

BrightSign

User Guide

HD110, HD210, HD410, HD810, HD1010, and HD2000

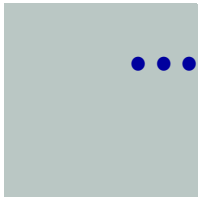
MATCHES:

- BrightSign HD110, HD210, HD410, HD810, HD1010 Software Version: 3.0.1

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Chapter 1

Introduction



What is BrightSign?

BrightSign is a standalone digital sign or kiosk controller that plays content from standard Flash memory cards. You can use BrightSign with almost any standard or high-definition monitor or TV to play continuous video or image loops. On select BrightSign models, you can add a touch screen or input device, such as a button board or keyboard, for interactive presentations, and since BrightSign is compatible with standard media authoring software, you can choose the tools you use to create your content.

Because BrightSign has no moving parts, it is durable, reliable, and an ideal replacement for a PC in information kiosks, tradeshow, retail displays, and other applications. And best of all, BrightSign enables you to maintain or improve the quality of your presentations. Using professional-quality decoding and scaling, BrightSign delivers crisp, clean, high-definition still images as well as 1920x1080 video from your high-definition MPEG sources.

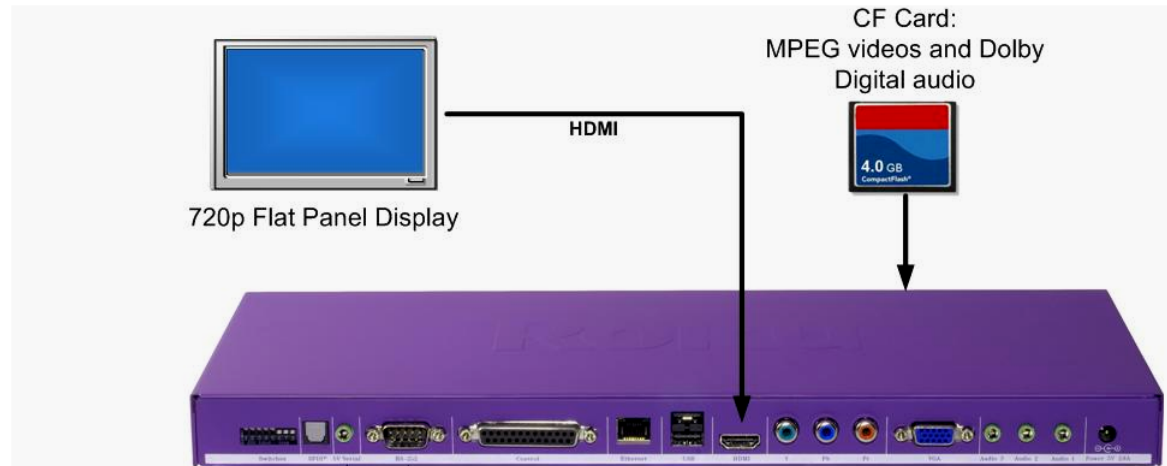
Sample BrightSign setups

You can connect BrightSign to a wide-range of devices based on your audio, video, and interactivity needs.

Video or slide show loop

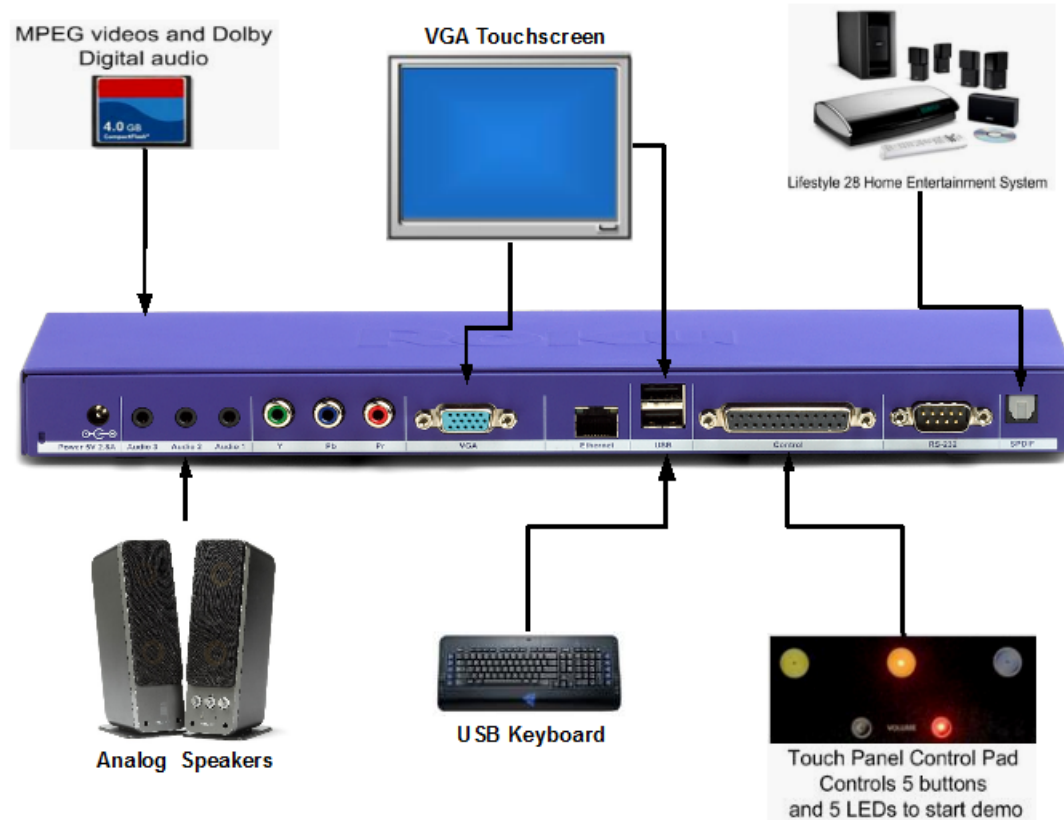
Place a video or set of still images on a Secure Digital (SD) or CompactFlash (CF) card, and connect BrightSign to a display. (CF cards are supported on the HD2000 only.) You can use any of the following methods to connect to a display:

- Use a VGA cable to connect to a flat panel monitor
- Use an RGB component cable to connect to a high-definition display, such as a plasma TV (HD810, HD1010, and HD2000 only)
- Use an HDMI cable to connect to a high-definition display



Interactive presentation

By connecting powered speakers to BrightSign, you can add audio to your display, and you can add interactivity by connecting an input device such as a keyboard, touch screen, button board, or LED. The example below uses an off-the-shelf USB keyboard.



Examples

Here are some examples of what you can do with BrightSign:

- Display a looping video with *DVD+* quality on a variety of monitor types
- Display a looping video with HD quality on a variety of display types
- Display a looping slide show in high definition
- Play looping music
- Display videos and images simultaneously in different parts of the screen (also referred to as *zones*)—videos in one zone, slideshow in a second zone, and on the HD210, HD1010 and HD2000, an RSS feed in a third zone
- (HD210, HD810, HD1010, and HD2000 only) Schedule any of the above to play at a specific time (hour, day, month, year)
- Combine any of the above
- Create interactive presentations that play video, photos, or audio in response to input from a remote, or a custom button board that you create (HD410, HD810, HD1010, and HD2000 only). The HD810, HD1010, and HD2000 also respond to input from a touch screen, mouse, or keyboard.
- Create a playlist with audio, video, and images



Chapter 2 Getting Started

Step 1: Get the hardware you need

To start using your BrightSign, you need the following hardware:

Display Any monitor, TV, or Elo touch screen with one of the following types of inputs:

- VGA
- Component (HD810, HD1010, and HD2000 only)
- HDMI

Storage card Either of the following:

- CF card (HD2000 only).
- USB Flash card (HD810, HD1010, and HD2000 only)
- SD card

Card Reader/Writer The card reader/writer must be connected to your Mac or PC and must be compatible with your storage card.

Optional Accessories Add any of the following items:

- USB keyboard (HD810, HD1010, and HD2000 only)
- USB mouse (HD810, HD1010, and HD2000 only)

- GPIO (General Purpose Input/Output) button board (HD410, HD810, HD1010, and HD2000 only)
- SoundBridge Remote
- Null modem cable

Step 2: Get the latest BrightSign software

Depending on when you purchased your BrightSign, you may need to download and install the latest software from the BrightSign web site.

TIP: Watch the BrightSign web site for information on BrightSign software updates so that you can take advantage of all the latest features.

- 1 Check your current software version.
 - a Connect a video monitor to your BrightSign.
 - b Start BrightSign without an SD card inserted.
 - c Look for the version number below the Roku logo on your screen.
- 2 Download the latest software.
 - a Go to the BrightSign web.
 - b Click the **Software Downloads** link.
 - c Compare the software version number with the number on your BrightSign screen.
 - d If your BrightSign software is older than the software on the web site, click the **Software** link to download the latest software.

- 3 Extract the software update file onto your SD card. (The file name is UPDATE.ROK.)
- 4 Insert the SD card into your BrightSign and apply power.
 - **HD2000:** Wait for your BrightSign to boot. (The display will be blank, but the LEDs on the front panel light as the unit boots.) Wait for the red upgrade LED to light up. During the upgrade, the connector activity LEDs turn on and off to indicate that the upgrade is in progress.
 - **HD110, HD210, HD410, HD810, and HD1010:** Wait for your BrightSign to boot. (The display will be blank but the Bsy LED flashes as the unit boots). During the upgrade, the yellow Upd LED flashes to indicate that the upgrade is in progress.

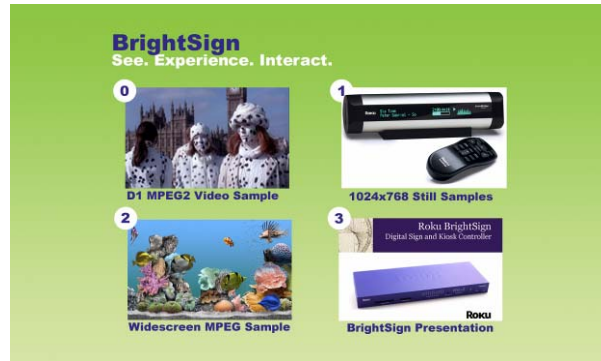
NOTE: *When the update finishes, BrightSign deletes the UPDATE.ROK file and reboots the unit. However, if the card was formatted with NTFS or HFS+, then BrightSign does not delete the UPDATE.ROK file and the unit doesn't reboot after the update.*

Step 3: Try the demo

The BrightSign demo shows an example of an interactive digital sign that displays still slides and video clips, and responds to input from a button board, touch screen, or mouse. It's easy to try if you have a BrightSign. Follow these steps:

- 1 Download the demo for your BrightSign model:
 - **HD2000:** Click the **HD2000 Demo** link.
 - **HD110, HD210, HD410, HD810, and HD1010:** Click the **HDCompact Demo** link.
- 2 Unzip the **BrightSignDemo.zip** file and copy the contents into the root directory of an SD card.
- 3 Connect your BrightSign to either of the following:
 - Elo touch screen
 - Standard monitor and USB Mouse
 - Standard monitor and Roku Button Board
- 4 Insert the SD card.

- 5 Turn on the power.
- 6 Use the touch screen, mouse, or button board to select one of the four hot spots.



You can also use the demo to try BrightSign with different types of monitors:

- 1 Connect your BrightSign to a monitor or TV using a VGA, component, or HDMI connection.
- 2 Make sure your monitor is configured to receive input from the cable you're using.
- 3 Start the demo by inserting the SD card you created in the previous set of steps.

Step 4: Get the results you want

Now you're ready to start using your BrightSign. Just add your content and follow the directions to play your presentation.

Chapter 3

Playing Media with BrightSign

Ways to play media

There are several ways to play media files on a BrightSign device:

- Play media automatically from an SD card when you turn on a BrightSign
- Play media via a script on an SD card
- Use the serial shell commands to test media playback

NOTE: *BrightSign HD110, HD210, HD410, HD810, and HD1010 output video through the VGA and HDMI connectors. These models communicate with the display attached to BrightSign and BrightSign automatically determines and sets the best video resolution. If BrightSign is unable to get video information from the display, the default video resolution is 1024x768x75p. BrightSign HD2000 outputs video through the Component and HDMI connectors and the default video resolution is 720p. If the resolution of a still image file does not exactly match the display resolution (videomode), then BrightSign scales the image to fit or it centers/crops the image, depending on the imagemode you selected*

BrightSign can autoplay the following types of media:

- **MPEG-2 video.** You can use a single file as a loop, or multiple files. On the HD2000, MPEG-2 files must be program streams. On the HD110, HD210, HD410, HD810, and HD1010, files must be transport streams with MP3 audio.
- **MP3 audio.** Any MP3 audio (in a video or mp3 file) must have a sample rate of 48 kHz or 44.1 kHz (or 32 kHz on an HD110, HD210, HD410, HD810, or HD1010).
- **(HD2000 only) AC3, WMA, WAV, 5.1 Dolby digital audio.** Any WAV files must contain 16 bit linear PCM data.
- **Bitmap files.** For still images, use an 8-bit, 24-bit, or 32-bit BMP file format. You can also use PNG and JPEG files. The maximum supported resolution is 1920x1080.
- **A playlist.** A playlist is a simple text file that contains the file names of still slides, video clips, or audio files to play.
- **(HD410, HD810, HD1010, and HD2000 only) An interactive playlist file.** BrightSign uses interactive playlists as a description of an interactive sign that responds to buttons, touch screen, mouse, track balls, etc. (Not all input devices are supported on all models; see [Product Specifications](#) for details.) Interactive playlists are very powerful and easy to create without any scripting. You can create an interactive playlist using Microsoft Excel (or any editor that supports CSV files, such as OpenOffice or the editor hosted at <http://csved.sjfrancke.nl/index.html>). See [Creating interactive presentations \(HD410, HD810, HD1010, and HD2000 only\)](#) for more information.
- **A custom BrightScript file.** A script is a simple program that controls behaviors based on events, and is appropriate for arbitrarily complex interactive media sequences.

Setting the video mode

The BrightSign software automatically sets the video resolution by communicating with the display attached to your BrightSign.

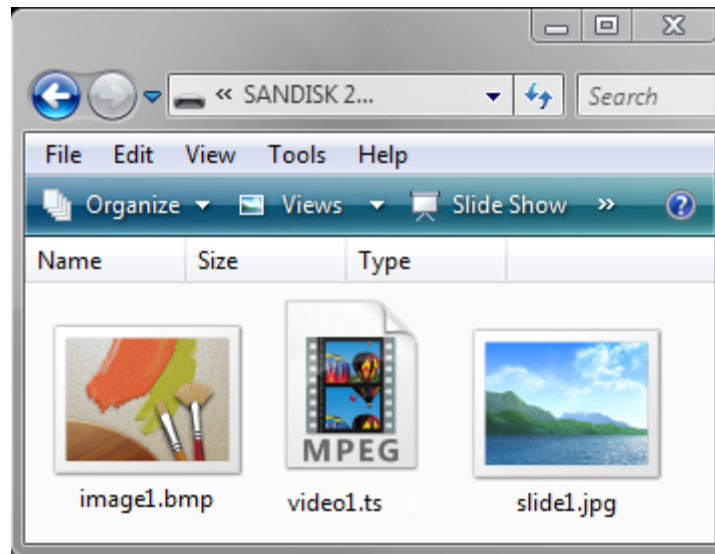
On the HD110, HD210, HD410, HD810, and HD1010, first BrightSign checks to see if a VGA display is attached. If it finds a VGA display, it sets the video resolution to the best mode supported by the VGA display and by BrightSign. If BrightSign doesn't find a VGA display, it looks for an HDMI display. If it finds an HDMI display, it sets the video resolution to the best mode supported by the HDMI display and by BrightSign. If BrightSign cannot find a VGA or HDMI display, or if the display does not comply with standards and properly communicate with BrightSign, it sets the video resolution to 1024x768x75p. If a display is attached but it is turned off when you turn BrightSign on, BrightSign tries to communicate with the display and set the best video mode; if the display is designed correctly, BrightSign can still set the best video mode. However, if a display does not provide the required information when it is turned off (a violation of the way displays are supposed to operate), you need to set the video mode explicitly by including the Videomode keyword in your playlist (see [Playlist commands](#) for details).

On the HD2000, BrightSign outputs video through the Component and HDMI connectors and the default video resolution is 720p. If the resolution of a still image file does not exactly match the display resolution (videomode), then BrightSign scales the image to fit or it centers/crops the image, depending on the imagemode you selected (see [Playlist commands](#) and [Keywords](#) for details). Video files are always scaled to fit. (The video mode button is not currently supported on the HD2000.)

Auto-playing files in alphabetical order upon power-up

You can autoplay one or more files on power-up or reset. When you use this method, the files play in alphabetic order by file name.

- 1 Copy your files into the root directory of an SD card. See the list of supported file types on the previous page.
- 2 Insert the SD card into your BrightSign.
- 3 Turn on your BrightSign. After a few moments, BrightSign plays the video and repeats it automatically to create a loop.



