

## USER GUIDE

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## 1 INTRODUCTION

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Raspberry Pi series are low cost credit card sized single board computers. The Raspberry Pi models feature a Broadcom SoC that includes an ARM CPU and an on chip graphics-processing unit (GPU). Raspberry Pi uses SD card that facilitates users to swap out different versions of the operating system or software updates, hence, speeding the development and testing process. This is a great way to develop new applications/software and show these to customers in remote locations or at trade shows.

The RDK media client software runs on the Raspberry Pi 2 and 3 devices and provides all the features and functionality of an emulator along with an enhanced WPE browser.

Please contact us at [info@RDKcentral.com](mailto:info@RDKcentral.com) for more information.

## 2 PURPOSE

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This document contains set-up and other information to run the RDK media client software on a Raspberry Pi 2 and Raspberry Pi 3 devices.

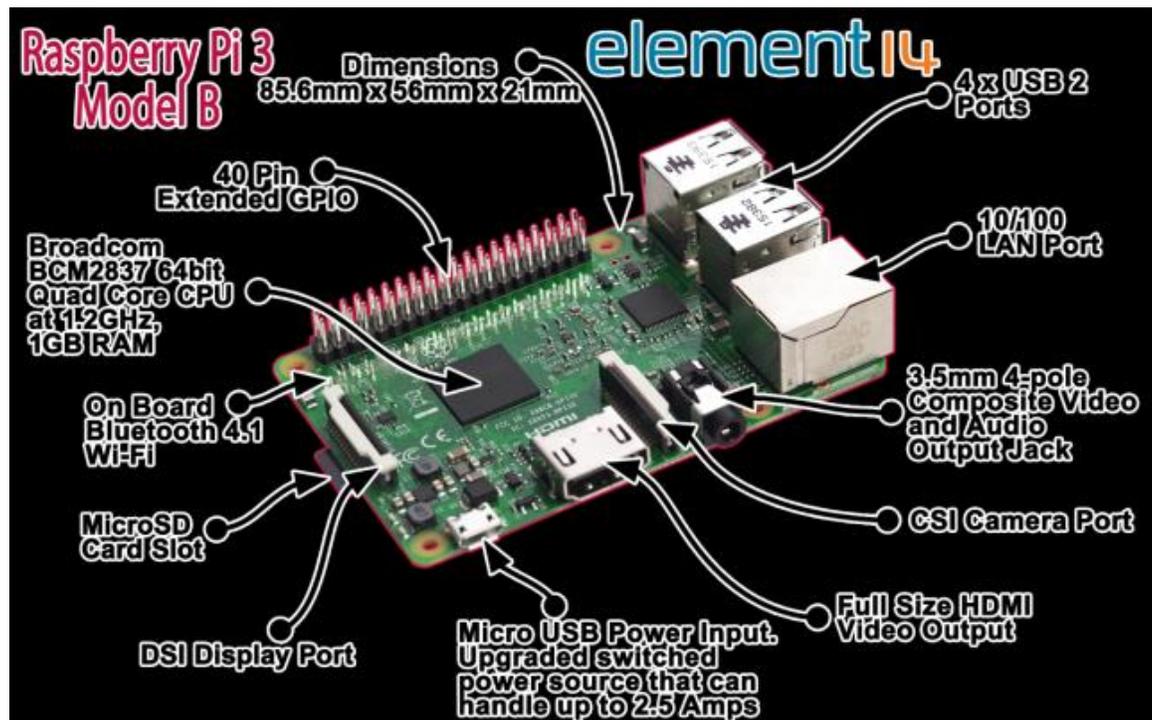
## 3 REQUIRED EQUIPMENT

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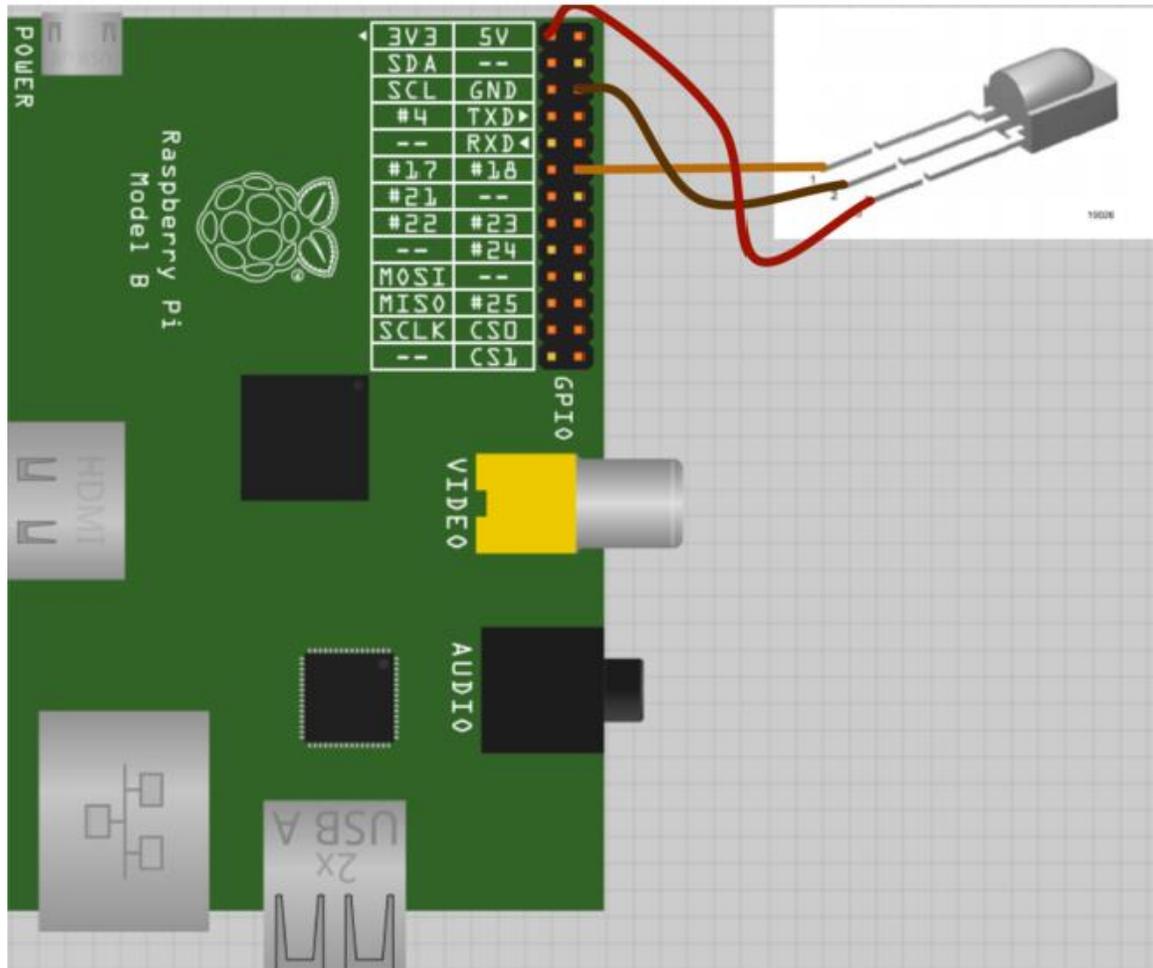
