SERIAL COMMUNICATION PROTOCOL

User Manuel

Version 1.9

October 6, 2008

Products:

GEF DVI-DLHDSDI
GEF DVI-DLHDSDI+
GEF SDI-DLHDDVI
GEF DLHDSDI-DVI+
GEF HDMI-DLHDSDI
GEF DLHDSDI-HDMI

CONFIDENTIAL

1. REMOTE FUNCTION

The remote functions are use to modify every settings in the main menu. Those functions call the same event as the remote control. Moreover, some news functions are available only by the serial port, such as read/write some information into the micro-controller. The syntax for each function is always the same. The '#" character is the start flag followed by the function name in capital letter and a space. The space tells the SH2 that the function name is ending. Finally, the parameters required for each function are separated by a space and ending by the '\r' character or "Enter"

#FunctionName_param1_param2_param3_param4\r

ASPECT

This function set the aspect ratio. If the extract or through mode is chosen, the default value are set. To modify those parameters, go to function EXT or THROUGH.

#ASPECT_param1\r

Parameter	Name	Value
1	Full Screen	1
	Letter/Pillar Box	2
	Panoramic	3
	Extract(Default Value)	4
	Through(Default Value)	5

AUDIO (SDI TO DVI ONLY)

Change the audio channel.

#AUDIO_param1\r

Parameter	Value	Default Value
1	[1 : 8]	1

AUTOLOCK

This function enables or disables the Auto Genlock Mode.

#AUTOLOCK_param1\r

Parameter	Name	Value	Default Value
1	Disable	0	0
	Video Input Reference	1	
	Reference Input [1]	2	

BLACKLEV

Set the black level of the image.

#BLACKLEV_param1\r

Parameter	Name	Value	Default Value
1	Black Level Value	[0 : 1023]	0

BRIGHT

Set the brightness value for a specific color.

#BRIGHT_param1_param2\r

Parameter	Name	Value	Default Value
1	Color Name	0 – Red	-
		1 – Green	-
		2 – Blue	-
2	Color Value	[0 : 100]	50

[1] This feature is available only on the PLUS card.

CLEANAPER

Set the clean aperture level for each position and size.

#CLEANAPER_param1_param2_param3_param4\r

Parameter	Name	Value	Default Value
1	Hozizontal size	[1 : 100]	100
2	Vertical size	[1 : 100]	100
3	Horizontal position	[1 : 100]	50
4	Vertical position	[1 : 100]	50

COLRANGE

Set the color range for the output. Only available for SDI To HDMI card.

#COLRANGE_param1\r

Parameter	Name	Value	Default Value
1	Color Range	0 – (16 – 235)	(16 – 235)
		1 – (0 – 255)*	

* 0-255 is only available for RGB444 output link configuration.

CONTRAST

Set the contrast level for a specific color

#CONTRAST_param1_param2\r

Parameter	Name	Value	Default Value
1	Color Name	0 – Red	-
		1 – Green	-
		2 – Blue	-
2	Color Value	[0 : 100]	50

CUSTOM (SDI TO DVI AND SDI TO HDMI ONLY)

Function used to modify the output format. The default, the maximum and minimum values always depend on the current output format and the current custom output parameters. This is the reason why this function can modified only one parameter at a time.

See Annex A for the list of the refresh rate value.

#CUSTOM_param1_param2\r

Parameter	Name	Value	Minimum	Maximum
1	Horizontal Total	0	Horizontal Active + Horizontal Sync Back Porch	3500
	Horizontal Active	1	1	Horizontal Total minus Horizontal Sync Back Porch *
	Horizontal Sync Back Porch	2	1	Horizontal Total minus Horizontal Active
	Horizontal Sync Width	3	1	Horizontal Sync Back Porch
	Vertical Total	4	Vertical Active + Vertical Sync Back Porch;	3500
	Vertical Active	5	1	Vertical Total minus Vertical Sync Back Porch *
	Vertical Sync Back Porch	6	1	Vertical Total minus Vertical Active
	Vertical Sync Width	7	1	Vertical Sync Back Porch
	Refresh Rate	8	0	13
2	Value wanted for the parameter selected in param_1			

*: If this condition goes up to 2048, the maximum are set to 2048 .

