greenMachine® Datasheet

HDR Evie+

packages:
GMPT HDREVIE+
licenses:
GMC-HDR-EVIE+-titan

~~callisto+~~
✓ titan

1x12G-SDI & 4x3G-SDI Dynamic Segmented HDR to SDR Converter

Description

The greenMachine HDR Evie+ is the only real-time HDR to SDR converter with sectional dynamic tone mapping on a frame-by-frame basis for 12G-SDI formats (3840 x 2160p / 60Hz) and up to 3G-SDI formats.

HDR EVIE+ provides 4x 3G-SDI or 1x 12G-SDI UHD processing channels supporting down-conversion from HDR to SDR through appropriate sectional dynamic tone mapping. For this conversion every frame gets divided into 144 equally sized parts with idividual adjustments blended into each other in real-time. It also supports the Wide Color Gamut (WCG) needs of broadcasters and professional AV sectors.

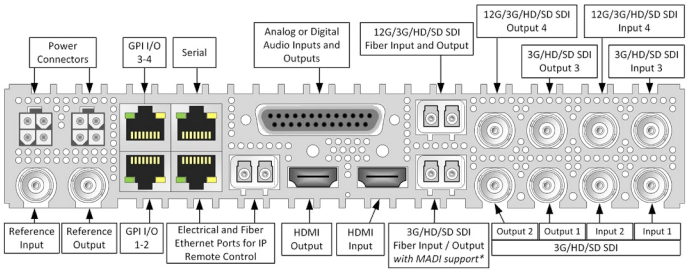
Both the constellation license GMC-HDR-EVIE+-titan and the greenMachine GMPT-HDREvie+ include the constellaton license GMC-HDRS for HDR Static.



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Functions

- *Local Dynamic to Global Dynamic Ratio engine* allows a user to mix sectional tone mapping and global tone mapping
- *Global Dynamic to Static Ratio engine* allows a user to mix dynamic tone mapping and static tone mapping proportionally
- *Dynamic adaptation speed engine* (frame-by-frame) allows adjustment of tone mapping calculation speed for smooth and consistent viewing impression
- *Automated Scene Detection engine* allows a user to adjust the parameter that detects a scene change for automated adjustment of image brightness levels
- User-adjustable *target brightness*, *contrast,* and *saturation*
- Frame Synchronizer
- Embedding /De-embedding with DolbyE™ embedding support
- Basic Audio & Video Test Generator
- Audio Processing with gain adjustment, mute, inversion, and stereo to mono mix-down
- MetaData Management
- Video Adjustment include saturation, gain, black and hue adjustment
- Color Correction (RGB/CMYW gain and offset)
- Timing with available video and audio delay per channels is 30 frames and 1.3 seconds respectively
- Nova controller with full SNMP v2 support and custom control

Technical Specifications

Sectional Dynamic HDR Down-Conversion

Input Transfer Characteristics	PQ ST-2084, PQ BT-2100, HLG, Sony SLog3, Arri LogC, Red Log3G10, BMD Film, Panasonic V-Log, Canon C-Log2
Output Transfer Characteristics	Standard Dynamic Range (SDR)

Colorimetry Supported

Input Colorimetry	BT.2020, BT.709, Sony S-Gamut, ACES, DCI-P3, Panasonic V-Gamut, BMD Film, Canon Cinema Gamut, Arri Alexa, Red Wide Gamut
Output Colorimetry	W. 2020, BT. 709