The equipment listed below is required for complete functionality of the standalone environment. The only devices that are tested to work properly in this solution are the specific brands and models listed below. Support for other types of equipment is not available at this time.

1. **HDP Developer Box XG1V3**
2. **Raspberry Pi 2 or Raspberry Pi 3 device**
3. **Standard USB keyboard**
4. **Television set/monitor with HDMI input**
5. **Ethernet cable**
6. **SD Card**
7. **TSOP4838 GPIO IR receiver**
8. **Xfinity-XR2 Remote Control**

## 4 SYSTEM SET-UP



1. Connect TV/Monitor to HDMI Video Output
2. Connect Ethernet cable to LAN port.
  - a. The other end of the Ethernet cable should be connected to the network where DHCP server is running so that the Raspberry Pi device gets assigned an IP address on boot-up.
  - b. Ensure that the XG1V3 Media Gateway Box and Raspberry Pi device are on same network.
  - c. Connectivity to Internet is required only if you want to play OTT content such as videos from YouTube.
3. Connect Standard Keyboard to one of USB ports
4. Connect your IR receiver to the board per the diagram displayed below.
  - a. Pin 1 is DATA, connect it to GPIO 18 (Pin 12) on Raspberry-Pi
  - b. Pin 2 is GND, connect it to GROUND (Pin 6) on Raspberry-Pi
  - c. Pin 3 is POWER, connect it to 5V (Pin 1) on Raspberry-Pi



