

DMD Extender

Configuration Utility

V0.10.1 April 2014

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Introduction

The DMD Extender Configuration Utility is a Windows application designed to make configuring the Extender software as easy as possible.

Each version of the DMD Extender software comes with its own version of the Configuration Utility, except v0.4 – in the case of this version of software it is recommended to upgrade to the latest version and use the Configuration Utility to reset your configuration.

The DMD Extender Configuration Utility is Copyright 2013 Dr Pinball.

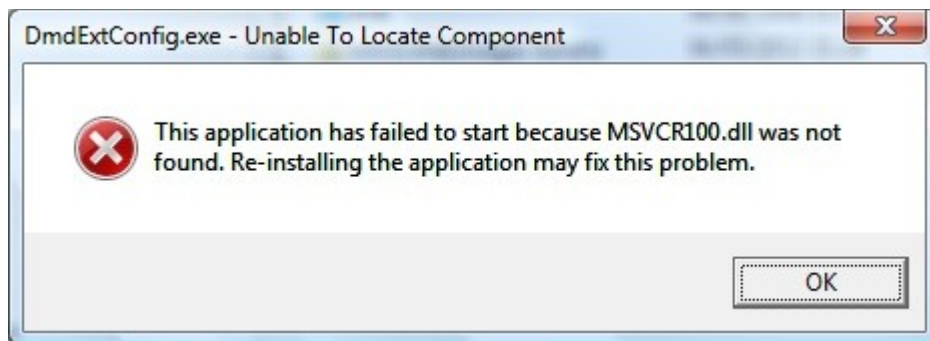
Caution

 The preview feature of the DMD Extender Configuration Utility allows the user to record a short sample of the DMD video. The content of this video may be copyrighted. Unauthorised recording of such material may be contrary to the provisions of the copyright laws.

Running for the First Time

Insert the SD Card into a Windows computer and double click on the file DmdExtConfig.exe. The application will start to execute.

You may be presented with the following message:



If this occurs, please download 'Microsoft Visual C++ 2010 Redistributable Package (x86)' from the following location:

<http://www.microsoft.com/en-us/download/details.aspx?id=5555>

When the application runs successfully for the first time it will create a backup of the configuration files and place them on the SD Card. You may see two new files as follows:

- pinball.bak
- config.bak (optional)

Please leave these files on the SD Card, as they are the backup for your configuration and contain important product keys.

How To Use the Configuration Utility

The configuration utility has 3 tabs, *General*, *Dot Colours* and *Images*. The sections below describe each tab.

