1310 Kootenay Street
Vancouver, British Columbia
Canada, V5K 4R1

Tel: (604) 228-4624
Fax: (604) 228-4622
Web: www.brightsidetech.com

DR37-P Software Manual

DR37-P
37" Professional High Dynamic Range Display

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Version:	**0.2**

How to Install HDR Viewer

This section describes the steps to install the BrightSide HDR Viewer. HDR Viewer has to be installed **before** attaching the DR37-P display and turning it on.

The steps to install the HDR Viewer are as follows:

1. Ensure that your computer and operating system meet the minimum requirements:

    Intel Pentium 4, greater than 2.8 GHz
    RAM: 1GB
    Hard drive: 80GB
    DVD drive
    Graphics card: nVidia FX 6800 or 7800 or nVidia Quadro 4400 with 256MB of RAM and at least one DVI-D output
    USB1.1
    Microsoft Windows XP with Service Pack 2

2. Ensure the NVIDIA graphics adapter driver is compatible with the display. The following combinations have been tested:

    DirectX version 9.0c (4.09.0000.0904)

Driver Version	Geforce 6800	Geforce 7800
77.50	Works well	untested
77.76	untested	Driver packaged with card - no problems seen
78.01	**Works**	**No problems seen - suggested best driver**
81.85	untested	Screen corruption - do NOT use

    The latest NVIDIA display drivers have been included on the installation CD in the folder "1 NVidia Quadro and GeForce Drivers for WinXP " and can be found online at:

   http://www.nvidia.com/content/drivers/drivers.asp

3. Open the folder "2 NVIDIA PureVideo Bronze Installer " on the installation CD and install NVIDIA PureVideo Decoder Platinum

    Enter the registration information provided separately.

4. Open the folder "3 BrightSide HDR Viewer Installer" on the installation CD and install DirectShow Filter Manager
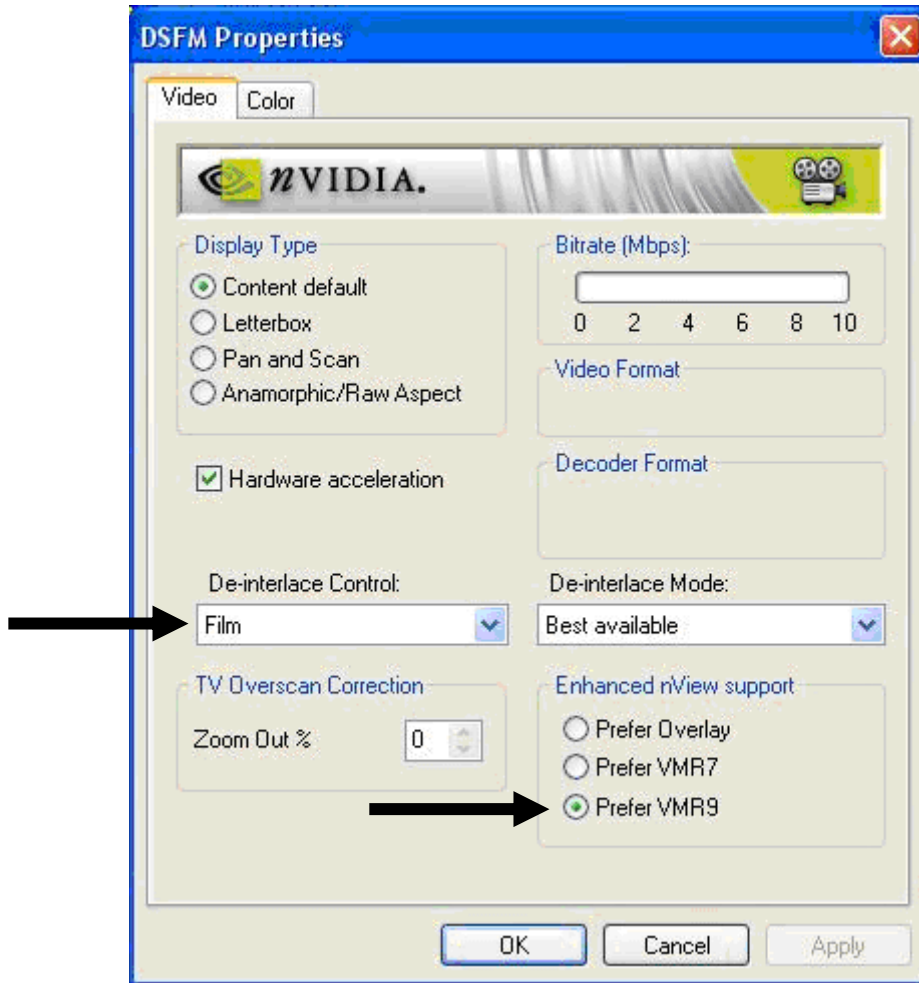
5. Launch DirectShow Filter Manager

