

## Service generator – converter SG4K\_02 (SDI in HDMI, HDMI in SDI).



### Purpose:

The multifunctional device "Service Generator-Convertor" for television studios (hereinafter referred to as "SG4K\_02") can be used either as a test signal generator for real-time evaluation of HD and UHD television signal paths, or as a format converter with SDI and HDMI inputs and outputs.

### Capabilities:

- Generation of test signals (SDI, HDMI), including moving patterns, for testing the performance of television signal paths in HD and UHD formats (up to 2160p(50/60/59)Hz).
- Conversion of an incoming SDI signal to HDMI output or an incoming HDMI signal to SDI output with time base correction using a frame synchronizer.
- Optical input with conversion to SDI generator output.
- Optical generator output.
- Embedded audio from input signals is transferred to the output with audio time base synchronization (resampling). Selection of audio group and stereo pair for embedded audio in both input and output signals is supported.
- Ethernet\_100 interface for communication with a personal computer for operational control via the "DSCConfig" software, and for firmware/hardware updates via the "FlashUpdate" software; Ethernet\_1000 interface is available for streaming.

- Built-in SDCARD player for playing UHD video clips (2160p(50/60/59)Hz). If a lower resolution is selected at the device's outputs, downscaling is performed using built-in hardware. Video clip recording to SDCARD is done using the "Media Manager" software in DAVC format (a proprietary format developed by DVL).
- Analog audio test signal output with adjustable frequency and level.
- External sync signal output, with selectable output signal type: "SD black burst" or "HD tri-level sync".
- Front panel control using buttons and an LCD display, or remote control from a PC using "DSCConfig" software.
- Supported formats:  
1080i(50/60/59), 720p(50/60/59), 1080p(25/30/29), 1080p(50/60/59), 1080p(100/120/119), 2160p(25/30/29), 2160p(50/60/59)

### Construction:

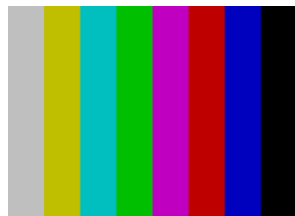
The device is housed in a standard 1U 19" rackmount chassis and is powered by an external +12V power supply.

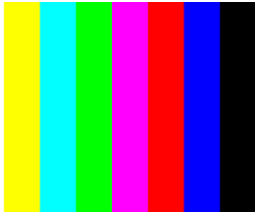



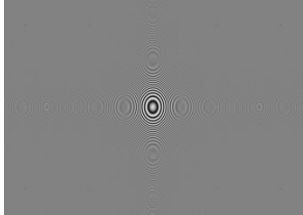
The front panel features a power switch, an LCD display for mode indication, and control buttons: "UP", "DOWN", "LEFT", "RIGHT", "EXIT", and "ENTER".

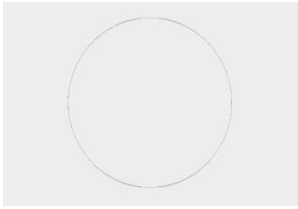
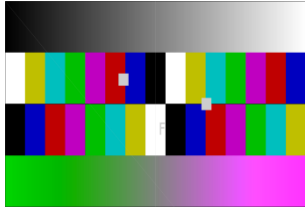
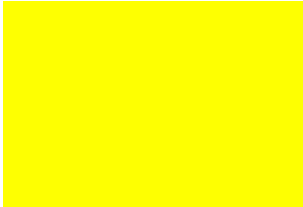

The rear panel includes:

- Input signal connectors (BNC, HDMI (DVI connector))
- Output signal connectors (2 x BNC, HDMI (DVI connector))
- Communication interface connectors for Ethernet\_100 (RJ-45) and Ethernet\_1000 (RJ-45)
- Connector for optical interface (FSP module), and two connectors for +12V power input

The operational selection of the test signal is made from the menu: you can choose the following signals:

1. <u>"Color bar 75%"</u>	
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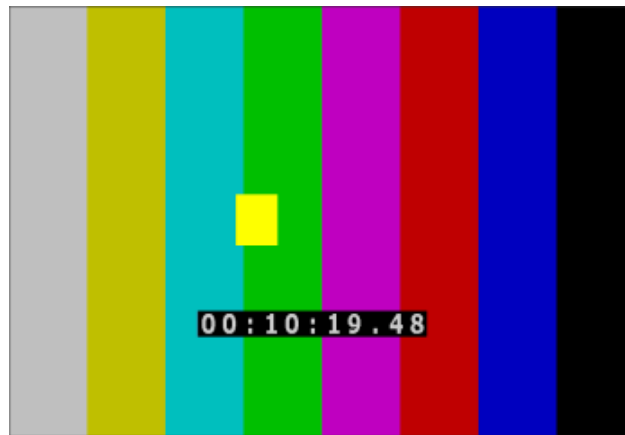
2. <u>"Color bar 100%"</u>	 A vertical color bar with eight distinct color patches: yellow, cyan, magenta, red, blue, and black.
3. <u>"Check field"</u>	 A horizontal bar with two equal-width color patches: magenta on top and black on the bottom.
4. <u>"Cross field"</u>	 A black square with a fine, light gray grid pattern.
5. <u>"RP 219-2002"</u>	 A complex test pattern consisting of a top row of color patches (gray, cyan, magenta, red, blue, black) and a bottom row of color patches (cyan, yellow, black, white, black, red).
6. <u>"Zone Plate"</u>	 A gray square with a series of concentric circles centered in the middle, creating a zone plate effect.

7. <u>"Black circle on white"</u>	
8. <u>"DVL complex signal"</u>	
9. <u>"Color field"</u> (The parameters are tuned)	
10. "Noise signal"	

### Overlay of Additional Graphic Elements:

In addition to selecting the video signal source for the outputs (test signal generator or format converter) and choosing the test signal, there is an option to select additional graphic elements that will be overlaid on the output image:

1. "Frame";
2. "Moving Square" (with an option to select the color);
3. "Time Timer".



**The operation of the device from the front panel:**



The device is operated from the front panel using the MENU and the buttons "UP," "DOWN," "LEFT," "RIGHT," "EXIT," and "ENTER," with navigation and information displayed on the LCD screen.

### **Button Functions:**

- Menu item selection: "Up", "Down"
- Confirm selection: "Enter" or "Right"  
(After selecting the desired menu item and pressing the "Enter" button, an asterisk symbol "\*" appears in the lower right corner of the display to confirm the action.)
- Exit submenu: "Exit" or "Left"  
(The "Left" button duplicates the function of the "Exit" button, and the "Right" button duplicates the function of the "Enter" button.)

Initial Splash Screens on the LCD Display  
(Displayed during the startup and initialization of internal modules):



Type of the main menu after turning on:



Choice options mainly menu:

1. Frame rates
2. Out format
3. Out video source
4. DigOut Aud.source
5. Analog Aud.source
6. Test pics select
7. Converter source
8. Conv input format
9. Still pic select
10. Aud gen freq
11. HDMI out Color
12. Analog aud level
13. SDI out aud group
14. SDIout aud range

15. HDMI out aud range
16. SDI in aud group
17. SDI in aud pair
18. SDI in aud range
19. HDMI in aud pair
20. HDMI in aud range
21. Sync out type
22. One pixel border
23. Moving cube
24. Cube speed
25. Clock timer
26. Ground color Y
27. Ground color Cb
28. Ground color Cr
29. Factory reset

Types of submenu "1 Frame Rate":



Select options for the submenu "2 out format":

- 1080i(50/60/59)
- 720p(50/60/59)
- 1080p(25/30/29)
- 1080p(50/60/59)
- 1080p(100/120/119)
- 2160p(25/30/29)
- 2160p(50/60/59)

Select options for the submenu "3 out video source":