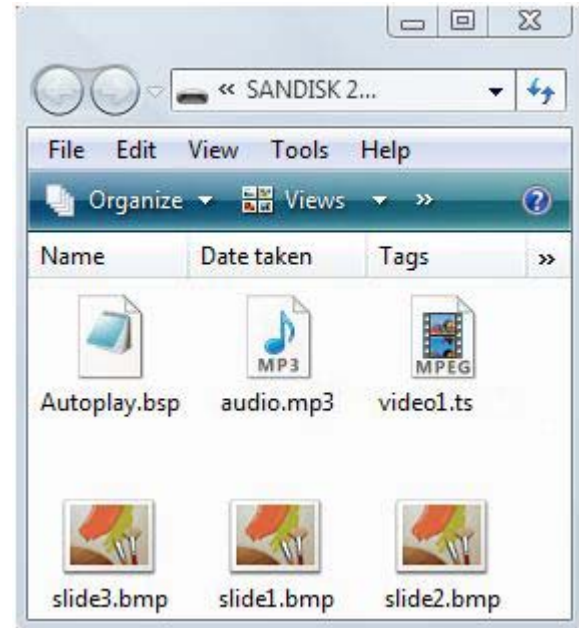
EXAMPLE 1: *SD card with auto-play files*

Auto-playing a playlist upon power-up

A playlist is a text file that describes the items you want to play and the order in which you want to play them. A playlist can include still images, video clips, or audio clips. For details on creating playlists, see [Working with Playlists](#).

To autoplay a playlist file on power-up or reset, do the following:

- 1 Create a playlist file and name it **AUTOPLAY.BSP** (see [Working with Playlists](#) for details).
- 2 Copy the playlist file into the root directory of an SD card.
- 3 Copy any still graphics, audio files, or video files you included in the playlist into the root of your SD card.
- 4 Insert the SD card into your BrightSign.
- 5 Turn on your BrightSign. After a few moments, BrightSign plays the playlist and loops it automatically.



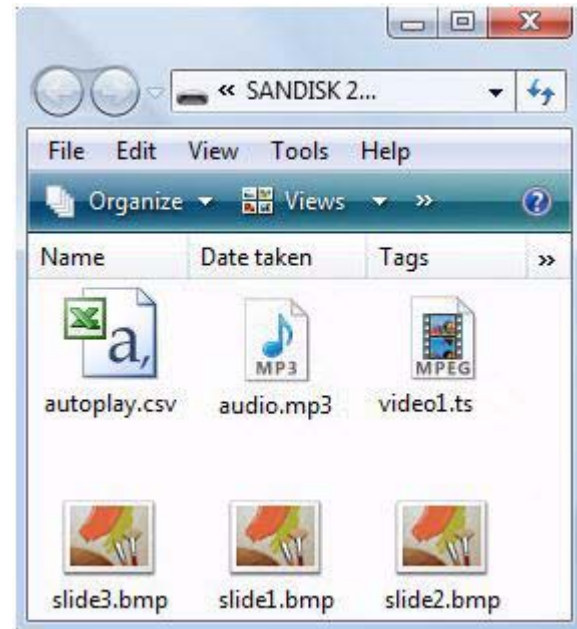
EXAMPLE 2: SD card with playlist files

Auto-playing an interactive playlist upon power-up

BrightSign HD410, HD810, HD1010, and HD2000 can also play a sophisticated presentation that is described in an interactive playlist. An interactive playlist is a simple text file that contains a table of information. Using Microsoft Excel, you can easily create a file that describes a sophisticated interactive presentation. The interactive playlist describes which media to play upon power-up, and which media to play when a user presses a button or triggers other events.

To autoplay an interactive playlist on power-up or reset, do the following:

- 1 Create an interactive playlist using Microsoft Excel and name the file **AUTOPLAY.CSV** (see [Creating interactive presentations \(HD410, HD810, HD1010, and HD2000 only\)](#) for details).
- 2 Copy your media files and your interactive playlist into the root directory of an SD card.
- 3 Insert the SD card into your BrightSign.
- 4 Turn on your BrightSign. After a few moments, BrightSign runs the interactive playlist and plays the media referenced in the file.

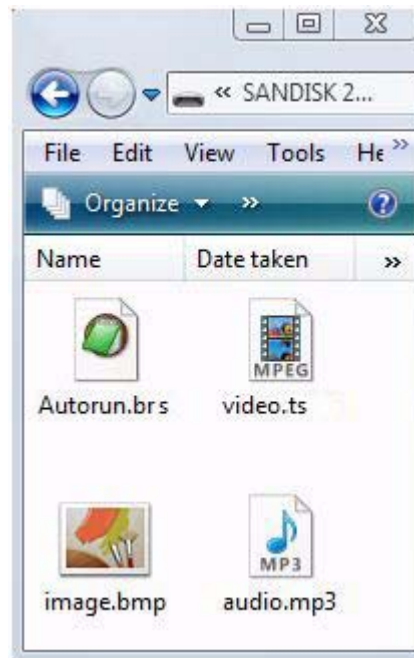


EXAMPLE 3: SD card with interactive playlist files

Auto-playing a script upon power-up

Creating a BrightScript script gives you the most control over your interactive presentation. To autorun a script, do the following:

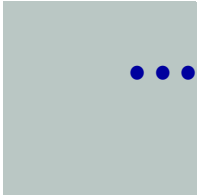
- 1 Create a script using a text editor and name the file **AUTORUN.BRS** (see [Working with Scripts](#) for details).
- 2 Copy the script into the root directory of your SD card.
- 3 Insert the SD card into your BrightSign.
- 4 Turn on your BrightSign. After a few moments, BrightSign runs the script and plays the media referenced in the script.



EXAMPLE 4: SD card with script files

Chapter 4

Working with Playlists



What is a playlist?

A BrightSign playlist is a text file that ends in BSP (BrightSign Playlist). It contains the names of the files you want to play and the order in which you want to play them. Files in a playlist are played in sequence, one after the next. This means that you cannot use a playlist to play files simultaneously. For example, you cannot play an audio file and a video file at the same time unless you add your audio to your video file.

A simple playlist might contain just these lines:

```
slide1.bmp  
slide2.bmp  
slide3.bmp
```

This playlist would play SLIDE1.BMP, then SLIDE2.BMP, then SLIDE3.BMP, and then it would repeat to create a loop.

The files in a playlist don't have to be bitmaps; you can use video or audio files too. You can also mix media types in a single playlist and trigger GPIO (General Purpose Input/Output) pins. In addition to filenames, there is a set of commands that you can use in a BrightSign playlist. For example, if you want the playlist to pause for 5 seconds between images, the slideshow playlist above could be modified like this:

```
slideinterval 5  
slide1.bmp  
slide2.bmp  
slide3.bmp
```

To pause five seconds between slides 1 and 2, and two seconds between slides 3 and 4, modify the playlist like this:

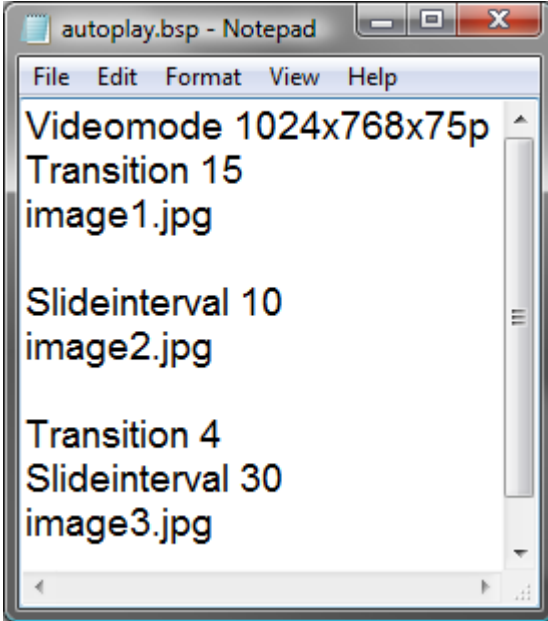
```
slideinterval 5  
slide1.bmp  
slide2.bmp  
slideinterval 2  
slide3.bmp  
slide4.bmp
```


Creating a playlist

- 1 Using a text editor, such as Notepad, enter the names of the files you want to play in the order in which you want them to play.
- 2 (Optional) Enter any commands you want to add to your playlist. See the next section, [Playlist commands](#), for a description of available commands.
- 3 Use the **Save As** command to the file with a **BSP** extension.

NOTE: *By default, most text editors automatically save files with a TXT extension, so you need to override the default file extension when saving the playlist file.*

- 4 Copy the following files to your SD card:
 - Your playlist (the file you created in steps 1-3)
 - Media files referenced in your playlist
- 5 Do either of the following:
 - Play the playlist automatically upon startup (see [Auto-playing a playlist upon power-up](#) for details).
 - Play the playlist at a scheduled time (see [Auto-playing content at a scheduled time \(HD210, HD810, HD1010, and HD2000 only\)](#) for details).



```
autoplay.bsp - Notepad
File Edit Format View Help
Videomode 1024x768x75p
Transition 15
image1.jpg

Slideinterval 10
image2.jpg

Transition 4
Slideinterval 30
image3.jpg
```

EXAMPLE 1: *Playlist file*

Playlist commands

Here is the list of commands that you can use in a playlist:

BMP, MP3, MPG (HD2000 only), VOB (HD2000 only), TS (HD110, HD210, HD410, HD810, and HD1010), PNG, JPG

Any line that is a file name and that ends in one of these extensions is valid. Names may contain spaces.

debug

Use this command to view debug information on the display (serial port).

rem <comment>

Any line starting with rem is ignored, so you can include comments in your playlist. Rem is short for *remark*.

print <line to print to console>

Use this command to send a line of text to the display. This command is useful for debugging.

(HD2000 only) audiomode # (default is 1)

BrightSign provides 5.1 audio decoding that is controlled via the audiomode command. If your audio source is a video file, you can use any of the following audiomode commands:

- **audiomode 0:** Provides decoded 5.1 surround sound (via USB or all six analog outs).
- **audiomode 1:** Mixes down 5:1 surround sound to stereo.
- **audiomode 2:** Mutes the audio.

(HD2000 only) audiooutput # (default is 0)

BrightSign has 5 different audio outputs. If an output is not specified, BrightSign uses analog audio 0 in stereo as the default. Of the 5 outputs, there are five audiooutput modes that are set with the audiooutput command. The audiooutput command can have one of the following values:

- **0:** Outputs analog audio.

- **1:** Outputs USB audio.
- **2:** Outputs SPDIF audio in stereo PCM.
- **3:** Outputs SPDIF audio in raw AC3.
- **4:** Outputs analog audio with SPDIF mirroring raw AC3.

(HD2000 only) audiochan # *(default is 2)*

Since there are three analog outputs, you must also use the audiochan command if you selected analog audio output:

- **audiochan 2:** Sets output 1 (this is not a typo).
- **audiochan 1:** Sets output 2.
- **audiochan 0:** Sets output 3.

volume # *(default is 100)*

You can set the volume level by specifying a value between 0 and 100. For example: `volume 100` is full volume.

videomode <mode> *(HD110, HD210, HD410, HD810, and HD1010 default is 1024x768x75p;*

HD2000 default is 1280x720x60p)

Set the output framebuffer format. The options are:

HD2000

- **VGA:**
 - 1024x768x60p
 - 1280x768x60p
- **HDMI:**
 - 720x480x60p
 - 720x576x50p
 - 1280x720x60p
 - 1280x720x50p
 - 1920x1080x60i

HD110, HD210, HD410, HD810, and HD1010:

- **VGA:**
 - 1024x768x75p
 - 1360x768x60p
- **Component:**
 - 720x576x50p
 - 720x480x60p
 - 1280x720x60p
 - 1280x720x50p
 - 1280x720x59.94p
 - 1920x1080x50i
 - 1920x1080x59.94i
 - 1920x1080x60i
- **HDMI:**
 - 1024x768x75p
 - 1360x768x60p
 - 720x576x50p
 - 720x480x60p
 - 1280x720x60p
 - 1280x720x50p
 - 1280x720x59.94p
 - 1920x1080x50i
 - 1920x1080x59.94i
 - 1920x1080x60i
 - 1920x1080x50p
 - 1920x1080x29.97p (preferred mode)
 - 1920x1080x60p

Viewmode <setting> (default is 0)

You can use a view mode that is different from the default by setting the mode prior to starting video playback. The view_mode values are:

- **0:** Scales the video to fill the screen without maintaining the aspect ratio. Images may appear stretched.
- **1:** Centers the image and adds black borders. This is also referred to as *letter boxed* video. The aspect ratio is maintained.
- **2:** Centers the image and fills the screen. The aspect ratio is maintained.

imagemode # (default is 0)

The imagemode command specifies whether the image is scaled to the display.

- **imagemode 0:** Centers the image without scaling (may result in cropping if the image is larger than the current videomode resolution).
- **imagemode 1:** Scales the image to fit the display. The whole image is displayed as large as possible with correct aspect ratio.
- **imagemode 2:** Scales the image to fill the display while maintaining aspect ratio.
- **imagemode 3:** Scales the image to fill the screen without maintaining aspect ratio.

slideinterval # (default is 3)

Set the number of seconds between slides. The number must be an integer. For example: slideinterval 3 inserts a 3-second pause between slides.

transition # (default is 0)

Set the transition between images. Transition commands include:

- **0:** Changes images immediately with no transition.
- **1 to 4:** Wipes the image from top, bottom, left, and right.
- **5 to 8:** Explodes the image from the center, top left, top right, bottom left, and bottom right.
- **10 to 11:** Divides the image into vertical and horizontal venetian blinds.
- **12 to 13:** Comb the image both vertically and horizontally.

- **14:** Fades the image to the background color.
- **15:** Fades between the current image and the new image.
- **16 to 19:** Slides the image from top, bottom, left, and right.

GPIOEnableInput <GPIO number> (HD410, HD810, and HD1010 only)

Sets the specified GPIO port as an input port.

GPIOEnableOutput <GPIO number> (HD410, HD810, and HD1010 only)

Sets the specified GPIO port as an output port.

GPIOOn <GPIONumber>, <GPIONumber>,...

Turns on the specified GPIO outputs. All other GPIO output ports are turned off. Examples:

```
GPIOOn 0, 2, 4
```

Turns on GPIOs 0, 2, and 4. All other GPIO output ports are turned off.

```
GPIOOn
```

Turns off all GPIO output ports.

PauseMS #

Use this command when you want the playlist to pause for a specified number of milliseconds. The number must be an integer. For example, to pause for 250 milliseconds, the command would be: `PauseMS 250`

PowerSaveModeOn

Turns off the syncs for VGA output and the DAC output for component video. For many monitors, this causes the monitor to go into standby mode.

PowerSaveModeOff

Turns on the syncs for VGA output and the DAC output for component video.

lighton # or lightoff #

Use the lighton and lightoff commands to set or clear one of the GPIO outputs.

- For the HD410, HD810, and HD1010, the number can be any integer between 0 and 7. For example: `lighton 3` sets LED 3 on the button board.
- For the HD2000, the number can be any integer between 17 and 22. For example: `lighton 17` sets LED 0 on the button board.

waitbuttonany (HD410, HD810, HD1010, and HD2000 only)

Use this command when you want the playlist to pause until any GPIO buttons is pressed.

pause #

Use this command when you want the playlist to pause for a specified number of seconds. The number must be an integer. For example, to pause for 5 seconds, the command would be:

```
pause 5
```

stop

Use this command to stop playback of the playlist.

Creating interactive presentations (HD410, HD810, HD1010, and HD2000 only)

With BrightSign you can create presentations that respond to input from the user (capabilities vary by model, see [Product Specifications](#) for details on features supported by your model.) For example, you can let customers choose which video to watch by pressing the button associated with the video of their choice. Interactive presentations also respond to user input from touch screens, mice, serial or USB keyboards, and barcode scanners (see [Supported input devices](#) for a complete list of supported input devices). To accomplish this with BrightSign, you need to specify the input device, and you need to do either of the following:

- Use Microsoft Excel to create a control table and use the BrightSign interactive playlist mode (see the next section, [Using Excel to create interactive presentations](#) for details).
- Create a custom control script (see the next chapter, [Working with Scripts](#) for details).

Using Excel to create interactive presentations

BrightSign can play a sophisticated sign that is described in an interactive playlist. An interactive playlist is a simple text file that contains a list of information separated by commas. Using Microsoft Excel, you can create an interactive playlist to describe a sophisticated interactive sign using a text table. The table describes which media to play, and which media to play when a user presses a button or triggers other events.

A good example of an interactive playlist is the one used in the BrightSign demo. You can run the demo to see what it does, and then modify it to meet your needs.

- 1 Run the demo as described in the introduction.
- 2 Find the file **AUTOPLAY.CSV** in the zip file and copy it onto your desktop.
- 3 Double-click **AUTOPLAY.CSV** to open it into Microsoft Excel (you must have Excel installed on your computer. If not, you can load it into any text editor, but the file won't display in table format).
- 4 Edit the file to meet your needs (see Keywords for a description commands you can include in your interactive playlist file).