Operation Modes

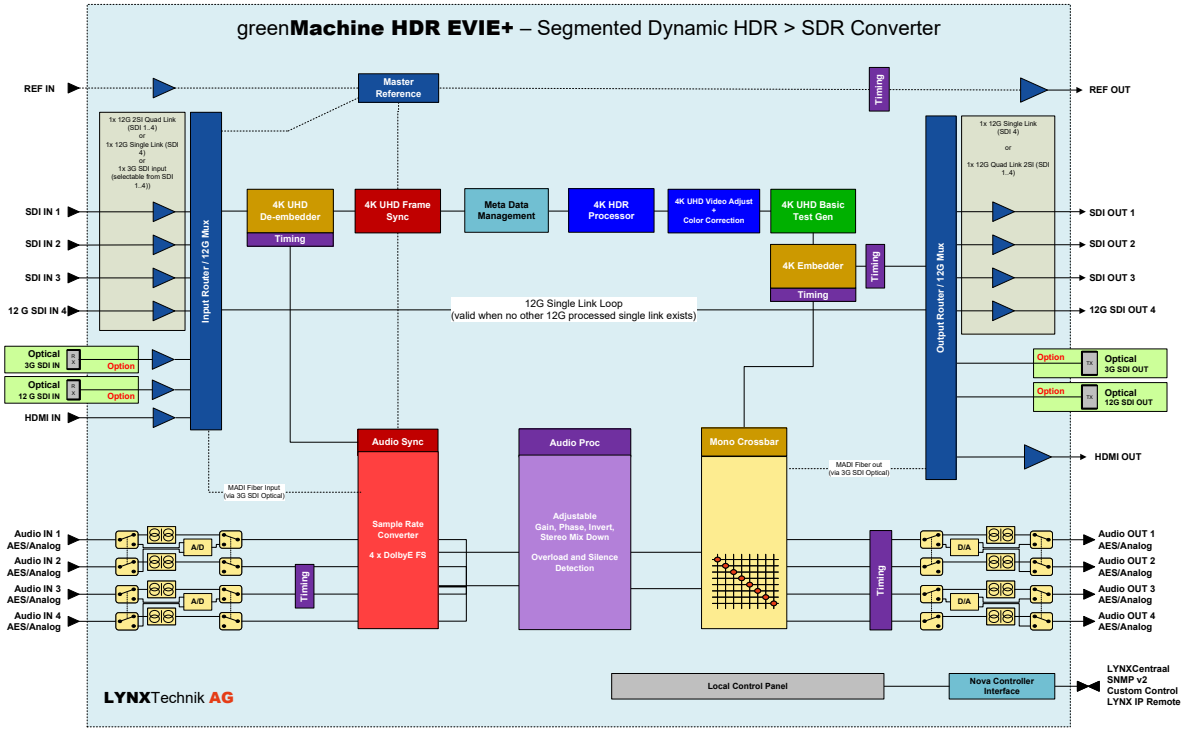
- 12G UHD single channel configuration
- 3G HD quad channel configuration

Input / Output Data Range

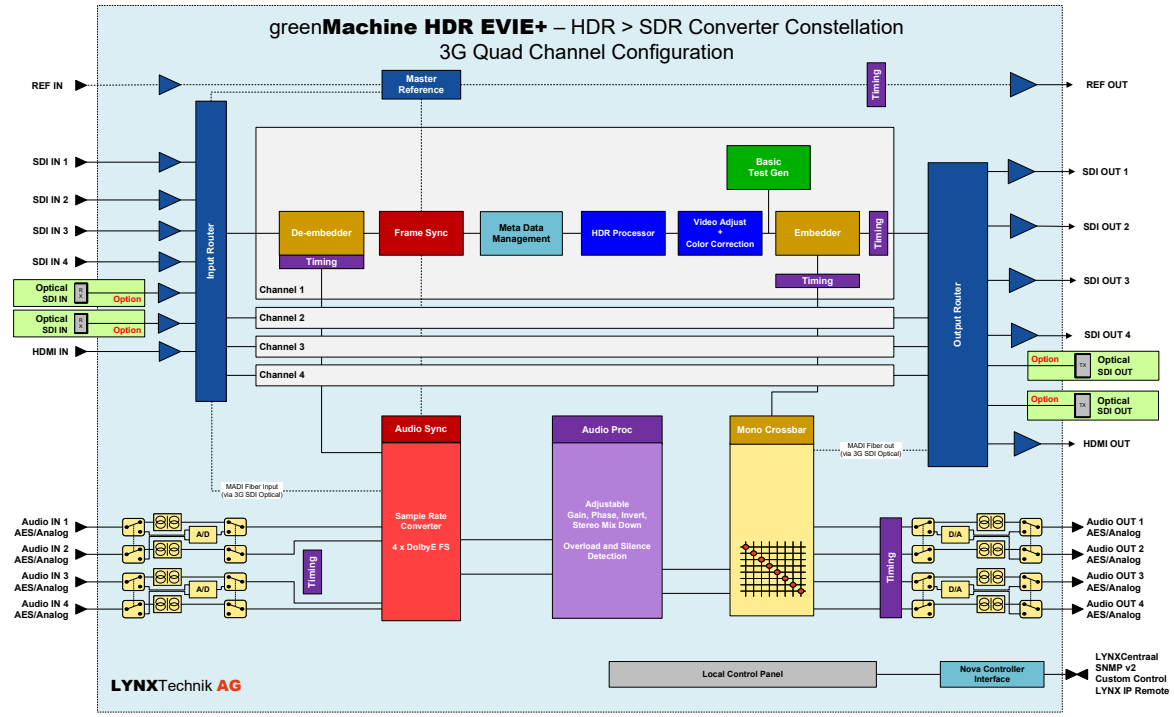
- Full range : Video signal representation (10bits) in full range of values from 0 to 1023 decimal (according to ITU BT 2100)
- Narrow range : Traditional video signal (10 bits) representation from 64 to 940 decimal values

