User Defined Video Modes for HDMI Software from BitifEye

1. Introduction

This feature allows you to define your own video modes; these video modes can be used in both ValiFrame for HDMI and the HDMI Frame Generator. This gives to the flexibility to even test proprietary video modes almost as easy as standard CEA video modes.
These video modes have to be defined in an XML file named UserModes.xml, a sample file with two video modes is available on our website ww.bitifeye.com in the Support section.
The file has to be placed in the folder C:\Documents and Settings\All Users\Application Data\BitifEye\

Note: The exact name of the folder may be slightly different if you are using a different operating system language

2. UserModes.xml

The file is an XML file that contains a list of so called frame parameters; each FrameParameter node defines one user defined video mode.
The following is a list of the parameters required to define one video mode together with a description.

- FrameRate – The frame rate of the video mode in Hertz
- HResolution – The horizontal resolution of the video mode (the visible part)
- VResolution – The vertical resolution of the video mode (the visible part)
- Code – The video identification code for this mode, as you have always proprietary modes the number shouldn't be important, however the numbers have to be unique to identify the video mode and the number has to be 150 or higher as this is the allowed range for user defined video modes.
- HBlank - The size of the horizontal blanking
- VBlank – The size of the vertical blanking
- PixelRepetition – A value how often each pixel should be repeated, to meet the HDMI spec. requirements, this value is typically 0.
- PreHCounter – The number of pixels prior the HSync active edge
- SignalHCounter – The number of pixels the HSync signal stays active
- PreVCounter – The number of lines prior the VSync active edge
- SignalVCounter – The number of lines the VSync signal stays active
- VHighActive – Defines, whether the Vsync signal has active high (true) or active low (false) state
- HHighActive – Defines, whether the Hsync signal has active high (true) or active low (false) state
- Interlaced – Defines if the video mode is a progressive or interlaced mode, allowed values are 'true' and 'false'
- AspectRatio – Defines the aspect ratio of the video mode used in the AVI InfoFrame, allowed values are 'A16_9' and 'A_4_3'.

3. How to use User Defined Video Modes

After you have defined your video modes and copied the file into the directory described above, you should be able to see the video modes at the end of the video mode list in BitifEye's HDMI programs.

Take care that you restart the programs after you have changed some settings in the file in order to get the list updated.

4. Generating Hardware PRBS modes

You can generate Hardware PRBS modes from the HDMI Frame Generator and ValiFrame. To do this you have to define the video modes as mentioned above with some minor differences. The data rate however needs to match the requirements of the instrument (> 620 MHz)

- VResolution must have the value 9285 (to indicate hardware PRBS mode)
- HResolution must contain the number of the polynomial (e.g. 7 for PRBS7)
- FrameRate contains the data rate in MHz
- Code must be unique (same as above)
- All other parameters are "don't cares" and simply require having valid values.

5. Generating Software PRBS modes

A new feature allows generating software PRBS modes for the HDMI Frame Generator and ValiFrame. There are 2 advantages over the existing PRBS feature. The data rate can be lower than 620 MHz and you can specify the tab values for the PRBS. In addition this feature will generate the described PRBS on all lanes (clock & data) (when used in HDMI Frame Generator) where as the Hardware PRBS will send a clock pattern on the clock lane.

To do this you have to define the video modes as mentioned above with some minor differences.

- VResolution must have the value 9286 (to indicate software PRBS mode)
- HResolution must contain the number of the polynomial (e.g. 7 for PRBS7)
- HBlank contains the tab value for the PRBS or a 0 for the default tabs.
- FrameRate contains the data rate in MHz
- Code must be unique (same as above)

All other parameters are "don't cares" and simply require having valid values.

The tab value is specified like this: If you want to generate for example a PRBS7 with the following polynomial X^7+X^6+1, your tabs are on the 7th and 6th position resulting in the binary pattern 0110 0000, this is 0x60 = 96. This is your tab value.