12G-CROSS

HDMI / SDI 4K CROSS CONVERTER
with Scaling and Frame Rate Conversion

OPERATING MANUAL

Designed and Manufactured in Sydney, Australia

Contents

Introduction

Thank you for purchasing the 12G-CROSS HDMI / SDI 4K CROSS CONVERTER.

The 12G-CROSS is a truly portable converter, which incorporates our easy to use LCD and button control system. This gives you easy access to most of the amazing features that have been unavailable without a computer until now. The days of having to play with complicated dip switches or having to carry around a computer to change a simple setting are gone.

The 12G-CROSS can be controlled using our USB Control panel available at
http://decimator.com/DOWNLOADS/DOWNLOADS.html

The 12G-CROSS features the following four modes:

1. HDMI to SDI while simultaneously converting SDI to HDMI
2. HDMI to HDMI while simultaneously converting SDI to SDI
3. HDMI to SDI and HDMI
4. SDI to SDI and HDMI

It supports VESA formats via the HDMI input.

The 4K Motion Adaptive Scaling Engine, can be driven by either the HDMI or SDI input to be scaled and/or frame rate converted to the required standard. The scaler also supports horizontal and/or vertical flipping.

Either HDMI or SDI outputs can be simultaneously sourced from either the HDMI or SDI input or the 4K Motion Adaptive Scaling Engine.

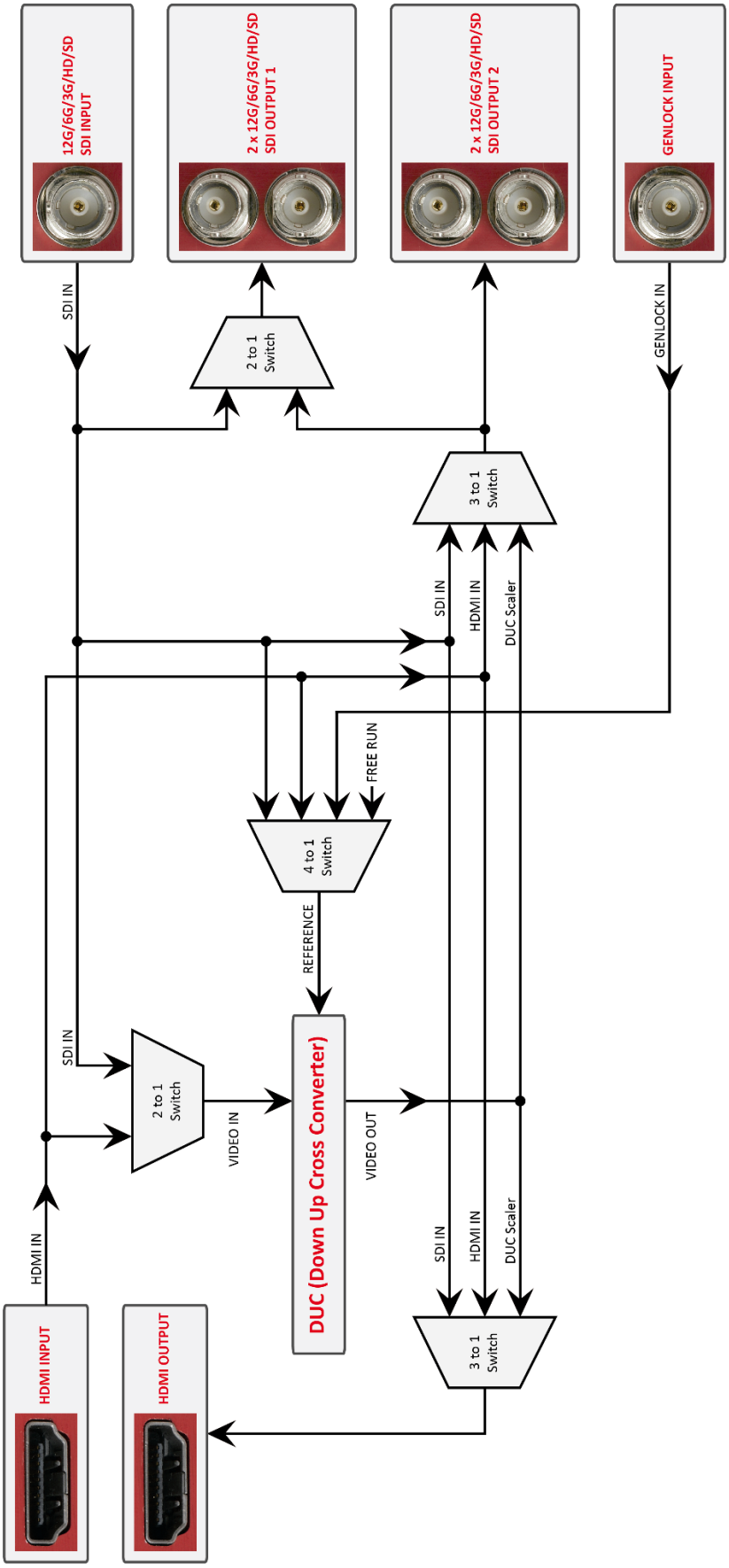
The 12G-CROSS includes the Professional 12G/6G/3G/HD/SD Test Pattern Generator featuring:

- 57 Selectable Output Formats
- 58 Test Patterns including Luma and Chroma Zone-plates
- Audio Test Tone Generator

This unit also includes:

- Support for 2K and 4K Format conversions on the output
- Support for both 3G level A and B on the input and output
- Horizontal and/or Vertical image flipping via the scaler
- 2 x (12G/6G/3G/HD/SD)-SDI Active Loop-Through or Additional Output
- Audio Pair Rearrangement
- Robust Aluminium Case
- USB port for control and firmware updates
- Metal Thread Locking DC Power Socket
- Power Supply, HDMI Cable and USB Cable

Flow Chart



Main Menus

Upon power up, the unit starts in the Main Menu with Input Status selected.
The Main Menus are:

1. Input Status
2. Control
3. Scaling/TPG
4. Aspect
5. Audio
6. Colour
7. Setup

Press the < and > buttons to move left or right through the menus.
To enter into a menu press the ENTER button.

Notes:

1.) Defaults are highlighted in yellow.
2.) When an option is changed, a highlighted S will appear in the top right of the LCD screen and will disappear when the options are saved after 10 seconds. Avoid powering down the unit during this time.
3.) You can always return to the Main Menu by pressing the BACK button twice.
4.) As you move through the menus changing values, they will be instantly applied to the unit.
5.) Scaler and DUC (Down Up Cross conversion) are used interchangeably in the MENUs.

Input Status Menu **(Has no SUB-MENUs)**

```
S:3GB 1080p59.94
H:ED 480p59.94
G:HD 1080i50
D:12G 4Kp50
```

←Current SDI input format
←Current HDMI input format
←Current Genlock input format
←Current Scaling output format

The input shows the current SDI and HDMI input status as well as the DUC output format status.

Control Menu **(Has SUB-MENUs)**

```
Control
SDI OUT SOURCE
SDI IN
```

←Main Menu
←Sub Menu
←Value Window

When highlighted in the Main Menu, press the ENTER button to enter this sub-menu.
Press the < and > buttons to move left or right respectively through the 9 menus below and press the BACK button to go back to the Main Menu when finished.
The current value for each Sub Menu is shown in the Value Window.

1. Control → SDI OUT SOURCE

This is the current source for the SDI output.
When the sub menu is highlighted, press ENTER to toggle through the following sources:

1.) SDI IN
2.) HDMI IN
3.) Scaler ←Output from Scaler

2. Control → HDMI OUT SOURCE

This is the current source for the HDMI output.
When the sub menu is highlighted, press ENTER to toggle through the following sources:

1.) SDI IN
2.) HDMI IN
3.) Scaler ←Output from Scaler

3. Control → HDMI OUT TYPE

This is the current HDMI output type.
When the sub menu is highlighted, press ENTER to toggle through the following types:

1.) DVI RGB444 ←DVI-D RGB 4:4:4
2.) HDMI RGB444 2C ←HDMI RGB 4:4:4 with 2-Channels of Audio
3.) HDMI YCbCr444 2C ←HDMI YCbCr 4:4:4 with 2-Channels of Audio
4.) HDMI YCbCr422 2C ←HDMI YCbCr 4:2:2 with 2-Channels of Audio
5.) HDMI RGB444 8C ←HDMI RGB 4:4:4 with 8-Channels of Audio
6.) HDMI YCbCr444 8C ←HDMI YCbCr 4:4:4 with 8-Channels of Audio
7.) HDMI YCbCr422 8C ←HDMI YCbCr 4:2:2 with 8-Channels of Audio