6. In DirectShow Filter Manager. As shown below, select the row "NVIDIA Video Decoder" and then click on the "Show filter properties" button.
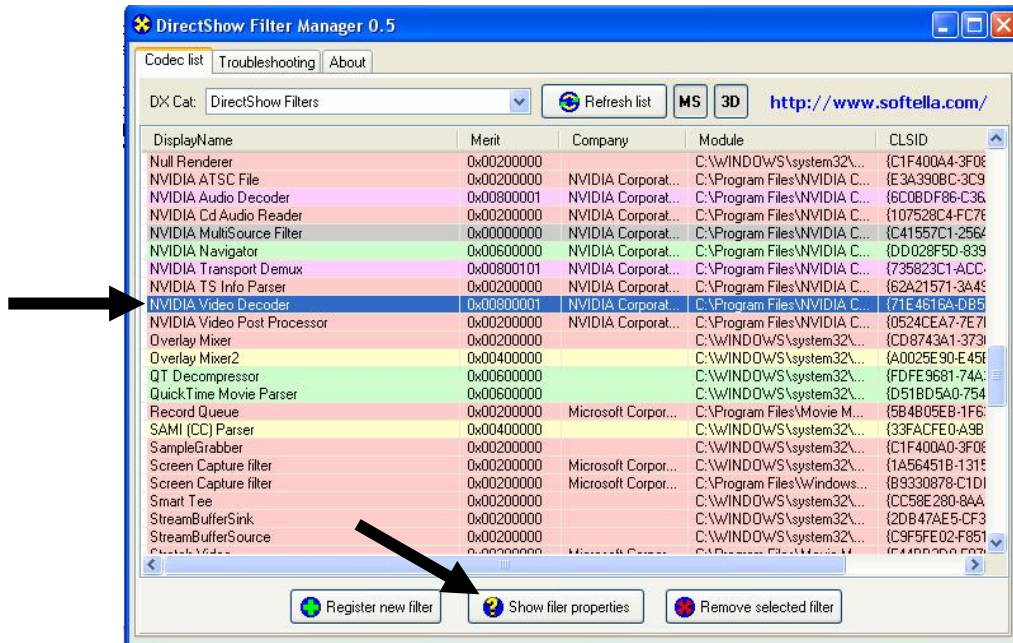
7. In the Filter Properties dialog, change to the 'Filter merit' to FFFFFFFF (8 F's) then click the "Set new merit" button. Then press the "Filter settings" button.
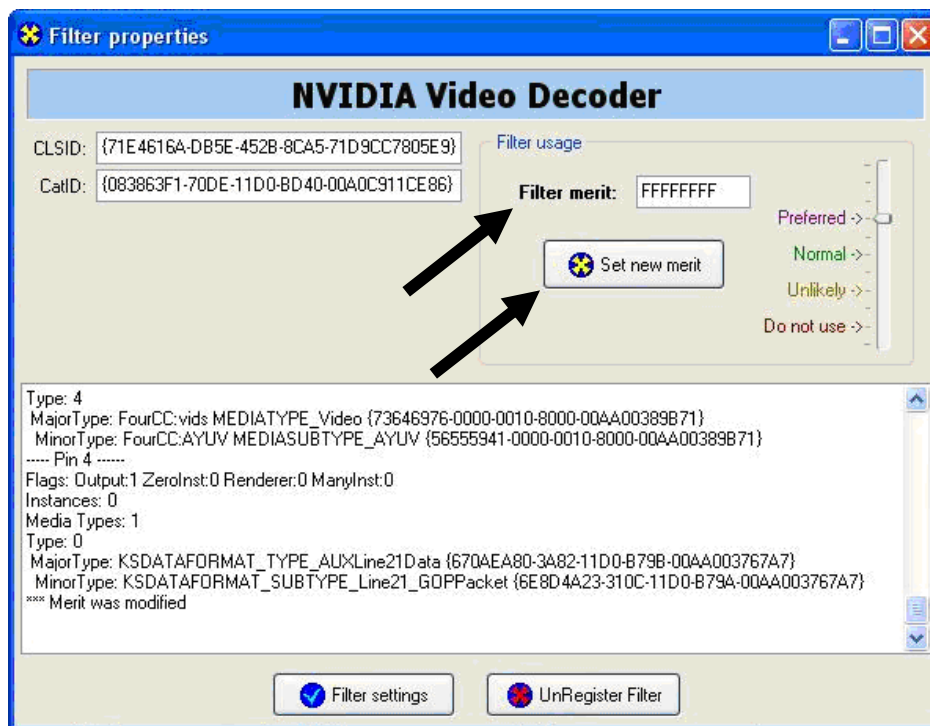
8. In the DSFM Properties dialog, change 'De-interlace Control' to 'Film' and select 'Prefer VMR9' bullet if it is shown under the 'Enhanced nView support' section. Then press apply

