

SAGA Video Core



Overview

Current SAGA Video core provides a **Chunky Screenmode** that supports 8/15/16/24/32-bits and YUV422.

Final version will have full Planar modes like in original **Commodore AGA Chipset** but with enhanced specifications.

Features

- **Chunky plane** that can be displayed on its own by any dedicated RTG Driver.
- Supports the following **Pixel Formats** : CLUT8, RGB15, RGB16, RGB24, RGB32, YUV422.
- Supports the following **Resolutions** : Any valid mode from 320×200 to 1920×1080.
- FrameBuffer can be **any address** from accessible FastRAM.
- FrameBuffer can be **Read and Write**, for Direct Hardware drawings.

Not yet implemented Features :

- Planar mode that supports all **AGA Chipset modes**.
- Planar mode that supports **new enhanced modes**.
- **Chunky plane** that can be displayed together with 8 planar planes or alone on its own.

Chunky VIDEO Registers

The FrameBuffer of the Chunky Video Mode can be **any** address from accessible FastRAM, by specifying the SAGA_VIDEO_PLANEPTR register. The FrameBuffer is **Readable and Writable**, for faster Direct Hardware drawings.

Register	Name	Access	Size	Description
DFF1EC	SAGA_VIDEO_PLANEPTR	W	ULONG	Set the SAGA Video FrameBuffer Address
DFF1F4	SAGA_VIDEO_MODE	W	UWORD	Set the SAGA Video Mode
DFF1F8	SAGA_VIDEO_PLLW	W	UWORD	Set the SAGA Video PLLW
DFF1FA	SAGA_VIDEO_PLLR	W	UWORD	Set the SAGA Video PLLR

The Chunky Video mode can virtually accepts any resolution from 320×200 (LowRes) to 1920×1080

(1080p). The video engine can be dynamically reconfigured at any time by filling a valid ModeLine.

Register	Name	Access	Size	Description
DFF300	SAGA_VIDEO_HPIXEL	W	UWORD	Set the SAGA Modeline HPIXEL
DFF302	SAGA_VIDEO_HSSTRT	W	UWORD	Set the SAGA Modeline HSSTRT
DFF304	SAGA_VIDEO_HSSTOP	W	UWORD	Set the SAGA Modeline HSSTOP
DFF306	SAGA_VIDEO_HTOTAL	W	UWORD	Set the SAGA Modeline HTOTAL
DFF308	SAGA_VIDEO_VPIXEL	W	UWORD	Set the SAGA Modeline VPIXEL
DFF30A	SAGA_VIDEO_VSSTRT	W	UWORD	Set the SAGA Modeline VSSTRT
DFF30C	SAGA_VIDEO_VSSTOP	W	UWORD	Set the SAGA Modeline VSSTOP
DFF30E	SAGA_VIDEO_VTOTAL	W	UWORD	Set the SAGA Modeline VTOTAL
DFF310	SAGA_VIDEO_HVSYNC	W	UWORD	Set the SAGA Modeline HVSYNC

When the SAGA_VIDEO_MODE is set to SAGA_VIDEO_FORMAT_CLUT8, a palette should be defined by filling the 256-colors lookup table. Each color are 32-bits length, in the ARGB format.

Register	Name	Access	Size	Description
DFF400	SAGA_VIDEO_CLUT[0]	W	ULONG	Set the SAGA CLUT8 Color #001
DFF7FC	SAGA_VIDEO_CLUT[255]	W	ULONG	Set the SAGA CLUT8 Color #256

Chunky MODELINE Description

[Universal ModeLine Calculator](#) (UMC for AmigaOS 3.x, available on Aminet) can be used to generate a valid ModeLine for a given resolution. For example, we can ask UMC a valid ModeLine for a 800x600 @ 60Hz resolution. Then just type the following line (add the -rbt option for a reduced framebuffer) :

Example of a **standard** ModeLine :

```
>umc 800 600 60

"MODENAME"      PIXELCLOCK HPIXEL HSSTRT HSSTOP HTOTAL VPIXEL VSSTRT
VSSTOP VTOTAL HVSYNC
Modeline "800x600@60" 38.400000 800 832 912 1024 600 604
608 625 -HSync +VSync
```

Example of a **reduced** ModeLine :

```
>umc 800 600 60 --rbt

"MODENAME"      PIXELCLOCK HPIXEL HSSTRT HSSTOP HTOTAL VPIXEL VSSTRT
VSSTOP VTOTAL HVSYNC
Modeline "800x600@60R" 35.500000 800 848 880 960 600 603
607 618 -HSync +VSync
```

ModeLine Values Description :

Attribute	Short	Description
PIXELCLOCK	Bandwidth (MHz)	How many dots it can output per second.
HPIXEL	Width	Number of horizontal pixels drawn to the visible part of the screen.
HSSTRT-HPIXEL	Front Porch	Amount of black pixels drawn to the right of the screen.
HSSTOP-HSSTRT	Sync Pulse	Amount of time it takes to start another line.
HTOTAL-HSSTOP	Back Porch	Amount of black pixels drawn to the left of the screen.
VPIXEL	Height	Number of vertical pixels drawn to the visible part of the screen.
VSSTRT-VPIXEL	Front Porch	Amount of black pixels drawn on the bottom of the screen.
VSSTOP-VSSTRT	Vertical Sync	Amount of time it takes to move back up to the first line of the screen
VTOTAL-VSSTOP	Back Porch	Amount of black pixels drawn to the top of the screen.
HVSYNC	Flags	Sync Polarity. HSync on High Byte, VSync on Low Byte.

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