

VIDEO PLAYER FOR RASPBERRY PI (update 2018/12/25)

Introduction

Welcome to our new Video Player for Raspberry Pi (RPi) B+, 2 and 3. This player up to the latest update 2018/12/25, is able to play H.264 video up to 1920x1080 resolution (Full HDTV) at 60p with AAC or MP3 audio. This software player is able to receive many streaming native protocols: RTMP, RTSP (over UDP/TCP/HTTP), UDP (unicast/multicast, HTTP/S progressive, HLS and TCP. It uses the OpenMAX core from Bradcom so is able to change the speed of playback to adjust dynamically the delay to the original stream in the long run, so it is good for low-latency projects. It also has an internal RTMP server, that can be used to connect directly from RTMP encoders (such FMLE, Wirecast, or our BMD encoder softwares). And it is also able to play interlaced fields in the chosen order.











We have also added livestreamer as downloader in order to add other protocols such as: Dailymotion, Livestream, Twitch, Ustream and 60 more plugins (http://docs.livestreamer.io/plugin_matrix.html#plugin-matrix). Apart from this, livestreamer can be used for other protocols as well: HDS, Akamai HD, Apple HLS, RTMP, HTTP/S progressive: (<http://docs.livestreamer.io/cli.html#playing-built-in-streaming-protocols-directly>).

There also more features added to this version of player as: MPEG-2 (thru MPEG-LA license - <http://www.raspberrypi.com/mpeg-2-license-key/> -), you can add easily a logo and a background thru the web interface, use the GPIO26 as a trigger to control an external relay (active when receiving stream, and inactive when there's no stream), new updates thru web interface uploading, hardware watchdog that make impossible to be hung by hardware and automatically reconnected on network disrupts, etc...

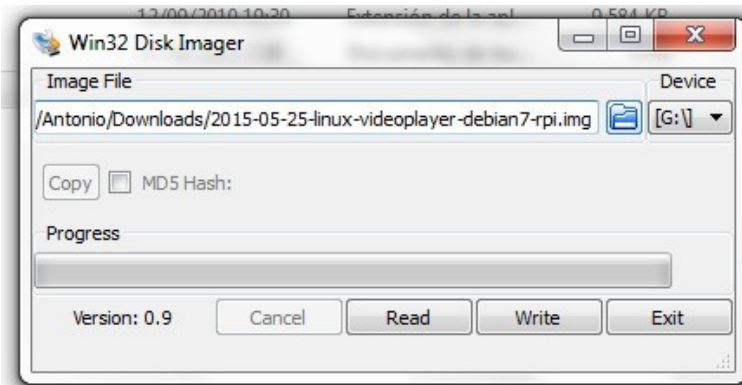
In essence, this is a must have player for any broadcast business that wants to be updated using the state of the art in video technology.

Installing the software

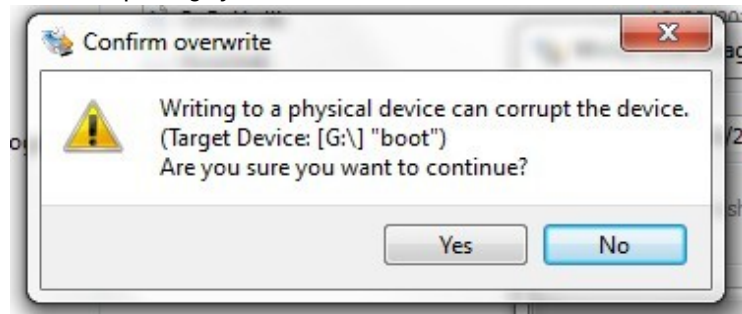
RPi uses a microSD card in versions B+, 2 and 3. We recommend to use 8GBs Samsung Class 10 cards or higher. You will have to download the .img file, and use Win32 Disk Imager to burn it into the microSD card. Once you downloaded and installed the Win32DiskImager, you will see something like this in the installation folder you chose.

