How to Set up a Brightsign

What is Brightsign?

Brightsign is a company that produces professional media players. Media players of this type are called 'digital signage' media player. 'Digital signage' media players are also used in shops and for commercial applications, as well as museums and galleries. They are designed with constant, uninterrupted playback in mind.

Brightsign define themselves as the 'Market Leaders in Digital Signage Media Players'. As of December 2014, the company had sold half a million units. Brightsign are popular in museums and galleries, not just for digital signage, but for displays of video art — because they enable reliable playback, they're reasonably inexpensive, and allow for synchronisation.

The limitations of Brightsigns as of 2016 are that they: only 4:2:0 colour space video, only support MPEG2 or H.264 (mp4) video, and do not play uncompressed video.

Main Features of Brightsign

- It's a media player.
- They take SD cards, formatted as FAT32 (files under 4GB), NTFS and EXFAT.
- They have HDMI, VGA outputs.
- The VGA also outputs component and composite video, with an adapter.
- They all output stereo audio over mini jack, and HDMI.
- All models output (pass through) surround sound ac3 over HDMI, and some models have optical audio output.

File Formats

- H.264 video in a mov, mkv, or mp4 file
- MPEG2 video in an mpeg or mov container
- Some models support H.265 video
- Stereo MP2 audio in an MPEG container
- Stereo AAC or MP3 in mov, mkv, or mp4 file
- Surround audio in AC3 format in an MPEG or MP4 container
- Stereo uncompressed wave files (aiff or wav) in mov file

Format specifics:

- Video
    - Resolution: up to 1920 x 1080 (newer models support 4K)
    - Bit Rate: recommended 25Mbits/sec, tested up to 60Mbs in conjunction with a 95Mbs SD card.
- Audio: 48Khz or 44.1KHZ; any arbitrate.

Quick Guide to Types of Brightsign:

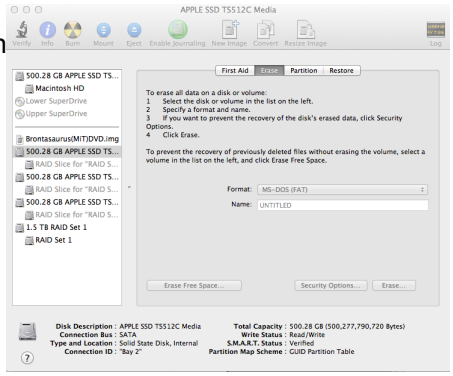
HD120	HD210	HD220	HD222	LS322	XD232	XD1030	4K242
							
Circa 2009	Circa 2009	Circa 2009	Circa 2011	Circa 2011	Circa 2011	Circa 2012	2013
				Audio Only		Optical Audio	4K and H.265

A note on SD cards and Formatting:

SD cards are now everywhere. The standard dates back to 1999. It is more or less the same technology that powers contemporary solid state hard drives. Today, SD cards comes in various capacities and speeds. The quality of the disk can be an issue, so stick to known, industry brands such as Sandisk. It's recommended to use cards with “class 10”, “45mbs”, “60mbs”, or “95mbs” specifically written on them, in the required capacities.

Brightsigns accept SD cards formatted as FAT32, NTFS and EXFAT. EXFAT support however, is unreliable, and therefore should be avoided. FAT32 is the most straightforward, but has the problem that it only supports file-sizes up to 4GB. NTFS does not have this limitation, but as the windows file format, it is not natively supported by Macs. To work with an NTFS SD card on Mac, you must use a plugin.

How Format as Fat 32 (Max file 4GB):
Open Disk Utility on a mac. Select your SD card. Choose the 'Erase' tab. Select 'MS-DOC (FAT)' from the 'Format:' drop-down and press the 'Erase' button. Done.



How Format and use SD card as NTFS (no Max file size):
I recommend a software called 'Tuxera NTFS for Mac' from www.tuxera.com. It enables the use of NTFS formatting within Disk Utility on Mac, and enables Macs to read and write files to an NTFS drive. Therefore, to format an SD card as NTFS on Mac, install Tuxera, and select NTFS as a format in Disk Utility.

However, Tuxera is neither open source nor free, but a licence is inexpensive at around £20.

How does Brightsign work?

A Brightsign works fairly automatically. So if you're curious if something will work, or how it will look, just try it. Put a mp4 or mpeg file on a SD card and it will play and repeat, so long as it has power. Please bear in mind, a Brightsign can take 2 minutes to start up, especially older models.

How to control the Brightsign with Scripts.

Before I begin, I should mention that there is a software for creating Brightsign presentations called 'Bright Author'. However, it is for PC only, and there ways to do all the options that the software gives you with scripts alone. Bright Author just generates the scripts for you, and copies the video for you and places them on the SD card.