5. Insert the SD card into Micro SD Card Slot
6. Connect Power cable to Micro USB power Input

## 5 HDP CONFIGURATION

### 5.1 Image Flashing

1. Linux:

- Insert an SD card in either the SD card port of the laptop or the USB SD card reader.
- Verify that the SD card has been detected by executing either of the commands listed below:
  - # lsblk
  - # sudo fdisk -l

**Notes:** Remember to look at the size of the device to be sure that you have identified the device number associated with your SD card. We use “dd” command to write the generated image on the SD card, thus an incorrect identification may delete data from your hard drive or other device of importance. In most case, the hard disk drive will be at /dev/sda.

- Type the following command to ensure that the partitions, if present, on the SD card are not mounted
  - # mount
- Repeat the below command to unmount all the mounted partition present on the SD card.
  - # umount <partition-mountpoint>
- Execute the following command to flash the image on the SD card
  - # sudo dd if=<r-pi sdimg> of=<SD card device> bs=1M

for ex:

```
# sudo dd if=rdk-mc-rpi.sdimg of=/dev/sdb bs=1M
```
- Repeat the below command to unmount all the mounted partition present on the SD card.
  - # umount <partition-mountpoint>
- Remove the SD card and insert it to the Raspberry Pi SD card slot

## 2. Mac

- Follow the instructions provided in the link below to flash the image:  
<https://www.raspberrypi.org/documentation/installation/installing-images/mac.md>

## 3. Windows

- Follow the instructions provided in the link below to flash the image:  
<https://www.raspberrypi.org/documentation/installation/installing-images/windows.md>

## 5.2 Launching WPE browser

- Insert the micro SD card with the flashed RDK media client image in the SD card slot of Raspberry Pi.
- Plug in the power cable to boot up the Raspberry Pi device
- Type “root” when the login prompt is displayed
- Check network connectivity.

```
# ifconfig
eth0      Link encap:Ethernet  HWaddr B8:27:EB:56:81:CD
          inet addr:10.213.51.90  Bcast:10.213.51.255  Mask:255.255.255.0
          inet6 addr: fe80::ba27:ebff:fe56:81cd%1994996079/64 Scope:Link
          UP BROADCAST RUNNING MULTICAST  MTU:1500  Metric:1
          RX packets:322337 errors:0 dropped:0 overruns:0 frame:0
          TX packets:86446 errors:0 dropped:0 overruns:0 carrier:0
          collisions:0 txqueuelen:1000
          RX bytes:259154898 (247.1 MiB)  TX bytes:8642327 (8.2 MiB)
```

- Run following to launch XG1 guide

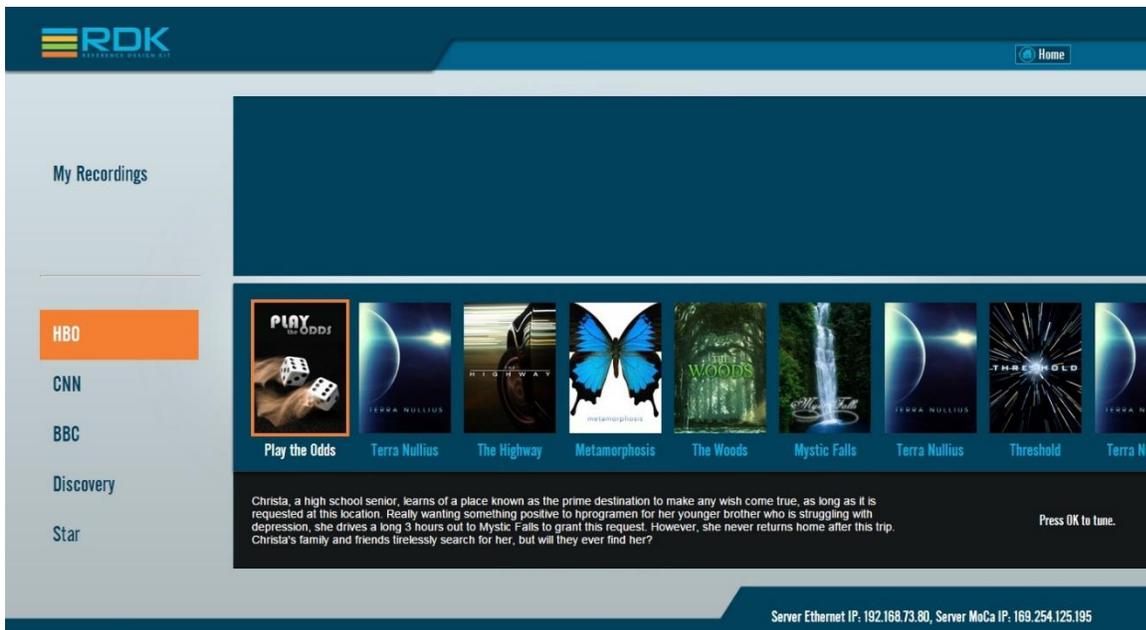
```
# WPELauncher http://<xg1 IP>:8082/ui/guide.html
```