Nombre	Fecha de modifica...	Tipo	Tamaño
 Changelog	07/08/2013 7:51	Documento de tex...	3 KB
 GPL-2	05/01/2013 8:08	Archivo	18 KB
 LGPL-2.1	05/01/2013 8:08	Archivo 1	26 KB
 libgcc_s_dw2-1.dll	07/01/2011 13:35	Extensión de la apl...	105 KB
 libstdc++-6.dll	07/01/2011 13:35	Extensión de la apl...	860 KB
 mingwm10.dll	06/03/2010 19:31	Extensión de la apl...	24 KB
 QtCore4.dll	04/05/2011 13:38	Extensión de la apl...	2.478 KB
 QtGui4.dll	12/09/2010 19:30	Extensión de la apl...	9.584 KB
 README	07/08/2013 7:38	Documento de tex...	3 KB
 Win32DiskImager	06/08/2013 23:41	Aplicación	94 KB

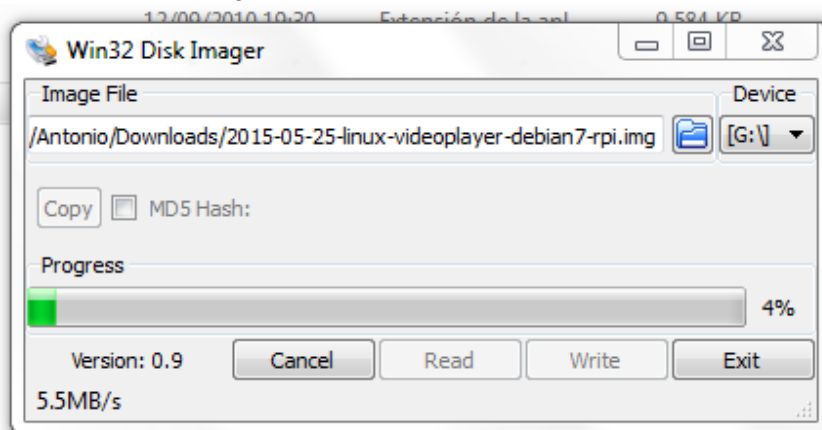
Insert the microSD card in your reader and your system will detect it. Then you can double click the Win32DiskImager application. Load the image (.img file) you want to burn.



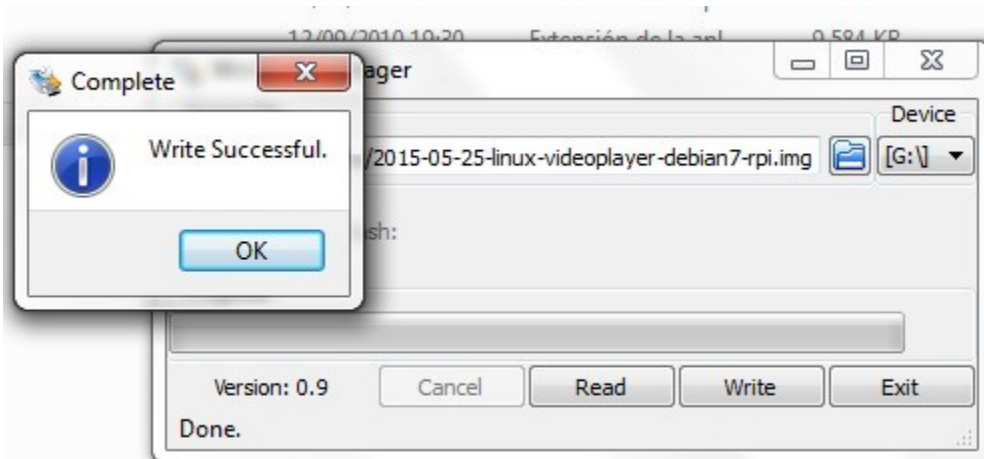
Now just click the Write button to start recording. Maybe a message will appear advising you about corrupting your old content inside the card.



Just press Yes, and recording will start.



Once the image is completely written into the card (100%), a message will appear to advise it.