- 5 Use the **Save As...** command to keep your changes and select **CSV** as the file format.

NOTE: *BrightSign requires a comma-separated CSV file. If you're outside the United States, check the regional settings in Excel and make sure the list separator is a comma and the decimal separator is a period. BrightSign requires a comma-separated CSV file with periods as the decimal separator (international defaults may vary).*

Below is a section of the AUTOPLAY.CSV file from the BrightSign demo. Due to space limitations, it does not include all the columns. The columns not shown here are similar to the 5 right-hand columns, and they describe what happens when the user presses buttons or when a video finishes or a slide times out.

VIDEOMODE	1024x768x60p					
IMAGEMODE	1					
EVENTS		elo:110:180:350:200	elo:510:180:350:200	elo:110:400:350:200	elo:510:400:350:200	elo:0:0:1024:768
STATE	demo_menu.bmp	Dalmations.ts	art1.bmp	cars.ts	bs1.bmp	
STATE	Dalmations.ts					demo_menu.bmp
STATE	Cars.ts					demo_menu.bmp
STATE	art1.bmp					demo_menu.bmp
STATE	art2.bmp					demo_menu.bmp
STATE	art3.bmp					demo_menu.bmp
STATE	art4.bmp					demo_menu.bmp
STATE	bs1.bmp				bs2.bmp	
STATE	bs2.bmp				bs3.bmp	
STATE	bs3.bmp				bs4.bmp	
STATE	bs4.bmp				bs5.bmp	
STATE	bs5.bmp				bs6.bmp	
STATE	bs6.bmp				bs7.bmp	
STATE	bs7.bmp				bs8.bmp	
STATE	bs8.bmp				bs9.bmp	
STATE	bs9.bmp				bs10.bmp	
STATE	bs10.bmp				demo_menu.bmp	

Keywords

You can include any of the following keywords at the beginning of your playlist file:

VIDEOMODE

HD2000:

- 1024x768x60p
- 1280x768x60p

HD210, HD410, HD810, and HD1010:

- 1024x768x75p
- 1360x768x60p
- 720x576x50p
- 720x480x60p
- 1280x720x60p
- 1280x720x50p
- 1280x720x59.94p
- 1920x1080x50i
- 1920x1080x59.94i
- 1920x1080x60i
- 1920x1080x50p
- 1920x1080x29.97p (preferred mode)
- 1920x1080x60p

NOTE: *The front panel button is not supported on the HD2000. If you use a script to change the video mode, BrightSign reboots and sets the video mode based on the script.*

IMAGEMODE

- **0:** Centers the image and no scaling takes place. If the image is bigger than the screen, BrightSign crops the image.
- **1:** Scales the image to fit so that it is fully viewable with its aspect ratio maintained.
- **2:** Scales and crops the image so that it totally fills the screen with its aspect ratio maintained.
- **3:** Scales the image so that it fills the screen and the whole image is viewable. This means that the image is stretched and the aspect ratio may not be maintained.

VIDEOPLAYERAUDIOMODE <audio mode> (HD2000 only)

Sets the audio mode used when playing a video

- **0:** Sets the audio to AC3 surround.
- **1:** Mixes AC3 surround audio down to stereo.
- **2:** Mutes the audio.

VIDEOPLAYERAUDIOOUTPUT <audio output> (HD2000 only)

Sets the audio output when playing a video

- **0:** Outputs analog audio.
- **2:** Outputs SPDIF audio in stereo PCM.
- **3:** Outputs SPDIF audio in raw AC3.
- **4:** Outputs analog audio with SPDIF mirroring raw AC3.

VIDEOPLAYERAUDIOSTEREOMAPPING <stereo mapping> (HD2000 only)

Sets the analog output when playing a video. Use this parameter when the VIDEOPLAYERAUDIOOUTPUT parameter is set to **0** – Analog audio.

- **0:** Maps stereo audio to Audio 3.
- **1:** Maps stereo audio to Audio 2.
- **2:** Maps stereo audio to Audio 1.

VIDEOPLAYERAUDIOVOLUME <volume> (HD2000 only)

Sets the volume when playing a video. The volume parameter can be any number between 0 and 100.

AUDIOPLAYERAUDIOOUTPUT <audio output> (HD2000 only)

Sets the audio output when playing an audio file.

- **0:** Outputs analog audio.
- **1:** Outputs USB audio.
- **2:** Outputs SPDIF audio in stereo PCM.
- **3:** Outputs SPDIF audio in raw AC3.
- **4:** Outputs analog audio with SPDIF mirroring raw AC3.

AUDIOPLAYERAUDIOSTEREOMAPPING <stereo mapping> (HD2000 only)

Sets the analog output when playing an audio file. Use this parameter if the AUDIOPLAYERAUDIOOUTPUT parameter is set to **0** – Analog audio.

- **0:** Maps stereo audio to Audio 3.
- **1:** Maps stereo audio to Audio 2.
- **2:** Maps stereo audio to Audio 1.

AUDIOPLAYERAUDIOVOLUME <volume> (HD2000 only)

Sets the volume level when playing an audio file. The volume parameter can be any number between 0 and 100.

FLIPELO (HD810, HD1010, and HD2000 only)

Reverses the coordinates of the touch screen. This keyword isn't used in the example above, and it should be used only if the touch screen coordinates appear to be reversed.

FLIPELO		
IMAGEMODE	2	
EVENTS		elo:110:180:355:210

GPIOEnableInput <GPIO number> (HD410, HD810, and HD1010 only)

Sets the specified GPIO port as an input port.

GPIOEnableOutput <GPIO number> (HD410, HD810, and HD1010 only)

Sets the specified GPIO port as an output port.

SerialPortSpeed <port speed> (HD410, HD810, HD1010, and HD2000 only)

Sets the baud rate for the serial line. Supported baud rates are: 1800, 2000, 2400, 3600, 4800, 7200, 9600, 12800, 14400, 19200, 23040, 28800, 38400, 57600, 115200.

SerialPortMode <port mode> (HD410, HD810, HD1010, and HD2000 only)

Sets the serial mode. The format is:

`SerialPortMode:8N1`

- The first character is the number of data bits. You can enter 5, 6, 7 or 8.
- The second character is the parity. N = none, O = odd, and E = even.
- The third character is the number of stop bits. You can enter 1 or 2.

UDPDestinationAddress <address> (HD1010 and HD2000 only)

Specifies the destination IP address in dotted quad form.

UDPDestinationPort <port number> (HD1010 and HD2000 only)

Specifies the destination port for UDP packets.

UDPReceiverPort <port number> (HD1010 and HD2000 only)

Specifies on which port UDP packets are received.

REGISTRYSECTION <registry section name>

Specifies the registry section where registry input is stored. If the registry section name is not specified in the interactive playlist, registry input appears in the **User** section of the registry. See [Using the registry](#) for additional information.

DELETEREGISTRYSECTION <registry section name>

Deletes the specified registry section and all registry keys and values within this section.

DELETEREGISTRYKEY <registry key>

Deletes the specified registry key from the current registry section. The corresponding registry value is also deleted.

EVENTS

After the keywords, the first line of the interactive playlist is the EVENTS row. For every event type you want to respond to, you must make an entry in this row. You do not need to enter events you don't use. BrightSign supports the following event types:

elo (HD810, HD1010, and HD2000 only)

Triggers with a USB Mouse or Elo Touch Screen press within a rectangular touch area. Use this format to define the touch area:

`elo:x:y:width:height`

- **x:y** represents the starting position, where 0,0 is in the upper left
- **width:height** represents the width and height of the area in pixels based on a 1024x768 resolution

You can have as many elo events as you wish. Events can overlap touch areas, but in this case, you should only use one at a time (see the demo example and how it uses a touch area that covers the entire screen when not in the main menu).

NOTE: You can also use **elor** instead of **elo**. They are interchangeable.

eloc (HD810, HD1010, and HD2000 only)

Triggers with a USB Mouse or Elo Touch Screen press within a circular touch. Use this format to define the touch area:

`eloc:x:y:radius`

- **x:y** represents the center of the circular region
- **radius** represents the radius of the circular region, in pixels

button (HD410, HD810, HD1010, and HD2000 only)

Triggers on a GPIO Control Port button press. Use this format to define the button number:

`button:number`

- **number** represents a number between 0 and 12.

Keyboard:<key character> (HD810, HD1010, and HD2000 only)

Triggers when the specified character is received from a USB keyboard.

Remote:<remote value> (HD810, HD1010, and HD2000 only)

Triggers when the specified keycode value is received from the remote.

Serial:<serial string in> (HD410, HD810, HD1010, and HD2000 only)

Triggers when the specified serial string is received from the serial input.

udp:<udp string in> (HD1010, and HD2000 only)

Triggers when the specified udp string is received from the network.

timeout

You can use a timeout event when a video or slide is displaying, or an audio file is playing. For example, use timeout when you want to advance a slide show to the next slide or to exit a looping video after a certain number of seconds of playback. You can have only one timeout event per interactive playlist. The format is:

`timeout:seconds`

- **seconds** represents the number of seconds after the video/image/audio starts that the event will trigger.

mstimeout

This event is similar to timeout, but you can have multiple mstimeout events per interactive playlist. The format is:

`mstimeout:milliseconds`

- **milliseconds** represents the number of milliseconds after the video/audio/image starts that the event will trigger.

videoend

This event triggers when a video finishes playing. You can use this event to move on to another state after the video ends. The format is: `videoend`. There are no parameters.

audioend

This event triggers when an mp3 file finishes playing. You can use this event to move on to another state after the audio ends. The format is: `audioend`. There are no parameters.

STATE

After the EVENTS row, the interactive playlist may include one or more STATE rows. These rows begin with the keyword STATE. The first cell after the STATE keyword is the name of the video or image file to display, or audio file to play. When the state is entered, this file starts playing. The remaining cells describe what state to jump to when the corresponding event happens. For example, in the demo example, the first state is DEMO_MENU.BMP. While in this state, the main menu for the demo appears on the display. If the user presses the elo touch screen or clicks the mouse in the right spot to trigger the elo:110:180:350:400 event, then BrightSign jumps to the new state CARS.TS. Look at the STATE rows in the demo example; notice one of these rows starts with CARS.TS. It is also important to note that there can be only one state with a particular file.

To understand this better, open the demo's AUTOPLAY.CSV file in Excel while playing the demo on your BrightSign. As you select options on your BrightSign, look at the interactive playlist to see how it tells your BrightSign what to do. You can then edit the autoplay interactive playlist in Excel and Save As... a CSV file to create your own applications.

Controlling GPIO outputs from an interactive playlist

To control GPIO output for a particular state, add a GPIO command to the second column of the state specification in the interactive playlist.

The general syntax is:

```
<state name>:<gpio command>(<gpio_num>;<gpio_num>;gpio_num)
```

Enter the state name followed by a colon, then the gpio command, then a list of GPIO's separated by semicolons inside parentheses. For the HD2000, GPIO values must be between 17 and 22. For all other models, GPIO values must be between 0 and 7. GPIO value 0 or 17 corresponds to the first LED on the button board.

The GPIO commands are:

- **gpiosOn:** Turns on the specified GPIO's; unspecified GPIO's are unchanged.
- **gpiosOff:** Turns off the specified GPIO's; unspecified GPIO's are unchanged.

- **gpios**: Turns on the specified GPIO's; unspecified GPIO's are turned off.

Examples

```
Demo_menu.bmp:gpios(1;3;5)
```

When BrightSign enters the demo_menu.bmp state, LED's 1, 3, and 5 are turned on; the other LED's are turned off.

```
aq.ts:gpiosOn(2)
```

When BrightSign enters the aq.ts state, LED 2 is turned on and the other LED's are unaffected.

```
ppt10.bmp:gpiosOff(0;2;4)
```

When BrightSign enters the ppt10.bmp state, LED's 0, 2, and 4 are turned off; and the other LED's are unaffected.

```
product1.bmp:gpios()
```

When BrightSign enters the product1.bmp state, All LED's are turned off.

Controlling serial output from an interactive playlist

To control serial output for a particular state, add a Serial command to the second column of the state specification in the interactive playlist. When BrightSign enters the serial state, the specified string is output via the serial connector. The format is:

```
serialSend:<string>
```

Controlling udp output from an interactive playlist

To control udp output for a particular state, add a udp command to the second column of the state specification in the interactive playlist. When BrightSign enters the udp state, the specified string is output via the ethernet connector. The format is:

```
udpSend:<string>
```

Preloading images

The autoplay script preloads still images so that appear automatically when a user triggers their display. Here are the rules that apply to preloading an image:

- If a state row only has one possible next image state, then the next image is preloaded.
- If a state row has more than one possible next image state, and one of them is the next row in the state table, then the image associated with the next state is preloaded. Therefore, if you have a sequence of images that display one after the other and you want them to preload, put them in sequential rows in the state table. To see an example of this, look at the BS1.BMP, BS2.BMP, etc. state rows in the interactive playlist demo.

Simultaneous states within a single interactive playlist (HD2000 only)

Within a single interactive playlist, you can create an interactive presentation with simultaneous states. For example, you can:

- Play an HDMI slide show at the same time as an analog audio file.
- Plays a video with English audio in the main speakers, French audio in headphone #1, and Spanish audio in headphone #2.

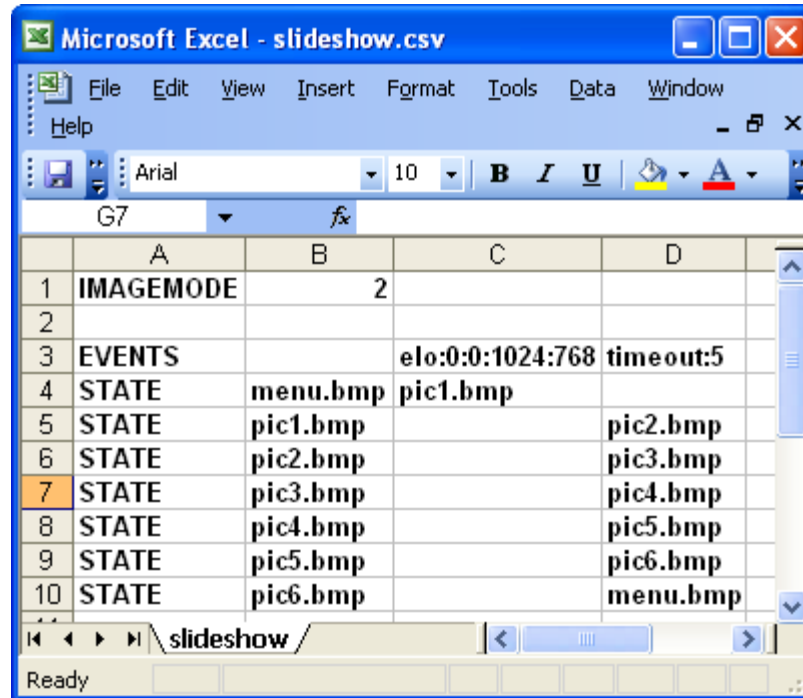
The various states can run simultaneously and independently. To use simultaneous states, insert the keyword **NEXT** in the first column of the first row that follows all of the primary STATE rows. You can then add other keywords, followed by the states for the simultaneous activities. You can use this process to add up to four states.

When using simultaneous states, only the first state can include video and images. Additionally, the states must use independent resources. For example, if state 1 is using analog output Audio 1, then this output channel is unavailable to other states– therefore, another state would use analog output Audio 2.

See [EXAMPLE 5: Simultaneous states in a single interactive playlist](#) for an example of an interactive playlist with simultaneous states.

Interactive playlist examples

The BrightSign demo shows that you can design powerful interactive signs using interactive playlists. The following examples illustrate how easy it is to use and understand interactive playlists.



The screenshot shows a Microsoft Excel window titled "Microsoft Excel - slideshow.csv". The menu bar includes File, Edit, View, Insert, Format, Tools, Data, Window, and Help. The toolbar shows the font set to Arial, size 10, with bold, italic, and underline options. The active cell is G7. The spreadsheet contains the following data:

	A	B	C	D
1	IMAGEMODE	2		
2				
3	EVENTS		elo:0:0:1024:768	time out:5
4	STATE	menu.bmp	pic1.bmp	
5	STATE	pic1.bmp		pic2.bmp
6	STATE	pic2.bmp		pic3.bmp
7	STATE	pic3.bmp		pic4.bmp
8	STATE	pic4.bmp		pic5.bmp
9	STATE	pic5.bmp		pic6.bmp
10	STATE	pic6.bmp		menu.bmp

The status bar at the bottom shows "Ready" and a navigation bar with a "slideshow" label and navigation arrows.

EXAMPLE 2: *Slideshow that advances automatically after the first slide plays*

Example 2 contains two events: an elo event (used for ELO touch screens or any mouse input) and a timeout event. The clickable/touch area is defined as the whole screen. One touch or click starts the slideshow.

