



HD/SD SDI Test Pattern Generator

Manual Version 1.01



BURST ELECTRONICS INC

EDGEWOOD, NM USA

(505) 898-1455 VOICE

(505) 890-8926 Tech Support

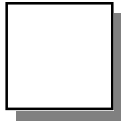
(505) 898-0159 FAX

www.burstelectronics.com



Made in USA

Hardware, software and manual copyright by Burst Electronics. All rights reserved. No part of this publication may be reproduced or distributed in any form or by any means without the written permission of Burst Electronics.



Introduction

Congratulations on your purchase of the Burst Electronics model DG4 Digital Video Test Pattern Generator. We hope that this manual will cover any questions you may have concerning the operation of this product.

General:

The DG4 is a full featured, multi-pattern, multi-format, SMPTE 259M (SD) and SMPTE 274M/296M (HD) SDI test pattern generator with 16-Channel voice ID's and tones plus analog genlock input and digital DAR input. The pattern lineup was chosen to expose system weakness and limitations. The moving zoneplate is used to qualify video compression and scaling. The pathological pattern is used to stress the PLL's in the signal path. There is even a traveling image which moves smoothly about the screen to reveal dropped or repeated frames. Also included is a white flash video pattern with coincident audio tone to measure the audio-to-video encoder delays.

The embedded voice channel ID repeats every 15 seconds, leaving no doubts or confusion about what audio channel is being monitored. In between the voice ID's are standard level 1kHz audio tones for the "right" and 440Hz audio tones for the "left" within each group. The dwell is approximately 1 sec of voice and 14 seconds of tone. The inclusion of standard level tones permits very accurate system leveling. The DG4 digital audio output level can be selected for the US -20dBFS or the European -18dBFS standard output level.

A genlock input can force the output of the DG4 to match the genlock source frame rate simplifying the format selection process.

The DG4 test pattern, format, and operational features are front panel selected using a 5-way pushbutton switch (function defined by mode) with menu display on an integrated LCD display.

Power is supplied from external wall mounted 12VDC @ 1A universal power supply.

Product Description

The DG4 has a 5 second boot time. During this time the company name and software revision # are displayed

The DG4 has four outputs for serial digital video, a composite video analog output, an input for analog black burst or tri-level sync with loop out, an audio DAR input and a power input.

The DG4 features 'power on recall' which saves selected the video standard and pattern. The format and pattern are displayed after the boot sequence is complete.

Selecting formats and patterns

Please see the Menu Flowchart diagram towards the rear of this manual to help you navigate through the menu system. The below explanations are here to help you with the function of each menu item.

Pressing up/down on the NAV button changes the pattern. To select this pattern, push the NAV button, then select right (yes) to save or left (no) to return to the previous menu.

Patterns:

- Full Field 75% Color Bars
- Full Field 75% Color bars/+Circle
- RP219 with Motion
- RP219 with Motion/+Circle
- Luminance Staircase
- Luminance Ramp
- Pathological/PLL
- Checkerboard B&W
- Chroma Cb
- Chroma Cr
- Convergence/+Circle
- Convergence
- Black Field
- White Field
- Blue Field
- Green Field
- Red Field
- Moving Zoneplate

Pressing right or left on the NAV button scrolls through the various available formats. To select the format push the NAV button, then select right (yes) to save or left (no) to return to the previous menu.

Formats:

- NTSC (480i)
- PAL(576i)
- 720p60
- 720p59.94
- 720p50
- 1080p30
- 1080p29.97
- 1080p25
- 1080i30
- 1080i29.97
- 1080i25
- 1080SF30
- 1080SF29.97
- 1080SF25
- 1080SF24
- 1080SF23.98
- 1035SF30
- 1035SF29.97

Setup Categories

The DG4 has five (5) setup categories. The categories are:

Genlock Video
Audio Settings
System Settings
Diagnostics
Push to Exit

Genlock Video

Press the NAV button once to enter Setup Category, then scroll right to enter Genlock Video category, press again to enter the Genlock menu. Continuing to scroll right, there

are the following options:

Genlock Enabled/Disabled - Press NAV button up or down to select. Default is Enabled. (*Note: Use the appropriate analog input to genlock the selected format.*). Genlock Enabled causes the DG4 to actively monitor the Genlock input and forces the SDI output's format to match the incoming video reference signal. Genlock Disabled allows the DG4 to generate video to any of the supported video standards format.

Field Match/Reverse - Press NAV button up or down to select. Default is Match.

Lock Continuous/Momentary - Press NAV button up or down to select. Default is Continuous. Note: Lock will default to Momentary if Genlock input is not compatible with output format rate.

Horiz Phase - Press NAV button up or down to select from 0 to 1716. Default is 0. For adjusting the Horizontal Phase.

Vert Phase - Press NAV button up or down to select from 1 to 525. Default is 1. For adjusting the Vertical Phase.

