

4D Systems

Application Note: 4D-AN-P2002

Playing Video on PICASO based modules using RAW option

Document Date: 15th December 2012

Document Revision: 1.0

Description

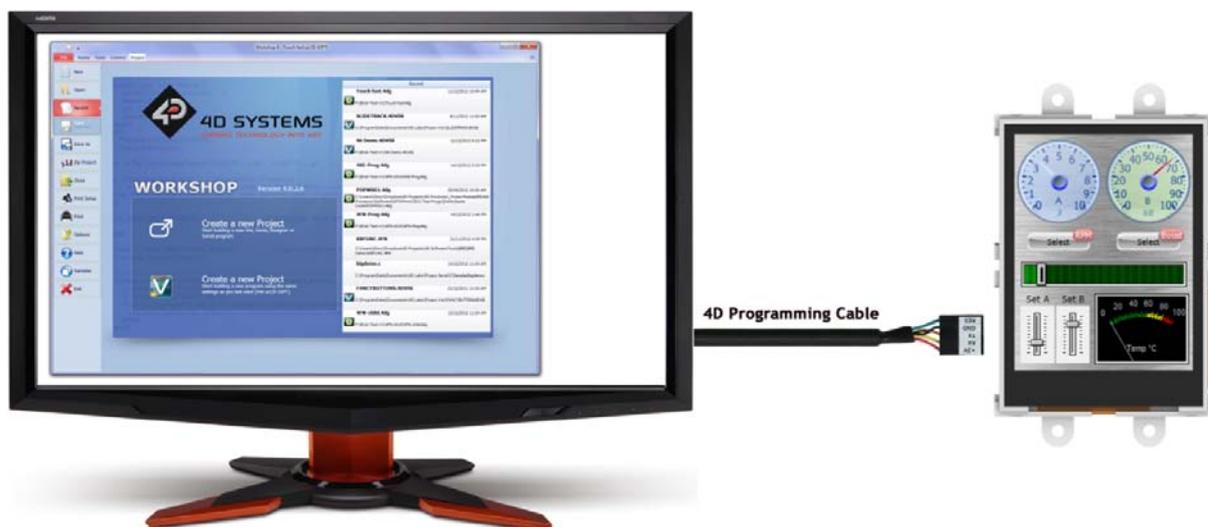
This application note is a step by step procedure on how to play video on PICASO based modules. In order to carry out this application note, the following items are required;

- Any 4D PICASO Display Module
- 4D Programming Cable
- micro-SD (μ SD) Memory Card
- 4D Workshop4 IDE Software Tool
- Graphics Composer Software Tool

✚ There is another method of displaying videos, using FAT option instead of RAW. This Application Note discusses RAW method only.

Application Overview

Playing a video on a 4D display module is one of the most useful techniques to learn, as it can be used in many different applications. This application note will guide the user through a sequence of steps to convert the video into 4D format, to then implementing this in code. A series of modifications can then be applied to the video using 4DGL graphics functions.



Setup Procedure

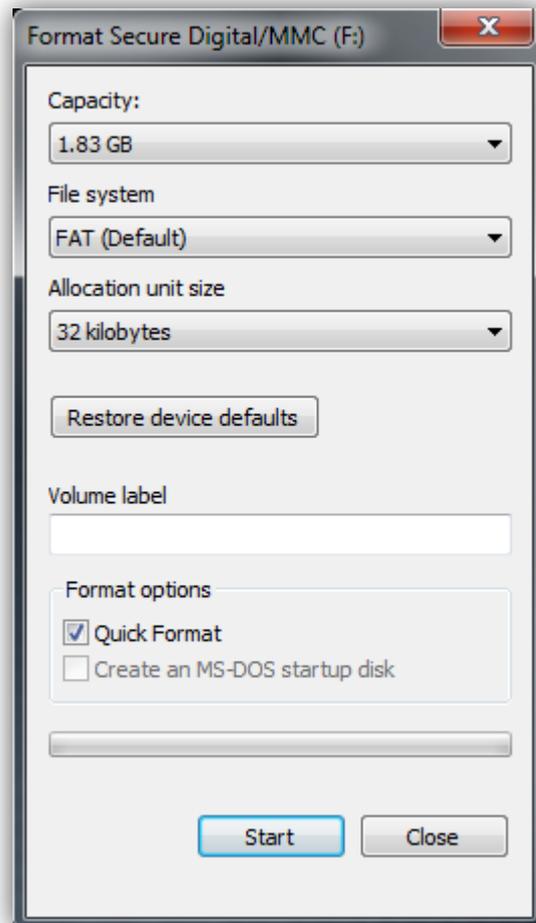
Firstly, the 4DWorkshop4 IDE environment and Graphics Composer software tools need to be downloaded. This is where the end user application is developed and can be found from the 4D Systems website links below:

<http://www.4dsystems.com.au/>

Simulation Procedure

Preparing the μ SD memory card

In order to playback video on a module, a μ SD card must first be sourced for storing the file. The first step is to format the μ SD to FAT16 or FAT (Default). Insert the card into a PC and right click on the μ SD card and select **Format**. Leave all settings as they appear, or change them accordingly as shown in the snapshot below. Press the **Start** button and the card will now be formatted.



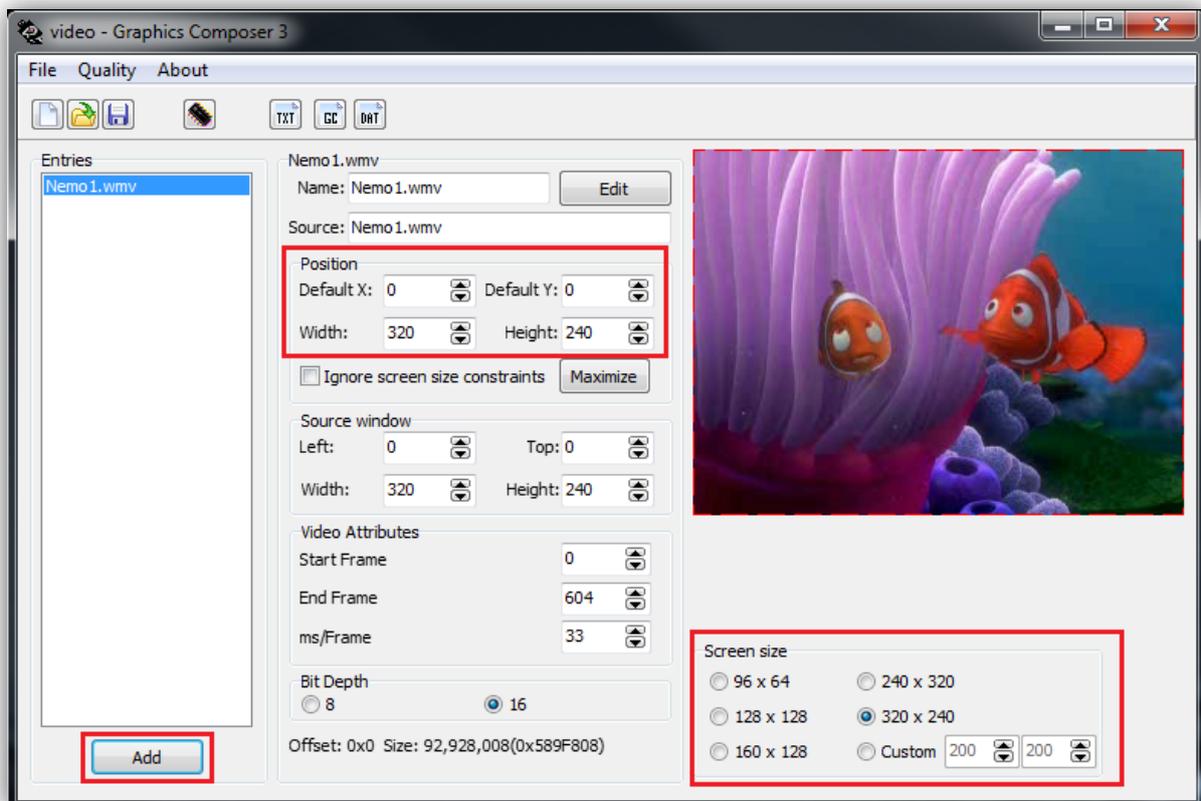
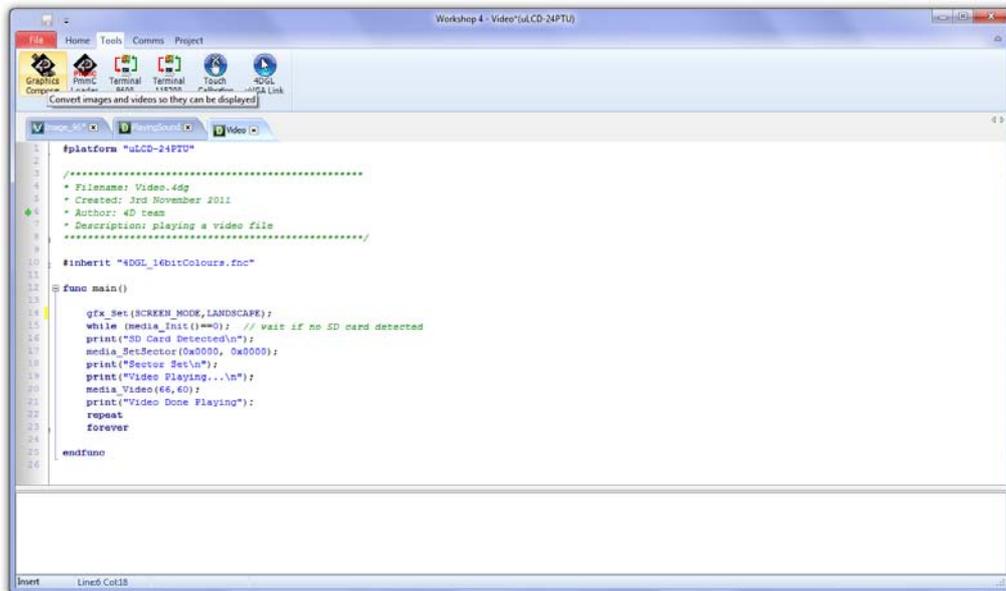
Supported Video File Formats