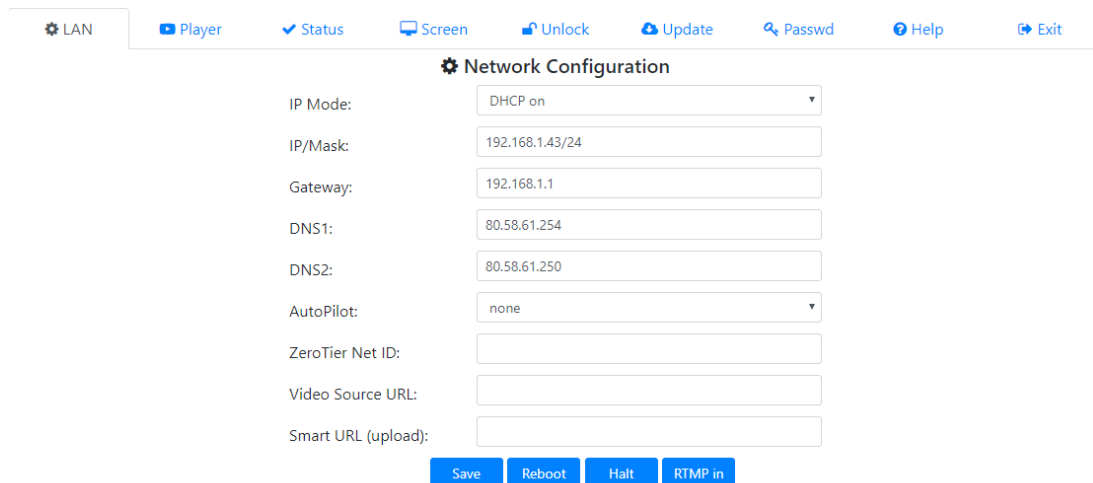


Configuration

You can now extract the card, and plug it into the RPi board. Plug a FAT formatted USB drive, connect the board to the network and power it, and wait until you have colorbars in the video default output (HDMI). This will take less than 40 seconds on a Rpi 3. You can extract the USB drive, and plug it in a computer in the same network. You will discover a new file recorded on it called "**rpoplayer**". Double click on it and your web browser will open with the control panel on it. You can also use a computer in the same network and a ip scanner software to find the IP of your player and access it thru your preferred web browser.



Enter the default login username and password: **admin/admin** . By default the network is configured to be DHCP on, so you will have to enable a DHCP server in your network (i.e: in your router), so you RPi will acquire an IP from it.



All the fields in this Control Panel are self-explained, just passing the mouse over it. You will also have an updated version of this manual, just pressing in the **Help** menu.

If you want to have an Static IP, tell your network administrator to configure this part for you. This page will tell you any error you might have entering the values. The Auto Pilot option has 2 possibilities: none (when the player is plugged in, will start playing the url stream configured in the Player's page), player (will start to play the url stream configured in the Player's page once plugged in).

You can also join to your private VPN LAN using ZeroTier service. Just enter your ZeroTier Network ID.

You will have to press Save in order to save all changes made in these pages. You can also Reboot or Halt (stop completely the system) pressing the proper buttons.

Player Settings

This is the Player's Page default settings:

▶ Player Settings

Station Name:	<input type="text" value="STATION"/>
Screen Mode:	<input type="text" value="Digital (16/9) 576i50"/>
Video Aspect:	<input type="text" value="Original"/>
Background:	<input type="text" value="transparent"/>
Bars:	<input type="text" value="ON"/>
Logo:	<input type="text" value="OFF"/>
Audio Decoding:	<input type="text" value="Software"/>
Downloader:	<input type="text" value="none"/>
Streaming URL:	<input type="text" value="rtmp://localhost/live/stream"/>
Raw URL:	<input type="text" value="yes"/>
RTSP Transport:	<input type="text" value="TCP"/>
Playback Buffer (ms):	<input type="text" value="700"/>
Identifier:	<input type="text" value="b827ebe8c81c"/>
Username:	<input type="text" value="username"/>
Password:	<input type="text" value="password"/>
Audio Card:	<input type="text" value="Embedded"/>
Audio Volume:	<input type="text" value="96"/> % <input type="button" value="-"/> <input type="button" value="+"/> (0 to 100%)

Let's explain every field step by step:

Station Name .- This field can be used to identify this player from other players you might use in your broadcasting network deployment. You can use spaces on it, but have in mind that you can send this value to your server using the GET method when the Raw URL field is set to "no". Some servers can use this value to show the name of the station in your control dashboard.

Screen Mode .- Here you will select the resolution and the aspect (4/3 or 16/9) of your final screen to be shown, no matter the source stream's resolution and frame rate are, it will be resized to your selected screen mode. Analog is for the analog video/audio output, and Digital is only for HDMI video/audio output.