Functional Diagram

12G-SDI Single Channel Mode



3G-SDI Quad Channel Mode



Hardware Specifications

BNC Connection

SDI Inputs	4x 3G-SDI video on 75 Ohm BNC connector (SMPTE 259M, 292M, 424M) with automatic video format and standard detection	
	Return Loss:	>15dB from 5MHz to 1.5GHz, >10dB from 1.5GHz to 3GHz
	Automatic cable EQ (Belden 1694A):	340m @ 270Mbit/s, 150m @ 1.5Gbit/s, 110m @ 3Gbit/s
12G SDI Input*	1x 12G-SDI video on 75 Ohm BNC connector "Input 4" (SMPTE 259M, 292M, 424M, 2082) with automatic video format and standard detection	
	Return Loss:	>7dB to 6GHz; >4dB to 12GHz
SDI Output	4x SDI video on 75 Ohm BNC connector (SMPTE 259m, 292M, 424M)	
	Timing jitter:	< 0.2 UI @ 270Mbit/s, < 1.0 UI @ 1.5Gbit/s, < 2.0 UI @ 3Gbit/s
	Alignment jitter:	< 0.2 UI @ 270Mbit/s, < 0.2 UI @ 1.5Gbit/s, < 0.3 UI @ 3Gbit/s
	Return Loss:	>15dB from 5MHz to 1.5GHz, >10dB from 1.5GHz to 3GHz
12G SDI Output*	1x 12G-SDI video on 75 Ohm BNC connector "Output 4" (SMPTE 259M, 292M, 424M, 2082)	
	Return Loss:	>7dB to 6GHz; >4dB to 12GHz
Reference Input	• 1x analog video reference on 75 Ohm BNC connector • Analog bi-level (SDTV) or tri-level (HDTV) auto detect	
Reference Output	• 1x analog video reference on 75 Ohm BNC connector • Analog bi-level (SDTV) or tri-level (HDTV), cross lock capability	

Supported SDI Formats

SDTV	525 / 59.94Hz 625 / 50Hz		
HDTV	1080i / 50Hz 1080i / 59.94Hz 1080i / 60Hz 1080p / 23.98Hz 1080p / 24Hz 1080p / 25Hz 1080p / 29.97Hz	1080p / 30Hz 1080psf /23.98Hz 1080psf / 24Hz 1080psf / 25Hz 720p /23.98 Hz 720p / 24Hz 720p / 25Hz	720p / 29.97Hz 720p / 30Hz 720p / 50Hz 720p / 59.94Hz 720p / 60Hz
3G-SDI Level A	1080p / 50Hz 1080p / 59.94Hz 1080p / 60Hz		
12G-SDI* Single Link	3840 x 2160p / 50Hz 3840 x 2160p / 59.94Hz 3840 x 2160p / 60Hz		
12G-SDI* Quad Link 2SI Level A (4x 3G)	3840 x 2160p / 50Hz 3840 x 2160p / 59.94Hz 3840 x 2160p / 60Hz		

***NOTE:** 12G-SDI operations not supported on 3G constellations and constellation modes (i.e. quad channel 3G-SDI configuration or 3GUPXD)

Optical Connection (optional SFP required)

Fiber I/O	• 1x 3G SDI SFP Transceiver (SMPTE 297M - 2006) • 1x 12G SDI SFP Transceiver (SMPTE 292M, 424M , 2082) - no SD SDI (270MBit)**
Optical Ethernet	IEEE 802.3z 1000Base-X Gbit/s Ethernet over Fiber at 1Gbit/s (125 MB/s)

