

Using HDMI to YUV Converter.

A technical briefing by J. S. Technology.

Introduction.

Not every display has an HDMI connector but they may have another high quality input – the YUV / YPbPr Component video input. How does one change HDMI to YUV? The solution presented here is to use an HDMI to YUV / YPbPr Component video converter. Both HDMI and YUV Component video are similar in terms of quality, so with a high quality video converter there will be no degradation in picture quality.

Additionally due to the complex nature of HDMI in multi-display environments it's more desirable to use YUV where there are few problems with distributed video. Hence why some professional installers prefer to convert HDMI to YUV to ensure compatibility for their clients.

The Connections.

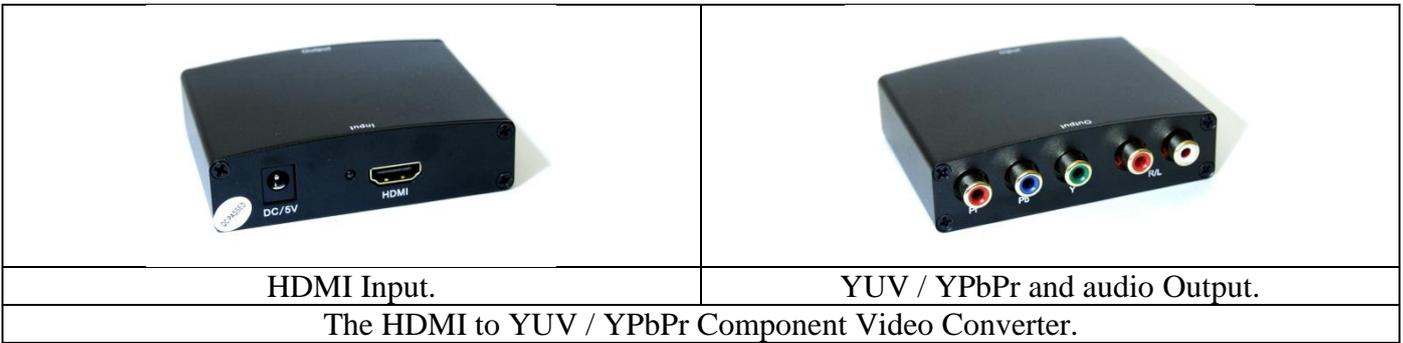
In this guide we will use Apple TV as the source. The principle is the same for other HDMI sources such as Sky HD, Virgin Media, BT Vision, Freeview, DVD players, Blu-Ray players, Xbox 360, PS3 and others.

	
<p>Apple TV with HDMI output, and optical audio.</p>	<p>Component input on TV. Note: Connections are marked Pb/Cr/R, Pb/Cb/B, Y/G.</p>

It is apparent from looking at the rear of Apple TV that none of the available connections would mate with those on our screen. There is only one video output: The HDMI.

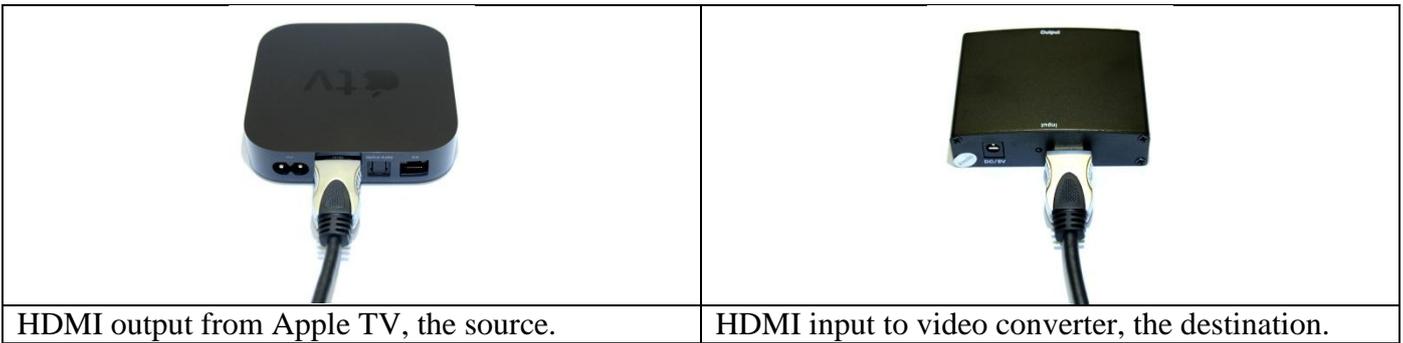
On the display we can see an input marked “COMPONENT/RGB IN” as this is a dual format input but will be used as a “component” input. In this format we're interested in the Y, Pb, and Pr input type. The connections marked VD and HD are unused. Audio L&R may also be used, but it is quite common for these to be routed to an external amplifier for higher audio quality than is possible via the display.