9. Close the Filter Properties dialog, and close the DirectShow Filter Manager application.

10. Ensure the screen refresh rate is 60 Hz. The refresh rate may not be available in the windows display settings, so you may need to add the refresh rate manually into the nVidia display driver. If you do not do this, HDR Viewer may not run. The instructions to set the screen refresh rate for nVidia specific display cards are:
    1. Go into nVidia display properties for the DR37-P
    2. Go to the Advanced option in the Display Properties Settings tab.
    3. In the graphics card tab, go to "Screen Resolutions & Refresh Rates" on the left pop-up menu.
    4. Ensure the refresh rate is 60 Hz. If not, then add a custom refresh rate.

11. Open the folder "4 BrightSide HDR Viewer Installer" and install HDR Viewer.

12. Logoff and restart to have changes take into effect.

Installing USB drivers for the DR37-P display

1. In the Windows File Explorer select from the menu, Tools>Folder Options. Open the View tab and uncheck
   "Hide extensions for known file types"
   "Hide protected operating system files (Recommended)"
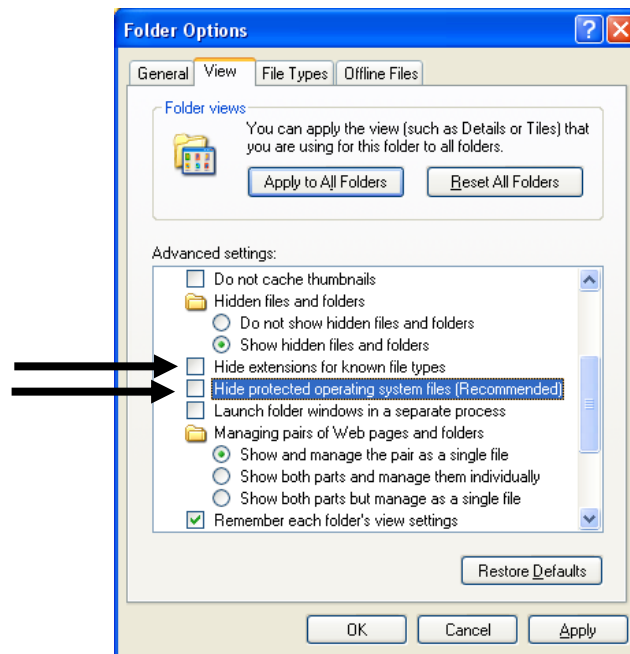
2. Open the C:\Windows folder on your computer's HDD

3. In a separate Explorer window, open the folder "5 USB Driver Files" on the installation CD

4. Copy CyUSB.inf into Windows/inf

5. Copy CyUSB.sys into Windows/System32/drivers

6. Plug in display's USB cable and turn on the display.

7. If WindowsXP asks for the driver for the display locate the CyUSB.sys file you installed. You may wish to move the display's USB cable into each USB port and repeat this process until all ports work.

Please make sure the CyUsb.sys driver is located in the Windows/System32/drivers directory and that CyUsb.inf is located in the Windows/inf directory.

As an experiment, if there is also a CyUsb.pnf file in the Windows/inf directory (Windows XP creates it automatically from the CyUsb.inf), delete it and reboot.

Installing the Display Control Panel Application

Open the folder "6 Firmware and Display Control Panel" on the installation CD.

The folder "Firmware V34 " contains the Display Control Panel executable as well as the firmware code.

1. Copy the folder "Firmware V34" to C:\Programs\BrightSide\.

Within the folder "Firmware 34" the file MSCOMCTL.OCX must be installed and registered in windows/system32 for the Display Control Panel to work.

If you have Office XP or Visual Studio C++ installed you may not need to perform this step.

Here is the procedure:

1. Copy MSCOMCTL.OCX to the folder WINDOWS/system32

2. Open Start>All Programs>Accessories>Command Prompt

3. Enter the command "cd windows/system32"

4. Enter command "regsvr32 mscomctl.ocx"

DOS should say that the OCX was registered successfully.

