the address bar of your browser.

For Example, *10.0.1.13*

In Select Your Network drop-down list, select *Switch to Wired mode*

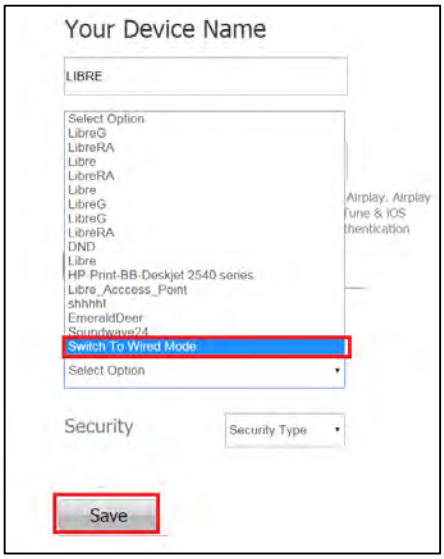


Figure 6.11-1: Switch to Wired Mode

Connect the device with an Ethernet cable

Click Save

LS module reboots automatically

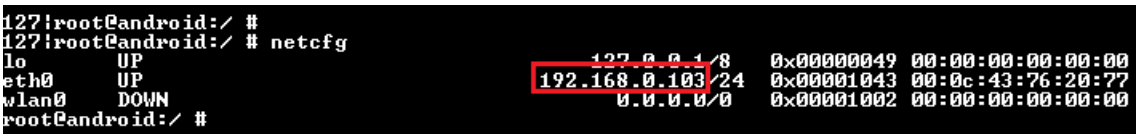
End--

Switching to Wireless Mode

To switch to wired mode from Wi-Fi mode proceed as below

Execute command #netcfg in the device terminal to know the device IP

For Example, *192.168.0.103*



Enter the IP in the address bar of your browser with port number

For Example, *192.168.0.103*

In Select Your Network drop-down list, select *Switch to Wi-Fi mode* and Click *Save*

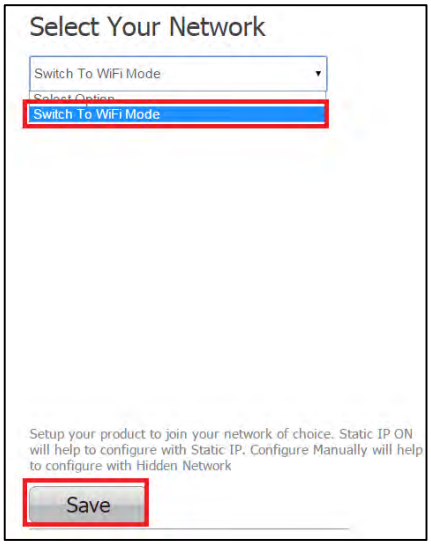


Figure 6.11-2: Switch to Wi-Fi Mode

LS module reboots automatically.

End--

6.12.TCP / IP Tunneling

TCP/IP Tunnelling is a unique feature supported by LS modules. Tunneling enables a Host MCU to communicate with other network devices over UART. The Host MCU can build their own proprietary protocol using LUCI tunneling.

For more information on TCP / IP tunneling refer LUCI document

LibreWirelessTechNote - LS_Light_Weight_Universal_Control_Interface

6.13.Wi-Fi Scan Result

Wi-Fi Scan result enables you to list the available access point. This feature is intended to be used by the APP developers to list the available networks in the APP for configuration.

To use the feature, in the address bar of your browser enter the IP address followed by */scanresult.asp.*

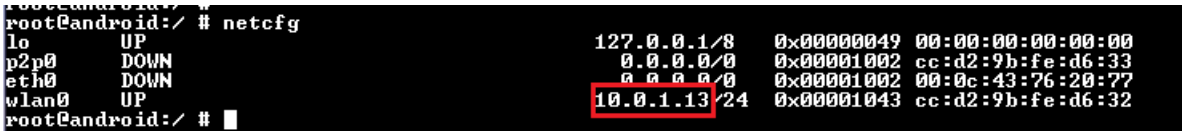
192.168.0.111/scanresult.asp

6.14.Device Name Configuration

You can define a friendly name to LS-Enabled device. To define the friendly name proceed as below.

Execute command #netcfg in the device terminal to know the device IP

For Example, *10.0.1.13*



Enter the IP in the address bar of your browser with port number

For Example, *10.0.1.13*

10.0.1.13

In *Your* Device Name section, Enter the Device Name in the white box and Click *Apply*

Device reboots automatically.

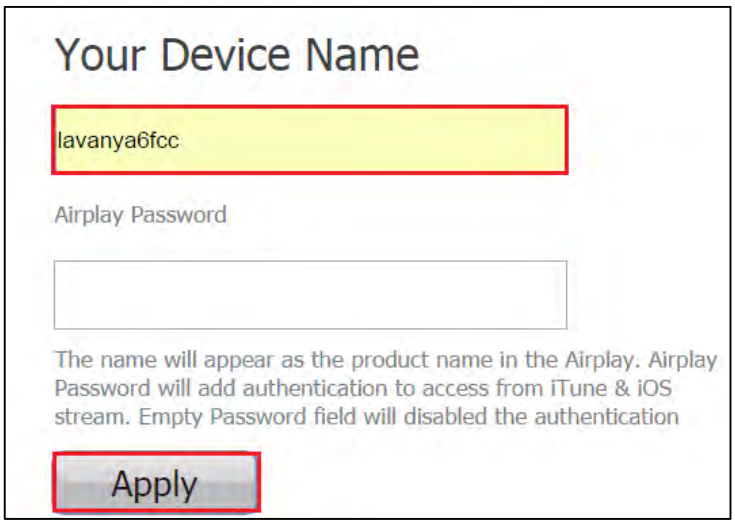
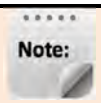


Figure 6.14-1: Device Name Section



- The device name length can be up-to maximum of 50 characters.
- After the Firmware upgrade, if the device friendly name is not set, the device name is listed as below
  - iTunes server and DMR Speakers lists the device as LibreSync_xxxxxx

End--

6.15. Switch between Wired and wireless modes

You can switch between wired and wireless mode using the Webserver

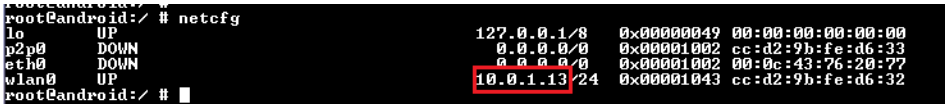
Switching to Wired Mode

To switch to wired mode from Wi-Fi mode proceed as below

Make Sure device is connected to an Wi-Fi Network

Execute command #netcfg in the device terminal to know the device IP

For Example, *10.0.1.13*



Enter the IP in the address bar of your browser with port number

For Example, *10.0.1.13*

In Select Your Network drop-down list, select *Switch to Wired mode*

Figure 6.15-1: Switch to Wired Mode

Connect the device with an Ethernet cable

Click Save

LS module reboots automatically

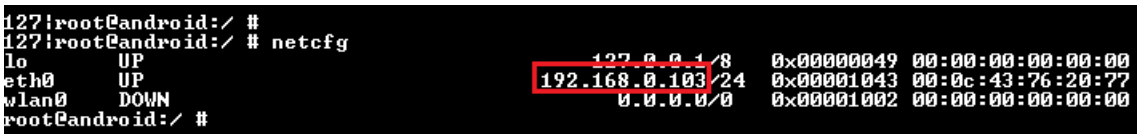
End--

Switching to Wireless Mode

To switch to wired mode from Wi-Fi mode proceed as below

Execute command #netcfg in the device terminal to know the device IP

For Example, *192.168.0.103*



Enter the IP in the address bar of your browser with port number

For Example, *192.168.0.103*

In Select Your Network drop-down list, select *Switch to Wi-Fi mode* and Click *Save*

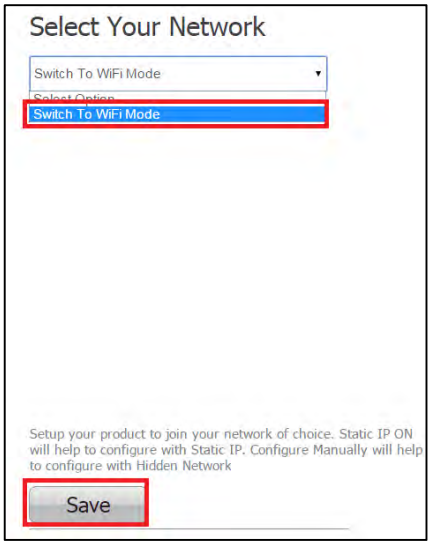


Figure 6.16-1: Switch to Wi-Fi Mode

LS module reboots automatically.