4. Control → DUC/TPG Source

This is the current source for both the Scaler and Test Pattern Generator.
When the sub menu is highlighted, press ENTER to toggle through the following sources:

1.) SDI IN
2.) HDMI IN

5. Control → DUC/TPG REF

This is the current reference for the Scaler and Test Pattern Generator.
Free-run allows the scaler to continue outputting even when no input is present.
When the sub menu is highlighted, press ENTER to toggle through the following selections:

1.) SOURCE
2.) FREE-RUN ←Free run without a reference
3.) SDI IN
4.) HDMI IN

6. Control → Use Genlock

This option controls whether the 12G-CROSS locks to a genlock signal or ignores it.
When the sub menu is highlighted, press ENTER to toggle through the following selections:

1.) If Present
2.) Always
3.) No

7. Control → No Signal Colour (Has SUB-MENU)

This is the background colour of the no signal status overlay.
When the sub menu is highlighted, press ENTER to toggle through the following selections:

1. Black	3. Green	5. Red	7. Yellow
2. Blue	4. Cyan	6. Magenta	8. White

8. Control → 3G Output is B

This determines if the 3G-SDI output level is B instead of A.
When the sub menu is highlighted, press ENTER to toggle through the following selections:

1.) No
2.) Yes

9. Control → Output 1 is loop

This determines if output 1 is an active loop copy of input 1 or the same as output 2.
When the sub menu is highlighted, press ENTER to toggle through the following selections:

1.) No
2.) Yes

Scaling/TPG Menu **(Has SUB-MENUs)**

```
Scaling/TPG
Output Format
12G 4Kp60
```

←Main Menu
←Sub Menu
←Value Window

When highlighted in the Main Menu, press the ENTER button to enter this sub-menu.
Press the < and > buttons to move left or right respectively through the 10 menus below and press the BACK button to go back to the Main Menu when finished.
The current value for each Sub Menu is shown in the Value Window.

1. Scaling/TPG → Test Pattern On

This indicates if the test pattern generator is on or off.
When the sub menu is highlighted, press ENTER to toggle through the following selections:

1.) No 2.) Yes

2. Scaling/TPG → Pattern (Has SUB-MENU)

This is the current test pattern.
When the sub menu is highlighted, press the ENTER button to enter this sub-menu.
Press the < and > buttons to move left or right through the 58 test patterns listed below and the BACK button to leave this SUB-MENU.

1. SMPTE HD Bars	21. White 75%	41. Y Move Dn Y ZP
2. Bars 100/0/100/0	22. Black	42. Y Move Up XY ZP
3. Bars 100/0/75/0	23. Red 100%	43. Y Move Dn XY ZP
4. Bars 75/0/75/0	24. Red 75%	44. Y Static C ZP
5. Bars 100% & Red	25. Yellow 100%	45. Y Move In C ZP
6. SMPTE EG 1 Bars	26. Yellow 75%	46. Y Move Out C ZP
7. Path EQ & PLL	27. Green 100%	47. C Static X ZP/L
8. EQ	28. Green 75%	48. C Static X ZP/H
9. PLL	29. Blue 100%	49. C Static Y ZP
10. Square on 4:3	30. Blue 75%	50. C Move Lt X ZP
11. Square on 16:9	31. Magenta 100%	51. C Move Rt X ZP
12. 5 Step Y Staircase	32. Magenta 75%	52. C Move Up Y ZP
13. 5 Step UV Staircase	33. Cyan 100%	53. C Move Dn Y ZP
14. Y Ramp	34. Cyan 75%	54. C Move Up XY ZP
15. UV Ramp	35. Y Static X ZP/L	55. C Move Dn XY ZP
16. Pluge	36. Y Static X ZP/H	56. C Static C ZP
17. Convergence	37. Y Static Y ZP	57. C Move In C ZP
18. Tartan Bars	38. Y Move Lt X ZP	58. C Move Out C ZP
19. 1/8 Fields White	39. Y Move Rt X ZP	
20. White 100%	40. Y Move Up Y ZP	

3. Scaling/TPG → Output Format (Has SUB-MENU)

This is the current output format for the Scaler.
When the sub menu is highlighted, press the ENTER button to enter this sub-menu.
Press the < and > buttons to move left or right through the 57 video formats listed below and the BACK button to leave this SUB-MENU.