More Information:

mscomctl.ocx is an ActiveX Control module that contains common controls used by Windows, such as ImageCombo, ImageList, ListView, ProgressBar, Slider, StatusBar, TabStrip, ToolBar, and TreeView controls.

It is a part of Windows ActiveX and is a Microsoft Windows XP System DLL.

Operating HDR Viewer

This section describes how to operate HDR Viewer and its control of the DR37-P display. HDR Viewer is designed to be a demonstration program and thus does not contain any image creation or editing functions. Within HDR Viewer you can create a playlist of images and movies, adjust their display timings and settings, and play the playlist.

Configuring HDR Viewer

The first thing you may want to do is to customize the program. Depending on your setup you may have to manipulate the way HDR Viewer processes images. Open up 'mediadisplay.txt' located in the installation directory of HDR Viewer. Below are the different options available in the file, if any of these options are not evident in the file, HDR Viewer will select a default value for you.

[mediadisplay]

Header for mediadisplay.txt, the header cannot be removed.

id

> Specifies which graphics card output the DR37-P is connected to.
>
> Example:
>
> id primary
>
> id secondary

resolution

> Allows user to run HDR Viewer at a custom resolution. The resolution must be supported natively by the graphics card. You may also specify to run either in windowed or fullscreen exclusive mode. Specified 0's for width and height of resolution defaults the viewer to the desktop resolution.
>
> Example:
>
> resoluton 640 480 windowed
>
> resolution 0 0 fullscreen
>
> resolution 1024 768 fullscreen

blurcorrection

> Notifies HDR Viewer to load the HDR Toolkit library during runtime if value is 1. If value is 0 it does not load the HDR Toolkit library and image processing will not be done on any display.
>
> Example:
>
> blurcorrection 1
>
> blurcorrection 0

lcddisplaygamma

> Configures gamma of the LCD panel. Since panels vary in gamma this needs to be customized to the display being used, since there is no way HDR Viewer can determine the gamma value during runtime.
>
> Example:
>
> lcddisplaygamma 2.7 2.7 2.7
>
> lcddisplaygamma 2.7
>
> lcddisplaygamma 4.0 4.0 4.0
>
> lcddisplaygamma 4.0

Media File Types Supported by HDR Viewer

HDR Viewer can display images with only 8-bits per RGB channel (e.g., gif, jpeg, png, tiff) which are often termed "low dynamic range" images as well as high dynamic range images with 10, 12, 16 or more bits per channel (e.g., hdr, pfm, exr).

Specifically, HDR Viewer can display the following types of images with typically low dynamic ranges:

File Extension	Name	Appropriate for	Number of bits/channel/pixel	Notes
.jpeg, .jpg	Joint Photographic Experts Group	Photographs of natural scenery	8 integer bits	Lossy compression
.png	Portable Network Graphic	Synthetic and natural images	8 integer bits	Non-lossy compression
.ppm	Portable Pixmap	Synthetic and natural images	1 to 16 integer bits	Lowest common denominator image file format http://netpbm.sourceforge.net/doc/ppm.html
.bmp	Windows Bitmap	Synthetic and natural images	integer bits per pixel (1, 4, 8, 15, 24, 32, or 64)	Typically uncompressed but also typically smaller than PPM
.dds	Microsoft DirectShow	Synthetic and natural images	8 integer bits	Typically only associated with MS Windows application development
.tif	Tagged Image Format	Synthetic and natural images	Integer bits per pixel (1, 4, 8, 15, 24, 32, or 64)	
.dib	Device Independent Bitmap	Synthetic and natural images	integer bits per pixel (1, 4, 8, 24)	Typically only associated with MS Windows application development

Because each of the above file format were designed for use with conventional low dynamic range displays, these file formats usually do not include image content with high ranges between their darks and their highlights. HDR Viewer can expand the dynamic range of these image files however the results are directly related to the quality of the original images the viewer's willingness to accept the display of noise typically hidden in the image by conventional display on the DR37-P. This is similar to the problem of displaying low resolution images on a high resolution display: you can have a small detailed display, or a blocky large display of the image.