General Tab

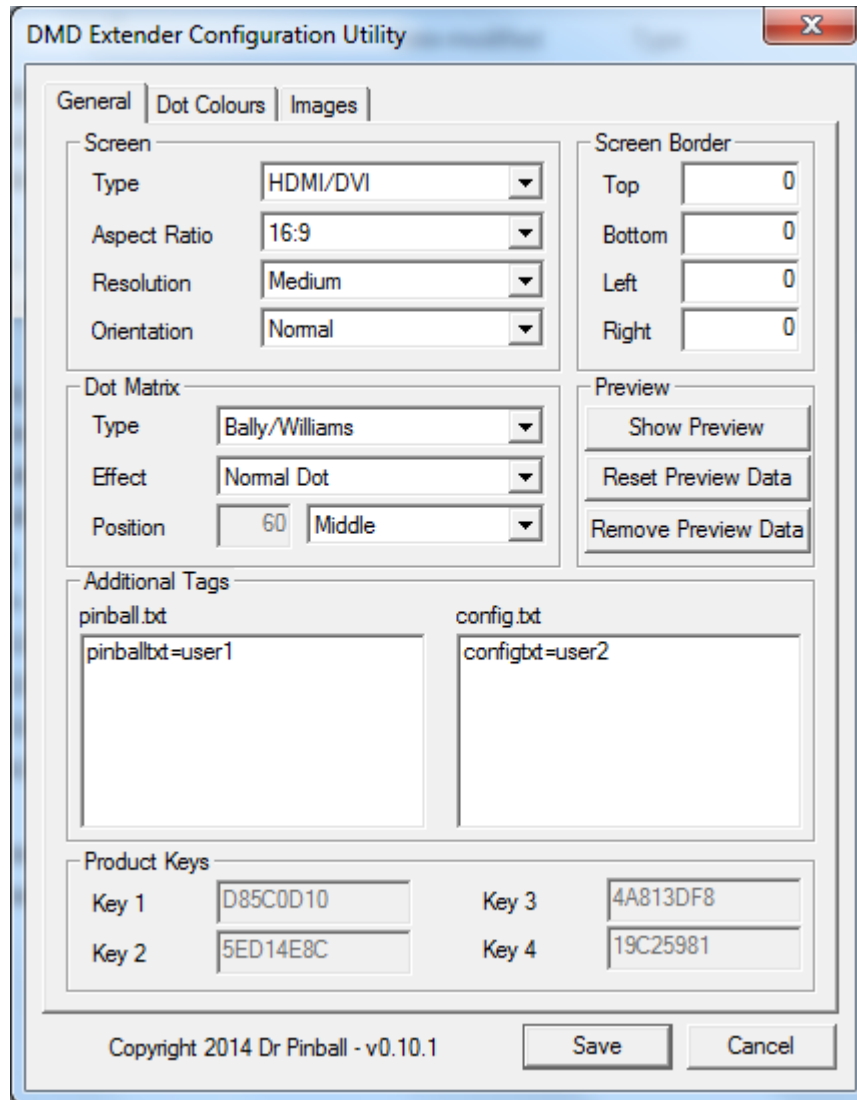


Figure 1 – General tab

The General tab is split into several sections, each one discussed below.

Screen

This section allows selection of the connected screen.

Type

Use the drop down list to select the type of monitor that will be connected to the Raspberry Pi mini computer. Options are as follows:

- HDMI / DVI – The HDMI socket will be used
- Composite NTSC – The Composite socket will be used – American TV/Monitor
- Composite NTSC (J) – The Composite socket will be used – Japanese TV/Monitor
- Composite PAL - The Composite socket will be used – UK / European TV/Monitor

- Composite PAL (B) – The Composite socket will be used – Brazilian TV/Monitor

The type of monitor selected has an effect on the available options in the Aspect Ratio section.

Aspect Ratio

The aspect ratio of a TV or Monitor defines the relative sizes of the screen's sides and has an effect on what is the most ideal screen resolution to be used.

Use the drop down list to select the size of screen that will be connected to the Raspberry Pi mini computer. Options (with general guidelines) are as follows:

- 4:3 - Portable and small sized CRT and Flat Panel TV
- 14:9 – Large sized CRT, not commonly found. Use 16:9 first.
- 16:9 – Larger sized / modern CRT and Flat Panel TV / Monitor
- 16:10 – Modern HDMI / DVI flat panel Monitor.

Please note that aspect ratio 16:10 is not available if the Monitor Type is set to any of the Composite types.

This setting affects the size of background image that can be used.

Resolution

The resolution selects the number of pixels that are used to draw each DMD dot, as follows:

- Low – Each DMD dot is shown by 1 X 1 pixel
- Medium – Each DMD dot is shown by 2 X 2 pixels
- High – Each DMD dot is shown by 3 X 3 pixels

Normally select either Medium or High resolution. For Data East / Sega 192 X 64, High is the same as Medium resolution.

This setting affects the size of the background image that can be used.

Orientation

Allows rotation of the screen by 180 degrees to show an inverted image. Useful to allow installation of a screen upside down. Select from:

- Normal
- 180 Degrees

Dot Matrix

This section affects the type and appearance of the Dot Matrix on the screen.

Type

Different manufacturers use different screen logic and timings. The DMD Extender is capable of supporting different types – use this section to set the type of pinball machine being used.

- Bally / Williams
- Data East / Sega 128 X 32
- Data East / Sega 192 X 64
- Stern SAM
- Stern White Star

- Gottlieb – 4 Colour
- Gottlieb – 7 Colour
- P-ROC

Effect

This section allows selection of a variety of effects that can be applied to the dots, as follows:

- Normal dots – traditional round dots
- Horizontal CRT – scan line simulation horizontally
- Vertical CRT- scan line simulation vertically
- ZX Speccy – A combination of Horizontal and Vertical CRT.