End--

6.16.Music Services

vTuner

vTuner is an internet radio device that receives and plays streamed media, either from Internet radio or Home network.

vTuner on Libre platform can be used to stream music using the Libre APP.

To stream music from vTuner proceed as below.

In the Now Playing screen of Libre APP, Tap *Sources*

Tap *vTuner* from the source List

Browse through the list and select the song of your choice.

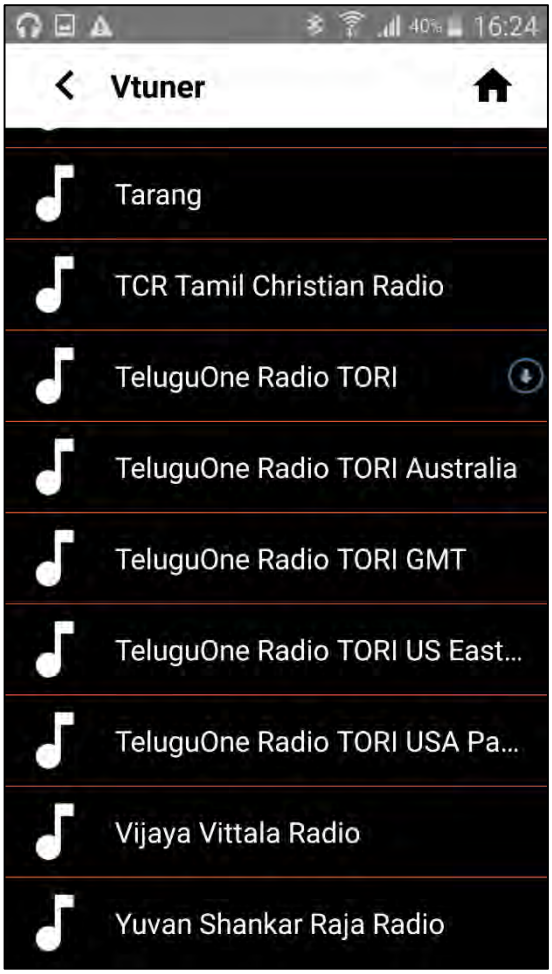


Figure 6.16.1-1: vTuner Browse Screen

LS enabled speaker starts streaming the song from vTuner.

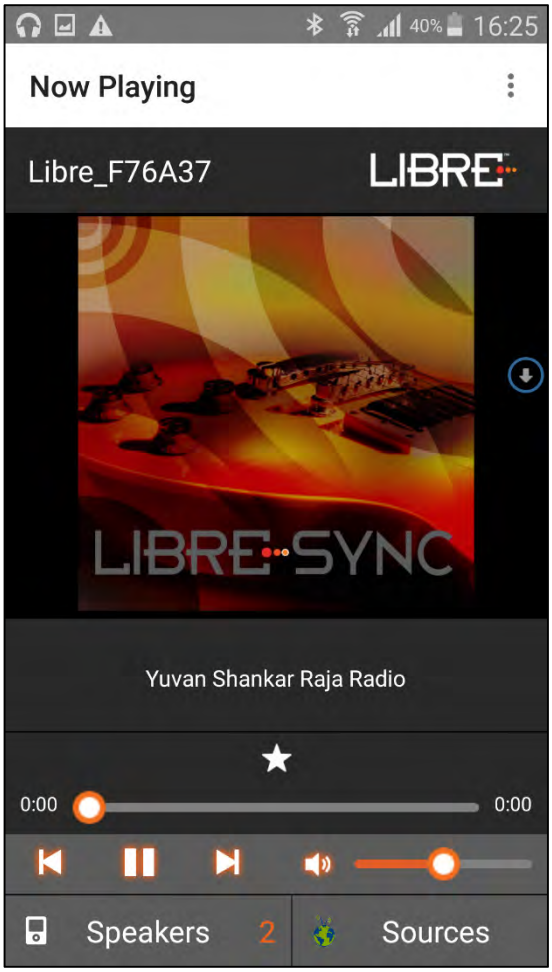


Figure 6.16.1-2: Now Playing Screen for vTuner

End --

TuneIn

TuneIn is an internet radio station that enables streaming of music.

TuneIn on Libre platform can be used to stream music using the Libre APP.

To stream music from TuneIn proceed as below.

Step 1. In the Now Playing screen of Libre APP, Tap ***Sources***

Tap *TuneIn* from the source List

Browse through the list and select the song of your choice.

Figure 6.16.2-1: TuneIn Browse Screen

LS enabled speaker starts streaming the song from TuneIn.

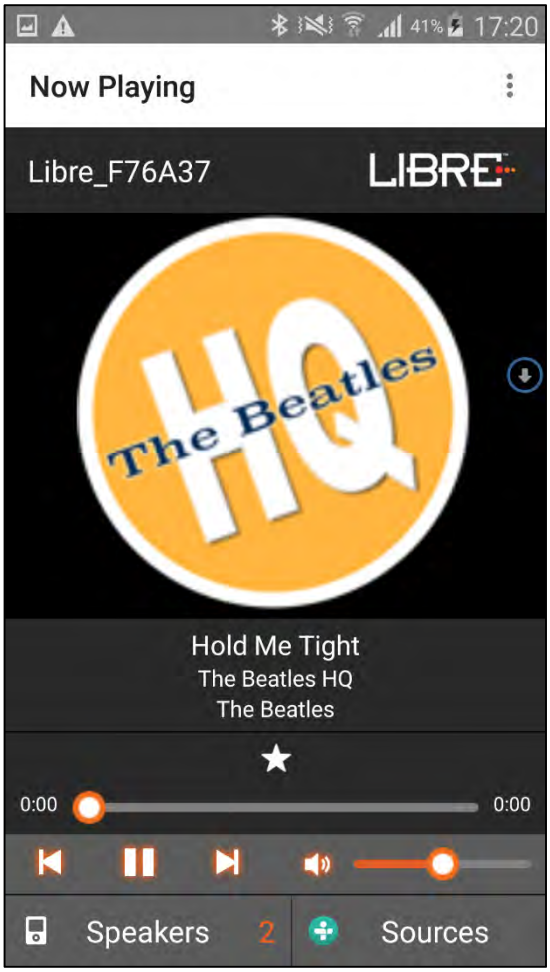


Figure 6.16.2-2: Now Playing Screen for TuneIn

End --

QQ Music

LibreSync enable you to stream music via QQ music service.

To use the QQ music service

Step 1. Register for QQ Music account and get the Username and Password for the account

Download the QQ Music app from the Play Store.

To stream music from QQ Music proceed as below.

Reboot the LS enabled device and connect to the network.

Connect Smartphone to the same network.

Open the QQ Music APP

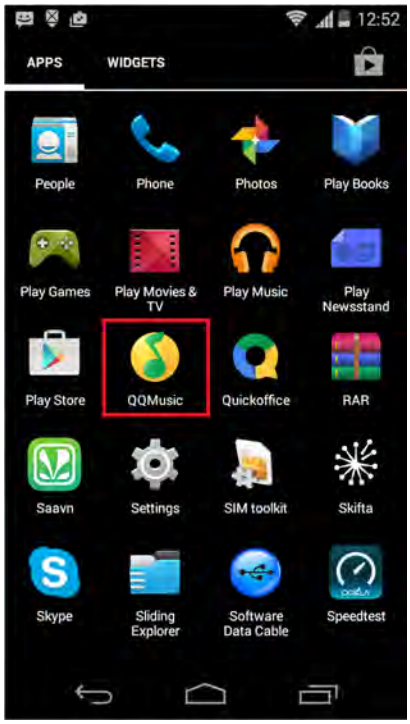


Figure 6.16.3-1: QQ Music APP

Login to QQ Music, using the Username and Password received, during registration.