Media File Types Supported by HDR Viewer, continued

HDR Viewer can display the following types of images with high dynamic ranges:

File Extension	Name	Appropriate for	Number of bits/channel/pixel	Notes
.hdr	Radiance, RGBE	High dynamic range images	11 on disk, 32 in memory	Slow to load because CPU has to expand image before sending it to graphics card
.pfm	Portable Floating-Point Map		32	Slow to load because of file size and required CPU processing. Lowest common denominator image file format http://netpbm.sourceforge.net/doc/pfm.html
.exr	ILM's OpenEXR	High dynamic range images	16-bit floating-point, 32-bit floating-point, and 32-bit integer pixels	Reasonable loading speed for 16-bit/channel images, but disk and computer bus speeds also affect loading speeds. Developed by Industrial Light and Magic http://openexr.com/

Finally, HDR Viewer can play low dynamic range movie files in the following formats:

File Extension	Name	Appropriate for	CODECs supported	Notes
.avi	Audio Video Interleave	Movie files	DIVX, XVID, various	.avi is best thought of as a content container where the codec (COmpression-DECompression) is responsible for reducing the file size
.ts	Transport Stream MPEG-2 Video Stream	Network, Cable or Satellite broadcase	MPEG-2	
.mpeg	Motion Pictures Experts Group	Movie files	MPEG-1, MPEG-2	
.mov	QuickTime	Movie files	various	
.wmv	Windows MoVie	Movie files	various	
.asf	Advanced Streaming Format	Movie files	various	

Media File Types Supported by HDR Viewer, continued

HDR Viewer can also display images that encode the LED backlight information and the processed LCD image.

8bit+

These files are typically of type .bmp. The top raster line of the image contains the LED intensities for the LED backlight. These types of images can also be displayed on your computers Windows desktop or with other full screen image presentation programs.

JPEG-HDR

 "JPEG-HDR" is an extension of the JPEG file compression scheme which can encode a high dynamic range image as a tone-mapped JPEG plus a high dynamic range luminance map. In a conventional JPEG image viewer the tone-mapped image is displayed. In an image viewer which can decode the luminance map a high dynamic range image can be displayed on the DR37-P.

MPEG-HDR

MPEG-HDR is an extension of the MPEG file compression scheme with an additional video stream for high dynamic range luminance map. As with JPEG-HDR, a conventional movie player, such as Windows Movie Player, displays a tone-mapped image. An MPEG-HDR player decodes the luminance map and can display the entire luminance range on the DR37-P.

Configuring HDR Viewer

When you run HDR Viewer for the first time, you have the option to associate supported media file types with HDR Viewer so that when you double click on a file in the Windows Explorer the file will be loaded into HDR Viewer.

Pressing the Accept button will associate the checked file extensions with HDR Viewer. Pressing the Cancel button will associate no file extensions with HDR Viewer.
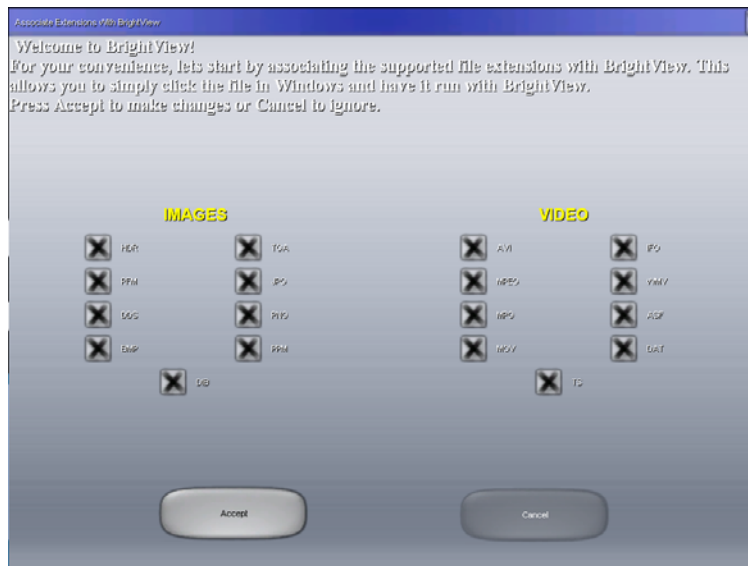
HDR Viewer Playlist Options

If you have associated file extensions with HDR Viewer, double clicking on the file in the Windows Explorer will launch HDR Viewer and add the file to the playlist.

The first screen you will then see is the Playlist Options:

- On the top right is the "EXIT" button. Press this or ALT-F4 to exit HDR Viewer

- On the right is a list of images in the current playlist, below this list are buttons Add, Remove, and Select All.