Position

This section allows selection of the position of the DMD section of the screen. The DMD section is the part of the screen that displays the dot matrix information.

You can decide to have the DMD section at the Top, Middle or Bottom of the screen, or choose a Custom value somewhere between these settings.

When choosing Top, Middle or Bottom the Position field shows the calculated position.

When choosing Custom the Position field becomes available to manually enter a position.

Use the Position value to help when designing a background image – this is the area you should avoid having an image in, it should be set to the background colour.

Changing the Aspect Ratio will automatically change the Position value, unless Custom is selected.

Preview

This section controls the viewing and creation of a preview video of the pinball DMD. It is possible to record 1 minute of DMD video from the pinball machine to allow viewing of the DMD when setting the colours in the Configuration Utility.

See the section below for more details of the Preview window.

Buttons in the preview section as follows:

Show Preview

This button will show the Preview window and commence display of the preview video for the selected DMD Type. Pressing the button again will show the preview in a larger window.

The Preview window is always shown at the top right of the Configuration Utility. If the Preview window is moved by the user, pressing Show Preview will again move the Preview window to the top right position.

If no preview video is available the Preview window will show a random animation effect.

Reset Preview Data

This button will reset the preview data for the current DMD Type. The next time the card is used in the DMD Extender for the current DMD Type a preview **will** be recorded.

Also, if no preview currently exists, selecting this button will force a preview to be recorded for the current DMD Type.

Remove Preview Data

This button will remove the preview for the current DMD Type. The next time the card is used in the DMD Extender for the current DMD Type a preview **will not** be recorded.

Screen Border

This section allows fine tuning the border around the screen. It is most useful for Composite type displays. If the screen output shows a large border or seems offset, it is possible to amend the values to shift the screen in a particular direction as follows:

- A positive value moves the screen away from the selected border.
- A negative value moves the screen closer to the selected border.

For small adjustments start with a value of +10 or -10.

Additional Tags

This section shows any additional tags that have been put into the configuration files by the user. The tags are shown for reference only and will be added back into the files when the user selects 'Save'.

Product Keys

These values are shown for reference only and cannot be amended.

Dot Colours

The Dot Colour tab can be shown as either 4, 7 or 16 colour modes.

16 colour mode is shown when the DMD Type is 'Stern SAM' or 'P-ROC'.

7 colour mode is shown when the DMD Type is 'Gottlieb – 7 Colour'.

4 colour mode is shown for all other DMD types.