- Test pic gen
- SD card player

Video conv out  
Still picture

Selection options for the submenu "4 dig out.source":

Internal gen  
SD card player  
Converter sound

Selection options for the submenu "5 analog Aud Source":

Internal gen  
SD card player  
Converter sound

Selection options for the submenu "6 Test Pics Select":

75% Color Bars  
100% Color Bars  
Check field  
Cross field  
SMPTE RP 219  
Zone plate  
Black Circle on wh. (white)  
DVL signal  
Color field  
Noice

Selection options for the submenu "7 Converter Source":

Auto  
HDMI  
SDI  
SFP

Selection options for the submenu "8 Conv Input Format":

Auto;  
1080i(50/60/59);  
720p(50/60/59);  
1080p(25/30/29);



1080p(50/60/59);  
 2160p(25/30/29);  
 2160p(50/60/59)

Select options for the submenu "10 aud.gen.freq":

20 Hz; 40 Hz; 60 Hz; 80 Hz; 100 Hz; 120 Hz; 160 Hz; 200 Hz;  
 240 Hz; 300 Hz; 400 Hz; 500 Hz; 600 Hz; 700 Hz; 800 Hz; 900 Hz;  
 1 KHz; 2 KHz; 3 KHz; 5 KHz; 7 KHz; 9 KHz; 10 KHz; 11 KHz;  
 12 KHz; 13 KHz; 14 KHz; 15 KHz; 16 KHz; 18 KHz; 19 KHz; 20 KHz

Selection options for the submenu "11 HDMI Out Color":

RGB  
 YUV 4:2:2  
 YUV 4:4:4

Select options for the submenu "12 analog aud.level":

-6 dB -5 dB -4 dB -3 dB -2 dB -1 dB  
 0 dB 1 dB 2 dB 3 dB 4 dB 5 dB 6 dB

Select options for the submenu "13 SDIUT AUD GROUP":

Audio Group 1  
 Audio Group 2  
 Audio Group 3  
 Audio Group 4

Select options for the submenu "14 SDIUT AUD RANGE":

- 6 dB  
 - 12 dB  
 - 18 dB  
 - 24 dB

Selection options for the submenu "15 HDMIOT AUDRANGE":

- 6 dB  
 - 12 dB  
 - 18 dB  
 - 24 dB

Selection options for the submenu "16 SDI in Aud Group":

Audio Group 1  
Audio Group 2  
Audio Group 3  
Audio Group 4

Selection options for the submenu "17 SDIIN AUD PAR":

Audio Pair 1  
Audio Pair 2  
Audio Pair 3  
Audio Pair 4

Select options for the submenu "18 SDIIN AUD RANGE":

- 6 dB
- 12 dB
- 18 dB
- 24 dB

Selection options for the submenu "19 HDMI in Aud Pair":

Audio Pair 1  
Audio Pair 2  
Audio Pair 3  
Audio Pair 4

*Selection options for the submenu "20 HDMIIN AUD RANGE":*

- 6 dB
- 12 dB
- 18 dB
- 24 dB

*Select options for the submenu "21 Sync Out Type":*

Black burst  
Tri-level sync

*Selection options for the submenu "22 One Pixel Border":*

Border ON  
Border OFF

*Selection options for the submenu "23 Moving Cube":*

Cube ON

Cube OFF

*Selection options for the submenu "24 Cube Speed":*

2 pix.per frame

4 pix.per frame

8 pix.per frame

16 pix.per frame

32 pix.per frame

40 pix.per frame

48 pix.per frame

64 pix.per frame

*Selection options for the submenu "25 Clock Timer":*

Timer ON

Timer OFF

*Select options for the submenu "26 Ground Color Y":*

001

002

....

253

254

*Selection options for the submenu "27 Ground Color CB":*

001

002

....

253

254

*Selection options for the submenu "28 Ground Color Cr":*

001

002

....

253

254

*Selection options for the submenu "29 Factory Reset":*

Click Enter