Figure 6.16.3-2: Login Screen

Browse for songs in the QQ Music Server

In Now playing screen, select 'Q' symbol

Figure 6.16.3-3: Device Selection Option

Select the LS enabled device

Figure 6.16.3-4: Device List

Playback from QQ music on the LS enabled device starts.

End - -

Spotify

LibreSync enables you to stream music via Spotify connect.

Spotify on LS-Enabled speakers supports to Save / Play/ Delete presets, for more information on Spotify Preset Actions refer to Message-Box # 75 in LUCI Document

(LibreWirelessTechNote-LS_Light_Weight_Universal_Control_Interface) available in LibreSync Document Portal.

To use the Spotify connect APP proceed as below.

Step 1. Register for Spotify premium account and get the Username and Password for the account

Download the Spotify app from the App store/Play Store.

Note:

- The device name is listed as, LibreSync_xxxxxx
- In Spotify free account, LS Device will not be listed in the Spotify speaker list.

To stream music from Spotify connect proceed as below.

Reboot the LS enabled device and connect to the network.

Connect iOS device/Android phone to the same network.

Open the Spotify APP

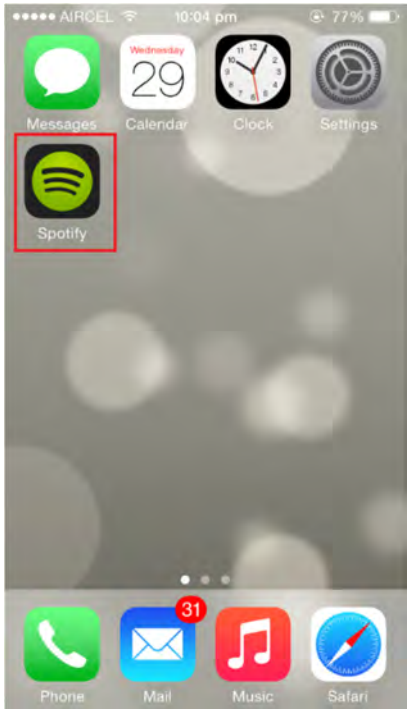


Figure 6.16.4-1: Spotify APP

Login to Spotify, using the Username and Password received, during registration.

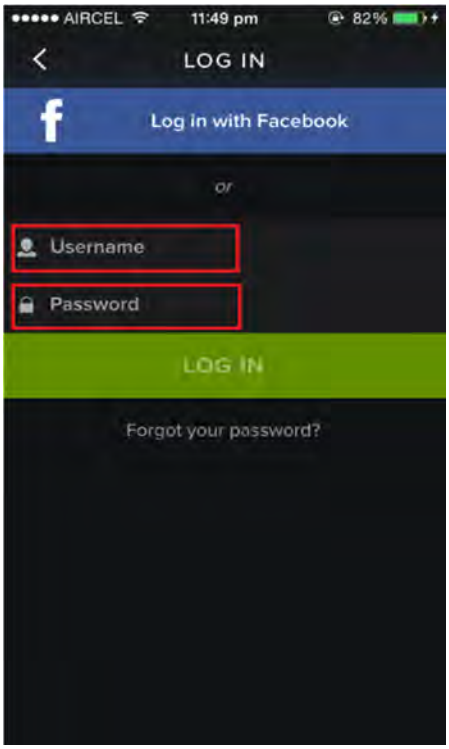


Figure 6.16.4-2: Spotify Login Screen

Browse for songs in the Spotify Server

In Now playing screen, select Speaker symbol in right bottom

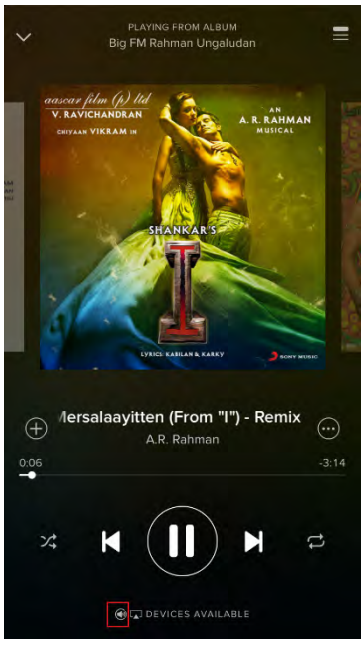


Figure 6.16.4-3: Device Selection

Select the LS enabled device

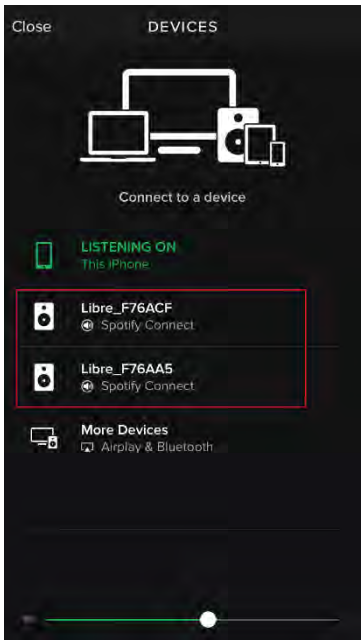


Figure 6.16.4-4: Device List

LS enabled device starts streaming music from Spotify Connect

End --

Deezer

Deezer on Libre platform can be used to stream music using the Libre APP.

To stream music from Deezer proceed as below.

Step 1. In the Now Playing screen of Libre APP, Tap ***Sources***

Tap *Deezer* from the source List

Enter the User Name and Password to login to the music service.

Browse through the list and select the song of your choice.

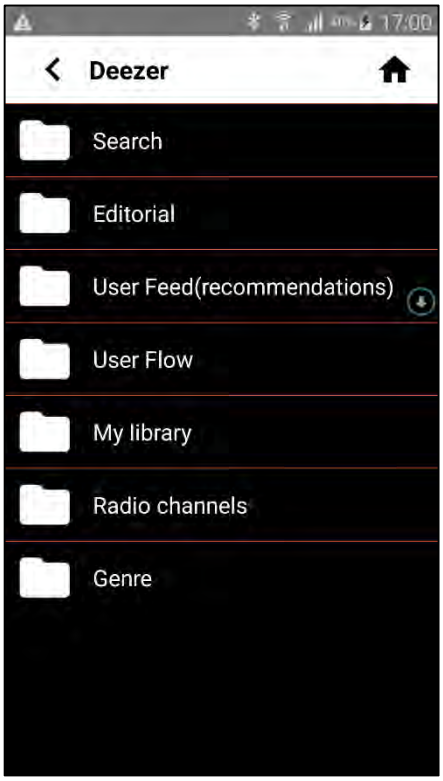


Figure 6.16.5-1: Deezer Browse Screen

LS enabled speaker starts streaming the song from Deezer.

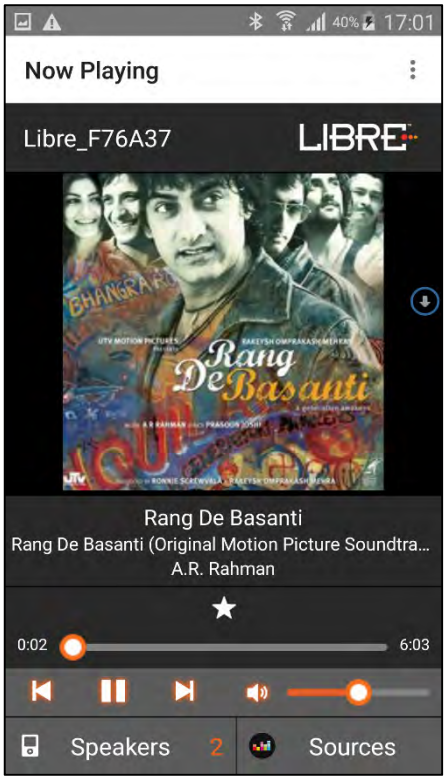


Figure 6.16.6-2: Now Playing Screen for Deezer

End --

Tidal

Tidal, also known as TIDALHiFi is a subscription-based music streaming service that offers lossless audio and high definition music. The service has over 30 million tracks and 75,000 music videos. Tidal on Libre platform is used to stream music using the Libre APP.