4 Colour Mode

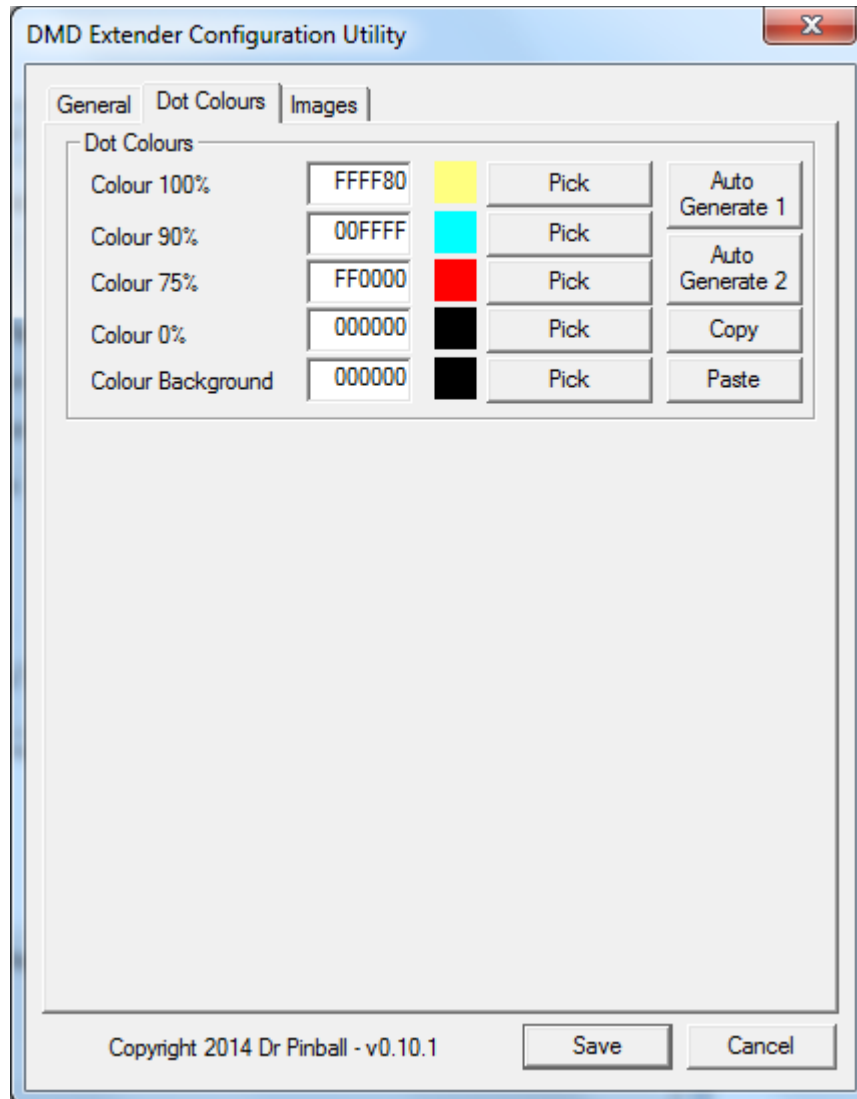


Figure 2 – Dot Colours tab, 4 colour mode

The dot matrix display generated by the pinball machine for the current DMD type uses 4 brightness of dot – 100%, 90%, 75% and 0%(off).

The DMD Extender allows the user selection of the colours displayed for the the 4 brightness levels.

Additionally a background colour can be chosen which will fill the screen if no background image is supplied, or allow matching with the background image in the case where an image is supplied.

The user can enter values into the edit fields for each colour. The values are 6 character hexadecimal numbers representing the Red, Green and Blue components of the colour. This is a standard way of representing a 24 bit colour.

To make the process easier it is possible to select the corresponding Pick button and use the standard Windows colour picker dialog to choose a colour.

The selected colour is always shown in a square next to the relevant edit field and 'Pick' button.

Auto Generate 1

After choosing the 100% colour, selecting the 'Auto Generate 1' button will automatically calculate the 90% and 75% colours.

Auto Generate 2

After choosing the 100% colour and the 75% colour, selecting the 'Auto Generate 2' button will automatically calculate the 90% colour.

Copy / Paste

'Copy' button copies the colour codes into the clipboard as a series of configuration file entries e.g.

2001=FFFF80

2002=00FFFF

2003=FF0000

2004=000000

2005=000000

It is also possible to paste these values into the colour fields using the 'Paste' button.

This feature allows users to share their colour codes e.g. via a forum post.