The two types script:

There are 2 types of Script: autoplay.bsp and autorun.brs. We use autoplay.bsp files for non-synchronised displays. We use autorun.brs for synchronised displays. Both type of scripts are text files, with a 'brs' or 'bsp' file extension replacing '.txt'.

Script use cases:

- Half of the time, you just need to set the resolution or aspect ratio on a single channel video – use 'autoplay.bsp' for that.
- The other half the time, you need sync. In this case, you 'autorun.brs' files.

An autoplay.bsp file

Let's start with an autoplay.bsp file – because it's the simplest. I've pasted one here below. To make it work on Brightsign, paste it into a txt file made with 'TextEdit' on a mac, or TextWrangler (available for free from http://www.barebones.com/). Note: use TextWrangler over TextEdit, because TextEdit will try and autocorrect your code, and will break it

```
videomode 1024x768x75p

viewmode 1

volume 100

video.mp4
```

This file is very simple. The first line is the command 'videomode', which sets the resolution of the signal from the Brightsign to the display device. Select the correct videomode for your display based off the resolution and frame rate of your video. For example, for a full-hd pal video file choose '1920x1080x50p'.

Explanation: The first two numbers, followed by an x without a space, are the resolution. The last number is the frame-rate, which does not match my video at 25 frames a second, but it's the closest option available to us. Lastly, the choice of P or I indicates whether the stream sent to the display device is interlaced or progressive. Keep to the format of your video, but in our case that is nearly always progressive ('p'), over interlaced ('I').

The viewmode is how the video is fit to the dimensions of the video output. The aspect ratio of the video might be different from the output signal. By default if not specified, the viewmode is '0'. Viewmode 0 does not maintain the aspect ratio of the video, it just fills the screen with the video, so the video may appear stretched. 'Viewmode 1', centres the image and adds black borders to either the top and bottom or left and right to preserve the aspect ratio of the video, which is also known as letterbox. 'Viewmode 2', like mode 1, preserves the aspect ratio, but it scales the smaller width to fit the screen and crops of the excess video.

We would nearly always use viewmode 0 or 1, depending on the set-up.

'volume 100', sets the volume of the audio. The default is 100, which is full volume. Try lower values should you need to turn down the audio.

In the autorun.bsp file, we finish with the name of our video file written out without any quotes or commands. If we want to play multiple video files, we simply write out the filename of the next file on a new line.

Easy.

Now for 'autorun.brs' scripts, for synchronised video.

Setting up a synchronised video installation for use with autorun.brs scripts.

Note: 'Autorun.brs' scripts do not allow you to set the volume and viewmode (aspect ratio), so to use 'autorun.brs' your material should be encoded properly to begin with.

First thing first: Allocate one Brightsign for each channel of video, making sure each Brightsign is the same model, and that the each Brightsign has the same firmware. If they do not all have the same firmware, download the latest version from www.brightsign.biz

Next, Tate previously bought a 'DVD sync kit' from Pixels, which contains the autorun.brs scripts and instructions for setting up. However, for convenience, you can download the DVD as a 500kb zip file version (with sample videos removed) from the following link:

https://www.dropbox.com/s/8kvlv9a7lo59ywr/Pixels%20Sync%20Kit.zip?dl=0

Aside: further Brightsign sync scripts can be got form Zach Poff's website. [1]

Readying the Brightsigns for synchronised video

1 Zach Poff is a visual artist, and the author of the now-outdated but once popular 'Multiscreener', which was popular with artists because it enabled synchronised HD video for free via Mac.

1. Navigate to the 'Fixed_IPA_Assignment' folder within the Pixels Sync Kit.
2. Copy the 'autorun.brs' file in that folder to an SD card.
3. Open the copied 'autorun.brs' file on the SD card in TextWrangler, and change the ip address in line 24 to be your starting IP address. Your starting IP is the first ip address in the range of ip addresses you would like to use. For example, if I have a 15 channel Brightsign installation to set up, I would use '192.168.0.1' to '192.168.0.15'.
4. Save the 'autorun.brs' file, and put it into the first Brightsign. When booted, the Brightsign will show the message: “Settings Updated. Remove Network Configuration Script from flash card”.
5. Eject the SD card and repeat steps 3 and 4 for the next ip address in the range, in this example '192.168.0.2'.

You should now have a Brightsign for each channel of video, which are all the same model, have the same firmware, and each having a unique ip address in the same range.