Now that the μ SD card is formatted, it is ready to have the desired video file loaded onto it. There are only specific file formats supported for video playback, which include;

- .avi
- .wmv
- .vob
- .mpg
- .gif

Loading an Appropriate Video File

Choose your product from the 4D Workshop4 IDE and select Designer environment. Open Graphics Composer from the “Tools” menu,

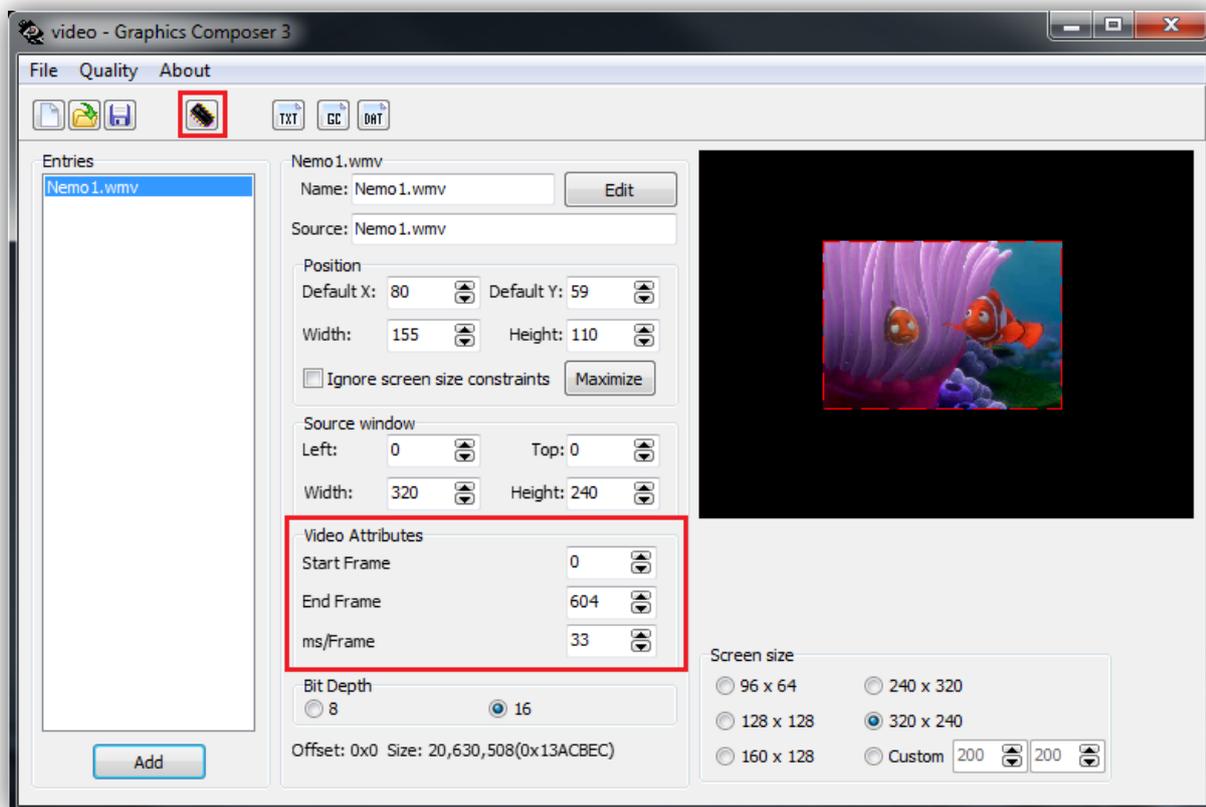


As shown in the image above, set the “Screen Size” in the bottom right corner. Click the **Add** button in the bottom left hand corner to add the video file. The maximum size video possible will

be dependent on the size of the μ SD card. Adjust various attributes of the video by either manipulating the image in the display area directly, or manually editing the X, Y, Width and Height figures as shown in the figure. Note the End frame, it is useful information required for coding. Also note, the Bit Depth would always be set to 16 bit.