To stream music from Tidal proceed as below.

Step 1. In the Now Playing screen of Libre APP, Tap ***Sources***

Tap *Tidal* from the source List

Enter the User Name and Password to login to the music service.

Browse through the list and select the song of your choice.

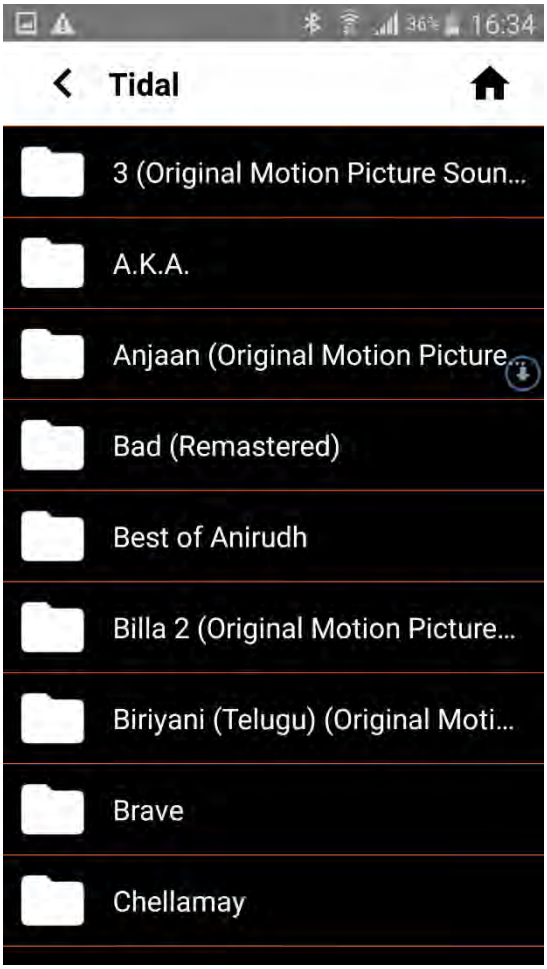


Figure 6.16.6-1: Tidal Browse Screen

LS enabled speaker starts streaming the song from Tidal.

Figure 6.16.6-2: Now Playing Screen for Tidal

End --

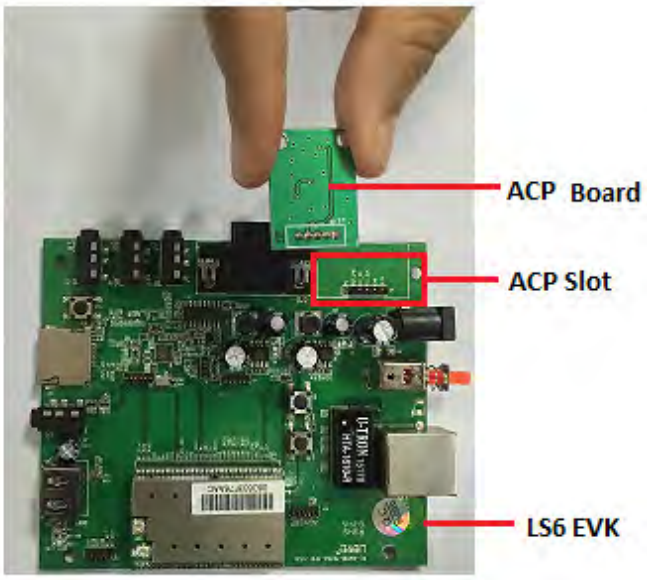
7. Appendix

7.1. ACP Setup

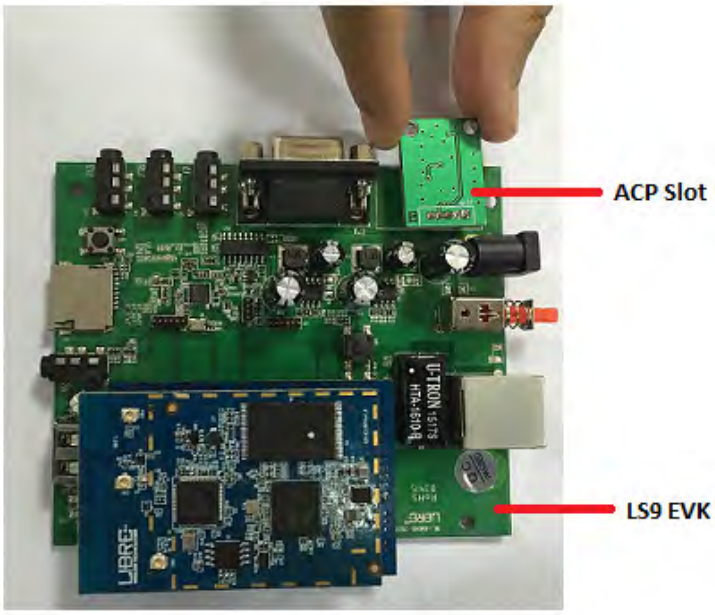
It is recommended to Use "**ACP 2.0C**".

To insert ACP on LS9 EVK proceed as below.

To use the ACP board in LS6 EVK, remove the ACP board from the ACP slot as shown below.



Insert the ACP board onto the ACP slot in the LS9 EVK as shown below.



End--

7.2. Rework on LS6 EVK to evaluate LS9 Module.

If you are using LS6 EVK for LS9 module evolution then

Remove electrolytic capacitor C15, C22, USB connector and Re-mount and soldier electrolytic capacitor on the back side of the LS6 EVK.

Connect 5v from LS6 EVK to LS9 module USB_VBUS J1-pin 17

7.3. Install USB Composite Drive

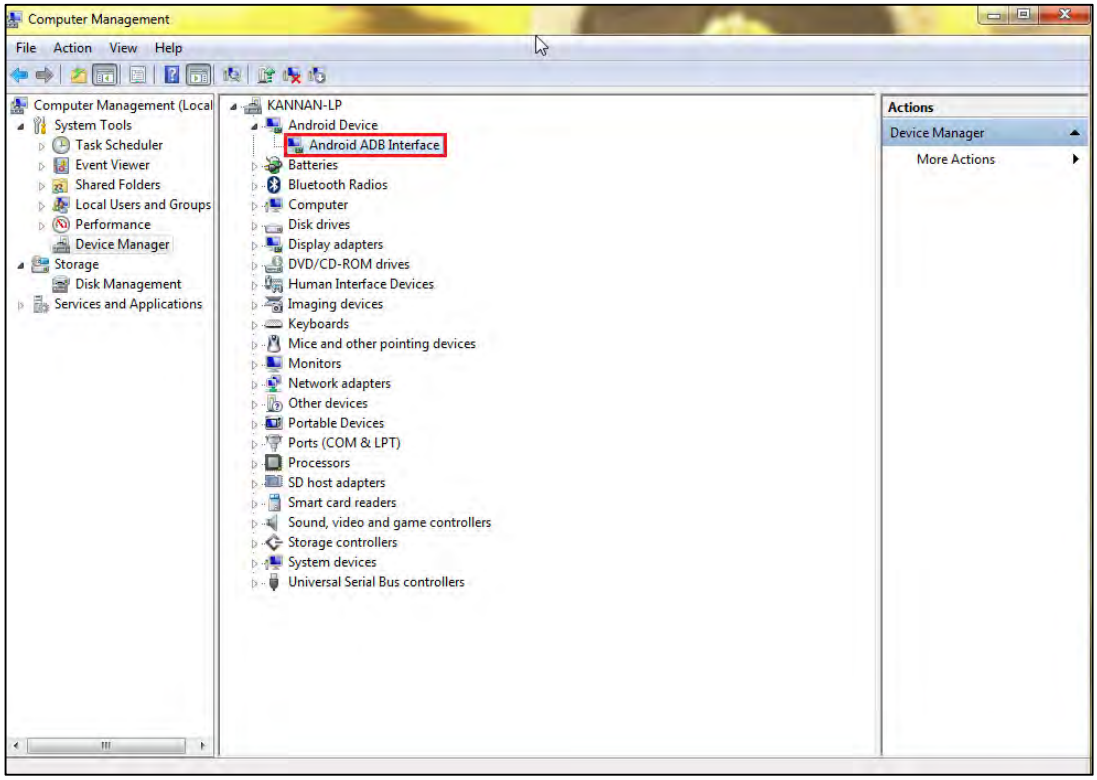
To Install USB Composite Drive proceed as below

Download Marvell Windows USB Driver available in Libre Portal

https://librewireless.sharefile.com/share#/view/s465a9d86cfb4fc4b/fi43add6-6929-324d-14ea-debffef787bf

Connect the power adaptor, press and hold the USB-Boot button, and simultaneously connect the USB cable and power on the EVK.