- In the middle are the settings for the playlist and for the currently selected image

- On the left side is a preview of the currently loaded image
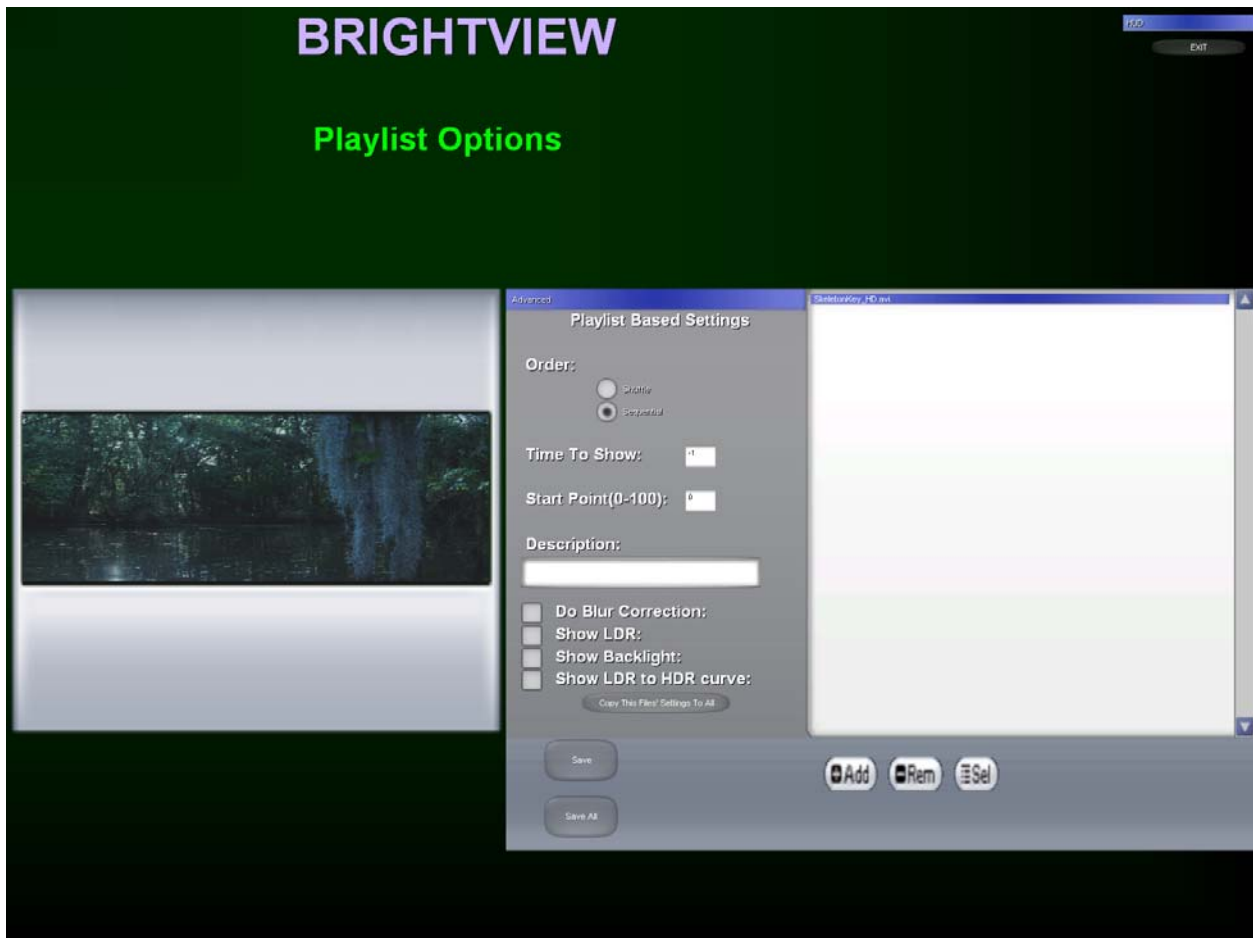
The Add button allows you to select additional files to add to the playlist, including the contents of existing playlists (.jag).

The Remove button removes the selected files from the playlist.

The Select all button selects all of the files in the playlist.

You can use shift-click and control-click as in the Windows Explorer to select continuous and non-continuous sets of files.

Dual View mode

Tone mapped images

If you are running the dual view mode and you wish to view a "tone mapped" LDR image on the secondary while viewing the HDR image on the primary display, you may include just the HDR image in the play list and rename the LDR image to the same filename as the HDR, concatenating the filename with "_tm". For example you may have a HDR image named "Bristol.hdr" and the tone-mapped one named "Bristol_tm.bmp". If you include "Bristal.hdr" in the play list, double click on the image and go full screen, this will tell the program that a tone mapped image is present when loading the HDR image. As you go full-screen the tone mapped image will then be viewable on the secondary display as the original image. The one you included in the play list will be viewable on the primary display. Note that this feature is only enabled if the tone mapped image is of type 'BMP'.