7 Colour Mode

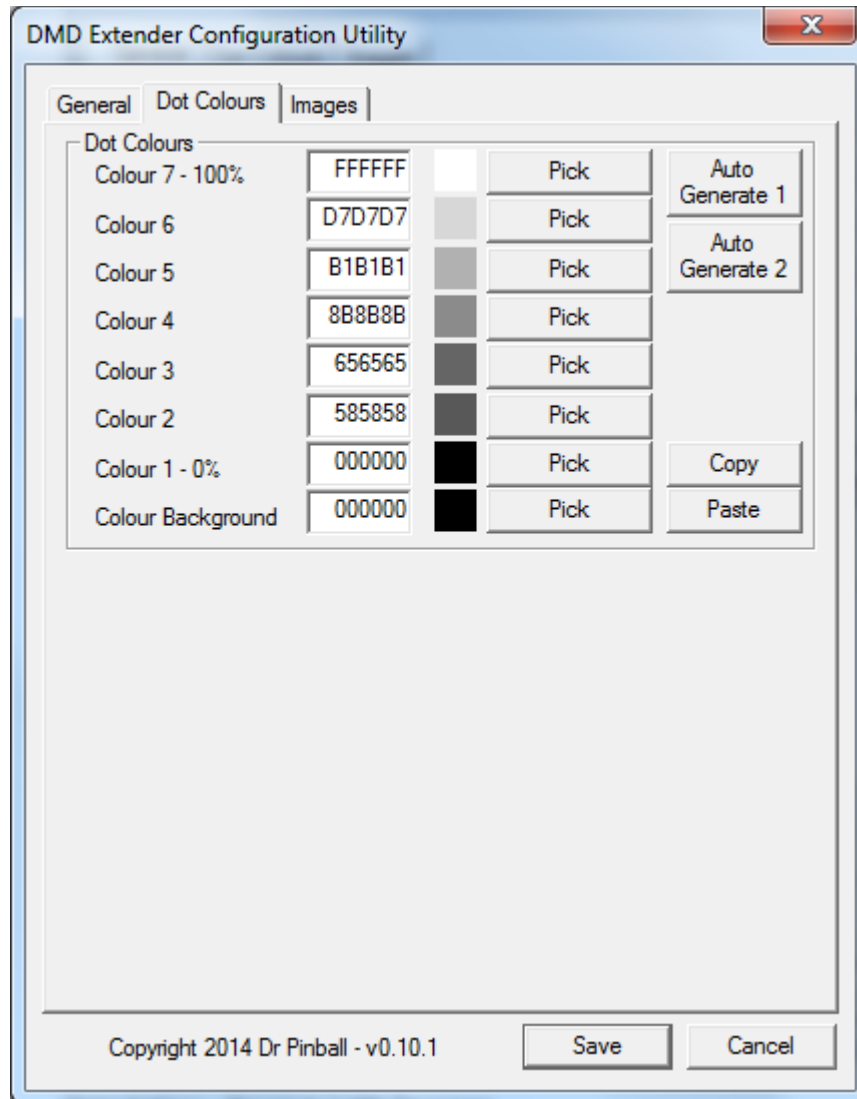


Figure 3 – Dot Colours tab, 7 colour mode

The dot matrix display generated by the pinball machine for the current DMD type uses 7 brightness of dot – colour 7, brightest to colour 1, off.

The DMD Extender allows the user selection of the colours displayed for the the 7 brightness levels.

Additionally a background colour can be chosen which will fill the screen if no background image is supplied, or allow matching with the background image in the case where an image is supplied.

The user can enter values into the edit fields for each colour. The values are 6 character hexadecimal numbers representing the Red, Green and Blue components of the colour. This is a standard way of representing a 24 bit colour.

To make the process easier it is possible to select the corresponding Pick button and use the standard Windows colour picker dialog to choose a colour.

The selected colour is always shown in a square next to the relevant edit field and 'Pick' button.

Auto Generate 1

After choosing colour 7, selecting the 'Auto Generate 1' button will automatically calculate the other colours in an equal gradient.

Auto Generate 2

After choosing colour 7 and colour 2, selecting the 'Auto Generate 2' button will automatically calculate the other colours in an equal gradient between colour 16 and 2.

Copy / Paste

'Copy' button copies the colour codes into the clipboard as a series of configuration file entries e.g.

```
2201=FFFFFF
2202=D7D7D7
2203=B1B1B1
2204=8B8B8B
2205=656565
2206=585858
2207=000000
2208=000000
```

It is also possible to paste these values into the colour fields using the 'Paste' button.

This feature allows users to share their colour codes e.g. via a forum post.