When this demo starts, BrightSign displays MENU.BMP since it's in the first STATE position.

- There is no timeout entry for MENU.BMP, so if there is no mouse or touch screen input, MENU.BMP remains onscreen forever.
- MENU.BMP has one touch/click event. When MENU.BMP is currently being displayed and there is a mouse click or touch screen input anywhere onscreen, BrightSign displays PIC1.BMP.
- Pictures 1 – 6 all have timeout entries. Each image displays for 5 seconds before the next image plays. The timeout entry for the last image is MENU.BMP.
- There is no elo entry for pictures 1 – 6, so nothing happens until the timeout is reached even if there is mouse or touch screen input while the images are playing.

	A	B	C
1	IMAGEMODE	2	
2			
3	EVENTS		elo:0:0:1024:768
4	STATE	menu.bmp	pic1.bmp
5	STATE	pic1.bmp	pic2.bmp
6	STATE	pic2.bmp	pic3.bmp
7	STATE	pic3.bmp	pic4.bmp
8	STATE	pic4.bmp	pic5.bmp
9	STATE	pic5.bmp	pic6.bmp
10	STATE	pic6.bmp	menu.bmp

EXAMPLE 3: Slideshow that advances only when a click / touch occurs

Example 3 has only 1 event, the same elo event as Example 2.

- There is an elo event entry for each image, so the next image plays when there is a mouse click or touch activity anywhere onscreen.
- There are no timeout events in this demo. Because Example 3 only has an elo event, and no timeout events, the user must click or touch the screen to advance the slideshow.

	A	B	C	D	E	F	G
1	IMAGEMODE		2				
2							
3	EVENTS		button:1	button:2	button:3	timeout:10	videoend
4	STATE	menu.bmp	attract.ts	showcase.ts	slide1.bmp	attract.ts	
5	STATE	slide1.bmp		slide2.bmp	menu.bmp		
6	STATE	slide2.bmp	slide1.bmp	slide3.bmp	menu.bmp		
7	STATE	slide3.bmp	slide2.bmp		menu.bmp		
8	STATE	attract.ts	attract.ts		menu.bmp		menu.bmp
9	STATE	showcase.ts	showcase.ts		menu.bmp		menu.bmp

EXAMPLE 4: Video and slide playback using button input

Example 4 plays two videos and three images and it contains five events: three button events, a timeout event, and a videoend event. When Example 4 starts, BrightSign displays MENU.BMP, since it's in the first STATE position.

- If the menu is being displayed, pressing button 1 starts the attract video; pressing button 2 starts the showcase video; and pressing button 3 starts the slideshow. If no button is pressed, the attract video starts automatically after 10 seconds.
- If the attract or showcase video is playing, pressing button 1 restarts it.
- If the attract or showcase video is playing, pressing button 3 returns to the menu. Since there is no entry under button 2 for either video, button 2 is ignored. When either the attract or showcase video ends, the menu is displayed, as indicated under the videoend event.
- For the slideshow, button 2 advances to the next slide, and button 1 goes back to the previous slide. Button 3 returns to the menu.

Microsoft Excel - autoplay.csv

File Edit View Insert Format Tools Data Window Help

Arial 10 B I U

	A	B	C	D
1	IMAGEMODE		3	
2	VIDEOMODE	1360x768x60p		
3				
4	EVENTS		timeout:3	audioend
5	STATE	image1.bmp	image2.bmp	
6	STATE	image2.bmp	image3.bmp	
7	STATE	image3.bmp	image1.bmp	
8				
9	NEXT			
10				
11	AUDIOPAYERAUDIOVOLUME		100	
12	AUDIOPAYERAUDIOOUTPUT		0	
13	AUDIOPAYERSTEREOMAPPING		0	
14				
15	STATE	audio1.mp3		audio2.mp3
16	STATE	audio2.mp3		audio1.mp3
17				
18	NEXT			
19				
20	AUDIOPAYERAUDIOVOLUME		75	
21	AUDIOPAYERAUDIOOUTPUT		2	
22				
23	STATE	audio3.mp3		audio4.mp3
24	STATE	audio4.mp3		audio3.mp3

autoplay

Ready NUM

EXAMPLE 5: Simultaneous states in a single interactive playlist

Example 5 contains three simultaneous states.

- The first state specifies the video mode, image mode, and audio output for video. In this case, the keyword `VideoPlayerAudioOutput` directs BrightSign to output stereo PCM via the SPDIF audio connector. This machine uses button 0 and the `videoend` event to control the videos and the image.
- Note the `NEXT` keyword on line 10; it signals the beginning of another state.
- The second state uses analog audio output through the Audio 2 connector. It uses button 1 and the `audioend` event to control the audio playback.
- The `NEXT` keyword on line 18 indicates the start of the third state.
- The third state uses analog audio output through the Audio 3 connector, and it uses button 2 and `audioend` events to control its audio playback.

Using rollover regions (HD810, HD1010, and HD2000 only)

In the previous section, [Using Excel to create interactive presentations](#), you learned that you can create touchable (clickable) areas on the screen using `elo` (`elor`) and `eloc` keywords in the `EVENTS` row of an interactive playlist. You can then use these regions like buttons to playback content. You can also set up any touch region as a rollover region. Rollover regions enable you to create more dynamic and interactive presentations that accept mouse and touch input and that are also sensitive to cursor movement. A rollover region has an `ON` image and an `OFF` image. Whenever the cursor is within a rollover region, BrightSign displays the `ON` image, and when the mouse cursor is outside the rollover region, BrightSign displays the `OFF` image. Therefore, rollover regions enable you to include features such as highlighting buttons as the user moves the cursor moves over them.

Using rollover events (HD810, HD1010, and HD2000 only)

You can define either a rectangular or circular rollover region. To setup a rollover region, use either of the following keywords in the events row:

NOTE: *When the `x_origin` : `y_origin` are set to `-1:-1`, the starting position for the ON and OFF images are also the starting coordinates for the rollover region. This is true for both rectangular and circular rollover regions.*

Relor

Define a rectangular rollover region using this format:

`relor:x:y:width:height:enable_rollover:on_bitmap:off_bitmap:x_origin:y_origin`

- **x:y** represents the starting position of the rollover region, where 0,0 is in the upper left corner of the display.
- **width, height** represents the width and height of the touch area in pixels.
- **enable_rollover:** 1 enables rollovers; 0 disables rollovers
- **on_bitmap** represents the name of the bitmap image that displays when the mouse is within the defined region.
- **off_bitmap** represents the name of the bitmap image that displays when the mouse is not within the defined region.
- **x_origin,y_origin** represents the starting position for the rollover image.

Reloc

Define a circular rollover region using this format:

`reloc:x:y:radius:enable_rollover:on_bitmap:off_bitmap:x_origin:y_origin`

- **x, y** represents the center of the touch area.
- **radius** represents the radius of the touch area in pixels.
- **enable_rollover:** 1 enables rollovers, 0 disables rollovers
- **on_bitmap** represents the name of the bitmap image that displays when the mouse is within the defined region.

- **off_bitmap** represents the name of the bitmap image that displays when the mouse is not within the defined region.
- **x_origin,y_origin** represents the coordinates for the center of the rollover image.

```
relor:765:674:96:43:1:next_ON.bmp:next_OFF.bmp:-1:-1
```

EXAMPLE 6: *Rectangular rollover region*

Example 6 shows what you would enter in the interactive playlist to define a rollover region. In this example:

- Starting position is 765, 674
- Rollover region is 96 pixels wide and 43 pixels high
- Rollover region is enabled
- On and off images are NEXT_ON.BMP and NEXT_OFF.BMP
- Rollover images are displayed in the same location as the rollover region

Normally, the on and off image have the same dimensions as the rollover region (width, height), and the same starting position (x,y). However, if your on and off images are larger than the touch region you use to activate the on and off images, you can use the rollover origin (x_origin, y_origin) parameters to specify a different starting position. You may also want to adjust the rollover origin if you have a menu with thumbnail images on the left side, and you want a larger image to appear on the right side of the screen when the user places the cursor over a thumbnail image on the menu.

	A	B	C	D	
1	IMAGEMODE	2			
2					
3	EVENTS		relor:765:674:96:43:1:next_lit.bmp:next_notlit.bmp:-1:-1	relor:643:674:95:43:1:back_lit.bmp:back_notlit.bmp:-1:-1	time out:10
4	STATE	menu.bmp	slide1.bmp		slide1.bmp
5	STATE	slide1.bmp	slide2.bmp	menu.bmp	slide2.bmp
6	STATE	slide2.bmp	menu.bmp	slide1.bmp	menu.bmp
7					

EXAMPLE 7: *Slideshow, with next and back buttons that light up when the mouse is over them*

Example 7 plays a simple slideshow with three images. It has two rectangular rollover region events and one timeout event. Examples 7.1 and 7.2 are the same as Example 7, but they are expanded to make them easier to read.

- If nothing is clicked or touched, the slide show starts automatically after the 10 second timeout, and then returns to the menu after it finishes.
- Similar to a standard elo entry, entering the rollover area, advances to the next slide until you reach MENU.BMP.
- Entering the second rollover area takes you back to the previous slide.

	A	B	C	
1	IMAGEMODE	2		
2				
3	EVENTS		relor:765:674:96:43:1:next_lit.bmp:next_notlit.bmp:-1:-1	relor:6
4	STATE	menu.bmp	slide1.bmp	
5	STATE	slide1.bmp	slide2.bmp	menu.
6	STATE	slide2.bmp	menu.bmp	slide1.
7				

EXAMPLE 7.1: *3 images with rollover regions*

Example 7.1 emphasizes that each of the three images have a rollover region that is 96 pixels long by 43 pixels tall.

- When the cursor is outside this area, BrightSign displays NEXT_NOTLIT.BMP.
- When the cursor is inside this area, BrightSign displays NEXT_LIT.BMP.

	D	E
bmp:-1:-1	relor:643:674:95:43:1:back_lit.bmp:back_notlit.bmp:-1:-1	timeout:10
	menu.bmp	slide1.bmp
	slide1.bmp	slide2.bmp
		menu.bmp

EXAMPLE 7.2: *3 images with rollover regions*

Example 7.2 shows that each of the 3 images has a rollover region that is 95 pixels long by 43 pixels tall.

- When the cursor is outside this area, BrightSign displays BACK_NOTLIT.BMP.
- When the cursor is inside this area, BrightSign displays BACK_LIT.BMP.

Scheduling playback (HD210, HD810, HD1010, and HD2000 only)

You can play videos, still images, and playlists at scheduled times using the autoschedule.txt file. This file specifies the date/time for the event as well as the file you want to play.

The syntax of the date/time specification is as follows:

Year "/" Month "/" Day "-" Day of Week "-" Hour ":" Minutes

For example, a date/time specification for December 23, 2009 at 3:20 PM is defined as:

2009/12/23-* -15:20

In this example, the Day of Week parameter is a wildcard defined with an asterisk. All date/time parameters not used must be defined as wildcards using an asterisk (*).

Valid syntax for Date/Time parameters:

- **Year:** 4 digit integer from 2000 to 2038
- **Month:** 2 digit integer from 01 to 12
- **Day:** 2 digit integer from 01 to 31
- **Day of Week:** the following 3 letter abbreviations: Sun, Mon, Tue, Wed, Thu, Fri, Sat
- **Hour:** 2 digit integer from 00 to 23
- **Minute:** 2 digit integer from 00 to 59

In the AUTOSCHEDULE.TXT file, the line following a date/time specification must be an interactive playlist file, playlist file, video file, or image file. When the date/time event occurs, BrightSign stops playing the current file and begins playing the new file.

The following is an example AUTOSCHEDULE.TXT file:

```
*/*/*-MON-01:00  
weekday.ts
```

```
*/*/*-SAT-01:00  
weekend.ts
```

In this example, the WEEKDAY.TS file launches on Monday at 1:00 AM and plays continually during the week; on Saturday at 1:00 AM, the file WEEKEND.TS launches and plays until Monday at 1:00 AM.

Another example AUTOSCHEDULE.TXT file:

```
2009/12/15--*-15:20  
image.png
```

```
2009/12/25--*-16:16  
music.bsp
```

```
2010/1/*-WED-16:00  
video.ts
```

```
2010/1/*--*-07:00  
breakfast.bsp
```

```
2010/1/*--*-14:00  
demo.csv
```

In this example, BrightSign displays the image IMAGE.PNG starting on December 15, 2009 at 3:20 PM. On December 25, at 4:16 PM, the playlist MUSIC.BSP starts. The next specification indicates that VIDEO.TS starts playing at 4:00 PM every Wednesday in January, 2010. The playlist BREAKFAST.BSP starts playing at 7:00 AM during January, 2010. Finally, DEMO.CSV launches every day in January, 2010, at 2:00 PM.

NOTE: *You can insert blank lines in an AUTOSCHEDULE.TXT file to make it easier to read. You can also add REM lines to annotate these files.*

Chapter 5

Working with Zones

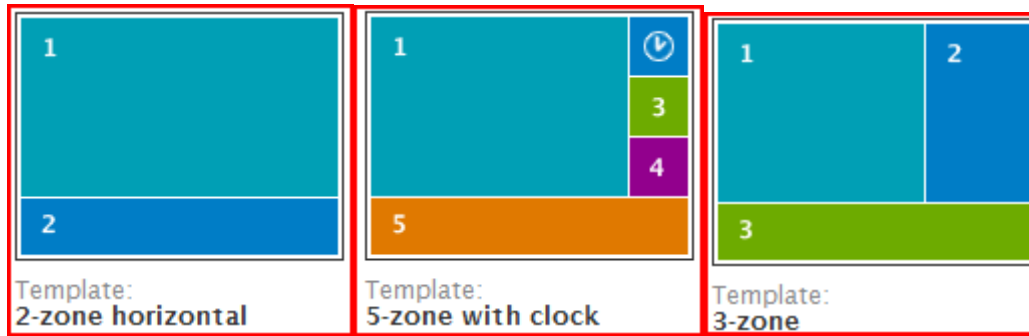


What are zones?

With BrightSign zones you can divide the screen into rectangles and play different content in each rectangle. You can create the following types of zones:

- **VideoORImages:** This zone supports videos and images. You can create only one zone with video (either a VideoORImages zone or a Video zone).
- **Video:** This zone supports videos. You can create only one zone with video (either a VideoORImages zone or a Video zone).
- **Images:** This zone supports playback images. You can create multiple image zones.
- **RSS:** This zone supports playback of a single RSS feed.
- **Text:** This zone plays static text.
- **Clock:** This zone displays the time and it requires the RESOURCES.TXT file.

Below are a few examples of zone layouts, but there are many other ways to arrange your zones on the screen. The only rules you need to keep in mind are that only one zone can contain video and Image zones cannot overlap. If there are additional zone types you would like to see or additional widgets (Text, RSS, Clock, etc), please email your suggestions to BrightSign.



EXAMPLE 1: *Multi-zone examples*

Can I customize the zones?

Here are some of the things you can customize in your zones:

- **Background screen color:** Specify the background color for the display.
- **Font:** Choose a true type font for Text and RSS playback.
- **Parameters:** Control settings for RSS and Text zones. You can set the following:
 - Line count
 - Length of time to display text
 - Text Appearance—animated or static
- **Commands:** Use commands to control the following:
 - **Foreground text color:** Set the foreground text color for Text, Clock, and RSS.
 - **Background text color:** Set the background color for the Text, Clock, or RSS widget.
 - **Background bitmap:** Set a bitmap image that sits behind the zones.

Using zones with playlists

The easiest way to use zones is with playlists. Here are a few examples of how to add zones to your playlists:

```
autoplay.bsp - Notepad
File Edit Format View Help
EnableZones
VideoMode 1920x1080x60i

DefineZone VideoOrlImages 0,0,1586,900
amazon_1080.ts

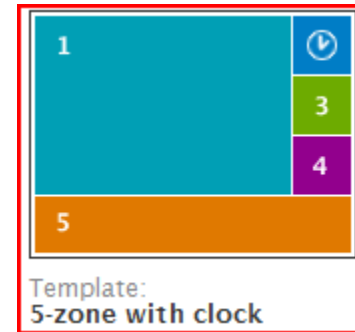
DefineZone Images 0,0,285,123
splash_master.png

DefineZone Images 1620,155,300,300
january_ad1.jpg

DefineZone Images 1620,565,300,300
january_ad2.jpg

DefineZone Clock 1620,0,300,100

DefineZone RSS 20,920,1880,140 3 0 4
http://rss.cnn.com/rss/cnn_us.rss
```



EXAMPLE 2: *5 zones with clock and RSS*

Example 2 shows a presentation with five zones:

- Zone 1 is the main video zone.
- Zone 2 is the clock zone in the top right.
- Zones 3 and 4 are the two image zones to the right.
- Zone 5 is the RSS zone at the bottom.