1. SD 720x487i59.94	20. HD 1920x1080psf23.98	39. 3G 2048x1080p60
2. SD 720x576i50	21. HD 1920x1080p30	40. 3G 2048x1080p59.94
3. ED 720x487p59.94	22. HD 1920x1080p29.97	41. 3G 2048x1080p50
4. ED 720x576p50	23. HD 1920x1080p25	42. 6G 3840x2160p30
5. HD 1280x720p60	24. HD 1920x1080p24	43. 6G 3840x2160p29.97
6. HD 1280x720p59.94	25. HD 1920x1080p23.98	44. 6G 3840x2160p25
7. HD 1280x720p50	26. HD 2048x1080psf30	45. 6G 3840x2160p24
8. HD 1280x720p30	27. HD 2048x1080psf29.97	46. 6G 3840x2160p23.98
9. HD 1280x720p29.97	28. HD 2048x1080psf25	47. 6G 4096x2160p30
10. HD 1280x720p25	29. HD 2048x1080psf24	48. 6G 4096x2160p29.97
11. HD 1280x720p24	30. HD 2048x1080psf23.98	49. 6G 4096x2160p25
12. HD 1280x720p23.98	31. HD 2048x1080p30	50. 6G 4096x2160p24
13. HD 1920x1080i60	32. HD 2048x1080p29.97	51. 6G 4096x2160p23.98
14. HD 1920x1080i59.94	33. HD 2048x1080p25	52. 12G 3840x2160p60
15. HD 1920x1080i50	34. HD 2048x1080p24	53. 12G 3840x2160p59.94
16. HD 1920x1080psf30	35. HD 2048x1080p23.98	54. 12G 3840x2160p50
17. HD 1920x1080psf29.97	36. 3G 1920x1080p60	55. 12G 4096x2160p60
18. HD 1920x1080psf25	37. 3G 1920x1080p59.94	56. 12G 4096x2160p59.94
19. HD 1920x1080psf24	38. 3G 1920x1080p50	57. 12G 4096x2160p50

Please note:
2048x1080 is abbreviated as 2k in the menu
3840x2160 is abbreviated as 2160p in menu
4096x2160 is abbreviated as 4Kp in the menu

4. Scaling/TPG → 1080i=1080psf

This indicates if 1080i is recognised as 1080psf instead of 1080i. As 1080i and 1080psf have the same format structure.
When the sub menu is highlighted, press ENTER to toggle through the following selections:

1.) No ←1080i input = 1080i
2.) Yes ←1080i input = 1080psf

5. Scaling/TPG → Horz Filter

This indicates the level of the horizontal anti-aliasing filter prior to the Scaler.
When the sub menu is highlighted, press ENTER to toggle through the following selections:

1.) Auto
2.) None
3.) Low
4.) Medium
5.) High

6. Scaling/TPG → Motion Det Level

The Motion Detection Level is the amount difference between frames to indicate motion.
A higher value is good for low moving video and a lower value is better for high motion video.
When the sub menu is highlighted, press the ENTER button to enter this sub-menu.
Press the < and > buttons to increase or decrease the unit in the cycle.

Default value is 32, Maximum limit is 1023.

7. Scaling/TPG → SDI Out Test Aud(io)

This selects the test tone generator on the SDI output.

When the sub menu is highlighted, press ENTER to toggle through the following selections:

1.) Off
2.) 1kHz Tone
3.) 1kHz Tone / 500Hz Tone / 1kHz Broken Tone / 500Hz Broken Tone
4.) Left = 1kHz Tone, Right = 1kHz Broken Tone

8. Scaling/TPG → HDMI Out Test Au(dio)

This selects the test tone generator on the HDMI output.

When the sub menu is highlighted, press ENTER to toggle through the following selections:

1.) Off
2.) 1kHz Tone
3.) 1kHz Tone / 500Hz Tone / 1kHz Broken Tone / 500Hz Broken Tone
4.) Left = 1kHz Tone, Right = 1kHz Broken Tone

9. Scaling/TPG → Horizontal Flip

This flips the image horizontally.