The solution to connecting these two devices is the **HDMI to YUV / YPbPr Component Video Converter** as shown below.



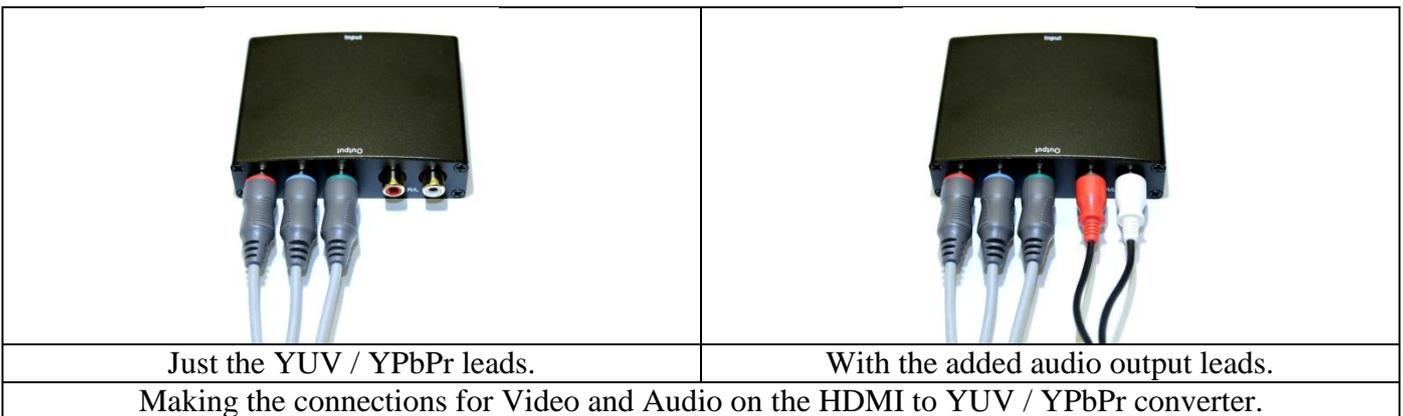
Making the Connections.

Apple TV only has one video output connection, the HDMI output and is connected to the converter as shown below:



The converter's output has two groups of connections of interest, one for Video and the other for Audio. Component video is typically in three coloured connections with audio in two.

Video		Audio	
Connector	Signal	Connector	Signal
Green	Y	White	Left
Blue	U or Pb	Red	Right
Red	V or Pr		



The leads from the HDMI to YUV / YPbPr converter are then connected to the display and, in this example, an external audio amplifier. Audio could have been directly connected to the display, however, in this example we demonstrate that it is possible to route audio to a separate and higher quality amplifier.

	
<p>Component YUV / YPbPr video connected directly to the display.</p>	<p>Audio connected to an external amplifier for higher quality audio.</p>

Configuring The Source.

In most cases the converter will work instantly with the default resolution output from the source. There are, however, cases where the source will output a higher resolution than the display can handle. The converter is still converting the HDMI output, but the YUV output is now higher resolution than the display is able to accept. In these circumstances refer to the user manual of the source on how to change the resolution.

Most displays will be able to display 480p, 576p, 720p and 1080i. These cover the resolutions that are output by digital TV sources such as Sky HD. Only the highest resolution of 1080p may present an issue with some displays. This higher resolution is typically from sources such as Blu-Ray or games consoles. Changing the source away from 1080p to one of the alternative resolutions that is supported by the display should cure the problem.

Output Comparison.

A question that’s often asked is does it work? Yes is the answer, but one reason is because J.S. Technology has evaluated a number of different converters and only stocks what they consider to offer the best results.

An example below compares the output from Apple TV to two alternative HDMI to YUV converters. The pictures are actual images displayed on a Panasonic plasma screen. While the converter stocked by J.S. Technology produces the expected result, the alternative has wildly incorrect colours on the output.

		
<p>The converter stocked by J.S. Technology.</p>	<p>Output is sharp and the colours are accurate.</p>	<p>Recommended.</p>
		
<p>An alternative evaluated by J.S. Technology but rejected.</p>	<p>The colours are incorrect. Note the yellow cab on right looks green.</p>	<p>Not recommended.</p>

Conclusion.

It is possible to easily convert using the right converter from HDMI to YUV / YPbPr Component video. However, care should be exercised when selecting the right converter to ensure picture detail and accuracy.

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