DEVTYPE

Function that returns the present device type connected, SDI to DVI or DVI to SDI. It's used by the updater to send the good update program.

#DEVTYPE\r

Name	Value returned
Device type	#DEVTYPE_DVITOSDI
	#DEVTYPE_SDITODVI

DEVERSION

Function that returns card and software version.

#DEVERSION\r

Name	Value returned
Device version	#DEVERSION_(Card Version)?(Software Version)

EDID (DVI TO SDI ONLY)

Program the EDID PROM with default value or the "EDID.bin" file in the working directory The EDID file can be a 128 bytes or 256 bytes only.

#EDID_param1\r

Parameter	Name	Value
1	Default EDID	0
	EDID.bin file (128 bytes)	1
	EDID.bin file (256 bytes)	2

ENHANCE

Set the detail enhancement value

#ENHANCE_param1\r

Parameter	Name	Value	Default Value
1	Detail Enhancement value	[0 : 100]	0

EXTRACT

Set the extract aspect mode

#EXTRACT_param1_param2_param3\r

Parameter	Name	Value	Default Value
1	Extract size percentage	[1 : 100]	100
2	Horizontal position	[0 : 100]	50
3	Vertical position	[0 : 100]	50

FRAME (SDI TO DVI ONLY)

Set the frame rate of the output image.

#FRAME_param1\r

Parameter	Frame Rate	Value
1	48 Hz	5
	50 Hz	6
	59,94 Hz	7
	60 Hz	8
	75 Hz	11
	85 Hz	13

GAMMA

Set the gamma correction mode. If the custom mode is chosen, set the gamma coefficient value in the second parameter. If User Table is chosen, set the second parameter to 1 to set the user table currently saved in EEPROM memory. To write a new gamma lut file, you must use the updater with the following command : "updater %comport% GAMMA (filename).csv". If the default or SRGB modes are chosen, set the second parameter to 0. See annexe B for gamma lut file format.

#GAMMA_param1_param2\r

Parameter	Name	Value	Default Value
1	Gamma correction mode	Default – 0	-
		SRGB – 1	-
		Custom – 2	-
		User Table – 3	-
2	If Custom mode is chosen in param1	[3 : 30]	1
	If User Table is chosen in param1	Set User Table – 1	-

Note that USER TABLE mode is available only on the PLUS Card.

INPUT

Set the input format of the image. See Annex A for all available format.

#INPUT_param1\r

INSEL (SDI TO DVI AND SDI TO HDMI ONLY)

Set the input channel selection.

#INSEL_param1\r

Parameter	Name	Value	Default Value
1	Channel	1 – Channel A	Channel A
		2 – Channel B	

LANGUAGE

Change the current language of the main menu

#LANGUAGE_param1\r

Parameter	Name	Value	Default Value
1	Language	0 – English	English
		1 – French	

LINKCONF

Function to change the link configuration. This option is not valid for all formats. Note that in DVI to SDI card, the link configuration is set in the output. In SDI to DVI cards, the link is set in the input. In these 2 cases, the available formats still the same.

#LINKCONF_param1\r

Parameter	Name	Value	Default Value
1	Link mode	0 – Single Link	Single Link
		1 – Dual Link YCrCb (4:4:4)	
		2 – Dual Link RGB (4:4:4)	

Here is the list of those available.

Formats available to modify link configuration	Value
1080i/60	22
1080i/59.94	23
1080i/50	24
1080i/50M	25
1080sf/29.97	29
1080sf/30	27
1080sf/25	31
1080sf/24	33
1080sf/23.98	35
1080p/30	26
1080p/29.97	28
1080p/25	30
1080p/24	32
1080p/23.98	34

Notice: Some formats set automatically the link configuration to dual link 4:2:2 progressive. Here is the list of those formats.

Format	Value
1080p/60	18
1080p/59.94	19
1080p/50	20
480p/59.94	6
576p/50	7

LIST

This function shows the list of all the available functions that can be executed on the serial port. It also gives the number of parameters that each function needs.