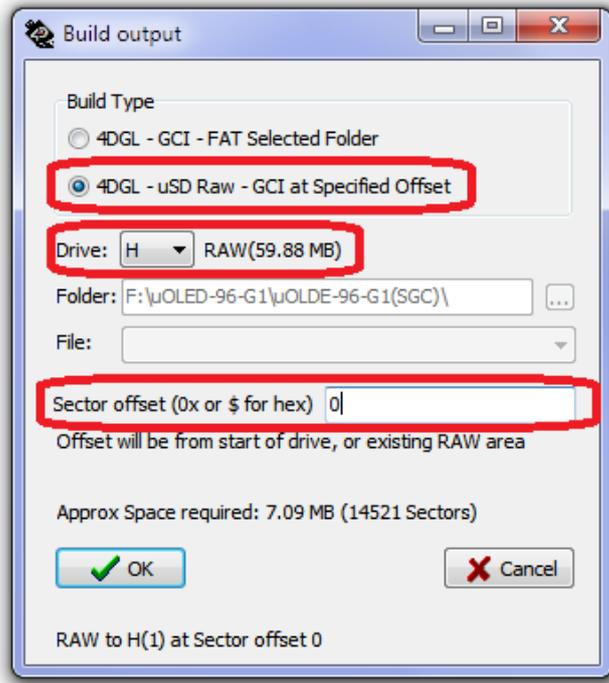
Experimenting with Video Attributes to Improve Playback

It should be noted that playback refresh rate is affected by the desired area for the video to play in. The image above shows the video at maximum width and height of the display area. The second snapshot shows a reduced size video playback area, still within the 320x240 display area. Notice that the second video playback will be much smoother than the first. Experiment with the start and end frames as seen in the Video Attributes Section, as well as the ms/frame characteristic as highlighted in the snapshot below. Insert the μ SD card into the module and click on the **Build** button in the top left hand area of the screen as denoted by the small chip.