For ex:

```
# WPELauncher http://10.213.51.109:8082/ui/guide.html
```

## 6 STANDALONE APPLICATION

### 6.1 Main Menu Page

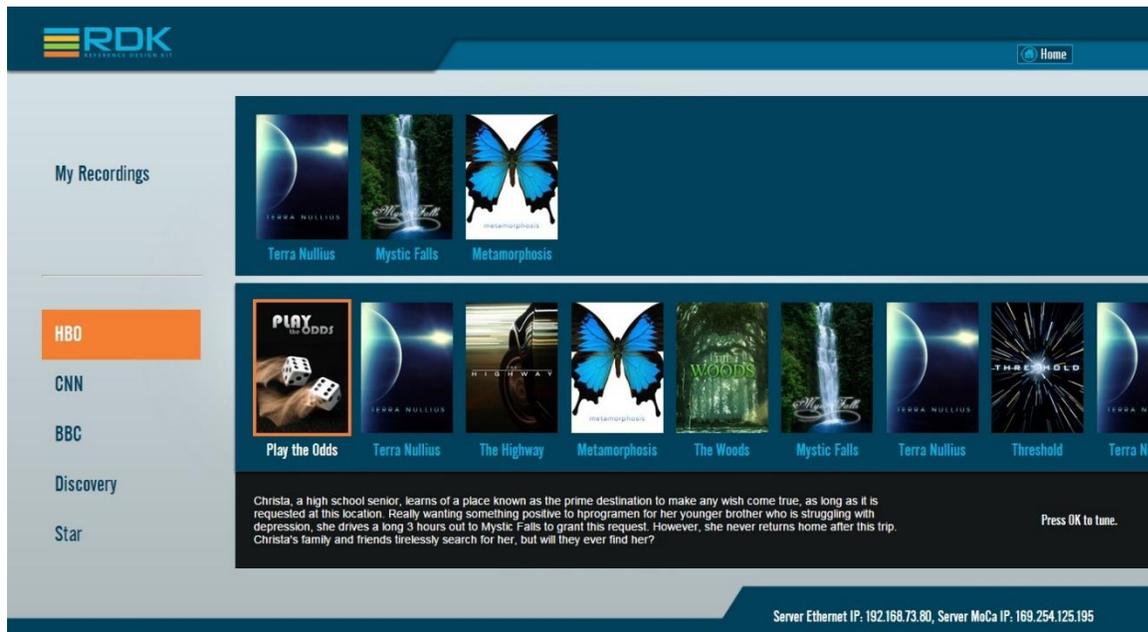


**Figure 1: Guide**

The main menu page shows a list of Live TV channels and Recordings. You can see the XG-1 Ethernet IP address on the bottom right corner of page.

Live TV channel names are listed on the Left grey plane, such as HBO, CNN, BBC etc.

## 6.2 My Recordings



**Figure 2: My Recordings**

Click on a recording to play that specific recording. A pop-up appears asking to either “Play” or “Delete” or “Cancel” a recording. Select “Play” button and press ‘ENTER’ key from keyboard to play the recording.