Playlist Settings

For the entire set of images you can specify that they be presented in either Sequential (in the order listed) or Shuffle (in random order).	
For each image in the playlist (as it is selected):	
The number of seconds to display the image, or the number of seconds of a movie to play	
For a movie, the percentage point into the movie to start playing	
Notes about the image or movie	
When checked, image processing is performed on the graphics card	
When checked, a comparison image is display on the other screen.	
turn on backlight	
show ldr to hdr curve	
Copy the settings for the file to all of the other files	

dvanced

Playlist Based Settings

Order:

○ Shuffle

● Sequential

Time To Show: 15

Start Point(0-100):   50

Description:

15 seconds showtime starting halfway through the clip

☒ Do Blur Correction:
☒ Show LDR:
☐ Show Backlight:
☒ Show LDR to HDR curve:

Copy This Files' Settings To All

Displaying Images and Movies in Full Screen Mode

After you have specified the order of the images and movies in the Playlist and their settings, you can load the first file by double clicking on its name in the playlist, and then clicking anywhere in the preview window on the left hand side of the Playlist Options screen. The image or movie will appear on the screen.

Modifying the appearance of media files

There are four types of media files that are viewable by HDR Viewer. There follows an explanation on how to modify the appearance of each of the four types: 8bit images, 8bit+ images, HDR images and movies. For more information on media types see page 22.

When in fullscreen mode, the HUD will automatically disappear after a few seconds so that the user may view the media fullscreen, however there may be times where it would be convenient to leave the HUD on permanently while changing some settings and seeing how the media looks with those settings applied. To keep the HUD on top of the media file being presented, click the 'HUD on top' button on the bottom right part of the main HUD. The main HUD is the grey area which features the next, forward, pause stop and play buttons as well as the time and status information of the playlist. You may press enter or double click on the mouse to get rid of the HUD after you are done playing with the appearance of the file.

Note that modifying the appearance of a media file is permanent during the life of the playlist. If you remove the playlist the settings are discarded. Once you have modified the files, you may save your new settings by saving the playlist. (see **Saving to a Playlist** section, page 26).

Saving to a Playlist

Saves the current playlist and the playlist state. Each file may have modified overlay settings described previously in 'Loading a media file' section. Before saving, make sure you select the ".jag" file type selected to tell the program to save out as a playlist and not to save as a specific image. If you wish to save an image, highlight the image in the playlist and click Save. Then under the 'file type' dropdown choose which type of image you wish to save as. When entering the filename, please note that you do not need to enter the file type in the filename. HDR Viewer will automatically concatenate the filename with the file type you chose before saving to the hard drive.

Modifying the appearance of an 8bit image

To modify the way an 8 bit image looks, you must have LDR-To-HDR and Blur Correction on. You may toggle both by pressing the 'a' key. Once you have enabled both LDR-To-HDR, you may adjust the gamma, contrast, brightness and individual r, g and b components of the image.' RGB scale' scales all three components together. By pressing 'F1' on your keyboard, you may see what the values of the R, G , B and 'RGB scale' sliders are (shown on top of screen).

Modifying the appearance of an 8bit+ image

Currently you may change the appearance of an 8bit+ image similar to that of an 8bit image, however it is not advised, as doing so will distort the 8bit+ header in the image causing display to go into the uniform backlight mode.

## Modifying the appearance of an HDR image

Here you may modify contrast, brightness and gamma. However the three individual channels are not available to modify. This is because LDR-To-HDR cannot be enabled while viewing a high dynamic range image. 'HDR Cut-off' is also available to you here. This will modify the maximum peak brightness input into blur correction, HDR Viewer determines a default by processing each image. Setting it higher will make the entire image brighter at the cost of saturating some of the bright areas. It is encouraged that these settings be modified to suit what is perceptually sufficient for the purposes of the person using the viewer.

Modifying the appearance of a movie

When in the movie mode you may adjust the Hue, Saturation, Contrast and Brightness of the movie. However these are only available for change as the movie is playing. When the movie is paused the changes made by these sliders are not taken into affect until the playback has been resumed. If you are doing LDR-To-HDR and Blur Correction, you may play with the R, G and B components of the movie by using the 4 sliders presented under Hue, Saturation, Contrast and Brightness. You may also make the movie full screen. This is useful if you are viewing content that is low resolution. However you may notice scaling artefacts as a result of the stretching. Checking the 'full screen' box will keep the aspect ratio of the movie while trying to stretch as much as possible. If you wish to stretch full screen disregarding the aspect ratio, check the 'stretch' box while the 'full screen' one is already enabled. These two features are saved in the properties of the file, so when you save the play list you may retain these settings when loaded in the future.