Build Output

Select the options as seen below, ensuring that the μ SD drive is selected and the offset set to zero.



Essential Commands for Video Playback

Playing a video is very easy with 4DGL. The following two commands are the very basics required to select and produce the video to the screen. The sector offsets shown are only an example:

```
media_SetSector(0x001D,0x5001); //set stream sector address
media_Video(0,0);
```

Extracting Sector Offsets

The Sector offsets are determined by extracting them from the GC or TXT files produced when the video is built. Click on either of the following buttons located in the top left hand area of the screen to view their contents.



Potential Issues

Using these two commands alone can result in unusual behaviour if used without additional code. As such, the following issue should be taken into account when playing a video file:

- No μ SD card inserted

Functions to Combat Issues

To deal with the above mentioned issue, the following command can be included:

- `file_Mount()`

Example Code

The following code snippet takes into account these issues:

```
while(media_Init()==0); //wait if no uSD card detected
media_SetSector(0x00,0x00); //set stream sector address
media_Video(0,0);
```

Complete Application Example

Finally, a fully scripted example is shown that includes error messages for any potential issues that may be encountered:

```
#platform "uLCD-24PTU"

/*****
* Filename: Video.4dg
* Created: 3rd November 2011
* Author: 4D team
* Description: playing a video file
*****/

#inherit "4DGL_16bitColours.fnc"

func main()

    gfx_Set(SCREEN_MODE,1);
    while (media_Init()==0); // wait if no SD card detected
    print("SD Card Detected");
    media_SetSector(0x0000, 0x0000);
    print("Sector Set");
    print("Video Playing...");
    media_Video(66,60);
    print("Video Done Playing");
    repeat
    forever

endfunc
```

Proprietary Information

The information contained in this document is the property of 4D Systems Pty. Ltd. and may be the subject of patents pending or granted, and must not be copied or disclosed without prior written permission.

4D Systems endeavours to ensure that the information in this document is correct and fairly stated but does not accept liability for any error or omission. The development of 4D Systems products and services is continuous and published information may not be up to date. It is important to check the current position with 4D Systems.

All trademarks belong to their respective owners and are recognised and acknowledged.

Disclaimer of Warranties & Limitation of Liability

4D Systems makes no warranty, either expresses or implied with respect to any product, and specifically disclaims all other warranties, including, without limitation, warranties for merchantability, non-infringement and fitness for any particular purpose.

Information contained in this publication regarding device applications and the like is provided only for your convenience and may be superseded by updates. It is your responsibility to ensure that your application meets with your specifications.

In no event shall 4D Systems be liable to the buyer or to any third party for any indirect, incidental, special, consequential, punitive or exemplary damages (including without limitation lost profits, lost savings, or loss of business opportunity) arising out of or relating to any product or service provided or to be provided by 4D Systems, or the use or inability to use the same, even if 4D Systems has been advised of the possibility of such damages.

4D Systems products are not fault tolerant nor designed, manufactured or intended for use or resale as on line control equipment in hazardous environments requiring fail – safe performance, such as in the operation of nuclear facilities, aircraft navigation or communication systems, air traffic control, direct life support machines or weapons systems in which the failure of the product could lead directly to death, personal injury or severe physical or environmental damage ('High Risk Activities'). 4D Systems and its suppliers specifically disclaim any expressed or implied warranty of fitness for High Risk Activities.

Use of 4D Systems' products and devices in 'High Risk Activities' and in any other application is entirely at the buyer's risk, and the buyer agrees to defend, indemnify and hold harmless 4D Systems from any and all damages, claims, suits, or expenses resulting from such use. No licenses are conveyed, implicitly or otherwise, under any 4D Systems intellectual property rights.