Model HD-8020

Multi-rate HD/SD-SDI

Digital to Analog Converter

Owner's Manual

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Overview

The HD-8020 is a high quality 12-bit digital to analog converter that accepts HD SMPTE-292 and SD SMPTE 259M-C input signals and converts them to same rate and format analog video.

For HD signals the 8020 the user can select YPbPr or RGB outputs with embedded tri-level sync or H and V sync on a five BNC interface.

For SD signals the 8020 can be configured to output Component, Composite and Y/C signals. In component mode the user can select RGB or YPbPr in BetaCam(tm), MII(tm) or SMPTE/N10 levels.

How to Configure an 8020

Switch Bank 1 – Analog Output

The third switch bank controls the analog encoder's configuration. Both the HD and SD analog outputs are configured by these switches. Additional analog configuration is available using the interior switches as described in the Internal Switch Setting section.

The SD analog output type is selected by the first three switches of S1.

Switch Bank 1 - Analog Output Configuration – SD Setup			
S1-1	S1-2	S1-3	Function - SD Analog Configuration
ON	ON	ON	SD Composite and Y/C
OFF	ON	ON	SD YPbPr BetaCam(tm) levels
OFF	ON	OFF	SD YPbPr MII (tm) levels
OFF	OFF	ON	SD YPbPr SMPTE levels
OFF	OFF	OFF	SD RGB levels

Switch Bank 1 - Analog Output Configuration - SD Setup Continued	
S1-4	Function Color / Monochrome Mode
ON	SD color ON
OFF	SD color OFF – useful for driving B&W monitors

Switch Bank 1 - Analog Output Configuration - SD Setup Continued	
S1-5	Function Setup Control for NTSC
ON	SD Setup ON (NTSC signals only)
OFF	SD Setup OFF

Switch Bank 1 - Analog Output Configuration - SD Color Bars	
S1-6	Function Color Bars
ON	SD Analog Color Bars ON
OFF	SD Analog Color Bars OFF

The last two analog output switches set up the HD color type (YPbPr or RGB) and sync type.

Switch Bank 1 - Analog Output Configuration - HD Setup	
S1-7	Function Color Type
ON	HD Component YpbPr
OFF	HD Component RGB

Switch Bank 1 - Analog Output Configuration - HD Setup	
S1-8	Function HD Sync selection
ON	Embedded Tri-level
OFF	H & V external

Sync can be either embedded on the HD video as tri-level or bi-level or as external H&V. To select bi-level you must use the internal rotary switches and change the embedded sync type to bi-level. The default embedded sync is tri-level and is on all three output HD channels (YPbPr or RGB).

If H&V external sync is selected, the embedded sync is removed for RGB signals and H&V are sent to the H&V connections on the HD-15 connector.

Switch Bank 2 – Reticule Overlay

The second bank of switches control the reticule overlays. This overlay engine is very flexible and can be user programmed with other aspect ratios via the internal rotary switches and saved in non-volatile memory. This allows the creation of film aspect ratios or video aspect ratios specific to the project at hand.

Switch Bank 2 – Reticule Overlay - Output Enable	
S2-1	Function
ON	Enable overlays on analog outputs
OFF	Disable overlays on analog outputs

The next switches define what type of overlay is to be used. Each type can be enabled or disabled individually. The user can use the factory default settings or program their own and save those settings. Use the internal rotary switches, defined in the next section to program the user settings. Place S2-6 to user presets (ON). This feature gives a total of eight different overlays of which four can be used at one time.

Switch Bank 2 – Reticule Overlay - Overlay Type Selection					
S2-2	S2-3	S2-4	S2-5	S2-6	Function
ON					Center Cross Enable or User Preset
OFF					Center Cross Disable or User Preset
	ON				4 x 3 Safe Area Enable or User Preset
	OFF				4 x 3 Safe Area Disable or User Preset
		ON			4 x 3 Full Aperture Enable or User Preset
		OFF			4 x 3 Full Aperture Disable or User Preset
			ON		16 x 9 Safe Area Enable or User Preset
			OFF		16 x 9 Safe Area Disable or User Preset
				ON	User Presets Enabled (internal switches to configure)
				OFF	Factory Defaults Enabled

The next switch setting selects white, blue, Green or black reticules. The overlay can be User programmed, via internal switches, to be any color and saved as user default. This user color would be present when the User Preset Enable switch (S2-6) is ON.