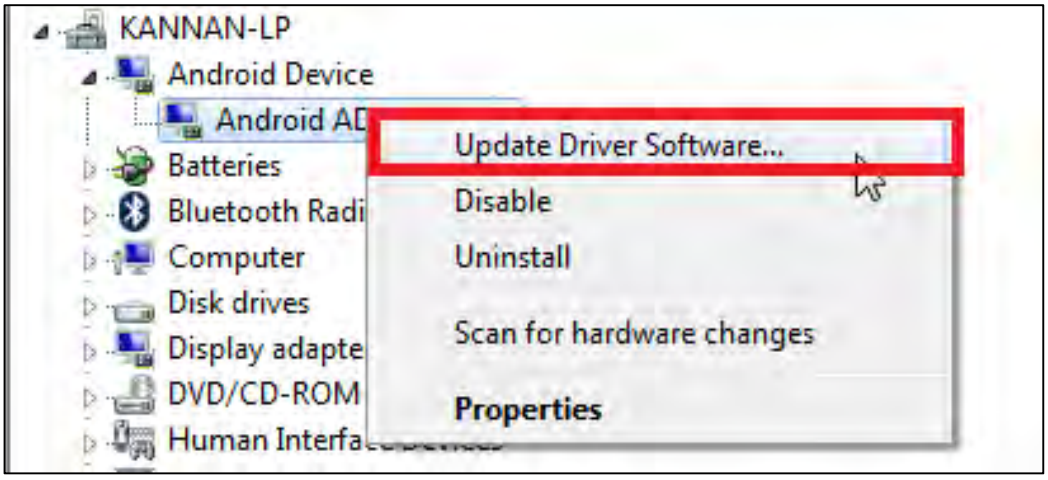
Open Device Manager.



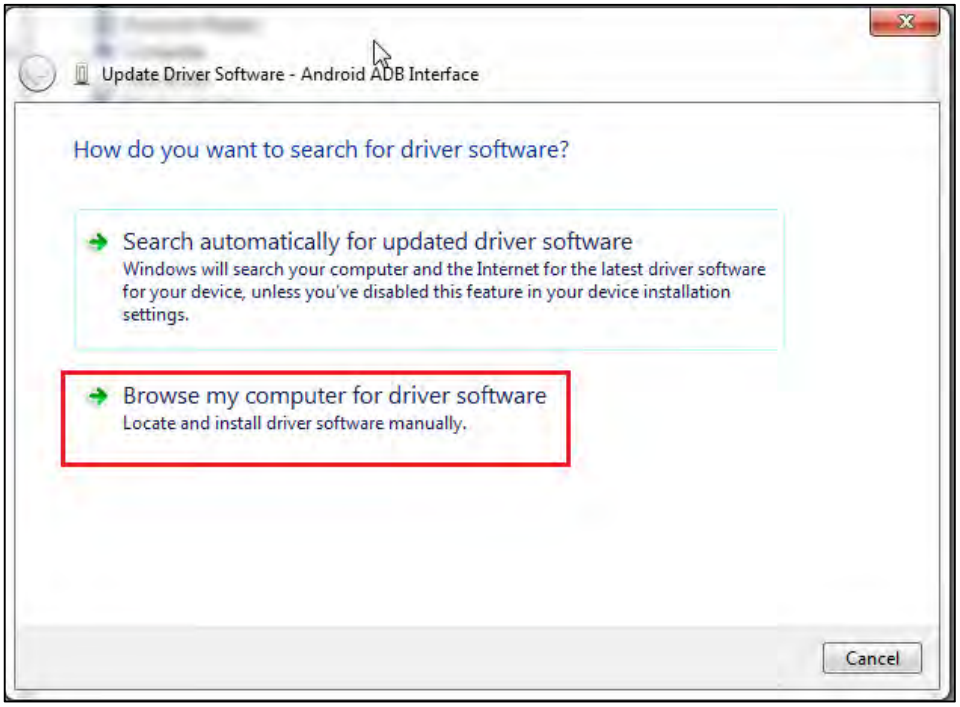
Note:

After boot up, if there is only one "Android ADB Interface" device as shown in the above screenshot, then follow, section 2.1.1 to install USB Composite Drive. Otherwise skip section 2.1.1 and go to section 2.1.2 directly.

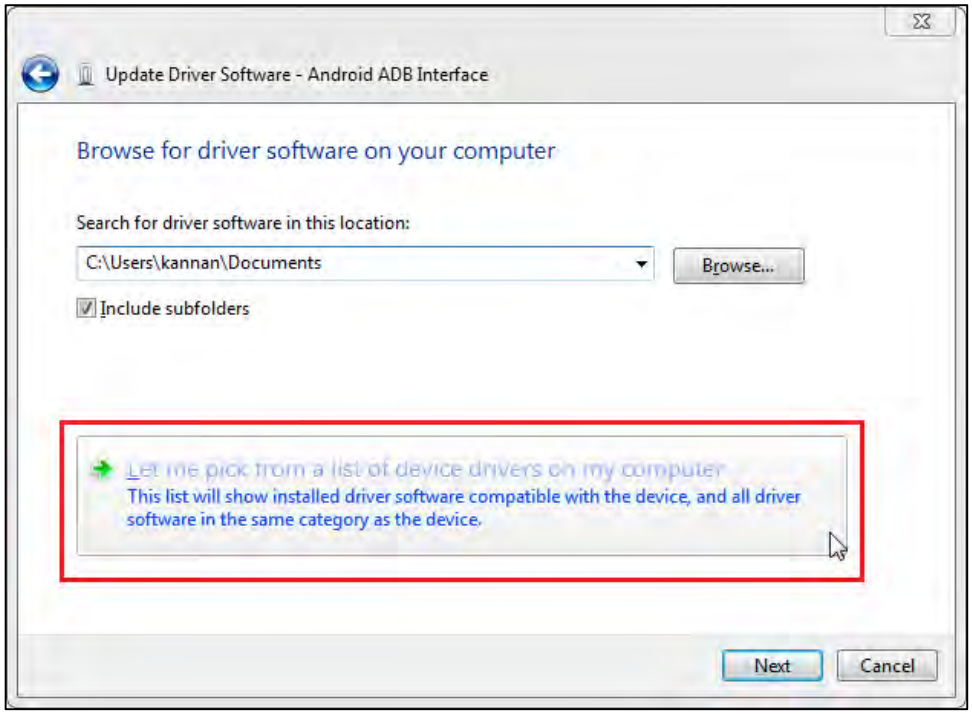
Right click "Android ADB Interface", and select "Update Driver Software".