The following explains each line in the Example 2 playlist:

- **EnableZones:** This **must be** the first keyword in your playlist when using zones.
- **VideoMode:** This keyword sets the video resolution (see [Playlist commands](#) for details).
- **DefineZone:** This keyword sets the location of the zones on the screen. For each zone, you specify the following:
 - Zone type (VideoORImages, Video, Images, Clock, Text, or RSS; see [What are zones?](#) for details.)
 - Starting position (in pixels)
 - Width and height (in pixels)

The syntax for the DefineZone keyword is:

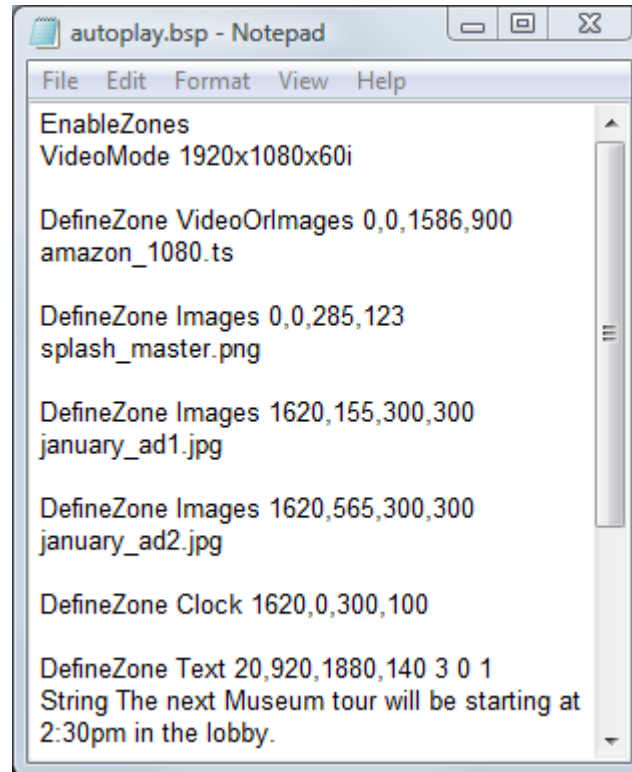
```
DefineZone <zone_type> <rectangle_spec> <zone_param1> <zone_param2>  
<zone_param3> <zone_param4>
```

When you're defining an RSS zone, you must also specify the RSS feed you want to display in addition to the size and location of the zone. All of this information must appear in the same entry in the playlist. The syntax to define an RSS feed is:

```
DefineZone RSS 20,610,1250,90 3 0 4  
http://news.bbc.co.uk/rss/newsonline\_uk\_edition/sci/tech/rss.xml
```

The three numbers after the RSS dimensions represent the following:

- **3** (1st number): Represents the number of lines to display
- **0** (2nd number): Indicates whether the text is animated or static (0 for animated, 1 for static)
- **4** (3rd number): Represents the number of seconds to display each segment



```
autoplay.bsp - Notepad
File Edit Format View Help
EnableZones
VideoMode 1920x1080x60i

DefineZone VideoOrImages 0,0,1586,900
amazon_1080.ts

DefineZone Images 0,0,285,123
splash_master.png

DefineZone Images 1620,155,300,300
january_ad1.jpg

DefineZone Images 1620,565,300,300
january_ad2.jpg

DefineZone Clock 1620,0,300,100

DefineZone Text 20,920,1880,140 3 0 1
String The next Museum tour will be starting at
2:30pm in the lobby.
```

EXAMPLE 3: *5 zones with clock and text*

Example 3 is similar to Example 2, but the RSS zone is replaced with a Text zone. The following explains the Text zone entry:

- **DefineZone TEXT:** This keyword creates a text zone. In addition to providing the size and location of the zone, you must also specify the strings you want to display by using the **STRING** keyword. You can use as many STRING entries as you want.

```
DefineZone RSS 20,610,1250,90 4 0 10  
String This is the first string  
String This is the second string
```

The three numbers after the Text zone dimensions represent the following:

- **4** (1st number): Represents the number of lines to display
- **0** (2nd number): Indicates whether the text is animated or static (0 for animated, 1 for static)
- **10** (3rd number): Represents the number of seconds to display each string

Other keywords for zones

In addition to the keywords described in the previous section, you can also use the following keywords when adding zones to a playlist:

- **Backgroundbitmap:** This keyword adds a background bitmap image. You can add a background bitmap to Text, RSS, or Clock zones. The stretch parameter indicates whether the image stretches to the size of the window (0 for no stretch; 1 is stretched). The syntax is:

```
<.bmp file> <stretch>
```

```
Backgroundbitmap logo.bmp 1
```

- **Color:** The color keywords use RGB color values to indicate the density of color for the background screen color, the foreground text and background text. The color values syntax is:

```
r:g:b:a
```

When specifying the color values, the **a** (alpha) value is optional. If you don't specify an alpha value, it defaults to 255. The alpha value has no effect on the foreground text color or background screen color. However, the alpha value does effect the background color for individual zones (RSS, Text, and Clock) as well as the background text color. The alpha value is between 0 and 255 (0 [zero] is transparent and a value of 255 is opaque).

You can use the following color keywords:

- **BackgroundScreenColor <color values>**: Sets the background color for all zones.

```
EnableZones
VideoMode          1920x1080x60i
BackgroundScreenColor 181:181:181
```

- **ForegroundColor <color values>**: Sets the text color RSS, Text, or Clock zones.
- **BackgroundTextColor <color values>**: Sets the color of the background behind the text in RSS, Text, or Clock zones.
- **Font **: Sets the font. You can use any TrueType font.

```
DefineZone Text      160,890,1600,120 3 0 1
ForegroundColor      75:75:75
BackgroundTextColor  200:200:200:0
Font                  CF:/ComicSansMSBold.ttf
```

- **Language <language>**: Sets the language for a particular zone. In the Clock zone, this keyword uses the values from the resources file associated with the specified language.

Comix Tour example

The Comix Tour demo illustrates zones in action. This section provides the playlist that created the demo, so you can see how the playlist controls the demo.

Main Video Zone

Background color

Image Zone (playlist #1)

NEED A VACATION? ALASKA!!! Discover the wilderness while it's still warm. Fish at camp, and relax for two weeks with our WILDERNESS DAYS. Book yourself wild now! Packages from \$2,499. Promo code ALASKA-10.

Text Zone with custom TrueType font

Image Zone (playlist #2)

EXAMPLE 4: Screen capture of the Comix Tours demo

The sections that follow show the playlist for Comix Tours demo:

Global settings

```
EnableZones
VideoMode 1920x1080x60i
BackgroundScreenColor 181:181:181 'color gray71
```

Zone 1 – video or images

```
REM
*****
DefineZone VideoOrImages 40,60,1344,756
audiochan 0 'analog audio
NewEnglandFishingWithFlyByLogo-ZonesDemo.ts
```

Zone 2 - images

```
REM
*****
DefineZone Images 1384,100,420,420
Slideinterval 2 '2 seconds between images
Transition 15 ' Fades between current and new image
ZoneAfrica_00.png
ZoneAfrica_01.png
ZoneAfrica_02.png
ZoneAfrica_03.png
ZoneAfrica_04.png
ZoneAfrica_05.png
ZoneAfrica_06.png
ZoneAfrica_07.png
ZoneAfrica_08.png
ZoneAfrica_09.png
ZoneAfrica_10.png
ZoneAfrica_11.png
```

Zone 3 - images

```
REM *****  
DefineZone Images 1384,520,536,356  
Slideinterval 4 '4 seconds between images  
Transition 19 ' slides from right  
ZoneWorld_00.png  
ZoneWorld_01.png  
ZoneWorld_02.png  
ZoneWorld_03.png  
ZoneWorld_04.png  
ZoneWorld_05.png  
ZoneWorld_06.png  
ZoneWorld_07.png  
ZoneWorld_08.png  
ZoneWorld_09.png  
ZoneWorld_10.png  
ZoneWorld_11.png  
ZoneWorld_12.png  
ZoneWorld_13.png  
ZoneWorld_14.png  
ZoneWorld_15.png  
ZoneWorld_16.png  
ZoneWorld_17.png  
ZoneWorld_18.png  
ZoneWorld_19.png  
ZoneWorld_20.png  
ZoneWorld_21.png  
ZoneWorld_22.png  
ZoneWorld_23.png  
ZoneWorld_24.png  
ZoneWorld_25.png
```

ZoneWorld_26.png
ZoneWorld_27.png
ZoneWorld_28.png
ZoneWorld_29.png
ZoneWorld_30.png
ZoneWorld_31.png
ZoneWorld_32.png
ZoneWorld_33.png
ZoneWorld_34.png
ZoneWorld_35.png

Zone 4 - text

```
REM *****  
DefineZone Text 160,890,1600,120 3 0 1  
ForegroundColor 75:75:75'silver 16  
BackgroundTextColor 200:200:200:0  
Font CF:/ComicSansMSBold.ttf
```

STRING COMIX TOURS. Prices so good, they're comical!
<http://www.comixtours.com/>

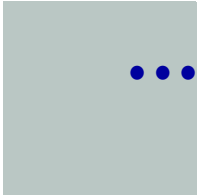
STRING SUMMER OF LOVE SIZZLERS!!! Spanish Riviera Romantic Getaway packages starting from only \$1,999. Airfare and 10-day hotel accommodations included. Call us now and book your romantic summer fun! Promo code SPAIN-25.

STRING NEED A VACATION? ALASKA!!! Discover the wilderness while it's still warm. Fish, camp, and relax for two weeks with our WILDERNESS DAYS. Book yourself wild now! Packages from \$2,499. Promo code ALASKA-10.

STRING Work wearing you down? Spouse tired of eating at home? What's the meaning of life? Fly away! See the world! Book vacation packages from our many HOT, SUMMER DEALS! We'll send you away so fast your head'll spin!

Chapter 6

Working with Scripts



What are scripts?

A script is a simple program that controls behaviors based on events, such as changing video playback when the user presses a button. Scripts are commonly used on PCs and Web Sites. For example, Microsoft Office macros are often Basic Scripts. Adobe Flash apps often rely on ActionScripts for their logic, and web pages are often driven by scripts written in PHP, Perl, or JavaScript.

You can use BrightSign without any knowledge of scripts to accomplish common goals such as playing video loops or slideshows. By using interactive playlists, you can create more sophisticated presentations that include input from a touch screen or mouse. However, to create the most interactive presentations, you need to use scripts.

BrightSign has a built in scripting language (called BrightScript), similar in many ways to Basic found in Microsoft Office and Windows Script Hosting VBScript in Windows XP. Scripts can be as simple as one or two lines, and as complicated as thousands of lines.

If you don't have scripting skills in-house, you can hire an IT or Web developer to write scripts for you, or for a fee, BrightSign can also develop custom scripts and applications for you.

Sample script

Here is how to create a very simple script:

- 1 Using a text editor, create a file called **HELLO.BRS** by entering this line:

```
print "hello world"
```
- 2 Save HELLO.BRS into the root directory of a SD card.
- 3 Insert the SD card into BrightSign.
- 4 Connect the serial port of BrightSign to your PC using a null modem cable.
- 5 On your PC, run HyperTerminal.
- 6 Turn on BrightSign and wait for the **Roku>** shell prompt to appear.
- 7 Type:

```
script hello.brs
```

You should see "hello world" on your PC screen.

- 8 If you want the script to autorun upon boot, rename it **AUTORUN.BRS**.

Roku Objects

As well as the BrightScript language itself, BrightSign relies upon a library of Roku Objects to expose the hardware to the scripting language. Each Roku Object provides access to certain capabilities. For example, there is a roVideoPlayer object and a roTouchScreen object. To create an object in a script, you need to use the CreateObject() function.

When writing scripts, refer to the following two manuals:

- **Roku BrightScript Reference:** Describes the scripting language
- **Roku Object Reference:** Describes Roku Objects, such as **roVideoPlayer**

Examples

A good way to learn BrightScript is to look at or modify existing scripts.

You can also test BrightScript commands using the shell. Here is an example:

```
Welcome to the Roku Shell version 3.04 Release
```

```
Type '?' for help or 'help <command>' for help on <command>.
```

```
Roku> script
```

```
BrightScript Micro Debugger.
```

```
Enter any BrightScript statement, debug commands, or HELP.
```

```
BrightScript> print "hello"
```

```
hello
```

```
BrightScript> ? "hello"
```

```
hello
```

```
BrightScript> ?5+6
```

```
11
```

```
BrightScript> ?type(5)
```

```
Integer
```

```
BrightScript> if 1=1 then print"1 does equal 1!" else print "strange!"
```

```
1 does equal 1!
```

```
BrightScript> ?right("abcdef",3)
```

```
def
```

```
BrightScript> exit
```

```
Roku>
```

Using the GPIO control port

HD410, HD810, and HD1010 units have a DB15 General Purpose Input Output (GPIO) Port. HD2000 units have a DB25 General Purpose Input Output (GPIO) Port. On the HD410, HD810, and HD1010, the GPIO port has 8 bidirectional ports. On the HD2000, the GPIO port has 12 inputs and 6 outputs. You can connect the inputs directly to buttons or switches and the outputs directly to LEDs. To use the GPIO port, you must create a simple custom cable that connects your BrightSign to your buttons or LEDs. For more information and example circuits, see the *BrightSign Hardware Manual*. You can also purchase a test button/LED board from BrightSign to evaluate the GPIO port and test scripts that read these buttons or set these LEDs. For more information on using Roku's test button / LED board, see the *BrightSign Compact Button Board Hardware Reference Manual* also available.

Here is an example of a script for the HD410, HD810, or HD1010 that flashes an LED for half a second each time the user presses a button on the BrightSign button/LED board.

```
print "BrightSign Button-LED Test Running"

p = CreateObject("roMessagePort")
tmr = CreateObject("roMessagePort")
gpio = CreateObject("roGpioControlPort")
gpio.SetPort(p)

gpio.EnableInput(0)
gpio.EnableInput(1)
gpio.EnableInput(2)
gpio.EnableInput(3)
gpio.EnableOutput(4)
gpio.EnableOutput(5)
gpio.EnableOutput(6)
gpio.EnableOutput(7)

event_loop:
    msg=wait(0, p)
    if type(msg)<>"roGpioButton" then event_loop
    butn = msg.GetInt()
    if butn > 3 then event_loop
    gpio.SetOutputState(butn+4,1)
    print "Button Pressed: ";butn
    msg = wait (500, tmr)
    gpio.SetOutputState(butn+4,0)
    goto event_loop
```


The following example script for the HD2000 flashes an LED for half a second each time the user presses a button on the BrightSign button/LED board.

```
print "BrightSign Button-LED Test Running"
p = CreateObject("roMessagePort")
tmr = CreateObject("roMessagePort")
gpio = CreateObject("roGpioControlPort")
gpio.SetPort(p)

event_loop:
    msg=wait(0, p)
    if type(msg)<>"roGpioButton" then event_loop
    butn = msg.GetInt()
    if butn > 5 then event_loop
    gpio.SetOutputState(butn+17,1)
    print "Button Pressed: ";butn
    msg = wait (500, tmr)
    gpio.SetOutputState(butn+17,0)

clear_events:
    msg=p.GetMessage():if type(msg)<>"rotINT32" then clear_events
    goto event_loop
```



Chapter 7 Getting Help

Learning more and support

The following resources can help you get the most from your BrightSign:

- Refer to each of the following BrightSign documents.
 - BrightSign Installation and Regulatory Guide
 - BrightSign User Guide (this guide)
 - BrightSign HD2000 Hardware Guide
 - BrightSign Compact Button Board Hardware Reference Manual
 - BrightSign BrightScript Reference
 - BrightSign Object Reference
 - BrightSign Specifications
 - Example Scripts
- Visit the BrightSign community forums to discuss projects with other customers and BrightSign engineers.
- Contact for help with custom projects.

Frequently asked questions

What video frame rates does the HD2000 support?

The HD2000 supports output frame rates of 50Hz and 59.94/60Hz. The following video frame rates are supported:

- **1080:** 23.98p, 24p, 25p, 29.97p, 30p, and 59.94/60p
- **720:** 23.98p, 29.97p, and 30p

How do I create portrait mode content on BrightSign?

You can create portrait mode content from your authoring application (e.g. PhotoShop, After Effects, etc). To preview your work as you go, you will need to work in a 1080x1920 canvas.

Whether you edit in a 1080x1920 or 1920x1080 canvas, the key is that when you are done editing, you must output your content sideways as 1920x1080. For videos, you simply encode into a standard MPEG file with standard HD dimensions (1920x1080). It is then presented right-side up when the display is in portrait mode.

How do I connect a component display to the VGA output on the HD2000?

If you want to use two component screens, you can build a VGA to Component adapter using the following pinout:

- Pin 1 = Y
- Pin 2 = Pb
- Pin 3 = Pr
- Pin 6, 7, 8 = Ground

How many displays can I connect to the BrightSign?

The HD110, HD210, HD410, HD810, HD1010, and HD2000 all support playing the same content on multiple displays.