When the sub menu is highlighted, press ENTER to toggle through the following selections:

1.) No
2.) Yes

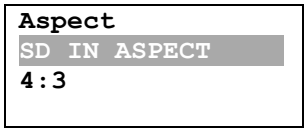
10. Scaling/TPG → Vertical Flip

This flips the image vertically.

When the sub menu is highlighted, press ENTER to toggle through the following selections:

1.) No
2.) Yes

Aspect Menu **(Has SUB-MENUs)**



←Main Menu
←Sub Menu
←Value Window

When highlighted in the Main Menu, press the ENTER button to enter this sub-menu.
Press the < and > buttons to move left or right respectively through the 4 menus below and press the BACK button to go back to the Main Menu when finished.
The current value for each Sub Menu is shown in the Value Window.

1. Aspect → SD IN ASPECT

This option sets the aspect ratio of Standard definition input signals.
When the sub menu is highlighted, press ENTER to toggle through the following selections:

1.) 4:3
2.) 14:9
3.) 16:9

2. Aspect → SD OUT ASPECT

This option sets the aspect ratio of Standard definition output signals.
When the sub menu is highlighted, press ENTER to toggle through the following selections:

1.) 4:3
2.) 14:9
3.) 16:9

3. Aspect → IN IMAGE ASPECT (Has SUB-MENU)

This option sets the input image aspect ratio, by default it will be the same as the input.
When the sub menu is highlighted, press the ENTER button to enter this sub-menu.
Press the < and > buttons to move left or right through

1. Input	11. 192:145 (1.324)	21. 133:75 (1.773)
2. 4:3 (1.333)	12. 296:221 (1.339)	22. 71:40 (1.775)
3. 14:9 (1.556)	13. 960:617 (1.556)	23. 932:525 (1.775)
4. 16:9 (1.778)	14. 467:300 (1.557)	24. 341:192 (1.776)
5. 256:135 (1.896)	15. 51:32 (1.594)	25. 683:384 (1.779)
6. 64:87 (0.736)	16. 307:192 (1.599)	26. 9:5 (1.8)
7. 3:4 (0.75)	17. 8:5 (1.6)	27. 64:35 (1.829)
8. 1:1 (1)	18. 5:3 (1.667)	28. 72:35 (2.057)
9. 5:4 (1.25)	19. 53:30 (1.767)	
10. 32:25 (1.28)	20. 85:48 (1.771)	

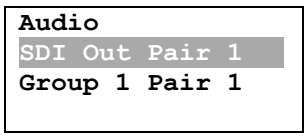
4. Aspect → OUT IMAGE ASPECT

This option sets the output image aspect ratio.
When the sub menu is highlighted, press ENTER to toggle through the following selections:

1.) AN or LB or PB
2.) AN or CC
3.) AN or LC or TC
4.) AN or RC or BC
5.) 16:9
6.) Stretch

NOTE: AN = Anamorphic
PB = Pillar Box
LB = Letter Box
CC = Centre Cut
LC = Left Cut
RC = Right Cut
TC = Top Cut
BC = Bottom Cut

Audio Menu **(Has SUB-MENUs)**



←Main Menu
←Sub Menu
←Value Window

When highlighted in the Main Menu, press the ENTER button to enter this sub-menu.
Press the < and > buttons to move left or right respectively through the 12 menus below and press the BACK button to go back to the Main Menu when finished.
The current value for each Sub Menu is shown in the Value Window.

The following sub menus are available:

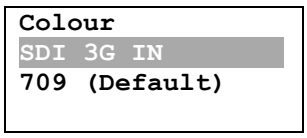
1.) SDI Out Pair 1
2.) SDI Out Pair 2
3.) SDI Out Pair 3
4.) SDI Out Pair 4
5.) SDI Out Pair 5
6.) SDI Out Pair 6
7.) SDI Out Pair 7
8.) SDI Out Pair 8
9.) HDMI Out Pair 1
10.) HDMI Out Pair 2
11.) HDMI Out Pair 3
12.) HDMI Out Pair 4

Each sub menu selects the audio pair source for the SDI and HDMI outputs.