Switch Bank 2 – Reticule Overlay - Color Selection		
S2-7	S2-8	Function
ON	ON	Reticule color is White or User Preset
OFF	ON	Reticule color is Blue or User Preset
ON	OFF	Reticule color is Green or User Preset
OFF	OFF	Reticule color is Black or User Preset

Internal Switch Settings

The 8020 has additional configuration controls via internal register rotary selection and input (up/down) switches. To access these controls, disconnect power while removing the bottom cover and locate two rotary switches (S5, S6) and two push button (S7-UP, S8-Down) switches and reapply power.

Default convention: Use S7 (UP) to increment or turn function on. Use S8 (Down) to decrement or turn function off. On most functions, pressing both S7 & S8 (Up & Down) restores the default mode.

To save user settings, select 99 and press either the Up or Down switch.

S5S6

00: Normal User Mode
Restore to 00 prior to device use

10-19: Reserved

20-29: Reserved

30-39: Reserved

57: Enable over sampling on Encoder
Default is on

58: Enable HD VBI
Default is on

59: Enable SD VB
Default is on

60: User Reticule Mode Vert bars size H
61: User Reticule Mode Vert bars thickness
62: User Reticule Mode 4x3 box Horz size
63: User Reticule Mode 4x3 box Vert size
64: User Reticule Mode 4x3 box Horz Thickness
65: User Reticule Mode 4x3 box Vert Thickness
66: User Reticule Mode 16x9 box Horz size
67: User Reticule Mode 16x9 box Vert size
68: User Reticule Mode 16x9 box Horz Thickness
69: User Reticule Mode 16x9 box Vert Thickness

70: User Reticule Mode Cross Horz size
71: User Reticule Mode Cross Vert size
72: User Reticule Mode Cross Horz Thickness
73: User Reticule Mode Cross Vert Thickness
74: User Reticule Mode Y Level
75: User Reticule Mode Cb Level
76: User Reticule Mode Cr Level

74-83, 86: Reserved

84: HD Analog Embedded SYNC
UP = tri-level (default)
Down = bi-level

85: SD-SDI/Analog Dejitter
UP = Filter ON
Down = Filter OFF

88: Restore factory defaults

89-98: Reserved

99: Save current values

Make certain that the rotary switches are restored to 0, 0 before re-installing the bottom cover.

Specifications

DIGITAL INPUT

Input – Dual-Rate	SMPTE-292 HDSDI (10-bit) and SMPTE259M-C (10-bit) ♦ HD: 720 i25/29.97/30/59.94/60 and p/23.98/24: embedded in p59.94/60 ♦ HD: 1080 i23.98.59.94/60/50 - p25/29.97/30 - p/sF 23.98/24 ♦ SD: 486 i29.97 NTSC - 575 i25 PAL
Input Equalization:	330ft (100 Meters) Belden 1505A
Return Loss:	> 15 dB

DIGITAL OUTPUTS

Active Loop	Two HD or SD SDI reclocked copies of input (Dual-Rate)
Return Loss:	> 15 dB

ANALOG OUTPUTS

Output Signal:	Both HD, SD Analog HD – YPbPr or GBR SD – Composite, Y/C or Component
Frequency Response:	HD: Y/GBR: 0-28 MHz +/- 0.25 dB Pb/Pr: 0-13 MHz +/- 0.25 dB SD: 0-5.2 MHz +/- 0.25 dB
Encoding Path:	12-bit encoding and DAC – 10-bit input
Return Loss:	>36dB
Connectors:	HD15 with 5BNC breakout cable
Sync:	HD Bi/Tri-Level Sync on Video - H/V Sync SD – Sync on Video

RETICULE OVERLAY

Types:	4x3, 16X9 Safe Area, 4x3 full aperture, and center cross - each type can be individually enabled and User size adjusted
Reticule Color:	White, Blue, Green or Black
Reticule Outputs:	Enabled on all HD-analog, SD-analog
Options:	Remote Reticule control

Operating Range:	40-100 degrees F. (non-condensing)
Input Power:	5VDC input: + 5 VDC @ 0.6A (3 watts) 12VDC input: + 6.5 to 18 VDC @ (3 watts)
Options:	Anton Bauer Mod-Tap cable
Size:	5.4” x 3” x 1” (137mm x 76mm x 25mm)

This product is not authorized for use in life support systems. Product liability is limited only to the replacement of this unit. Cobalt Digital Inc. does not assume any liability for loss of use due to failure of this component.

Specifications subject to change without notice.

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