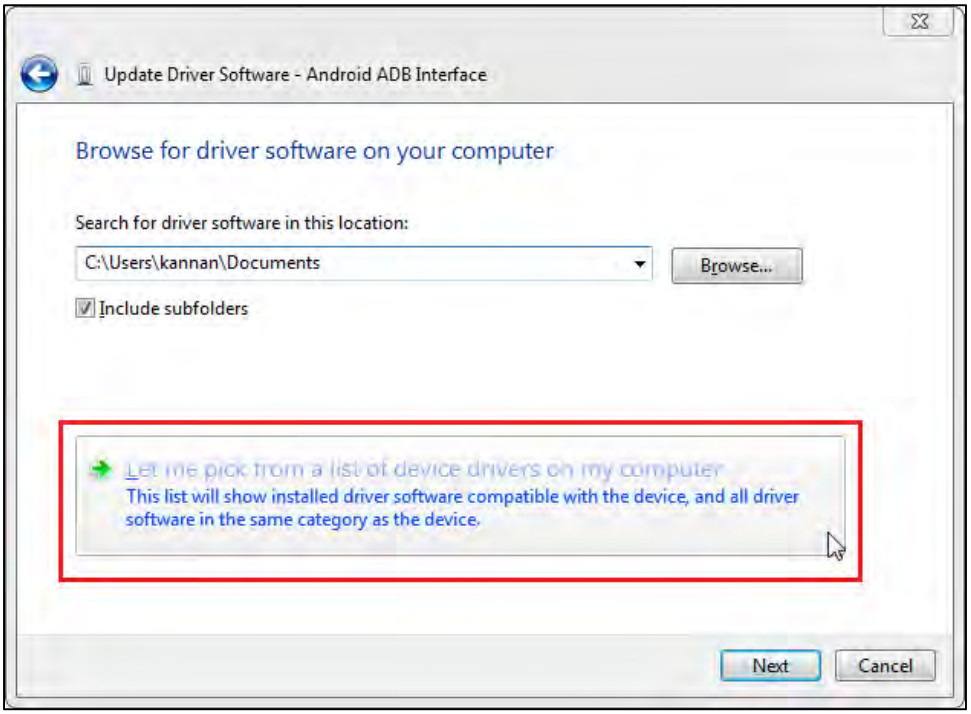
Select "Browse my computer for driver software".



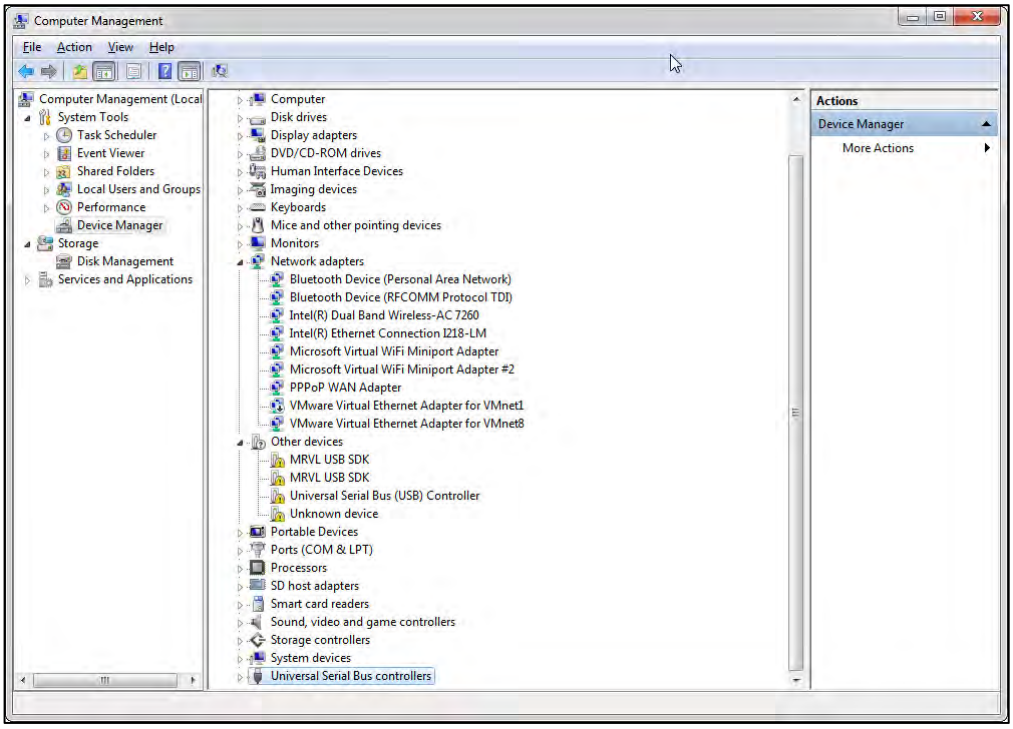
Select "let me pick from a list device drivers on my computer"



Select "USB Composite Device", then click "Next".



After installation, two unknown devices will be seen as shown in the below screenshot.



End--

7.4. Install Android Composite ADB Driver

To install Android Composite ADB Driver (ADBD) proceed as below.