Press the ENTER button, to toggle through the following selections, for each sub menu:

1.) Group 1 Pair 1 (default for SDI Out Pair 1 and HDMI Out Pair 1)
2.) Group 1 Pair 2 (default for SDI Out Pair 2 and HDMI Out Pair 2)
3.) Group 2 Pair 1 (default for SDI Out Pair 3 and HDMI Out Pair 3)
4.) Group 2 Pair 2 (default for SDI Out Pair 4 and HDMI Out Pair 4)
5.) Group 3 Pair 1 (default for SDI Out Pair 5)
6.) Group 3 Pair 2 (default for SDI Out Pair 6)
7.) Group 4 Pair 1 (default for SDI Out Pair 7)
8.) Group 4 Pair 2 (default for SDI Out Pair 8)
9.) Off

Colour Menu **(Has SUB-MENUs)**



←Main Menu
←Sub Menu
←Value Window

When highlighted in the Main Menu, press the ENTER button to enter this sub-menu.
Press the < and > buttons to move left or right respectively through the 11 menus below and press the BACK button to go back to the Main Menu when finished.
The current value for each Sub Menu is shown in the Value Window.

The Colour Menu controls the colour space of the signal on the HDMI or SDI outputs.

1. Colour → SDI 3G IN
This option controls how the payload ID is handled on the SDI input at 3G. If no payload ID is detected, the default option will be used. If the setting is set to always, then no matter what is detected in the Payload ID, that colour space will be used.
When the sub menu is highlighted, press ENTER to toggle through the following selections:

1.) 709 (Default)
2.) 2020 (Default)
3.) 709 (Always)
4.) 2020 (Always)

2. Colour → SDI 6G/12G IN
This option controls how the payload ID is handled on the SDI input at 6G/12G. If no payload ID is detected, the default option will be used. If the setting is set to always, then no matter what is detected in the Payload ID, that colour space will be used.
When the sub menu is highlighted, press ENTER to toggle through the following selections:

1.) 2020 (Default)
2.) 709 (Always)
3.) 2020 (Always)
4.) 709 (Default)

3. Colour → HDMI 3G IN
This option controls how the AVI (Auxiliary Video Information) InfoFrame is handled when a 3G format is detected on the HDMI input. If AVI InfoFrame is detected, the default option will be used. If the setting is set to always, then no matter what is detected in the AVI InfoFrame, that colour space will be used.
When the sub menu is highlighted, press ENTER to toggle through the following selections:

1.) 709 (Default)
2.) 2020 (Default)
3.) 709 (Always)
4.) 2020 (Always)

4. Colour → HDMI 6G/12G IN
This option controls how the AVI (Auxiliary Video Information) InfoFrame is handled when a 6G/12G format is detected on the HDMI input. If AVI InfoFrame is detected, the default option will be used. If the setting is set to always, then no matter what is detected in the AVI InfoFrame, that colour space will be used.
When the sub menu is highlighted, press ENTER to toggle through the following selections:

1.) 2020 (Default)
2.) 709 (Always)
3.) 2020 (Always)
4.) 709 (Default)

5. Colour → HDMI VESA IN

This option controls how the AVI (Auxiliary Video Information) InfoFrame is handled when a VESA format is detected on the HDMI input. If AVI InfoFrame is detected, the default option will be used. If the setting is set to always, then no matter what is detected in the AVI InfoFrame, that colour space will be used.

When the sub menu is highlighted, press ENTER to toggle through the following selections:

1.) 709 (Default)
2.) 2020 (Default)
3.) 601 (Always)
4.) 709 (Always)
5.) 2020 (Always)
6.) 601 (Default)

6. Colour → SDI 3G OUT

This option controls the colour space on the SDI output, when the output format is set to 3G.
When the sub menu is highlighted, press ENTER to toggle through the following selections:

1.) 709
2.) 2020

7. Colour → SDI 6G/12G OUT

This option controls the colour space on the SDI output, when the output format is set to 6G/12G.
When the sub menu is highlighted, press ENTER to toggle through the following selections:

1.) 2020
2.) 709

8. Colour → HDMI 3G OUT

This option controls the colour space on the HDMI output, when the output format is set to 3G.
When the sub menu is highlighted, press ENTER to toggle through the following selections:

1.) 709
2.) 2020

9. Colour → HDMI 6G/12G OUT

This option controls the colour space on the HDMI output, when the output format is set to 6G/12G.
When the sub menu is highlighted, press ENTER to toggle through the following selections:

1.) 2020
2.) 709

10. Colour → HDMI RGB OUT

This option controls the HDMI output colour space legal limit, when outputting RGB.
When the sub menu is highlighted, press ENTER to toggle through the following selections:

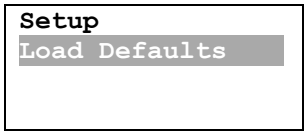
1.) Full
2.) Limited

11. Colour → HDMI Y,Cb,Cr OUT

This option controls the HDMI output colour space legal limit, when outputting Y, Cb, Cr.
When the sub menu is highlighted, press ENTER to toggle through the following selections:

1.) Limited
2.) Full

Setup Menu **(Has SUB-MENUs)**



←Main Menu
←Sub Menu
←Value Window

When highlighted in the Main Menu, press the ENTER button to enter this sub-menu.
Press the < and > buttons to move left or right respectively through the 4 menus below and press the BACK button to go back to the Main Menu when finished.
The current value for each Sub Menu is shown in the Value Window.

1. Setup → LOAD DEFAULTS

When highlighted in the Menu Window, press the ENTER button to load the default settings. The device will be reset to the Main Menu Input Status.

2. Setup → LCD OFF TIME

This is time taken for the LCD light to turn off after the last button press.
When the sub menu is highlighted, press ENTER to toggle through the following times:

1.) 5 seconds
2.) 15 seconds
3.) 30 seconds
4.) 1 minute
5.) 5 minutes
6.) 10 minutes
7.) 30 minutes
8.) Never

3. Setup → BACK2STATUS TIME

This is time before the main menu is returned to Input Status after the last button press.
When the sub menu is highlighted, press ENTER to toggle through the following times:

1.) 5 seconds
2.) 15 seconds
3.) 30 seconds
4.) 1 minute
5.) 5 minutes
6.) 10 minutes
7.) 30 minutes
8.) Never

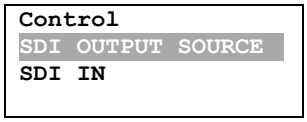
4. Setup → AUTO SAVE

When changes are made, this option determines whether they are saved to memory.
When the sub menu is highlighted, press ENTER to toggle through the following selections:

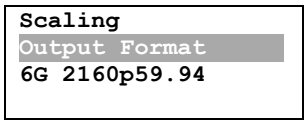
1.) Yes
2.) No

Setting up Format Conversion

To set up the scaler module of the 12G-CROSS use the following steps:
Navigate to the control menu using the arrow buttons, press enter to go into it and the SDI OUTPUT SOURCE should now be highlighted. Press the enter button to cycle from SDI IN to the Scaler. If you wish to output the scaler on HDMI, press the right arrow once to reach the HDMI OUTPUT SOURCE and repeat the same step.



To now change the format you are converting to, press the back button once and then right arrow to reach the Scaling menu. Press enter to go into it and the first option is the Output Format. By pressing enter and using the arrow buttons you can navigate to the format you wish to convert to. The output will instantly update to whichever format you have picked, provided a signal is present or free run is set.



SERVICE WARRANTY

Decimator Design warrants that this product will be free from defects in materials and workmanship for a period of 36 months from the date of purchase. If this product proves to be defective within this warranty period, Decimator Design, at its discretion, will either repair the defective product without charge for parts and labour, or will provide a replacement product in exchange for the defective product.

In order to service under this warranty, you the Customer, must notify Decimator Design of the defect before the expiration of the warranty period and make suitable arrangements for the performance of service. The Customer shall be responsible for packaging and shipping the defective product to a designated service centre nominated by Decimator Design, with shipping charges prepaid. Decimator Design shall pay for the return of the product to the Customer if the shipment is to a location within the country in which the Decimator Design service centre is located. The Customer shall be responsible for paying all shipping charges, insurance, duties, taxes, and any other charges for products returned to any other location.

This warranty shall not apply to any defect, failure or damage caused by improper use or improper or inadequate maintenance and care. Decimator Design shall not be obligated to furnish service under this warranty a) to repair damage resulting from attempts by personnel other than Decimator Design representatives to install, repair or service the product, b) to repair damage resulting from improper use or connection to incompatible equipment, c) to repair any damage or malfunction caused by the use of non-Decimator Design parts or supplies, or d) to service a product that has been modified or integrated with other products when the effect of such a modification or integration increases the time or difficulty of servicing the product.