16 Colour Mode

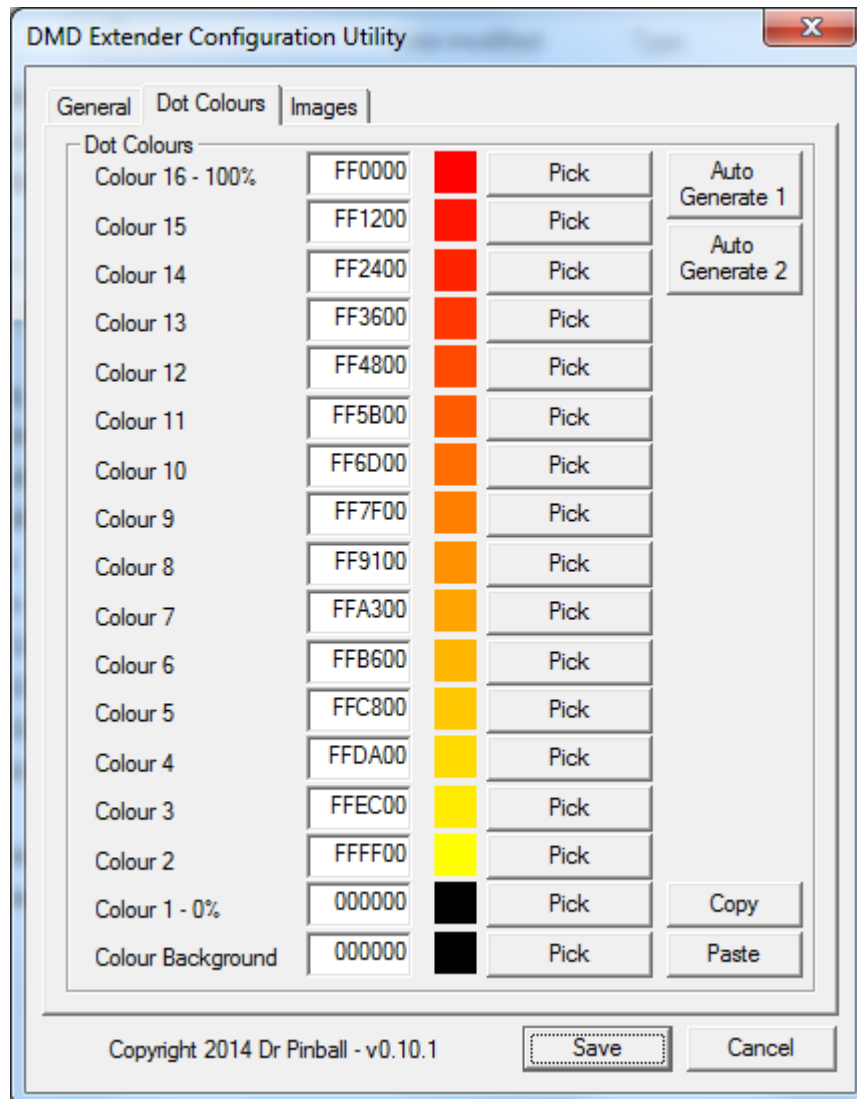


Figure 4 – Dot Colours tab, 16 colour mode

The dot matrix display generated by the pinball machine for the current DMD type uses 16 brightness of dot – colour 16, brightest to colour 1, off.

The DMD Extender allows the user selection of the colours displayed for the the 16 brightness levels.

Additionally a background colour can be chosen which will fill the screen if no background image is supplied, or allow matching with the background image in the case where an image is supplied.

The user can enter values into the edit fields for each colour. The values are 6 character hexadecimal numbers representing the Red, Green and Blue components of the colour. This is a standard way of representing a 24 bit colour.

To make the process easier it is possible to select the corresponding Pick button and use the standard Windows colour picker dialog to choose a colour.

The selected colour is always shown in a square next to the relevant edit field and 'Pick' button.

Auto Generate 1

After choosing colour 16, selecting the 'Auto Generate 1' button will automatically calculate the other colours in an equal gradient.

Auto Generate 2

After choosing colour 16 and colour 2, selecting the 'Auto Generate 2' button will automatically calculate the other colours in an equal gradient between colour 16 and 2.

Copy / Paste

'Copy' button copies the colour codes into the clipboard as a series of configuration file entries e.g.

```
2101=FF0000
2102=FF1200
2103=FF2400
2104=FF3600
2105=FF4800
2106=FF5B00
2107=FF6D00
2108=FF7F00
2109=FF9100
2110=FFA300
2111=FFB600
2112=FFC800
2113=FFDA00
2114=FFEC00
2115=FFFF00
2116=000000
2117=000000
```

It is also possible to paste these values into the colour fields using the 'Paste' button.

