
Service Generator – Converter SG4K_01
(SDI to HDMI, HDMI to SDI)

Purpose:

The multifunctional device “Service Generator-Converter” for television studios (hereinafter referred to as “SG4K_01”) can be used as a test signal generator for quick assessment of HD and UHD television signal paths, or as a format converter with SDI and HDMI inputs and outputs.

Features:

- Generation of test signals (SDI, HDMI), including moving patterns, for checking the operation of television signal paths in HD and UHD formats (up to 2160p at 50/60/59 Hz).
- Conversion of SDI input to HDMI output or HDMI input to SDI output with frame synchronization (TBC – time base correction).
- Embedded audio from the input is transferred to the output with audio resampling and synchronization. Audio group and stereo pair selection is available for both input and output.
- Ethernet_100 interface for PC control using the “DSCConfig” software and firmware updates via “FlashUpdate.”
- Built-in SD card video player capable of playing UHD (2160p at 50/60/59 Hz) clips. If a lower resolution is selected for output, downscaling is performed by the internal hardware. Video clips are recorded to the SD card via “Media Manager” in proprietary DAVC format by DVL.
- Analog audio test signal output with adjustable frequency and level.

- External sync output with selectable signal type: “SD black burst” or “HD tri-level sync.”
- Front panel control using buttons and an LCD display, or via PC using “DSCConfig.”

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)

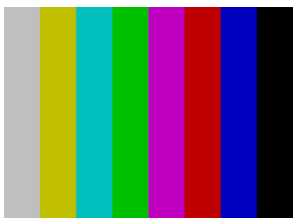
Construction:

The device is housed in a standard 1U (19” rack-mount) enclosure and powered by an external +12V power supply.
The front panel features an LCD mode display and control buttons: “UP,” “DOWN,” “LEFT,” “RIGHT,” “EXIT,” and “ENTER.”
A power switch is also located on the front.
The rear panel includes connectors for input signals (BNC, HDMI via DVI connector), output signals (2x BNC and HDMI via DVI), Ethernet_100 interface (RJ-45), and two +12V power connectors.

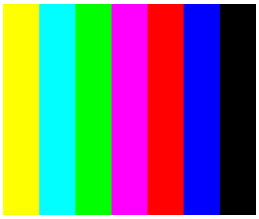
Test Signals:

Test signals are selected from the menu. Available signals include:

1. “Color bar 75%”

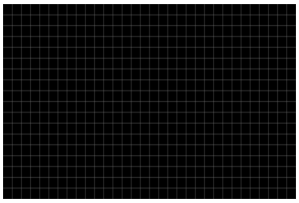


2. “Color bar 100%”



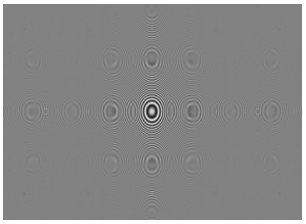
3. “Check field”

4. “Cross field”



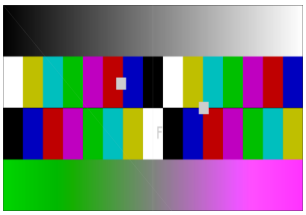
5. “RP 219-2002”

6. “Zone Plate”



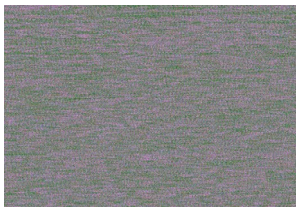
7. “Black circle on white”

8. “DVL complex signal”



9. “Color field” (customizable parameters)

10. “Noise signal”

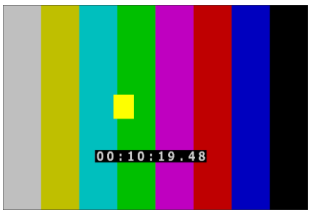


Overlay Graphic Options:

In addition to selecting a video source (test signal generator or format converter), you can add the following overlay graphics to the output image:

1. “Frame border”
2. “Moving square” (color selectable)

3. “Clock timer”



Front Panel Control:

Device operation is controlled via the front panel using a menu displayed on the LCD screen. Navigation is done with the following buttons:

- “UP,” “DOWN” – scroll options
- “RIGHT” / “ENTER” – confirm selection (a “*” appears in the lower right corner to confirm action)
- “LEFT” / “EXIT” – go back (both buttons function identically)

Startup Splash Screens:

On startup, the LCD displays:

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|    LOADING         |
| SERVICE GEN-4K     |
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```

Then:

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----------------------
|  Connect to        |
|    device …        |
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```

Main Menu:

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|   MAIN MENU        |
| 1 FRAME RATES      |
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Menu Options:

1. Frame rates
2. Output format

3. Output video source
4. Digital audio source
5. Analog audio source
6. Test picture selection
7. Converter source
8. Converter input format
9. Still picture selection
10. Audio generator frequency
11. HDMI output color format
12. Analog audio level
13. SDI output audio group
14. SDI output audio range
15. HDMI output audio range
16. SDI input audio group
17. SDI input audio pair
18. SDI input audio range
19. HDMI input audio pair
20. HDMI input audio range
21. Sync output 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

Submenu Details:

1. Frame Rates:

- 25 / 50 / 100
- 30 / 60 / 120
- 29 / 59 / 119

2. Output 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)

3. Output Video Source:

- Test picture generator
- SD card player
- Converter output
- Still picture

4/5. Audio Source (Digital / Analog):

- Internal generator
- SD card player
- Converter audio

6. Test Picture Selection:

- 75% Color Bars
- 100% Color Bars
- Check Field
- Cross Field
- SMPTE RP 219

- Zone Plate
- Black Circle on White
- DVL Signal
- Color Field
- Noise

7. Converter Source:

- Auto
- HDMI
- SDI

8. Converter 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)

9. Still Picture Selection:

- Picture 1–4

10. Audio Generator Frequency:

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

11. HDMI Output Color Format:

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

12. Analog Audio 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

13–16. Audio Groups and Ranges (SDI/HDMI In/Out):

- Audio Group 1–4
- Audio Pair 1–4

- Range: -6 / -12 / -18 / -24 dB

21. Sync Output Type:

- Black burst
- Tri-level sync

22. One-Pixel Border:

- ON / OFF

23. Moving Cube:

- ON / OFF

24. Cube Speed:

- 2–64 pixels per frame

25. Clock Timer:

- ON / OFF

26–28. Ground Color (Y, Cb, Cr):

- Values: 001–254

29. Factory Reset:

- Press Enter
