

# Record with OBS Studio

The biggest challenge when recording from an Android TV Box (video streaming hardware) is to record video and surround sound in sync. I tried several ways of doing this and found one which allows me to do it in one recording without too expensive hardware. I have not found a video capture card on the market which allows to record a protected video stream or multi-channel surround sound.

**Note:** This guide is not intended to teach you how to circumvent copy protection. Make sure the source or service you are recording from allows you to make a copy for your own use before you record. Creating multiple copies or selling copies is prohibited by law.

**Note:** Subtitles stretch to convert from PAL to NTSC or vice versa: 0.960 / 0.959 or 1.0416

## Settings

### Gear

- Media Player: [Nokia Streaming Box 8010](#) or [Xiaomi Mi Box S 4K](#) Android streaming and video player
- BDP: [OPPO UDP-203](#) 4K Ultra HD Bluray Disc Player (player with HDMI passthrough and analog surround 7.1 audio outputs)
- Handheld App: Remote Control App  
<https://oppodigital.com/blu-ray-udp-203/blu-ray-udp-203-Support.aspx> or  
<https://apkcombo.com/oppo-udp-20x-mediacontrol/com.oppo.oppomediacontrol/download/apk>
- Video Capture: [Blackmagic Intensity Pro](#) 4K PCI-e capture card
- USB Audio: [ESI U86XT](#) USB audio interface
- Isolator: [Conext Link AD104 RCA Stereo 2 Channel Ground Loop Isolator Signal Noise Filter Suppressor](#) (avoid ground loop)
- NoHDCP: [UGREEN 40281 HDMI Audio Extractor](#) (disable HDCP)

With this setup you can record video and 5.1 or 7.1 audio at the same time.

### Cost of gear

- Media Player: 100 USD
- Disc Player: 1000 USD (you need to find a premium player or another device with HDMI passthrough and analog surround audio outputs). Instead of a Disc Player you can utilize any 5.1 pre-amplifier which supports an audio codec currently used by *Netflix*, *Disney+*, *Amazon Prime*, *HBO Go*, etc. If you use a pre-amplifier with variable output volume make sure you adjust the volume so you don't need to post-process amplification to it. Note that not every 5.1 pre-amplifier works, only one which supports the audio codec in the source stream.
- Multi-channel USB audio interface: 300 USD (with 6 or 8 analog inputs). If you don't have one or do not want to buy one you can record the 6 channels in 3 stereo pairs and then sync the audio with Audacity. 3 stereo pairs means you need to record the stream 3 times, each time you connect a different pair of analog output to the analog stereo input of the Video Capture card (e.g. L/R, C/LFE, SL/SR).
- Ground Loop Isolators: 30 USD (for 6 channels)

- HDMI to HDMI converter: 30 USD (to remove HDCP)
- TOTAL: **1500 USD**

## Connection diagram

flowchart LR; Isolator["Ground Isolator"]; Capture["Video Capture"]; USBaudio["USB Audio"]; Box["Media Player"]; Box--HDMI-->NoHDCP; NoHDCP--HDMI-->BDP["Disc Player"]; BDP--"FL/FR C/SW SL/SR (6ch RCA)"-->Isolator; BDP--HDMI-->Capture; Capture--"PCI-e or USB"-->PC; Isolator--"FL/FR C/SW SL/SR (6ch RCA)"-->USBaudio; USBaudio--USB-->PC; click PC "#software"

### Notes:

- The UDP needs to be set to *Source Direct* to pass through the video to the capture card, and the input needs to be set to *HDMI In*.
- While *Netflix* has a desktop client from which you could separately record 5.1 audio, other streaming clients on Windows do not have this feature.

## Steps

1. Switch on Media Player
2. Switch on Disc Player
3. Set Disc Player to HDMI in with remote or handheld app
4. Start OBS

## Software

- [OBS Studio](#) 27.2.4
- [HandBrake](#) 1.5.1 (GUI and CLI version)
- [SMPlayer](#) 22.2.0.10060

## Desktop Audio 5.1

- Video: none
- Audio: Windows 10 App

## FHD Surround 5.1 (Intensity Pro)

- Video: Mi Box S → 40281 (HDMI) → Intensity Pro (HDMI)
- Audio: Mi Box S → 40281 (SPDIF) → AVR-4308 (5.1 through Pre Out) to U86XT (Line IN 1-6)
- Make sure you connect the U86XT through a Ground Loop Isolator to the AVR to avoid ground loop issues while recording
- Set the AVR-4308 to volume -10 dB

## VHS Stereo (Intensity Pro)

- Video: HR-S6711EU (composite) → Intensity Pro (Y - green)
- Audio: HR-S6711EU (stereo) → Intensity Pro (RCA)
- Audio monitor: HR-S6711EU (stereo) → AVR-4308

## OBS Studio

### Settings

- Output
  - Hint:** Chose *Simple* or *Advanced*, not both, then save. *Simple* is good for lossless recording of both video and audio. *Advanced* is only necessary for some special use cases.
  - Output Mode: Simple
    - Recording Path
    - Recording Quality: Lossless Quality
  - Output Mode: Advanced
    - Type: Custom Output (FFmpeg)
    - File path or URL
    - Container Format: matroska
    - Audio Bitrate: 256 Kbps
    - Audio Track: 1
    - Audio Encoder: pcm\_s16le
- Audio
  - Sample Rate: 48 kHz
  - Channels: 5.1 or Stereo
- Video
  - Base (Canvas) Resolution: 1920×1080
  - Output (Scaled) Resolution: 1920×1080
  - Downscale Filter: [no downscaling required]
  - Common FPS Values: 60

### Properties Intensity Pro 4K

- Video Connection: HDMI
- Audio Connection: Analog RCA (we do not record the audio stream)

### Properties ESI U86 XT

- Device: U86 Multichannel 8 (ESI Audio Device (WDM) - U86)
- Advanced Audio Properties - Sync Offset: -120ms
- Advanced Audio Properties - Tracks: 1

### Filters

- Limiter: Threshold -1.00 dB, Release 60 ms

## Deinterlacing

- Disable

## How Tos

- [Prevent Clipping](#)
- [Profiles and Scene Collections](#)
- [How to transfer your VHS to Computer](#)
- [How to record high quality Wav audio in OBS ?](#)
- [Correct settings for capturing VHS](#)
- [5 Best Ways to Deinterlace Video in 2022](#)
- [How To Properly De interlace Videos To 50 or 60 Fps Progressive](#)

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