This feature allows users to share their colour codes e.g. via a forum post.

Images Tab

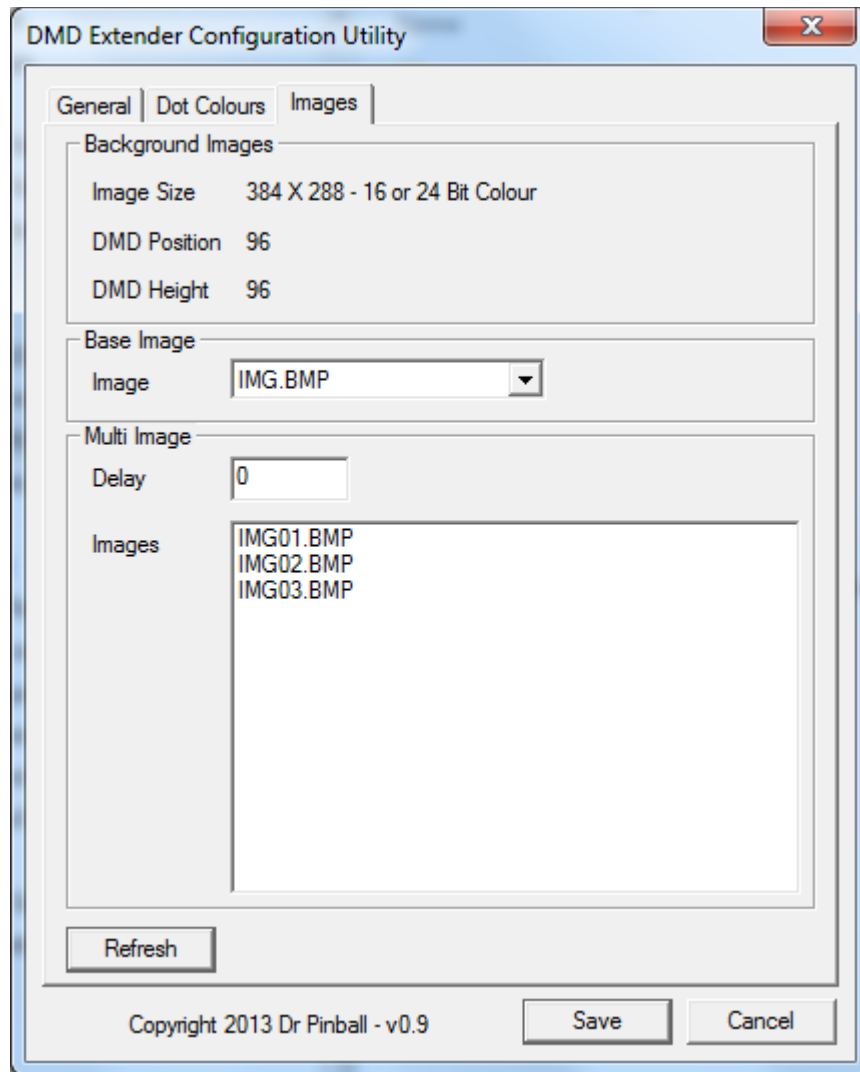


Figure 4 – Images tab

This section allows selection of background images to use on the DMD Extender screen.

Background Images

This section provides information about the size of the background image. Settings changed on the *General* tab affect the size of image required.

- Image Size – The size Width X Height of the image. Either 16 or 24 bit colour bitmap should be created
- DMD Position – The Y position of the DMD section (the DMD section is always the full screen width)
- DMD Height – The height of the DMD Section.

Base Image

The drop down list will show all images that are the correct name format, width and height. The image selected will be used as the background.

The image name must be 8.3 format with .bmp extension.

Select <No Image> if you do not require a background image.

When creating animated backgrounds, this image will be the first in the sequence.

Multi Image

Delay

When using animated backgrounds, this field selects the delay between images. The value is the number of DMD frames counted between background changes. A value of 1 is approximately 1/30th of a second.