Audio Settings

Press the NAV button once, scroll right to Audio Settings, press NAV button again to enter Audio Settings. Continuing to scroll right, there are the following options:

Audio Embedded On/Off - Press NAV button up or down to select audio embedding on the video outputs. Default is On.

Tones On/Off-Press NAV button up or down to select audio tone On or Off. Default is On. The audio frequency embedded on each channel is selectable in the Left Chan and Right Chan menu items.

Voice ID On/Off-Press NAV button up or down to select the Voice ID. Default is On. The Voice ID verbally identifies the left and right audio channels for 1 second every 15 seconds.

Level - Press NAV button up or down to select -18DbFS (EU) or -20DbFS (USA). Default = -20DbFS. This function selects whether you are using audio standard levels for the United States or in Europe.

Left Chan - Press NAV button up or down to select 1000Hz or 440Hz. Default is 440Hz.

Right Chan- Press NAV button up or down to select 1000Hz or 440Hz. Default is 1000Hz.

Voice Pacing- Press NAV button up or down to select Fast or Slow. Default is Slow.

Audio Sync- Press NAV button up or down to select Video or DAR. Default is Video.

System Settings

Time Delay-Scroll up or down to adjust from 10-800 seconds. Default is 30.

Contrast - Scroll up or down to adjust front panel contrast from 0-100%. Default is 10%.

Backlight High - Scroll up or down to adjust front panel active backlight brightness from 0-100%. Default is 95%.

Backlight Idle - Scroll up or down to adjust front panel backlight idle brightness from 0-100%. Default is 25%.

Factory Defaults - Enter Value 10 which will display “Yes”, press NAV button to enter. The default setting will return when cycling power.

Diagnostics (For Display Only)

Src Frame Rate - Shows Genlock Input Frame rate in Hz.

Src Line/Frame - Shows Genlock input Lines per frame

Genlock Locked - Shows status of Genlock (Yes or No)

GL Rate Match - Shows whether the Genlock input is a compatible rate (Yes or No).

DAR Lock - DAR Lock Status (Yes or No).

DG 4 Front Panel

Display:

Backlit LCD

Pushbuttons:

- Type: 5-position (up, down, left, right, select) Momentary Navigation Switch

- Functions:

- o Increment/Forward

- o Decrement/Backward

- o Mode

Take/Save

Genlock LED: Indicates video outputs are genlocked to an external source.

DAR LED: Indicates an external AES is locked to the video output.

DG4 Rear Panel

12Vdc — Power connector for the HDLG (see Specifications for power requirements).

DAR Input — External AES input used to lock onto the video output.

DAR/Term — Switch for AES or 75 ohm termination.

Genlock Loop Output — This is the BNC connection for black burst or tri-level sync loop through.

SDI Outputs — These four BNC connections are for SDI video output.

CVS Output - Composite video output to approximate the SDI output.

Specifications

Genlock Input:

Number: 1
Connectors: BNC
Standards: Tri-level sync, analog SMPTE 274M,
296M
Bi-level, analog NTSC (SMPTE 170M),
PAL (ITU624-4)
Level: 1v p-p
Frequency Lock Range: ± 75 ppm from nominal
Impedance: Hi-z looping input

SDI Outputs:

Number: 5
Connectors: BNC
Standards: SMPTE 274M/296M/259M
Level: 800mv p-p
Impedance: 75 ohm

FP Controls:

Display:
20x2 Character LCD with LED backlights

Pushbuttons:

- Type: Momentary Navigation Switch
- Functions:
 - o Increment/Forward
 - o Decrement/Backward
 - o Mode
- Take/Save

Patterns:

RP219 with Motion/+Circle
Full Field 75% Color bars/+Circle

Moving Zoneplate
Red/Stairstep
Green/Stairstep
Blue/Stairstep
White/Stairstep
Black/Ramp
Pathological/Sync Flash
Convergence/+Circle

Formats:

- NTSC (480i)
- PAL(576i)
- 720p50
- 720p59.94
- 720p60
- 1080i59.94
- 1080i60
- 1080p29.97
- 1080p24
- 1080sF24
- 1080p25
- 1080sF25
- 1080i25

Genlock:

- ON/OFF
- Match Frame Rate
- H-Phase +/- half line (in pixels)
- V-Phase +/- 100 lines (in lines)
- Invert Field

Audio:

- ON/OFF
- Voice only
- Tone only
- EBU levels

System:

- Software version
- Serial number
- Save settings as Power-On defaults
- Reset to Factory settings

Performance:

Signal Path: 4:2:2

Sampling: SD – 27MHz; HD – 74.25MHz or
74.25/1.001MHz

Quantization: 10-bits signal path

Return loss: > 15dB

Output Jitter: 0.25UI with 1-kHz High pass

General:

Power Supply: 12V DC @ 1A external Wall Mount

Environmental:

- Operation temperature: 0C to +40C
- Storage temperature: -40C to +85C
- Relative Humidity: 5% to 95% RH (non-condensing)