#LIST\r

MOTIONTHRES

Set the motion threshold value

#MOTIONTHRES_param1\r

Parameter	Name	Value	Default Value
1	Motion threshold value	[0 : 15]	4

NOISEREDUC

Set the noise reduction value

#NOISEREDUC_param1\r

Parameter	Name	Value	Default Value
1	Noise reduction value	[0 : 100]	0

NOISETHRES

Set the noise threshold value

#NOISETHRES_param1\r

Parameter	Name	Value	Default Value
1	Noise threshold value	[0 : 100]	0

OUTCONF

Set the output link configuration of the image. Only available for SDI To HDMI card.

#OUTCONF_param1\r

Parameter	Name	Value	Default Value
1	Link mode	0 – RGB 444	RGB 444
		1 – YCbCr 444	
		2 – YCbCr 422	

OUTPUT

Set the output format of the image. See annex A for all available format.

#OUTPUT_param1\r

PATTERN

Choose a test pattern image on the output port.

#PATTERN_param1\r

Parameter	Name	Value	Default Value
1	Test pattern mode	0 – No Pattern	No Pattern
		1 – Color bar	
		2 – Cross hatch	

REMOTCHAN

Change the current remote control channel.

#REMOTCHAN_param1\

Parameter	Name	Value	Default Value
1	Remote channel	[0 : 3]	Last programmed value

RESTORE

Restore all the default parameters.

#RESTORE\r

SAVE

Save all the current parameters in the PROM. Those parameters will be reloaded in the next boot.

#SAVE\r

SIZEPOS

Set the size and the position of the image. Note that this option is not available in the panoramic aspect mode

#SIZEPOS_param1_param2_param3_param4\r

Parameter	Name	Value	
		Min	Max
1	Horizontal size	1	Current horizontal resolution minus current horizontal position
2	Vertical size	1	Current vertical resolution minus current vertical position
3	Horizontal position	0	Current horizontal resolution minus current horizontal size
4	Vertical position	0	Current vertical resolution minus current vertical size

Parameter	Default Value
1	Current horizontal resolution
2	Current vertical resolution
3	0
4	0

SYNC (SDI TO DVI ONLY)

Set sync adjust manually.

#SYNC_paramam1_param2\r

Parameter	Name	Value	
		Min	Max
1	Vertical sync	0	Current vertical sync back

	adjust		porch minus current vertical sync width
2	Horizontal sync adjust	0	Current horizontal sync back porch minus current horizontal sync width

Parameter	Default Value
1	0
2	0

THROUGH

Set the through aspect mode

#THROUGH_param1_param2_param3_param4\r

Parameter	Name	Value
1	Horizontal size	[1 : 100]
2	Vertical size	[1 : 100]
3	Horizontal position	[0 : 100]
4	Vertical position	[0 : 100]

VERSION

This function returns the version of the Host Firmware, the Kernel and the configuration in that order.

#VERSION\r

ANNEX A :

Frame Rate (Hz)	Value
23.98	0
24	1
25	2
29.97	3
30	4
48	5
50	6
59.94	7
60	8
65	9
70	10
75	11
80	12
85	13

ANNEX B :

GAMMA LUT File format

This format is a standard CSV file. Each line contains Red, Green and Blue values separate by comma ",". A value must be between 0 and 1023. A file must contain 1024 lines.

```
1023,0,0    (Line 1)
1023,0,0
1023,0,0
1023,0,0
1023,0,0
1023,0,0
1023,0,0
…
…
1023,0,0    (Line 1024)
```