Video Aspect .- This field will let you select how to display the source on you selected screen mode. **Original** will respect the source's video aspect, so if you chose a 16/9 screen mode, and the source's aspect is 4/3, you will have a perfect 4/3 screen with blank side bars. **Fill All Screen** will fill all of your

screen, no matter if it has to stretch the source's picture to achieve it. **Fill Width** will spread the source's picture respecting its original video aspect until all the width of the screen is filled, so maybe your picture could overspan on height.

Fields Oder .- You can here choose the correct fields order of your source or how you want to display it. Any will display it on a random order, so select it only if your source is progressive. TFF is top field first, used for PAL and HDTV, and BFF is bottom field first, used for NTSC and DV.

Video Background .- The video displayed could have gaps on the edges depending on the source's aspect and the screen mode and video aspect selected, so if you choose a **transparent** background, the gaps on it could show the background bars if displayed, so if you don't want this, just choose the **black** background option.

Bars .- This enable or disable the background bars or picture you might upload thru the **Screen** Page.

Logo .- Here you can choose where to show your channel's logo on the screen. Go to the **Screen** Page to customize it.

Audio decoding .- By default **software** decoding is good for every audio format (AAC, MP3), however some AAC encoders will perform better using the **hardware** option. (not very relevant)

Downloader .- By default our player is able to access native URLs by itself (RTMP, RTSP -over UDP/TCP/HTTP-, TCP, HTTP progressive, HLS -.m3u8-, UDP -unicast/multicast-). However if you want to play special URL streams featured by **livestreamer** (Youtube Live, Dailymotion, Livestreamer, Twitch, Ustream and many more) just use it as your downloader. Have in mind that we use Livestreamer 1.12.2 version (the latest at the moment of writing), so we cannot ensure that these URLs could be played and supported by this BSD-2 project in the future.

Streaming URL .- This is the native protocol URL or the Livestreamer URL to access depending on your previous option's choice.

Raw URL .- If **yes**, then no extra fields will be sent to the streaming server when accessed by the URL request. If **no**, then **Username**, **Password**, **Identifier** and **Station Name** fields will be sent to the server using a GET method added to the URL request.

RTSP Transport .- This is only intended for RTSP URLs, and will select what kind of protocol will use to transport the RTSP commands (**UDP**, **TCP** or **HTTP**)

Playback Buffer .- To ensure a soft playback we will need a minimum buffer of video to avoid network jittering when possible. On low-latency connections the best protocols are UDP for local networks, TCP, RTMP, RTSP, HTTP for good public networks, and if even with 5000 ms of buffer these protocols are not stable, you will have to use HLS that has long latencies (20 to 50 seconds, depending on the video segment's length)

Identifier .- Is the MAC address of you Rpi board without colons (:). It is a readonly field so cannot change it.

Username/Password .- We send these values on the URL request using the GET method, so maybe you can configure your server to use this values for conditional access control.

Audio Card .- Here you will be able to select the audio card you want to use to output the audio (**embedded** = RPi internal, **USB Audio** = external when plugged in)

Audio Volume .- In % and using increasing or decreasing buttons instead of allowed values directly.

Once you are done with these settings, just press **Save** and start to **Play**.

The **Status** Page, will show the playing stream details along with internal hardware parameters (time to host, cpu usage, threads, temperature of core).

Screen Page

Here you can change the default bars background and the inexistent logo. You can select up to 2 PNG files at the same time, using the Ctrl button and click, so upload them in one go. The system will recognise them on their prefix names.

The background file must be prefixed with "back" (i.e: background.png). The background can be any size, but it will create a fitted version for the screen mode used, so try not to use lesser resolutions to avoid degraded quality in the picture showed.

The logo file must be prefixed with "logo" (i.e: logodebian.png). Have in mind that you can use Alpha Channels on the PNG to show transparent zones on it when displayed over the video picture. If the input size is above 512x512, it will be resized to this values. Have in mind the Screen mode resolution you chose, to set a well fitted logo size.

Once you upload a file, this is immediately changed and showed instead of the old one.

🖥️ Screen Configuration

Upload PNGs

Select up to 2 files starting with "back" or "logo" for every duty.

