

HDSync Setup Manual

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The website were to download the latest version of this software, its sourcecode and this manual, get updates and more informations is: <http://www.syncstarter.org>

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1 Background information

The digital video syncstarter software was developed through the past years by the Montevideo/NIMk Artlab to provide synced playback of multiple high definition videos on multiple screens.

In the video art field there are many artworks requiring the real-time synced playback of audio/video: HDSync provides such a functionality for HD decoders, to sync HD video playback on multiple devices.

If you intend to use HDSync, first of all be sure to read and understand the informations on the WDLXTV website. To run HDSync you'll need a **WDTV Live** device for each video channel you are playing.

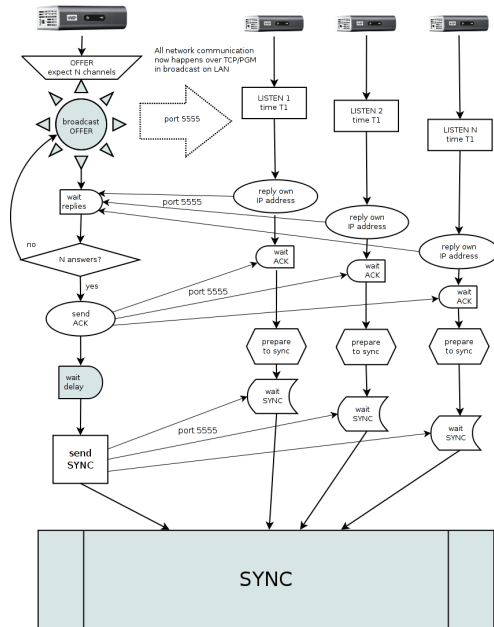


Be sure you have the **Live** model: the one with a network port on its back (Ethernet RJ45).



2 Mode of operation

Below a graph illustrating how HDSync works



3 Prepare the devices

Before proceeding with HDSync you need to upgrade your WDTV device with the WDLXTV homebrew firmware developed by B-Rad and his team: you need to do this because the firmware developed by the community is, as usual, way better than the one distributed by the company.

Flashing the new firmware into the device is fairly easy, detailed instructions on how to do that are available on the WDLXTV Wiki.

Be sure to choose a firmware that matches your device model. HDSync has been tested only on WDTV Live HD devices which are best supported by the WDLXTV firmware series **1.02.21**. There are two kinds of firmware, one is LIVE and the other Ext3: both will work, depending from how you use your device, the simplest option is to use the LIVE version unless you have more particular requirements that you are aware of, beyond the use of HDSync.

To setup the WDTV devices you need to connect them to a monitor or projector and operate them with the remote control: that's all what

is needed to upgrade the firmware once it is loaded on a USB stick.

4 Prepare the video files

There is a wide range of video codec and formats supported by the WDTV devices, although just some are suitable for smooth playback in sync. We recommend using MPEG2 encoding and M2T or Matroska transport for the files. Another important detail is that to **start the videos with 5 seconds black** else the starting images will flicker due to the sync mechanism.

5 Prepare the Usb keys

To run HDSync on your WDTV Live device you need one USB stick for each device (and therefore each video channel); the usb stick will contain our software and the video to play.

First **format the usb sticks with a journaled filesystem like the Linux Ext3** using tools like `mkfs.ext3` from a GNU/Linux OS.

Then place our `hdsync.app.bin` file (made available on <http://files.dyne.org/hdsync>) on the USB sticks together with the `hdsync.conf` configuration file. The configuration is a plain text file that needs to be edited: set how many video channels you are playing (`TOTALCHANNELS`), the unique channel number for this usb stick starting from 1 (`HDSYNCCHANNEL`) and on what kind of network the sync-starters will connect: (`HDSYNCNETWORK`) if the IP will be dynamically assigned (`DYNAMIC`) or if the devices are connected on their own local network without a DHCP server (`STATIC`).

At last, create a `video/` directory and put a video file inside. At the moment only one video file is supported, the first one in the sync directory list, so we recommend to put only one file in that directory to be sure of which one will play.

Freezes may occur after long term playback (sometimes in 4 hours, sometimes even after two weeks, due to WDTV firmware bugs). To overcome this problem one can include also `ffmpeg.app.bin` in the root of the USB:

HDSync will make use of FFMpeg to detect the size of the video being played and make sure that it all restarts looping when is time.

6 Connect

HDSync is made so that a complete setup will be extremely simple to activate and deactivate: just using an ON/OFF switch, since that is what works best when you want to leave your installation somewhere like in an art gallery and give simple instructions to people.

Once you loaded the WDTV boxes with the HDSync software and got everything configured, you will need to **connect them together via ethernet cables** - and a hub if there are more than 2 channels.

Then connect each WDTV box via a video cable (Composite or HDMI) to your monitor or beamer, then connect the audio to the amplifier.

Then obviously you need to connect all power cables for all electronic device involved in this setup; we use to set everything on the same power socket so that its **ON/OFF switch** will be the main for the whole installation.

At last, make sure that all cable connections are well plugged and...

7 Switch ON!

If everything went well so far you'll see the WDTV boot screens popping up, then arriving at the menu they will automatically select the video playback browser and stop on its first selection, wait half a minute, then start.

In this phase you can notice that network leds are blinking: in case you are using an hub you can count as many lights as many devices you have (else there is a problem in the way you connected the network).

Finally, if for some reason you don't remember the password to access your WD devices, you can reset it using the **wdtvhack.app.bin** application we provide from our repository: use it on a separate usb stick and boot with it once, the root password will be reset to **hackme**.

Then if you want to monitor the sync operation "from inside", you can assign yourself an IP in the range of those you used for the boxes, then log into the devices via ssh and read their log in **/tmp/hdsync.log**, realtime updates can be watches with the command:

```
tail -f /tmp/hdsync.log
```

This way you can also debug the software behaviour for errors; however you won't need this unless you are debugging HDSync. At last, if you have any troubles these are likely due to cables and setup of files on the USB sticks. **Happy Hacking!**

8 Terms and Conditions

HDSync is Free Software and you can use it, modify it and redistribute it as you want, provided you read and agree with all terms of the Affero GNU GPL v3 license.

If you use our software for your own art projects you can sell or distribute your artworks as you like; but you must specify in the public documentation of your projects that you are **using free and open source software by Dyne.org**. Beware: the lack of such a mention is an actual violation of our software license.

9 Support

If you rely on this software and you wish we develop it further, please don't hesitate to express your appreciation. You can get in touch with more people using HDSync via our mailinglist.

If you need support using HDSync, distributing artworks or producing installations with it, you can hire our assistance.

10 Authors

HDSync is copyright (C) 2010-2013

by Denis Roio <jaromil@dyne.org>

HDSync source includes code by iMatix Corporation (ZeroMQ library), Miru Limited (PGM library), Theodore Ts'o (UUID library).

Testing and fixes were contributed by Nicholas Lue, Michael van Rosmalen, Eddie Bal.

This software is packaged to run on B-rad's WDLXTV firmware and benefits by the research and development of the WDLXTV.com community.

Since version 1.2 there is an optional dependency from the FFMpeg.app.bin kindly provided by RMerlin, to detect video length.

11 Disclaimer

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