DVI TO SDI and HDMI TO SDI				SDI TO DVI and SDI TO HDMI			
INPUT		OUTPUT		INPUT		OUTPUT	
Format	Value	Format	Value	Format	Value	Format	Value
480i	0	480i	0	480i	0	480i	0
480p/59.94	6	480p/59.94	6	480p/59.94	6	480p/59.94	6
576i	1	576i	1	576i	1	576i	1
576p/50	7	576p/50	7	576p/50	7	576p/50	7
720p/23.97	15	720p/23.97	15	720p/23.97	15	720p/23.97	15
720p/24	14	720p/24	14	720p/24	14	720p/24	14
720p/25	13	720p/25	13	720p/25	13	720p/25	13
720p/29.97	12	720p/29.97	12	720p/29.97	12	720p/29.97	12
720p/30	11	720p/30	11	720p/30	11	720p/30	11
720p/50	10	720p/50	10	720p/50	10	720p/50	10
720p/60	8	720p/59.94	9	720p/60	8	720p/59.94	9
720p/59.94	9	720p/60	8	720p/59.94	9	720p/60	8
1035i/59.94	64	1035i/59.94	17	1035i/59.94	64	1035i/59.94	17
1035i/60	63	1035i/60	16	1035i/60	63	1035i/60	16
1080i/50	24	1080i/50	24	1080i/50	24	1080i/50	24
1080i/50M	25	1080i/50M	25	1080i/50M	25	1080i/50M	25
1080i/59.94	23	1080i/59.94	23	1080i/59.94	23	1080i/59.94	23
1080i/60	22	1080i/60	22	1080i/60	22	1080i/60	22
1080p/23.98	34	1080p/23.98	34	1080p/23.98	34	1080p/23.98	34
1080p/24	32	1080p/24	32	1080p/24	32	1080p/24	32
1080p/25	30	1080p/25	30	1080p/25	30	1080p/25	30
1080p/29.97	28	1080p/29.97	28	1080p/29.97	28	1080p/29.97	28

1080p/30	26	1080p/30	26	1080p/30	26	1080p/30	26
1080p/50	20	1080p/50	20	1080p/50	20	1080p/50	20
1080p/50M	21	1080p/50M	21	1080p/50M	21	1080p/50M	21
1080p/59.94	19	1080p/59.94	19	1080p/59.94	19	1080p/59.94	19
1080p/60	18	1080p/60	18	1080p/60	18	1080p/60	18
2K-p/23.98	73	1080sf/23.98	35	1080sf/23.98	35	2K-p/23.98	75
2K-p/24	74	1080sf/24	33	1080sf/24	33	2K-p/24	76
640x350/85	36	1080sf/25	31	1080sf/25	31	640x350/85	36
640x400/85	37	1080sf/29.97	29	1080sf/29.97	29	640x400/85	37
640x480/60	38	1080sf/30	27	1080sf/30	27	640x480/60	38
640x480/75	39	2K-p/23.98	75	2K-p/23.98	73	640x480/75	39
640x480/85	40	2K-p/24	76	2K-p/24	74	640x480/85	40
800x600/60	41	2K-sf/23.98	73	2K-sf/23.98	75	800x600/60	41
800x600/75	42	2K-sf/24	74	2K-sf/24	76	800x600/75	42
800x600/85	43			Auto Detect	255	800x600/85	43
1024x768/60	44					1024x768/60	44
1024x768/75	45					1024x768/75	45
1024x768/85	46					1024x768/85	46
1280x854	65					1280x854	65
1152x864/75	47					1152x864/75	47
1280x768/60	48					1280x768/60	48
1280x960/60	49					1280x960/60	49
1280x960/85	50					1280x960/85	50
1280x1024/60	51					1280x1024/60	51
1280x1024/75	52					1280x1024/75	52

1280x1024/85	53					1280x1024/85	53
1360x768/60	54					1360x768/60	54
1366x768/60	56					1366x768/60	56
1366x923/50	55					1366x923/50	55
1440x900/60	66					1440x900/60	66
1440x1080/60	67					1440x1080/60	67
1600x1024	68					1600x1024	68
1600x1200/60	57					1600x1200/60	57
1600x1200/65	58					1600x1200/65	58
1600x1200/70	59					1600x1200/70	59
1600x1200/75	69					1600x1200/75	69
1680x1050/60	70					1680x1050/60	70
1920x1200/60	71					1920x1200/60	71
2048x1080	72					2048x1080	72
Auto Detect	255						