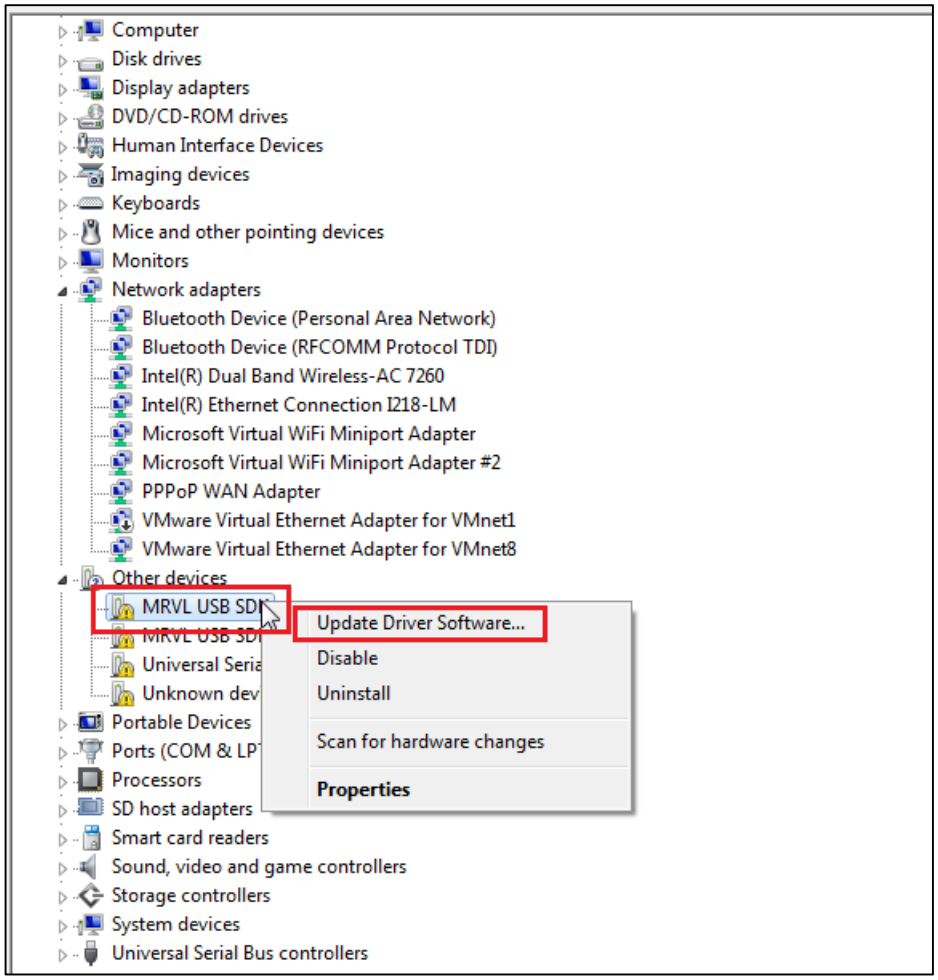
Download ADB Composite Driver from

http://developer.android.com/sdk/win-usb.html

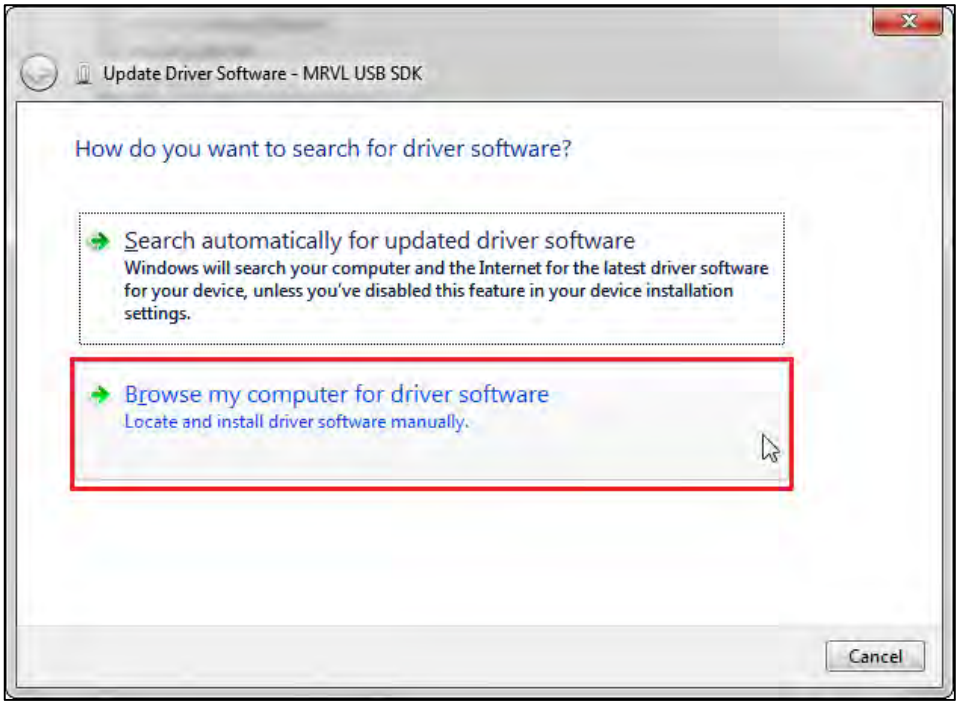
Power on LS EVK

> **Note:** ADBD starts on LS-EVK Boot-Up. Two unknown devices will show up in Device Manager as seen in the below screenshot.

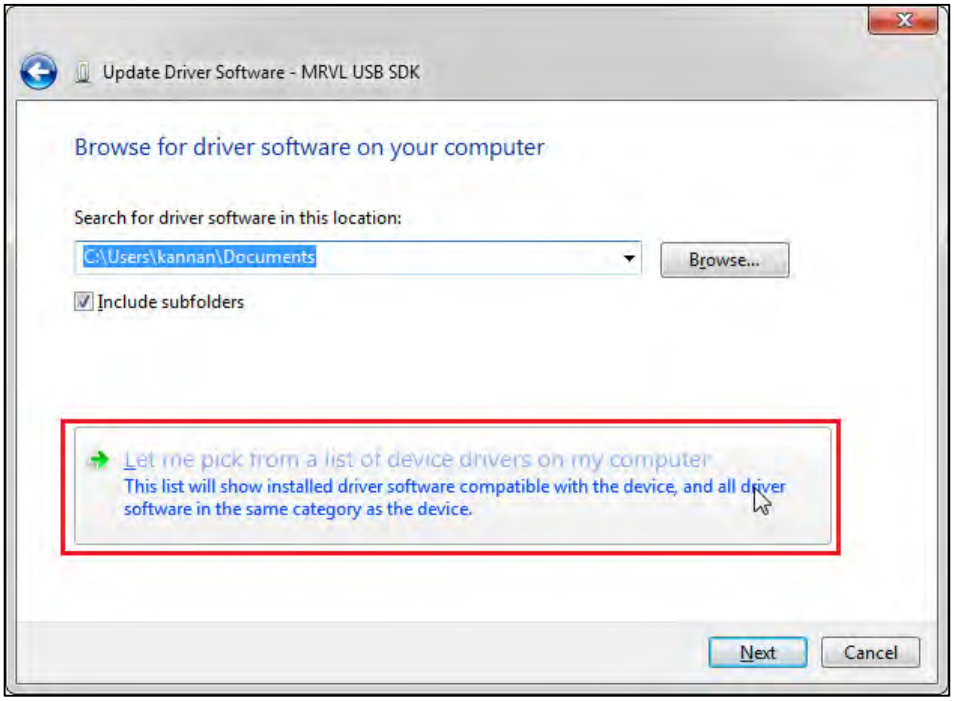
Right click the 2nd device, and select "Update Driver Software."



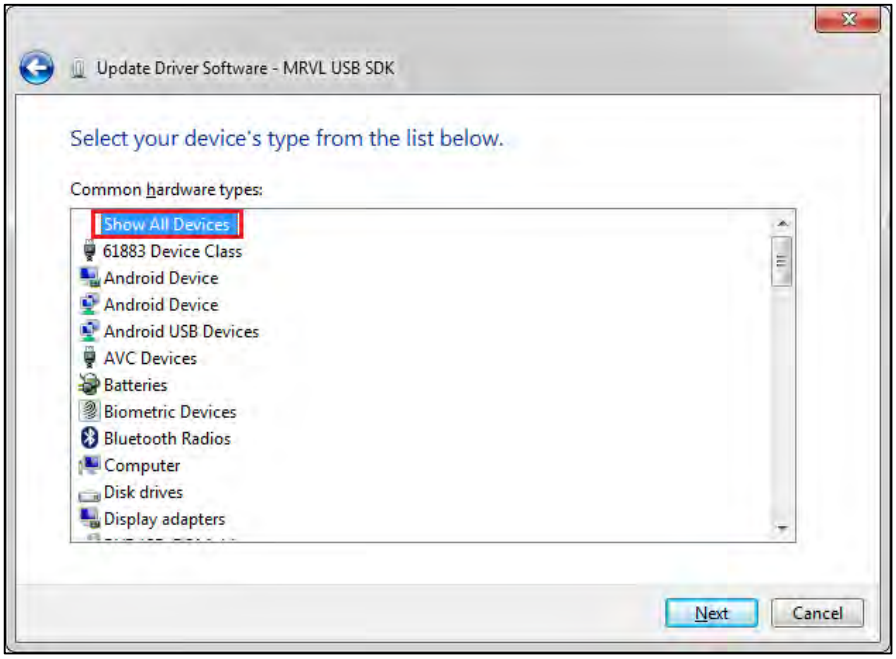
Select “Browse my computer for driver software”



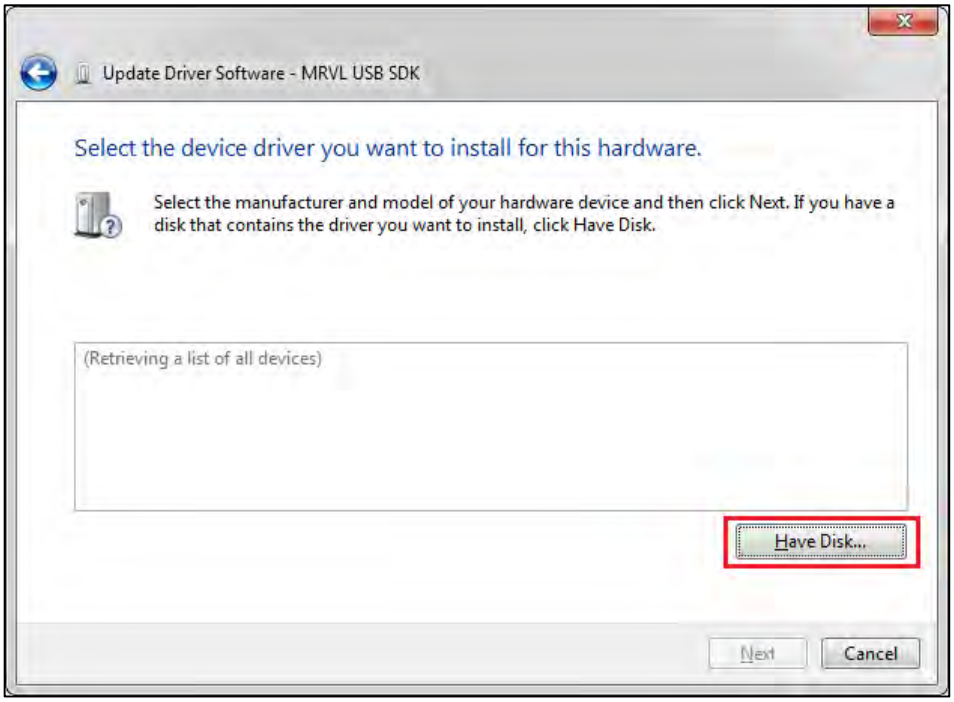
Select "let me pick from a list device drivers on my computer"