Batch Saving/Converting
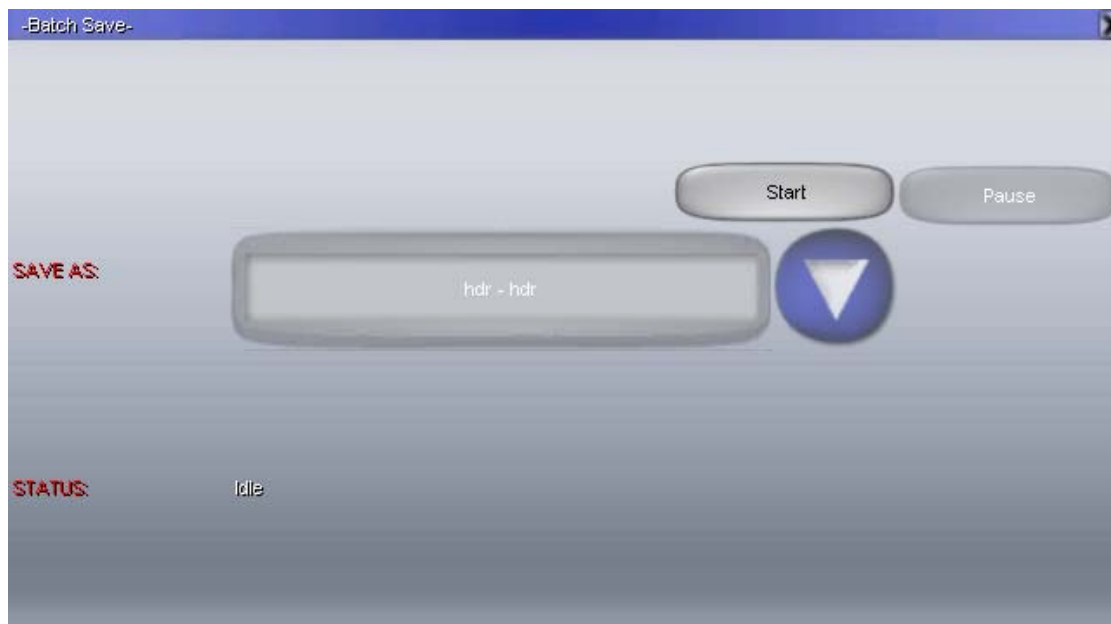
By clicking on the 'Save All' button in the playlist editor, you may save the files currently stored in the playlist to any supported file type as mentioned in 'Loading a media file' section. You may pause the conversion process or cancel it by closing the dialog. Note that it may take a few seconds to complete the current image conversion when you cancel or close the program while conversion is still in progress. Also, note that only valid image files will be saved by the Batch Save command.

Save Media File

In full-screen mode you may save the current media file. Click on the 'Save File' button located to right of the forward button in the media player heads up display. You can also save to any supported file type previously mentioned in 'Loading a media file' section. Note that when displaying a video, pressing the 'Save Current Frame' button will save the current frame in the installation directory of HDR Viewer. However, it will overwrite any saved frame that was already saved out.

Keyboard Shortcuts

A – While in full screen mode, toggle Blur Correction and LDR-To-HDR

N – While in full screen mode, go to the next media file in the playlist

B – While in full screen mode, go to the previous media file in the play list

PAGE UP – While in full screen mode and playing a DVD, go to the previous chapter in DVD, if it is the first chapter then go back to the root menu

While in the Playlist Options, move a file earlier in the playlist

PAGE DOWN – While in full screen mode and playing a DVD, go to the next chapter in DVD

While in the Playlist Options, move a file later in the playlist

LEFT ARROW – While in full screen mode and playing a DVD, chooses menu buttons to the left of the highlighted button. Also when DVD is playing, will increase playback speed by 2 times in reverse direction. When 'slow fw/rw' checkbox is enabled, will decrease playback speed by 2 times in reverse direction.

RIGHT ARROW – While in full screen mode and playing a DVD, chooses menu buttons to the right of the highlighted button. Also when DVD is playing, will increase playback speed by 2 times. When 'slow fw/rw' checkbox is enabled, will decrease playback speed by 2 times.

SPACE – While in full screen mode, pause the media file. If image, will pause the play list timer, if movie will pause movie clip

ENTER – While in full screen mode, toggle HUD. Double clicking left mouse button also does the same, as well as taking mouse cursor to bottom of screen (enables HUD only). When playing DVD, chooses the currently highlighted button in menu.

ESC – While in full screen mode, escape back to play list editor. When dialog box like save dialog or open dialog is open, it closes the dialog box

F1 – Toggles stats on current media file, and important keys while in full screen mode

ALT-F4 – Exit application and go back to windows

F2- switch between full screen and windowed

! – ??

' -

W -

A – toggles LDR2HDR and Blur Correction