A value of 0 will stop animation – only the base image will be displayed.

Images

To create an animated background you must supply more than 1 image. The Base Image above is used as the first image and further images must be named as follows:

For an animation containing 4 images...

Base Image: IMG.BMP

Images: IMG01.BMP

IMG02.BMP

IMG03.BMP

If the base image file name is 8 characters long the name used will be as follows...

Base Image: BACKIMAG.BMP

Images: BACKIM01.BMP

BACKIM02.BMP

BACKIM03.BMP

Starting with the base image, each image is displayed in sequence after the selected delay. When the last image has been displayed the sequence will start again with the base image.

Refresh Button

Use the Refresh button to update the screen lists – useful if you copy a new image file onto the SD Card which you would like to select.

Save / Cancel

Selecting the Save button writes the configuration settings to the two configuration files pinball.txt and config.txt.

Selecting Cancel exits the application without any changes being made.

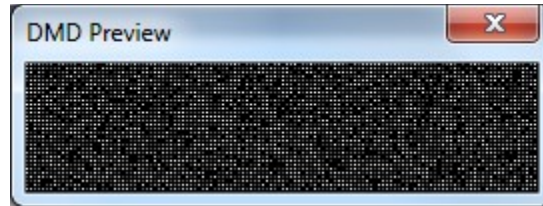
If the user has added additional settings to either pinball.txt or config.txt then these will be retained and added back into the files on selecting Save.

Preview Window

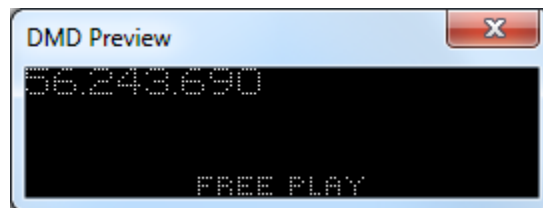
Selecting the button 'Show Preview' on the 'General' tab will display a preview of the DMD screen – selecting the button 'Show Preview' a second time shows a larger view of the DMD.

The preview seen depends on the DMD Type selected. Changing the DMD Type will change the preview window contents.

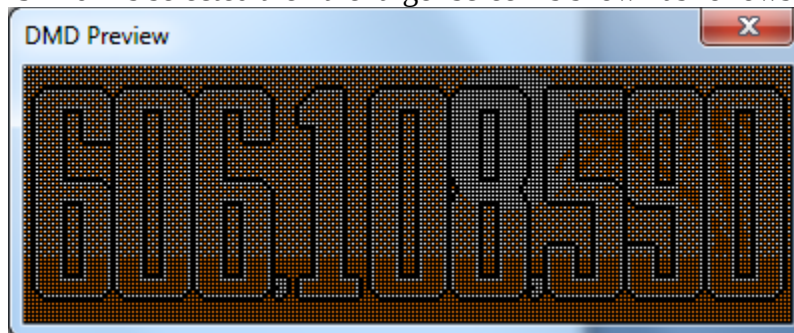
If no preview data has been stored for the current DMD Type a random image is displayed as follows:



If preview data has been stored for the current DMD Type an animated version of the DMD screen will be displayed, for example:



If DMD Type 'Sega 192X64' is selected then the larger screen is shown as follows:



Preview data is captured from the pinball machine during the first minute of operation. Notifications on the DMD screen will show the progress of the preview data capture.

If preview data already exists then new data will not be captured – use the button 'Reset Preview Data' to perform another preview recording.

Colour Adjustment

An important feature of the Preview is the ability to adjust the colours from the Colours tab. Changing the colours will be immediately applied to preview animation allowing the user to best choose the colours to suit their game.

Automatic DMD Extender Reboot

If the SD Card is removed from the Raspberry Pi whilst the pinball machine is switched on the DMD screen will freeze – a message appears prompting the user to replace the SD Card.

It is possible to amend the DMD Extender configuration using this Utility before replacing the SD Card.

The DMD Extender will then reboot and begin using the new configuration settings – you do not need to switch off the pinball machine.