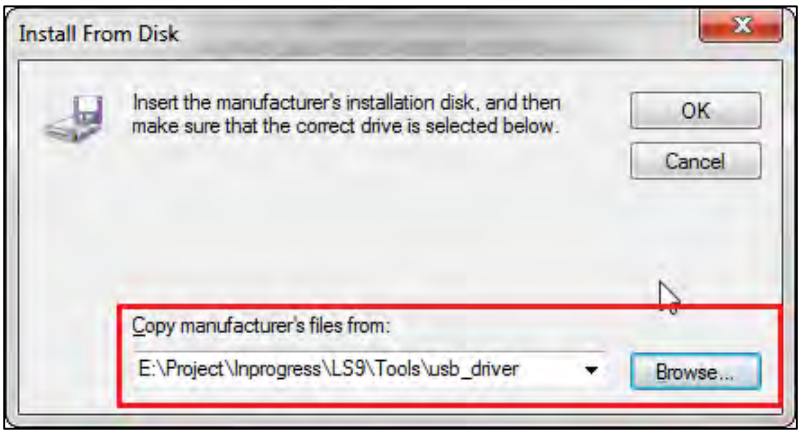
Select “Show all Device”, then click “Next”



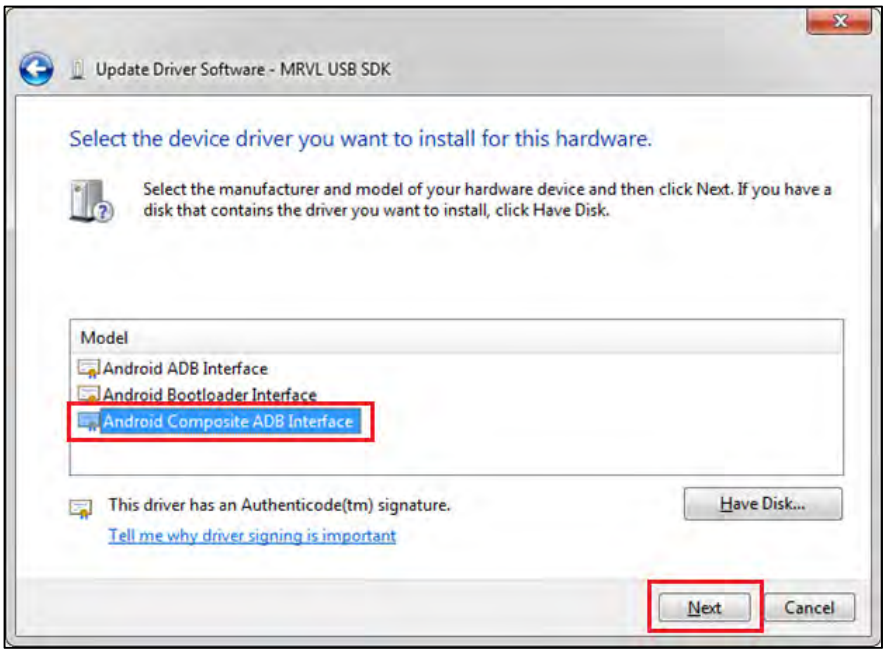
Select “Have Disk…”



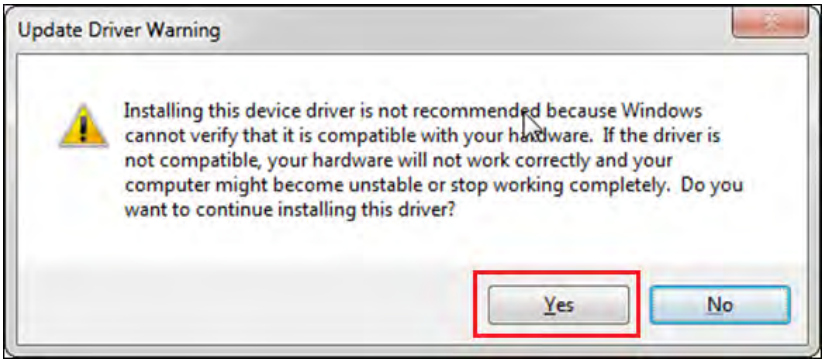
Go to Google USB driver file location and then select "OK"



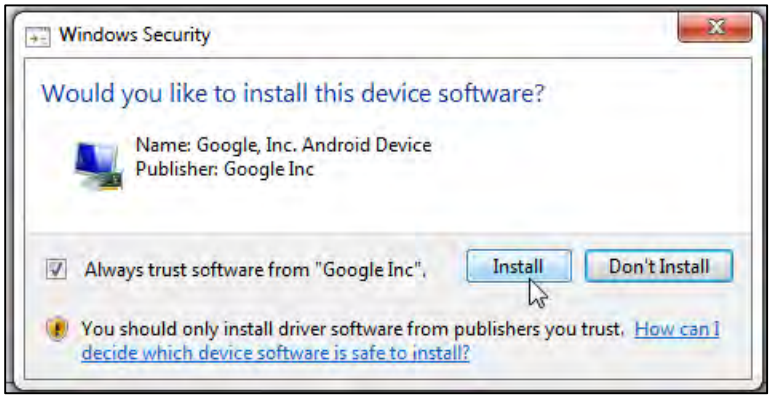
Select "Android Composite ADB Interface", then click "Next".



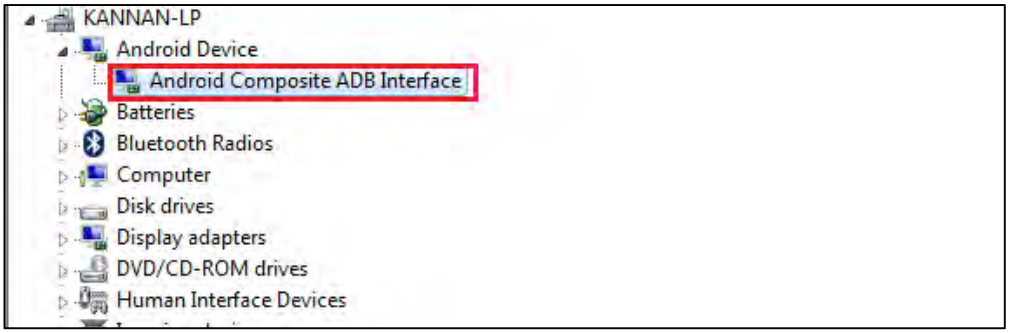
Click "Yes" on Update Driver Warning message then



Click "Install" on Windows Security message



After installation is complete, "Android Composite ADB Interface" device is displayed as shown in the screenshot.



End --

7.5. Sharing Folder

Windows

1. Right-Click on the folder where the firmware image (83_IMAGE) is placed and Click **Properties**.
2. Go to **Sharing** menu and Click **Share**.
3. From the drop-down select **Everyone** and Click **Add**.
4. Click Share.

Ubuntu

1. Right-Click on the folder where the Firmware Image (83_IMAGE) is placed and Click **Local Network Share.**
2. Select all the sharing options and Click Share.
3. Add all the permission for the Alert.
4. Click Apply.

FCC Statement

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

-Reorient or relocate the receiving antenna.

-Increase the separation between the equipment and receiver.

-Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.

-Consult the dealer or an experienced radio/TV technician for help.

To assure continued compliance, any changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate this equipment. (Example- use only shielded interface cables when connecting to computer or peripheral devices).

FCC Radiation Exposure Statement

This equipment complies with FCC RF radiation exposure limits set forth for an uncontrolled environment. This transmitter must not be co-located or operating in conjunction with any other antenna or transmitter. This equipment should be installed and operated with a minimum distance of 20 centimeters between the radiator and your body.

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

Caution!

Any changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

IMPORTANT NOTE:

In the event that these conditions can not be met (for example certain laptop configurations or co-location with another transmitter), then the FCC authorization is no longer considered valid and the FCC ID can not be used on the final product. In these circumstances, the OEM integrator will be responsible for re-evaluating the end product (including the transmitter) and obtaining a separate FCC authorization.

End Product Labeling

The final end product must be labeled in a visible area with the following:

“Contains FCC ID: 2ADBM-LS9-AC11DBT”.

Manual Information to the End User

The OEM integrator has to be aware not to provide information to the end user regarding how to install or remove this RF module in the user’s manual of the end product which integrates this module.