- **HD2000:** Connect up to 3 displays at the same time. Both HDMI and Component ports are active at the same time when in use. You can connect 1 HDMI and 2 Component displays. The VGA output is active and can be connected to a component display, with an adapter. When the BrightSign is set to a VGA resolution like 1024x768 or 1360x768, component and HDMI ports are inactive.
- **HD110, HD210, HD410, HD810, and HD1010:** Connect up to 2 displays at the same time. Both HDMI and VGA are active at the same time when using 1024x768 or 1360x768. For all other resolutions except 1080p, HDMI and Component are active at the same time (HD810 and HD1010 have component).

Can I synchronize multiple BrightSign units?

Yes, you can synchronize multiple BrightSign units.

NOTE: *The HD110 does not support synchronization.*

How accurate is synchronization?

BrightSign is accurate within 1.5 – 2 frames when you synchronize multiple units.

What can I synchronize on BrightSign?

You can synchronize files, playlists, or interactive playlists. You can synchronize any function that BrightSign can perform including content updates, executing serial or network commands, reading or writing files, etc.

How do synchronized BrightSign units communicate?

You can synchronize BrightSign units using a GPIO, Ethernet, or Serial port.

What is the maximum number of BrightSign units I can synchronize?

- **GPIO:** Using the GPIO port, you can connect up to 18 HD2000s to a single Master unit. The HD410, HD810, and HD1010 support up to 24 units connected via GPIO. The HD810 and HD1010 plus the Expander module, can support up to 78 BrightSign units connected via GPIO. You can connect up to 7 Expander modules with each Expander adding support for an additional 54 units—that's a total of 402 units.

NOTE: *If you use third-party USB hubs with more than two USB ports, you can connect more than 7 Expander modules to one BrightSign. Using solid-state relays, you can increase the number of addressable units.*

- **Ethernet:** Using a network, you can synchronize up to 254 units on the same subnet.

Can I synchronize different BrightSign models?

Yes, you can synchronize different BrightSign models.

Do BrightSign units support Genlock?

No, BrightSign units do not support Genlock.

Troubleshooting

If you are still having problems after following the troubleshooting tips in this section.

General troubleshooting

Before attempting to resolve any playback problem on your BrightSign, please start with this checklist.

- 1 Download a BrightSign demo.
- 2 Try a different flash card, or if you have only one flash card, reformat your flash card.
- 3 (HD2000 only) If a CF card isn't working, try an SD card. SDHC not supported.

The BrightSign power light is on, but there's no display

This is normally caused by a problem with the content or with the video connections.

- 1 If you're using an HDMI/Component display, make sure the display is set to the correct input.
- 2 If your BrightSign is currently set for 1080i output, try **720p**.
- 3 If you're using a VGA display, make sure your BrightSign is set to a resolution your display supports over VGA. If you aren't sure, set your Brightsign to **1024x768**.
- 4 If you're using a playlist or interactive playlist, remove the playlist from the flash card, and then try again. Repeat the test by removing **AUTORUN.BRS** if that file is present.
- 5 To rule out a problem with your content, download a BrightSign demo and confirm that it plays.

BrightSign isn't booting up properly / Err light is on or flashing (HD110, HD210, HD410, HD810, and HD1010 only)

- 1 Try starting BrightSign without a flash card inserted.
- 2 Try reinstalling the firmware.

NOTE: *If the error LED is flashing, please record how many times it flashes before pausing, and contact BrightSign Customer Support.*

CF card is not recognized by BrightSign (HD2000 only)

If BrightSign doesn't see any content on your CF card, that card may not be compatible with BrightSign or there might be a bent pin in the CF card slot.

- 1 Check the CF slot for a bent pin.
- 2 Reformat your CF card in FAT32 format.
- 3 Try a different brand and/or size card.

USB keyboard is not responding

BrightSign works with many brands of USB keyboards.

- 1 Disconnect the keyboard from BrightSign and reconnect it.
- 2 Connect your keyboard to BrightSign using a USB hub.
- 3 Try a different USB keyboard.

Elo touch screen coordinates aren't working properly

If the Elo coordinates appear to be reversed or flipped when using AUTOPLAY.CSV, try this:

- 1 Open **AUTOPLAY.CSV** and add the **FLIPELO** keyword to the top of the interactive playlist.
- 2 Copy the updated **AUTOPLAY.CSV** to your SD card.
- 3 Insert the SD card into your BrightSign and add power.

Problems with automatically playing files

Problems playing one or more files

If you're trying to loop one or more files without a playlist, please check the following:

- 1 Make sure you don't have any of the following autoplay files on the flash card: AUTOPLAY.BSP, AUTOPLAY.CSV, or AUTOSCHEDULE.TXT.
- 2 Set your PC to show file extensions and make sure your images are JPG, BMP, or PNG files, your videos are TS files, and your audio files are MP3 files. For the HD2000, videos must be Program Streams (PS) and use an MPG or VOB file extension.
- 3 See [General playback problems](#) and [Content Playback](#) for more troubleshooting tips.

General playback problems

If you're having general problems playing content with BrightSign, try the following:

- 1 Download the BrightSign demo and make sure it plays (see [Step 3: Try the demo](#) for details). If you're also having playlist problems, test the Playlist Demo.
- 2 Make sure your content meets the following specifications:
 - **Audio:** MP3, 48 kHz, 44.1 kHz, or 32 kHz sample rate. The HD2000 also supports WAV with 16 bit linear PCM data.
 - **Video:** Maximum resolution is 1920x1080. Formats vary by model:
 - **HD2000:** Standard MPEG-2 program stream, with optional 48 kHz audio layer.
 - **HD110, HD210, HD410, HD810, and HD1010:** MPEG-2 transport stream with 48 kHz, 44.1 kHz, or 32 kHz audio layer.
 - **Image:** Bitmap, 8-bit, 24-bit, or 32-bit only or PNG/JPEG files. Maximum resolution is 1920x1080.
- 3 Reformat your SD card as FAT32.
- 4 Copy your content, and any scripts, playlists, or interactive playlists to the SD card again.

- 5 Download and install the latest BrightSign software. If you're already using the latest software, reinstall the software (see [Step 2: Get the latest BrightSign software](#) for details).
- 6 Try using a different brand and/or size SD card.
- 7 Re-create content with different software, if possible.

Video output is red, green, or distorted

Red or distorted video output can occur if you're using a VGA display and Brightsign is set to a non-VGA resolution. The HD2000, for example, defaults to 720p output (component or HDMI) from the factory, which causes red output when a VGA display is attached to an HD2000. On other BrightSign models, you may see distortion or green output when using the default video setting with a VGA display. Therefore, you must set the BrightSign video output to 1024x768 or 1360x768; the HD2000 also supports 1280x768. For playlists (AUTOPLAY.BSP) and interactive playlists (AUTOPLAY.CSV), add the following line to correct the video output:

- **HD2000:** `VIDEOMODE 1024x768x60p`
- **HD110, HD210, HD410, HD810, and HD1010:** `VIDEOMODE 1024x768x75p`

No audio during playback

BrightSign defaults to analog audio. On the HD2000, Audio 1 is the default analog port.

- 1 Make sure your audio cable is firmly connected to the analog output on your BrightSign.
- 2 On the HD2000, try each of the analog outputs.
- 3 Check the volume on your powered speakers / AV receiver.
- 4 Make sure the AV receiver is set to the correct input.
- 5 Make sure your video isn't using PCM Audio (unless you're using the HD2000).
- 6 If you're using AC3 audio, make sure the audio is passed through over HDMI. AC3 audio is not decoded (unless you're using the HD2000).
- 7 If you set the volume or audio output in your playlist, double-check the settings you used. For audio output, 0=Analog, 1=USB, and 2=Optical/HDMI.

Content Playback

If you can play content that you downloaded under **Software Download**, but you can't play videos, images, or audio in your own presentations, follow the steps in this section to troubleshoot the problem.

My Image files don't play on BrightSign

If your image isn't playing, it might be an unsupported format, or it might not meet the required specifications to play on BrightSign. Make sure your images meet the following requirements:

- Images must be JPEG, Bitmap, or PNG files
- Images must have a max resolution of 1920x1080

NOTE: *HD2000 doesn't support progressive or CMYK JPEG files.*

My video files don't play on BrightSign

If your video isn't playing, it might be an unsupported format, or it might not meet the required specifications to play on the BrightSign. Make sure your videos meet the following requirements:

- Videos must be MPEG-1 and MPEG-2
- Videos must have a maximum bit rate of 25Mbps
- Videos must have a maximum resolution of 1920x1080
- (HD110, HD210, HD410, HD810, and HD1010 only) Make sure videos are MPEG-2 Transport streams
- (HD2000 only) Make sure videos are MPEG-1 System streams or MPEG-2 Program streams

NOTE: *You can normally use the same authoring application to convert between video and stream formats. There are also inexpensive or free utilities available to convert between formats. Streamclip (Mac & PC) is a free program that converts easily between Transport and Program streams. Mpeg2VCR (PC) does a great job converting between stream formats.*

My video quality is poor

Poor video quality is normally due to a problem with the file or to bad encoding.

- 1 Make sure that the format of your video content matches the properties of the display resolution, and that you've chosen the highest quality output possible. For example, if your videos is 640x480 and you scale it to 1920x1080, this degrades the quality.
- 2 Since most video output modes are progressive, you need to encode video files as progressive MPEG-2 files for the highest quality video reproduction. Otherwise you may see video artifacts when the video is digitally interlaced on a progressive display.
- 3 Try re-encoding the video, or using a different application to encode the video.
- 4 (HD2000 only) Use interlaced video when outputting at 1080i.

My audio quality is poor

Poor audio quality is normally due to a problem with the file or to bad encoding.

- 1 Try re-encoding the audio or video, or using a different application to encode the video.
- 2 Open your video using Mpeg2VCR, and save it. (You can download a 30-day trial of Mpeg2VCR from Womble.) Some videos have an uneven distribution of audio and video packets in the MPEG stream. This can cause audio drop outs, hiccups, or distortion.
- 3 (HD2000 only) Use interlaced video when outputting at 1080i.

My video plays fine, but there's no audio

No audio is normally caused by the wrong audio codec.

- 1 (HD110, HD210, HD410, HD810, and HD1010 only) Make sure the audio is MPEG-1 Layer II or MPEG-1 Layer III. If you're using AC3, it can be passed through over HDMI but not decoded by BrightSign.
- 2 Make sure the video has an audio layer.
- 3 Try re-encoding the video, or using a different application to encode the video.
- 4 See [General playback problems](#) for more troubleshooting tips.

My audio files don't play on BrightSign

If your audio file isn't a playlist, it might be an unsupported format, or doesn't meet the required specifications to play on the BrightSign. Make sure your audio file meets the following requirements:

- MP3s with a 44Khz or 48Khz
- (HD2000 only) WAV files are also supported

Troubleshooting Playlists

Before attempting to resolve any playlist problems on BrightSign, please start with this checklist.

- 1 Make sure the playlist and your content are in the root of the flash card.
- 2 Make sure the playlist file is named **AUTOPLAY.BSP**.
- 3 Download a BrightSign playlist demo and confirm that it plays.

Playlists that I create using MacOS don't work

This is most likely caused by improper formatting of the playlist. Playlists must be plain text files.

- 1 Use **TextEdit** to edit and save your playlists.
- 2 Open TextEdit preferences, and choose **plain text** as the default format.
- 3 Go to the **Open & Save** tab, and choose **Western (Windows Latin 1)**.

The demo files I downloaded work in my playlist, but my files do not

If the demo files play, then the problem could be with your files, not the playlist. Normally, if files don't play at all, there's a problem with the content format.

- 1 Remove any non-alpha numeric characters from your file names. For example, the symbol + is not acceptable in a file name.
- 2 See [Content Playback](#) for more help solving content related problems.

The demo playlist I downloaded works, but my playlist does not.

- 1 Try simplifying the playlist by removing any comments or keywords, and just include one or two files.
- 2 Try editing the playlist you downloaded, and using the modified playlist.
- 3 If you're using a word processor to edit your playlist, try using **Notepad** on the PC or **TextEdit** on the Mac. Playlists must be plain text files.

Troubleshooting Interactive Playlists

Before attempting to resolve any interactive playlist problems on BrightSign, please start with this checklist.

- 1 Make sure the interactive playlist and your content are in the root of the flash card.
- 2 Make sure the interactive playlist is named **AUTOPLAY.CSV**.
- 3 Download a BrightSign interactive demo and confirm it plays.

The demo files I downloaded work in my interactive playlist, but my files do not

If the demo files play, then the problem could be with your files, not the interactive playlist. Normally, if files don't play at all, there's a problem with the content format.

- 1 Remove any non-alpha numeric characters from your file names. For example, the symbol + is not acceptable in a file name.
- 2 See [Content Playback](#) for more help solving content related problems.

The interactive demo I downloaded works, but my interactive playlist does not

- 1 Remove any non-alpha numeric characters from your file names. For example, the symbol + is not acceptable in a file name.
- 2 Make sure that every file used in the interactive playlist is listed in the STATE column and that each file is listed only once. If you need to list a file twice in the STATE column, then create a duplicate of that file, with a different name.
- 3 Check the spelling of the file names.
- 4 For any input you accept, make sure that each event is listed only once on the EVENTS row. For example, you can use button:1 and button:2, but you can't use button:2 and button:2.
- 5 See [Working with Playlists](#), for sample interactive playlists.
- 6 See [Content Playback](#) for more help solving content related problems.

NOTE: *Some users have problems creating interactive playlists with OpenOffice. Please try Excel, Google Spreadsheet, or a CSV editor like the one hosted at <http://csved.sjfranke.nl/index.html>.*

My interactive playlists stops working when I press a button or try to provide any input

The interactive playlist ignores any events (input) that's not clearly defined. If your interactive playlist fails when you provide input, there's a problem with the file that's supposed to play when that button is pressed or the mouse is used.

- 1 Open the **AUTOPLAY.CSV** file and make sure the file that's supposed to play is listed in the **STATE** column.
- 2 Check the spelling of the file name.

Interactive playlists created using an international version of Excel don't work

BrightSign requires a comma-separated CSV file. If you're outside the United States, check the regional settings in Excel and make sure the list separator is a comma and the decimal separator is a period (international defaults may vary).

BrightSign and accessories

BrightSign isn't booting up properly / random lights lit

When BrightSign turns on, it cycles through the Connector Activity and Video Mode lights. The only two lights that should remain lit at the end of the startup process are the Video Mode light, normally 1024x768, and the Power light.

- 1 Download and reinstall the BrightSign software (see [Step 2: Get the latest BrightSign software](#) for details).
- 2 If reinstalling the BrightSign software doesn't fix the problem.

BrightSign software update fails

- 1 Confirm that the update file is named **UPDATE.ROK**.
- 2 Make sure the update file is in the root of the SD card, not in a sub-directory.
- 3 Reformat the SD card in FAT32 format.
- 4 Use a different flash card, if available. SDHC is not supported on the HD2000.
- 5 (HD2000 only) If you're using a CF card, try using an SD card or a USB flash card.

SD card works for playback, but can't update BrightSign

Your SD card might not be compatible with the *safe mode* software on BrightSign. If that's the case, you can try manually updating the software from the BrightSign shell or using a different SD card to do updates. See [Updating BrightSign software from the BrightSign Shell](#) for details.

SD card is not recognized by BrightSign

If BrightSign doesn't see any content on your SD card, that card may not be compatible with BrightSign.

- 1 Reformat your SD card in FAT32 format.
- 2 Try a different brand and/or size card.
- 3 If you're using an HD2000, make sure you're using an SD card, not an SDHC card.

Video selector switch does not work

The video selector switch is not currently implemented on the HD2000.

USB mouse is not responding

BrightSign works with many different brands of USB mice. Before troubleshooting the mouse, download the BrightSign Demo, and try using your mouse with the demo (see [Step 3: Try the demo](#) for details). If the mouse works with the demo, then the problem is with your script or the coordinates used in the interactive playlist.

- 1 Unplug the mouse from BrightSign, and reconnect it.
- 2 If you're using a wireless mouse, reconnect the wireless transmitter, and replace the batteries in the mouse.
- 3 Connect your mouse to BrightSign using a USB hub.
- 4 Your mouse may not be compatible with BrightSign. Try a mouse from the list of tested mice (see [Supported input devices](#) for details).

USB keyboard is not responding

BrightSign works with many brands of USB keyboards. To use a keyboard, you must write a custom script. The buttons supported by the AUTOPLAY.CSV are for input from the GPIO port.

- 1 Disconnect the keyboard from BrightSign and reconnect it.
- 2 Connect your keyboard to BrightSign using a USB hub.
- 3 Try a different USB keyboard.

Elo touch screen coordinates aren't working properly

If the Elo coordinates appear to be reversed or flipped when using AUTOPLAY.CSV, try the following:

- 1 Download version 1.1 or later of the Autoplay Script.
- 2 Open **AUTOPLAY.CSV** and add the **FLIPELO** keyword to the top of the interactive playlist.