Have in mind that when long files are selected, the upload process will make the browser to wait until the process has ended to show the results and the message of "**logo updated**" or/and "**background updated**". Be patient here.

Status Page

This page just will show the status of playback and some hardware INFO below.

✔ System Status

Available streams: 144p (worst), 240p, 360p, 480p, 720p (best)
Opening stream: 720p (hls)
Download of segment 485428 complete
Playing: 0h:00m:13s

Ping Time to Host: 22.60 ms
CPU usage= 8.62% [4x1200.0MHz] threads= 13
temp=42.4'C (keep below 75'C)

It will also show any error that might happen during the playback.

Unlock Page

Here you can ask for a license key if you tested our player and like how it works that fits perfectly for your needs. Just enter **Your E-mail** and press **Send**, the browser will block during the process some seconds until we receive your e-mail request, and a message will be show in red "**E-mail sent successfully !!!**". Once received we will contact you thru e-mail in order to accomplish the purchase, and will finally sent you a keycode to enter here in this page and press **Save**. The **Unlock Page** link will disappear from the menu, and your player will play non-stop.

You can test our player before purchasing our license playing in periods of 7 seconds. Once elapsed this time, the player will stop and the **Status Page** will show something like this:

✓ **System Status**

7 minutes of free playback are over !!!
Reboot to test once again
or
just buy a license if you like our media player

CPU usage= 0.17% [4x600.0MHz] threads= 10
temp=42.9'C (keep below 75'C)

If you want to test more, just go to the **Network Page** and press **Reboot** to keep on testing. There are no limits on how many times you want to test our player. Don't buy our license until you are sure you want it.

Update Page

You can **update** to the latest version of our software totally for free. When there is no new software, this page will show it, and when there is a new version to download, it will show an update button you can press whenever you want. The upgrade will take some time to download all it needs from our servers and install it. You will see the process in this page, show as messages until the end of the process.

☁ **Update Software**

Software Version: 20171116-rpi3metalplayer


New version available (press update to download it).

[update](#)

Once done, it will notify that in 5 seconds the service will be up again, and you will be able to enter the panel.

Password Page

Here you can change the **username** and **password** to access the control panel.

 **Change User and Password:**

Username:

Password:

re-Password:

You will have to enter the **Password** twice to ensure you write it correctly. Once done the next time you enter the panel, you will have to use the new parameters.

What happens if I forget my user/pass ?

You will need to know the MAC(**Ident**) of your board (some IP scanners will tell you this if you are in the local network of your player), so you will have to enter this URL to your browser:

http://ip_of_player/reset.cgi?id=ident (don't forget that the ident is the MAC with no colons (:)). Once done correctly user/pass will be reseted to its original values (**admin/admin**)

MPEG-2 License

You can buy an MPEG-LA license for you hardware thru the page:

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

You will need the **CPU serial** for that, and you will receive a **License** number started with 0x. You can access this page once logged in the control panel writing the URL of the page manually: http://ip_of_player/mpeg2

 **MPEG-2 License**

CPU Serial:

License:

MPEG-2 License Enabled OK

Here you will find the **CPU Serial** needed for the purchase procedure. Once entered the **License**, you will have to **reboot** the player in order to be activated. You will be able to **play** MPEG-2 video streams up to 1080i60.

Branding your Control Panel

You can freely customize our control panel just changing deeply its HTML code and CSS design, or just by changing the header PNG. You can download the files needed from the own player using the URL in your browser :

http://ip_of_player/panel.zip

You can open this ZIP file and edit directly its files, change them and even delete them. The header image file is inside the "images" folder as logo.png

Once you have your edited ZIP file, you can upload it using the URL in your browser: http://ip_of_player/branding?id=ident . You will need to be logged in the control panel to access this page. You can then upload your own zip file, and see how changes work.

Apart from this, if you read carefully our HTML code, you will see that we just use POST calls to CGIs with some parameters, so you can also make your own external software to control our player thru this CGI's interfaces.

However, have in mind that new updates could add new options to any of the HTML pages, so although settings and logos PNGs will not be overwritten, the HTML code could be changed in the future to allow new menus and options.

And that's all you need to know about our player. Have a nice time with it.