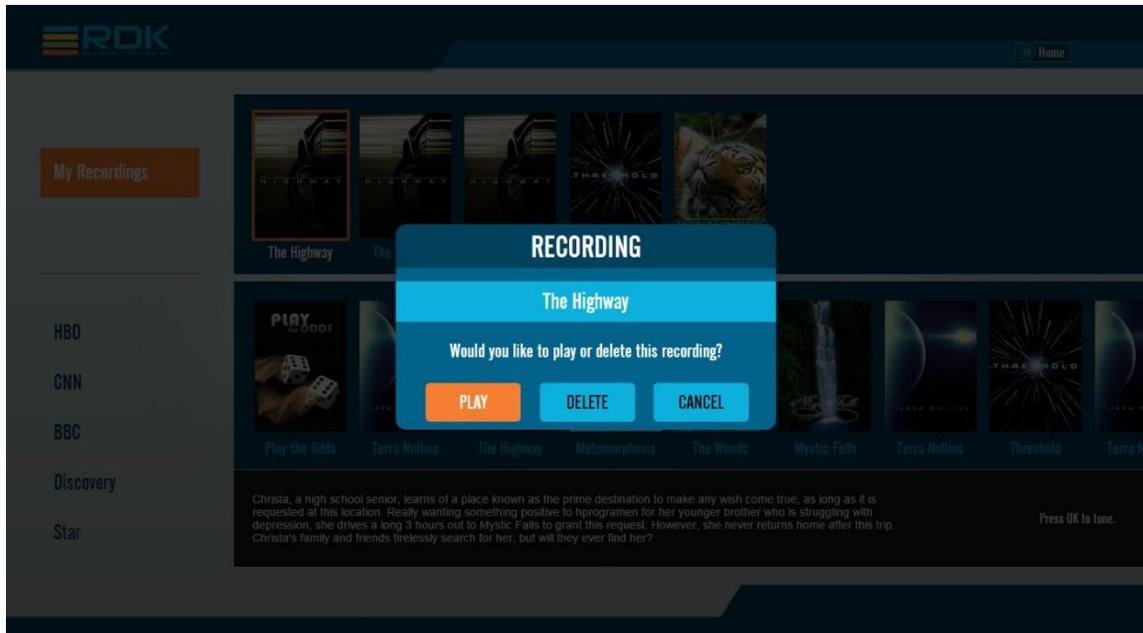


Figure 3: Recording Pop-up

### 6.3 Keyboard Navigation

Use the following keyboard keys to navigate the HDP guide page.

Navigation	Keyboard Key
UP	W
DOWN	S
LEFT	A
RIGHT	D
Select Video/Recording for Playback	ENTER
Channel Change during Playback	+/-
Record a Live Channel	R
Go back to Guide/Home Page	G

## 6.4 IR Key mapping

Use the following remote control keys to navigate the HDP guide page.

Navigation	Remote Key
UP	UP Arrow
DOWN	DOWN Arrow
LEFT	LEFT Arrow
RIGHT	RIGHT Arrow
Select Video/Recording for Playback	ENTER
Channel Change during Playback	CHANNELUP/DOWN
Record a Live Channel	REC
Go back to Guide/Home Page	XFINITY/MENU

## 7 CLOUD BASED EPG PLAYBACK SUPPORT

To play audio/video over the internet, type the following command

```
# WPELauncher <epg url>
```

```
e.g. WPELauncher http://107.21.252.26/scte/rdkott/
```

## APPENDIX A: MPEG-2 LICENSE FOR RASPBERRY PI

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You will be required to purchase license to play MPEG-2 TS streams on a Raspberry-Pi device. You can purchase the license key from the Raspberry Pi portal.

**URL:** <http://www.raspberrypi.com/mpeg-2-license-key/>

Read the “Product Description” section carefully on the above link and order the MPEG-2 license key for your Raspberry-Pi device. You should receive the license key on your registered email address.

Follow these steps to enable codecs on your device(s):

### 1. Linux:

- Insert an SD card in either the SD card port of the laptop or the USB SD card reader.
- Verify that the PC detects the SD card by executing either of the commands listed below:

```
# lsblk
# sudo fdisk -l
```

- Type the following command to check that the partitions on the SD card are mounted

```
# mount
```

- If not mounted, mount the FAT partition on the SD card with the following command

```
# mount /dev/mmcblk <partition-mountpoint>
```

- Open and edit the config.txt file. Add the following line at the end of the file.

```
# decode_MPG2=<Your_mpeg-2_licenseKey>
```

For ex:

```
# decode_MPG2=0xf628130b
```

- Save and close the file
- Remove the SD card and insert it to the Raspberry Pi SD card slot
- Following command will report codecs status:

```
# vcgencmd codec_enabled MP2
```