FLIPELO		
IMAGEMODE	2	
EVENTS		elo:110:180:355:210

- 3 Copy the updated **AUTOPLAY.CSV** and **AUTORUN.BRS** to your SD card.
- 4 Insert the SD card into your BrightSign and add power.

Chapter 8

Advanced Topics



Selecting Compact Flash cards

When you use BrightSign, your content and scripts resides on a Compact Flash (CF) or Secure Digital (SD) card. Although the CF/SD interface is standardized, there are a wide range of performance, compatibility, and reliability issues among CF/SD card brands and models. BrightSign strongly recommends that you use *industrial rated* CF/SD cards with BrightSign. We have tested industrial rated CF/SD cards from the following brands:

- Transcend
- PQI
- Simpletech

Avoiding CF/SD card corruption due to read fatigue

If you fail to use an industrial CF/SD card, the files on the CF/SD card may become corrupt after a period of time. This is due to the fact that CF/SD cards use NAND flash memory chips that are rated for a certain number of *block reads* before a particular block may develop a read error. Some types of NAND flash are more susceptible to read errors than others. For example, multi-level flash chips are much more susceptible to read errors than single level flash chips. CF/SD card controllers (the chip inside the CF/SD card that controls the flash memory and interfaces with the CF/SD connector) are responsible for eliminating these read errors as well as write errors through

various strategies. These strategies include *wear leveling* when writing, automatic error correction when reading, re-writing a block that is becoming susceptible to read errors, and moving blocks around in the NAND chip that are repeatedly read over and over.

A typical BrightSign application includes an *attract* video loop. If this video is fairly short, then a small number of flash blocks are read repeatedly. Over a month or so, the number of times the attract loop plays can be enough to trigger fatigue read errors if the CF card's controller chip is not designed to handle and eliminate these type of errors. Industrial rated CF/SD cards are designed with high levels of repeated use in mind. Whereas consumer CF/SD cards may be designed with lower cost or quality standards that assume a digital camera is the typical usage scenario.

Speed

All modern CF cards we have tried have sufficient read speed for digital sign and kiosk applications with standard definition video. In general you need a card that can sustain read rates of over 3 megabytes per second for standard video. However for standard video, we recommend CF/SD cards with read rates of 4 megabytes per second, which are easy to find. For Hi-Def video, we recommend a card that can sustain read rates of over 6 megabytes per second. You can test a card's speed with BrightSign by placing a file on it, and using the BrightSign Shell **readperf** command.

BrightSign compatibility

BrightSign is compatible with most CF/SD cards, but may not be 100% compatible with every model. Although there are standards for CF/SD card interfaces, most chips are slightly different. We have tested with a large number of chips, and at this point have high compatibility.

When deploying a group of BrightSigns into the field, BrightSign strongly recommends that you test the CF/SD card with the BrightSign software version you are using before deployment, and insist that your CF/SD card duplicator uses the same CF/SD brand and model number as the model number you tested.

Other ways to update your BrightSign software

- 1 Download the latest software.
 - a Go to the BrightSign web.
 - b Click the **Software Downloads** link.
 - c Compare the software version number with the number on your BrightSign screen.
 - d If your BrightSign software is older than the software on the web site, click the **Software** link to download the latest software.
- 2 Extract the software update file onto your CF/SD card and give it one of the following names:
 - **UPDATE.ROK:** Use this file name if you want to auto-delete the update file after the update is complete. This is useful when you want to distribute the update to the field on the same CF/SD card that contains the presentation content. After the first boot, your BrightSign automatically runs any auto-run content on the CF/SD card.
 - **UPDATE_SAVE.ROK:** Use this file name if you want to keep the update file on the CF/SD card after the update is complete. This is useful when you want to use the same CF/SD card to update multiple BrightSigns.
 - **UPDATE_NEWER.ROK:** Use this file name if you want to apply the update only if the version is newer than the version currently on your BrightSign. The update file is not deleted.
 - **UPDATE_DIFFERENT.ROK:** Use this file name if you want to apply the update only if the version does not match the version currently on your BrightSign. The file is not deleted.
- 3 Insert the CF/SD card into your BrightSign and apply power.
- 4 Wait for your BrightSign to boot. (The display will be blank, but the LEDs on the front panel light as the unit boots.) Wait for the red upgrade LED to light up. During the upgrade, the connector activity LEDs turn on and off to indicate that the upgrade is in progress.

- If you named the file UPDATE.ROK, the file deletes when the update finishes and the unit reboots.

NOTE: *If the card was formatted with NTFS or HFS+, then the UPDATE.ROK file does not delete and the unit does not reboot after the update.*

- If you named the file UPDATE_SAVE.ROK, the upgrade file does not delete and the unit does not reboot.

Generating HD content for an HD2000 using Final Cut Pro

From within Final Cut Pro:

- 1 Open an existing sequence or create a new one.
- 2 Add HD content to the sequence as needed.
- 3 Make sure audio tracks are enabled. If your project has no audio, add a *Slug* to one of the audio tracks.
- 4 Select the portion of the sequence you want to export.
- 5 Select **File > Export > Using Compressor**.

In Compressor:

- 1 In the **Settings** window, go to the **Settings** tab.
- 2 Find **Apple:Formats:MPEG-2:Program Stream** and drag it onto your file in Compressor (where it says Drag Settings and Destinations Here).
- 3 Select the program stream you just dragged onto your file.
- 4 Select your file.

- 5 In the Inspector window, click **Encoder** (second button from the left) and make sure that the resolution, frame rate, and aspect ratio are correct.

NOTE: Most HD sources (HDCAM, HDV etc) set the resolution to 1440x1080. Therefore, if you're creating 1080i or 720p content, you need to click **Change** next to the **appropriate field** and adjust the settings for your content.

- 6 After you confirm that the settings are correct, click **Submit**.

From the Finder:

- 1 Select the movie you want to compress (typically the exported master program).
- 2 Ensure that the movie contains an audio track. To confirm this:
 - a Open the movie in the QuickTime Player.
 - b Select **Window>Show Movie Properties** and make sure that a SoundTrack is displayed in the Properties window.
 - c If there is no audio track, go to Final Cut Pro and add audio as described in the previous section.
 - d To ensure that there is an audio track when exporting a movie from Final Cut Pro, click **File > Export > QuickTime Movie > Save** and be sure the **Include** option is set to **Audio and Video** in the Save dialog box.
- 3 Launch **Compressor**.
- 4 Drag and drop the movie file into Compressor (where it says **Drag Settings and Destinations**).
- 5 Find **Apple:Formats:MPEG-2:Program Stream** and drag it onto your file in Compressor (where it says **Drag Settings and Destinations Here**).
- 6 Select the Program stream you just dragged onto your file.
- 7 Select your file.

- 8 In the Inspector window, click **Encoder** (second button from the left) to confirm that the resolution, frame rate, and aspect ration are correct.

NOTE: Most HD sources (HDCAM, HDV etc) set the resolution to 1440x1080. Therefore, if you're creating 1080i or 720p content, you need to click **Change** next to the **appropriate field** and adjust the settings for your content.

- 9 After you confirm that the settings are correct, click **Submit**.

BrightSign shell

BrightSign has a command line shell that can be accessed via the serial port. The shell enables you to type commands to trigger tasks such as running scripts, playing video, trying different video modes, etc. You do not need to use the shell. You can simply put your content on a CF/SD card and configure it to auto-play on power-up (see [Playing Media with BrightSign](#)).

Accessing the BrightSign shell

You may find it useful to use the shell to test various options or for debugging. Follow these steps to access the shell:

- 1 Connect the DB9 connector on BrightSign to your PC's serial port using a null modem cable (available at Fry's, RadioShack, etc.).
- 2 Run a terminal emulator application, such as HyperTerminal on Windows XP (click **Start>All Programs>Accessories>Communications>HyperTerminal**.)
- 3 Configure the terminal with the following settings:
 - **HD2000**
 - 38400 baud
 - 8 data bits
 - No parity
 - 1 stop bit
 - NO flow control
 - TTY mode enabled

- **HD410, HD810, and HD1010**
 - 115200 baud
 - 8 data bits
 - No parity
 - 1 stop bit
 - NO flow control
 - TTY mode enabled
- 4** Create a CF/SD card with some test files on it (BMP graphics, 48 kHz MP3 files, MPEG-2 video, etc), and then insert the card into the BrightSign unit you connected to your PC.
- 5** Connect speakers and/or a monitor to BrightSign.
- 6** Turn on your BrightSign.
- 7** After a few moments you should see the BrightSign shell appear. It should also show you the software version number.

NOTE: *The current version of BrightSign software does not support hot-swapping of CF/SD cards. You must insert the CF/SD card before applying power.*

Shell commands

With the shell running, you can view a list of shell commands by typing: help <enter>. Type the command on a line by itself for more information on a particular command.

Example shell commands: playing files and changing settings

For a Directory of the cards contents use:

```
dir
```

To show the contents of a sub-directory named images, use:

```
dir images
```


To play a video named MYVIDEO.TS on the SD card, use:

```
videoplay myvideo.ts
```

To play a video with a space in its name, such as MY VIDEO.TS, use:

```
videoplay "my video.ts"
```

To change the volume level (0 - 100) to 75% when playing a video or audio, use:

```
videoplay volume 75
```

```
audioplay volume 75
```

To change the video mode, use this format with the videomode command:

```
videomode 1024x768x60p
```

To display an image, use this format with the imageplay command:

```
imageplay slide1.bmp
```

To specify an image mode, use this format with the imageplay command:

```
imageplay slide1.bmp 0
```

```
imageplay slide1.bmp 1
```

Referencing CF/SD cards

To list the contents of a CF card, enter:

```
dir cf:/
```

To list the contents of an SD card, enter:

```
dir sd:/
```

To explicitly refer to a card from within a script, use the following:

- For compact flash cards

```
CF: /
```

- For SD cards

```
SD: /
```

When BrightSign runs an AUTORUN.BRS script, it sets the current drive to the drive containing AUTORUN.BRS, so references to files on the same card do not need the CF:/ or SD:/ prefixes.

Testing CF/SD cards

BrightSign works with most CF/SD cards, but is not compatible with all CF/SD cards. You can test your card by using the **dir** / shell cmd, and/or using the shell cmd **readperf**.

Examples:

```
dir
readperf bigfile.ts
```

If the dir command fails, you get the following result:

```
Roku> dir /
opendir[/]
Error: can't open dir
```

If the readperf command fails, you get the following result:

```
Roku> readperf bigfile.ts
SET FEATURES transfer mode SUCCEDED

Unable to open file ATA:\autorun.brs
```

Testing scripts, playlists, and interactive playlists

The BrightSign shell enables you to test playback and see debug output. From the BrightSign shell you can start your script manually and view output from the script.

Manually starting a script

You can start a script from the shell by using the **script** command.

- 1 Follow the directions earlier in this section to connect BrightSign to your computer, and access it using HyperTerminal.
- 2 As your script runs, you see output in your terminal program including a variety of output such as mouse clicks or button presses, file names, audio and video settings, as well as any errors associated with incorrect use of functions or commands including the line numbers.

Testing playlists

When your playlist contains the keyword **debug** the AUTORUN.BRS script provides detailed output to the BrightSign shell during playback. To begin testing playlists, do the following:

- 1 Copy your content, including your AUTOPLAY.BSP and AUTORUN.BRS files to your CF/SD card.
- 2 Open your AUTOPLAY.BSP (main playlist file) and add the keyword: `debug`
- 3 Insert your CF/SD card into BrightSign, and add power.

Testing autorun and interactive playlist files

Running AUTORUN.BRS in debug mode provides detailed output to the BrightSign shell while the script is running. To begin testing the AUTORUN.BRS script in debug mode, do the following:

- 1 Copy your content, interactive playlist, and AUTORUN.BRS to your CF/SD card.
- 2 Open AUTORUN.BRS and find the following line near the top of the script:
`debug=false` 'set to true to turn on debug prints; false to turn them off
- 3 Change this line to: `debug = true`
- 4 Rename AUTORUN.BRS so it doesn't start automatically. For example, rename it RUN.BRS.
 - If you are testing a playlist, the main playlist must be named **AUTOPLAY.BSP**
 - If you are testing an interactive playlist, it must be named **AUTOPLAY.CSV**
- 5 Insert your CF/SD card into BrightSign, and add power.
- 6 When the Roku prompt appears, type the following:
`script run.brs`

Testing custom scripts

To make troubleshooting your custom scripts much easier, we recommend adding check and print statements, like those found in the AUTORUN.BRS script. Here are a few examples:

- Add print statements telling you which portion of the script you are currently in
- Add print statements showing the type of event that just occurred
- Add print statements showing names of files read from the flash card
- Add print statements showing the coordinates of a mouse click

To begin testing your custom script:

- 1 Copy your content and script file to the CF/SD card.
- 2 Name your script **RUN.BRS**. You can call it anything, as long as it's not AUTORUN.BRS, so it doesn't start automatically.
- 3 Add `debug = true` as the first line of your script. This command enables you to see output from the print statements you added to your script.
- 4 Insert your CF/SD card into your BrightSign and add power.
- 5 When the Roku prompt appears, type the following:

```
script run.brs
```

Multi-run script limitations

Currently when a script terminates, BrightSign does not free resources allocated by Roku Objects. This means that if you use the **script** shell command to run a script, and the script exits, you may not be able to run it again successfully unless you reboot your BrightSign between script tests.

Linux shell

BrightSign has a Linux shell that you can access via the serial port. To access the Linux shell, enter the following at the Roku prompt:

```
exit
```

When you are done using the Linux shell, enter the following at the Linux prompt:

```
reboot
```

Updating BrightSign software from the BrightSign Shell

BrightSign is pre-programmed with two primary software images: a *safe mode* and a *run mode*. The safe mode software image is write-protected, and you cannot change it once programmed by the factory. The main purpose of safe mode is to validate that the run mode ROM image is not corrupt and to boot your BrightSign. In addition, safe mode can upgrade or re-program the run mode ROM image.

The run mode software image is stored on a flash ROM and you can upgrade this software in the field. The update process is very safe (see [Step 2: Get the latest BrightSign software](#) for details updating the run mode software). If for some reason the update fails, for example if there is a power failure in the middle of the update, BrightSign boots in safe-mode and completes the update. BrightSign is always working on improving the BrightSign software, so check the BrightSign web site periodically for upgrades.

BrightSign works with most CF/SD cards, but is not compatible with all cards. Because the BrightSign safe mode software is normally older than the run mode software, more CF/SD cards are compatible with run mode than with safe mode. Therefore, BrightSign may not detect the UPDATE.ROK file on some CF/SD cards. It is impossible to tell by a CF/SD card's name, brand, or description if it is compatible. You must try it. (For details on testing your CF/SD cards and accessing the shell, see [Testing CF/SD cards](#) and [Accessing the BrightSign shell](#).)

To manually update using the BrightSign shell:

- 1 Copy the UPDATE.ROK file onto your CF/SD card.
- 2 Insert the CF/SD card in your BrightSign and apply power.
- 3 When the **Roku** > prompt appears in the BrightSign shell, type the following:
`update update.rok`

NOTE: *We are continuing to add support for more CF/SD cards.*

Using the registry

BrightSign has an I2C EEPROM with 2K bytes of memory that supports the storage of persistent settings. The BrightSign software uses the registry object to read and write BrightScript data to this eeprom. The purpose of the registry is to enable customers to store usage statistics and other small amounts of information that may change regularly.

Individual items are stored in the registry through the use of registry keys and values. For example, you use a registry key named "NumberOfButtonPresses" to count the number of times a button is pressed. Registry data can be organized into different registry sections if desired.

Interactive playlists support writing to the registry, deleting from the registry, and displaying the contents of the registry (see [Using Excel to create interactive presentations](#)). You can also display the contents of the registry from a playlist (see [Playlist commands](#)). In addition, you can access the registry by using a custom script that includes the **roRegistry** object (see the *BrightSign Object Reference Manual* for additional information).

The number of registry keys and values that you can use depends on a number of factors including the number of sections, the number of keys/values per section, and the size of the keys and values. In typical usage, there is room in the registry for about 50 keys.

Writing to the registry from an interactive playlist

When using interactive playlists, you can use the registry to track the number of times that the system transitions from one state to another. To do this, add the following to the state name in an event column:

```
:counter(<registry key name>)
```

In the demo example, the elo:1 10:180:350:400 event column shows the state CARS.TS is in. To track the number of times that the user activates this transition, enter `cars.mpg:counter(TouchToDemoMenu)` in place of CARS.TS. Then, each time the user requests CARS.TS, BrightSign increments the TouchToDemoMenu key value in the registry.

Displaying registry contents from an interactive playlist

To display the contents of the registry from an interactive playlist, add a row to the table with the word **DisplayRegistry** in the column to the right of the keyword STATE. The remainder of the row is like any other row in the table – it contains other states to transition to when events occur. Elsewhere in the table, add the state **DisplayRegistry** in the column for the event that you want to trigger the registry to display. When the system transitions to this state, playback from the prior state stops and the contents of the registry display on the monitor attached to the BrightSign.