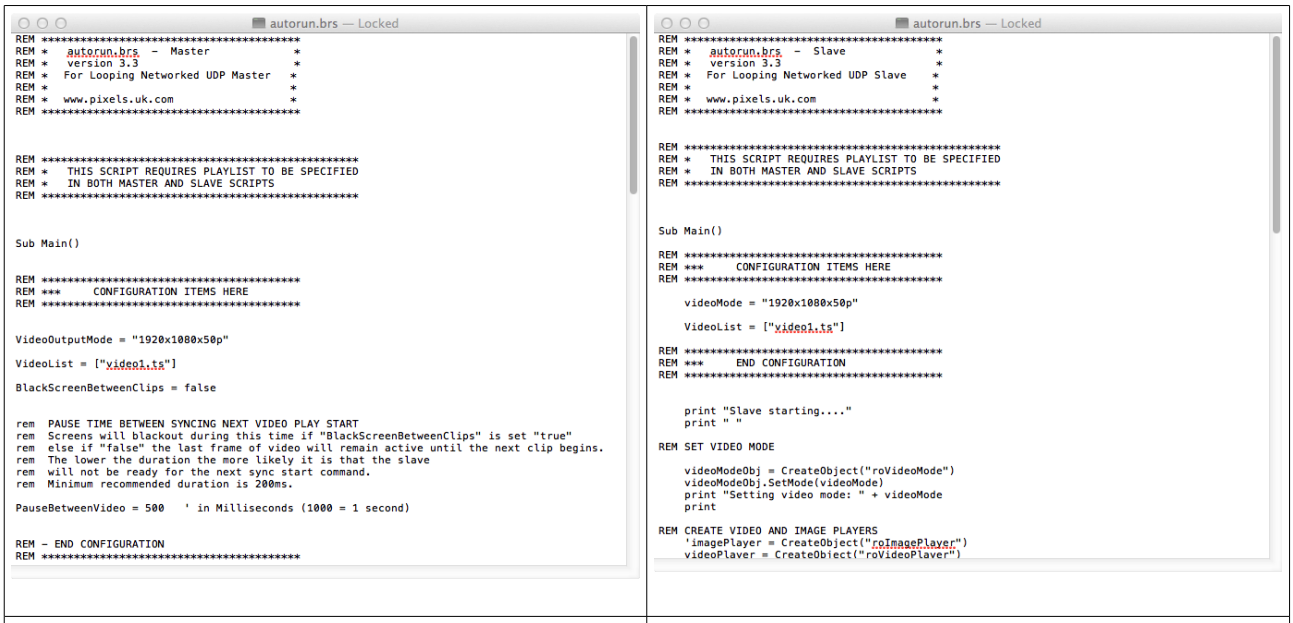
You are now ready to configure the 'autorun.brs' scripts:

There are two types of 'autorun.brs' script. Once controls the player that you want to be the master. The master players tells the other players, the slaves, when to start playback. Any of your machines can be the master, but normally you'd choose the player with the lowest ip, and what you know to be the first channel of video.

Once you have chosen which player and file you'd like to be the master, open the master 'autorun.brs' in TextWrangler[2].

NOTE: There is a lot of code in these scripts, but you only change 2 lines of code:

1) Change the 'VideoOutputMode' to the correct videomode for your display based off the resolution and frame rate of your video. For example, for a full-hd pal video file choose '1920x1080x50p' (See Appendix 1: Brightsign Videomode Settings' on the next page).
2) Under 'VideoList', write name of your file in double quotes. If you have multiple files for each Brightsign, write the name of each file in double quotes separated by comma, for example [“video1.mp4”, “video2.mp4”]



Master autorun.brs script	*Slave autorun.brs script*

Now place the script and your video file in the main directory of a correctly formatted SD card (FAT32 for files under 4GB, NTFS for files over).

Repeat this process for each channel of video you have, but use the 'slave' script subsequently to the first video.

2 TextWrangler (available for free from http://www.barebones.com/). Note: use TextWrangler over TextEdit, because TextEdit will try and autocorrect your code, and will break it

Lastly, connect each of your Brightsigns to an ethernet hub and turn on. That should be it. If something isn't right, or not working, check each of these steps again.

Appendix 1: Brightsign videomode settings:

Component:
ntsc-component
pal-component
ntsc-m
ntsc-m-jpn
pal-i
pal-bg
pal-n
pal-nc
pal-m

HDMI
720x576x50p
720x480x59.94p
720x480x60p
1280x720x50p
1280x720x59.94p
1280x720x60p
1920x1080x50i
1920x1080x59.94i
1920x1080x60i
1920x1080x24p
1920x1080x29.97p
1920x1080x30p
1920x1080x50p
1920x1080x59.94p
1920x1080x60p

HDMI / VGA:

640x480x60p
800x600x60p
800x600x75p
1024x768x60p
1024x768x75p
1280x768x60p
1280x800x60p
1360x768x60p

4k output via HDMI
Only 4K242 supports 4k video files, but the HD222 and XD1032 will upscale to 4K
3840x2160x24p
3840x2160x25p
3840x2160x29.97p
3840x2160x30p