To display only a subset of the registry, use the following syntax:

```
DisplayRegistry-<registry section name>
```

Copying registry contents from an interactive playlist

To copy the contents of the registry to a file onto a CF/SD card or a USB mass storage device, enter the following in the state table:

```
Execute(CopyRegistry <file-name>)
```

Examples of <file-name> include:

```
registry-output.csv
```

```
sd:/registry-output.csv
```

```
usb1:/registry-output.csv
```

Place the `Execute(CopyRegistry <file-name>)` entry in the appropriate row and column for the appropriate state or event in the interactive playlist. Unlike other entries in this part of the state table, this entry executes only the CopyRegistry command and does not transition to a new state. BrightSign simply copies the contents of the registry into a comma separated value format, so that you can easily import the information into a spreadsheet application.

Setting the date/time on BrightSign

The HD810 and HD2000 have a real-time clock that you can use to schedule content playback. In order to use the scheduling features, you must first set the date and time on BrightSign.

BrightSign has written a script that provides an interactive means for setting the date/time on BrightSign. The script is named SETDATETIME.BRS and is available at [this location](#).

Instructions for using the date/time script:

- 1 Go to BrightSign web and click the **Software Downloads** link.
- 2 Click the **SetDateTime Script** link to download the **SETDATETIME.ZIP** file.
- 3 Expand the **SETDATETIME.ZIP** file, which contains a script named **SETDATETIME.BRS**.
- 4 Copy **SETDATETIME.BRS** into the root directory of a CF/SD card and rename it **AUTORUN.BRS**.
- 5 Connect a USB keyboard or a GPIO button board to your BrightSign.
- 6 Insert the CF/SD card into your BrightSign and apply power.
- 7 Wait a few moments for the date/time screen to appear and enter the current date and time.

Once you set the date/time on BrightSign, the real-time clock maintains accurate time even if you turn your BrightSign off and on.

Using a custom boot script and logo

You can change the startup logo or add a boot script. Both the logo and boot script are stored in the internal FLASH and have a size limit of 200KB.

Using your own boot logo

- 1 Save your logo in one of the following file formats: BMP, 8 bit indexed, or RLE encoded.
- 2 Copy your logo to a CF card.
- 3 Connect your BrightSign to a PC using a null modem cable (see [Accessing the BrightSign shell](#) for details).
- 4 Run a terminal emulation program such as HyperTerminal (see [Accessing the BrightSign shell](#) for details).
- 5 Insert the CF card into your BrightSign and apply power.
- 6 When the terminal prompt appears, type the following (where LOGO.BMP is the name of your logo file):

```
writebootfile logo.bmp boot.bmp
```
- 7 Reboot BrightSign, and your logo should appear.

Widescreen vs. 4x3 discussion

You can use BrightSign with widescreen or 4x3 displays. However, you may find that using different display aspect ratios with the various BrightScreen options is confusing. In this section we try to clarify what you can expect.

Displaying videos

BrightSign treats video and images a little differently. When a video is playing back, it is displayed by default in what is known in BrightSignese as *ViewMode 0*. In other words, BrightSign scales the video to fill the current output resolution (as set by the videomode command), whatever its

aspect ratio. What this means from a practical point of view is that you should author the content for 16x9 if you intend to use a 16x9 display mode (any component mode). If you intend to use a 4x3 display mode (any VGA mode, for example 1024x768), then you should author the content for 4x3. If you author your video for widescreen, but play it back at 1024x768 or 640x480, it will look squashed. It isn't automatically letter-boxed like when played on a DVD player. For example, the aquarium video that is included in the BrightSign demo (that you can download from the BrightSign web site) is widescreen video. When you view the demo on a VGA display, it appears squashed, but it appears correct when you view it on a 720p display.

Using a custom script or modified AUTORUN.BRS, you can force a 16x9 video to be letter-boxed. Using ViewMode 1 sets the video to be letter-boxed and centered while maintaining aspect ratio. You can read more about ViewMode in the *Object Reference Manual*. The following example assumes you have a roVideoPlayer object called *video*:

```
video.SetViewMode(1)
video.PlayFile("\Aq.ts")
```

Displaying images

When displaying images, BrightSign is smarter about the way the images display. It knows the image resolution, and it assumes that all VGA resolutions are in 4x3 mode, and that all component resolutions (except 480p) are widescreen. BrightSign then scales the image according to the *imagemode* setting. However, if you connect a widescreen VGA monitor to the VGA port, you can expect to see distorted images. This is because 1024x768 is a 4x3 mode, and your widescreen monitor stretches it. To avoid this confusion, for widescreen modes, it is best to use a component input monitor.

Connecting BrightSign to your network

The HD210, HD1010, and HD2000 include a built-in 10/100Mbps Ethernet port, and support DHCP for automatic network configuration. BrightSign uses http protocol to communicate over your network using port 80—the same way you browse the web. You don't need to open any special ports in your firewall.

Configuring BrightSign using DHCP

To connect the BrightSign to your network:

- 1 Use an ethernet cable to connect your BrightSign to your network.
- 2 Insert your CF/SD card with your content and playlist into your BrightSign and add power. BrightSign automatically requests an IP address from your network when it boots.

Using a manual IP configuration

If you do not want to use DHCP or you can't because of your network setup, you can manually set the IP address on BrightSign in one of two ways:

- Configure BrightSign from the system shell, by connecting the BrightSign to your computer using a serial cable.
- Use a manual IP configuration script.

We recommend the manual IP configuration script method because it is easier than using the system shell. You can download a manual IP configurations script from the BrightSign website.

Follow these steps to manually configure your IP settings:

- 1 Go to BrightSign web and click the **Software Downloads** link.
- 2 Download and unzip the **MANUAL_IP_CONFIGURATION.ZIP** file, which contains an AUTORUN.BRS file.
- 3 Open **AUTORUN.BRS** with notepad or any text editor.
- 4 Edit **AUTORUN.BRS** to match the network settings on your network.
- 5 Copy **AUTORUN.BRS** to your CF/SD card.
- 6 Insert your CF/SD card into your BrightSign and add power.
- 7 When the option to press the video select button to choose DHCP appears, do not press the video select button. Wait 8 seconds, and BrightSign accepts the manual settings in your AUTORUN.BRS file.

- 8 When prompted, restart BrightSign to finish.

TIP: You can also copy and paste the following into a text file, and then change the network settings to match your own. After you make the changes, save the file as *AUTORUN.BRS*.

```
REM Start of script
nc = CreateObject("roNetworkConfiguration", 0)

nc.SetIP4Address(192.168.1.200)
nc.SetIP4Netmask(255.255.255.0)
nc.SetIP4Broadcast(192.168.1.255)
nc.SetIP4Gateway(192.168.1.1)

nc.AddDNSServer(192.168.1.1)
nc.AddDNSServer(208.67.222.222 )
nc.AddDNSServer(208.67.220.220)

nc.Apply()
a=RebootSystem()
REM End of script
```

Proxy servers

There are three ways you might connect the BrightSign to a server on the Internet.

- **Direction connection:** BrightSign has a routeable IP address and is accessible to the outside world. We do not recommend this configuration.
- **Intercepting or transparent proxy:** BrightSign has a private IP address that is only routeable within the local network. This configuration is used in most home and corporate networks. We recommend this configuration.

- **HTTP / socks proxy:** BrightSign does not currently support HTTP proxy or socks proxy configurations. Although BrightSign has a private IP address, it cannot make connections to the Internet by itself. Instead it has to connect to a proxy server and ask it to make the connection to the Internet. This can either be a protocol specific proxy (like many web proxies/caches) or a protocol agnostic proxy (e.g. socks).

Networking software options

After you connect your BrightSign hardware to your network and configure it to communicate with your network, you can choose whether you want to use Simple Networking software or BrightSign Network Manager to manage your BrightSign devices and content on your network.

The following is a brief description of the features offered by each of these networking software options:

- **Simple Networking:** This method provides an easy way to update BrightSign devices remotely. Create a BrightSign folder on your web server, place your new content in this folder, and then use BrightSign's Windows tool to create a sync file, so the BrightSign knows what's changed in the folder. When you use the NetworkTimer command in your playlist, BrightSign automatically downloads the content you place in your network folder.
- **BrightSign Network Manager:** This is a web-based solution that is designed for enterprise situations with a large number of BrightSign devices that require advanced networking features including:
 - **Reporting:** Track all BrightSign devices including the latest connectivity data, CF/SD card size, and current and upcoming presentations.
 - **Unit Organization:** Create groups and deploy content very quickly to one or more groups.
 - **Scheduling:** Pick the dates and times you want to deploy content to each group.
 - **Content Organization:** Upload audio, video, and image files to a central library for easy access.
 - **Presentation Creating:** Use a graphical interface to build playlists (with or without zones).

Using the NetworkTimer keyword

When using the Simple Networking method, you need to add a NetworkTimer keyword to your playlists. You can use the NetworkTimer keyword with an RSS feed or the automatic content download feature. The NetworkTimer keyword can take the following forms:

- **NetworkTimerPeriodic:** Instructs BrightSign to check your network folder at regular intervals. For example, you can update an RSS feed every 15 minutes. The syntax is as follows:

```
NetworkTimer "Minutes" "Item to update"
```

```
NetworkTimer 15 RSS
```

- **NetworkTimer:** Instructs BrightSign to check your network folder for new content at regular intervals based on the date/time parameter you specify. For example, you can check for new content every Monday at 6AM. The syntax of the date/time parameter is as follows:

```
Year "/" Month "/" Day "-" Day of Week "-" Hour ":" Minutes
```

```
NetworkTimer */*/*-MON-06:00 DOWNLOAD 'Mondays at 6AM
```

- **NetworkTimerRange:** Instructs BrightSign to check your network folder for new content during a specific timeframe. For example, you can check for new content every day between 10AM and 2AM. The syntax is as follows:

```
NetworkTimerRange 22 240 Download 'Every day between 10PM - 2AM
```

Chapter 9

Product Specifications

BrightSign features

Display resolutions	HD110	HD210	HD410	HD810	HD1010	HD2000
1024x768 (HDMI & VGA out)	X	X	X	X	X	X
1280x768 (VGA out)						X
1360x768 (HDMI & VGA out)	X	X	X	X	X	
480p (HDMI & component out)	X	X	X	X	X	X
576p (HDMI & component out)	X	X	X	X	X	X
720p (HDMI & component out)	X	X	X	X	X	X
1080i (HDMI & component out)	X	X	X	X	X	X
1080p (HDMI out)	X	X	X	X	X	
Video compression standards	HD110	HD210	HD410	HD810	HD1010	HD2000
MPEG-1						X
MPEG-2 transport streams with MP3 audio (TS)	X	X	X	X	X	
MPEG-2 program streams						X
Picture formats	HD110	HD210	HD410	HD810	HD1010	HD2000
BMP	X	X	X	X	X	X
PNG	X	X	X	X	X	X
JPEG (JPG)	X	X	X	X	X	X

Audio formats	HD110	HD210	HD410	HD810	HD1010	HD2000
AC3 pass through	X	X	X	X	X	X
MP3 decode out to analog and SPDIF	X	X	X	X	X	X
WAV decode out to analog and S/PDIF						X
USB device support	HD110	HD210	HD410	HD810	HD1010	HD2000
Touchscreen				X	X	X
Speakers				X	X	X
Mouse				X	X	X
Keyboard				X	X	X
Trackball				X	X	X
Barcode scanner				X	X	X
USB hub support				X	X	X
Front panel	HD110	HD210	HD410	HD810	HD1010	HD2000
Power LED	X	X	X	X	X	X
IR receiver						X
Compact Flash (CF) card slot (up to 128 GB cards)						X
MMC flash card slot (up to 4 GB cards)						X
SD flash card slot (up to 4 GB cards)	X	X	X	X	X	X
SDHC flash card slot	X	X	X	X	X	
Video mode select button						X
LEDs: connector activity and video mode	X	X	X	X	X	X
Power						
Typical power consumption						10.5 watts

Back panel connectors	HD110	HD210	HD410	HD810	HD1010	HD2000
Power	X	X	X	X	X	X
3 audio out stereo 1/8" mini plugs	X	X	X	X	X	X
VGA	X	X	X	X	X	X
Component out				X	X	X
3 RCA jacks: Y-Pr-Pb						X
HDMI out	X	X	X	X	X	X
2 high-speed USB host ports				X	X	X
10/100 ethernet jack		X			X	X
DB25 control port (for buttons & LEDs)			X	X	X	X
RS-232 serial port			X	X	X	X
Optical SPDIF audio out						X
1/8" 5V serial port			X	X	X	X
8 position dip switch						X
Other features	HD110	HD210	HD410	HD810	HD1010	HD2000
Auto play and looping video support	X	X	X	X	X	X
Playlists	X	X	X	X	X	X
Interactive playlists (CSV files)	X	X	X	X	X	X
Scripting						X
Real time clock				X		X
Single files larger than 4GB						X
Upgradable software	X	X	X	X	X	X
Customer configurable DIP switches						X
Scheduling playback		X		X	X	X
Persistent data storage via eeprom						X
USB mass storage device support						X

Supported media types

BrightSign supports the following media types:

MPEG-2 video files (program streams on the HD2000—VOB/MPG files, or transport streams on the HD110, HD210, HD410, HD810, and HD1010—TS files) These are the same types of files that are found on DVDs. You can create MPEG-2 video files using any video editing software, such as Pinnacle Studio or iMovie. These video files should meet the following parameters:

- **Video size** up to 1080i (1920x1080 interlaced).
- **Bit rate** up to 25Mbps.
- **Scale.** During playback video is scaled in real time to the output resolution (which can be much higher definition). The files must contain program streams (transport streams are not supported).

TIP: For additional information on authoring HD content, see [Generating HD content for an HD2000 using Final Cut Pro](#).

Image files You can create image files using most imaging software, such as Adobe PhotoShop, Macromedia Firefly, or even Paint, which comes with Windows. You can also save or convert any digital camera image to compatible formats.

The following image resolutions are supported:

- Up to 1920x1080 for HD output
- Up to 1024x768 for VGA output

The following image file types are supported:

- **8, 24, 32 bit BMP files**
- **PNG files**
- **JPEG files** *Baseline* JPEG files are supported. *Progressive* JPEG files are not supported.

MP3 audio files Stereo or mono files that meet the following parameters:

- 48 kHz
- 44.1 kHz

NOTE: *BrightSign has no sample rate conversion. Certain USB speakers only support a sample rate of 48 kHz. When using a USB speaker with this characteristic, BrightSign outputs all audio at this rate regardless of the sample rate it was recorded at.*

WAV audio files 16 bit linear PCM data.

Dolby Digital (AC3) 5.1 audio in a video file ○

- **5.1 AC3 audio playback from SPDIF and HDMI outputs.** SPDIF audio output is sent in its compressed state to the SPDIF receiver. You can also set an option within the autoplay script to automatically mix the AC3 5.1 audio down to stereo PCM.

Supported input devices

With BrightSign software you can connect the following devices to a BrightSign:

- Elo Touch Screens
- Many brands of USB Keyboards
- Many brands of USB Mouse or Trackballs
- Many brands of USB Bar Code Scanners (these appear as a keyboard)
- Quadravox Serial Button Board
- Any GPIO button, signal, or LED (your custom board or led display). BrightSign has a test button board available for purchase on our estore.
- VGA Monitors
- Component-input TVs
- HDMI Monitors / TVs
- High Definition Monitors/TVs
- Speakers/Amplifiers with stereo line-level inputs
- Audio playback devices with SPDIF optical digital audio input
- PC via Serial Port
- IR Remote Control using the NEC protocol. You can purchase a compatible remote from BrightSign.

USB mice

BrightSign has tested the following mice with BrightSign:

Type	Connection	Brand	Model	Name	Comments
Ball	Wired	Belkin	F8E841-BLK	MiniScroller Mouse	
Optical	Wireless	Belkin	F8E874	MiniWireless Optical Mouse	
Optical	Wired	Dynex	DX-OM20		
Optical	Wireless	Kensington	72216	PilotMouse Optical Wireless	requires USB hub
Optical	Wired	Logitech	M-BE58	First/Pilot Wheel Mouse	
Optical	Wired	Logitech	M-UV55A	Mini Optical Mouse	
Optical	Wired	Logitech	M-BT96a	Optical Mouse (3 buttons)	
Trackball	Wired	Logitech	T-BC21	Marble Mouse	
Optical	Wired	Logitech	M-BP86	MX310 Optical Mouse	requires USB hub
Optical	Wired	Logitech	m-bw112a	LX3 Optical Mouse	requires USB hub
Optical	Wireless	Logitech	RBS111	Cordless Mini optical mouse	requires USB hub
Optical	Wireless	Logitech	V200	Cordless notebook mouse	requires USB hub
Optical	Wireless	Logitech	LX5	Cordless Optical mouse	
Optical	Wired	Microsoft	69H-00001	Comfort Optical Mouse 1000	