****NOTE:** 12G-SDI SFPs can be used with 3G-SDI constellations and constellation modes, but only support 3G-SDI signals

AV Connection

HDMI	• 1x Input 10 bit HDMI 1.4b • 1x Output 10 bit HDMI 1.4b

Audio Connection

Audio I/O	4x input and 4x output on D-Sub 25 female connector
Analog I/O	Input impedance >10k Ohm Output mpedance 150 Ohm
	Analog I/O full scale level: selectable 12, 15, 18, 20, 22, 24 dBu
Digital	AES3 balanced transformer isolated; Digital output level: 4V peak to peak nom
MADI	64 channel MADI supported on selected constellations (optional MADI SFP reqired for this)

Technical Information

Power	12V DC @ 45W nominal (supports 7 - 24VDC input range)
	2x power connections for redundant power supply
Mechanical	W: 218mm (1/2 19"), H: 44mm (1.75"), D: 225mm (8.86") - including connectors.
	Weight: 1.4kg (3.09lb)
Ambient	Temperature: 5°C to 40°C (41°F to 104°F) maintaining specification
	Humidity: 90% maximum, non-condensing

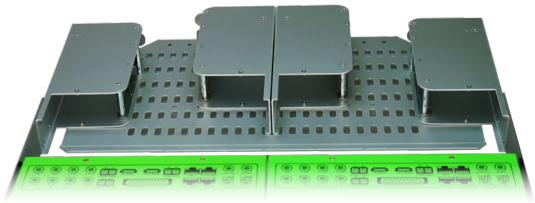
Network Connection

Ethernet (LAN)	1x 10/100/1000 BaseT RJ45 Connector
GPI I/O	• 4x general purpose inputs (RJ45 Connector) • 4x general purpose outputs (RJ45 Connector)
Serial Data	EIA/ETA RS232C / RS422 /RS 485 (selectable through Lynx-Centraal) - RJ45 connector ESD protection for up to 16kV

Options

RXT 6001 19" Rack Extension for RFR 6000

The RXT 6001 is a compact and flexible rack extension for RFR 6000. It can be setup to hold up to four RPS A100 power supplies with optimized airflow surfaces.



RXT 6001 installed in RFR 6000

ABS Case for greenMachine

The transport case is perfect to keep your greenMachine®, cables and documents organized and in one place, while also protecting it from enviromental influences. With it's study design, our ABS Case is the ideal partner to transport your greenMachine® whenever it is not wired in a rack, standalone or any other system you can think of.



Ordering Information

greenMachine Package			
Includes	**GM 6840**	greenMachine titan Processors	
	GMC-HDR-EVIE+-titan	greenMachine titan - HDR EVIE+ - Dynamic Segmented HDR to SDR converter UHD 12G-SDI or 4x 3G-SDI. Constellation Licence (Constellation Licence)	
	GMC-HDR-STATIC-titan	greenMachine titan - HDR STATIC- Static HDR to and from SDR Converter UHD 12G-SDI with UPXD or 4x 3G-SDI with Dual UPXD converter + Dual Scaler (Constellation Licence)	
	RFR 6000	Rack Frame for 1 or 2 greenMachines (without power supplies)	
	2x RPS A100:	Primary and Redundant Power Supplies with Region Specific Power Cord	
GMPT HDREvie+ (N/EU/US/UK)	greenMachine titan - HDR EVIE+ DYNAMIC Converter/Processor. UHD 12G-SDI or 4x 3G-SDI (EU/UK/US/None power cord) Power plug Variants (please specify when ordering) GMPT HDREvie+ N Power supply without Plug GMPT HDREvie+ EU Power Supply with EU Plug GMPT HDREvie+ US Power Supply with US Plug GMPT HDREvie+ UK Power Supply with UK Plug		**EAN:** 4250479327870
License Only (no hardware included)			
GMC-HDR-EVIE+-titan	greenMachine titan - HDR EVIE+ DYNAMIC Converter/Processor. UHD 12G-SDI or 4x 3G-SDI. Constellation Licence. (No Hardware)		4250479327252

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HESSEN Hessisches Ministerium für Wissenschaft und Kunst

Hochschule RheinMain University of Applied Sciences Wiesbaden Rüsselsheim

More broadcast applications:

- *GMC-TESTOR AV*: AV Test signal generator with delay compensation features in UHD or Quad 3G mode, incl. HDR test patterns
- *GMC-TESTOR*: Test signal generator in UHD or Quad 3G mode, incl. HDR test patterns
- *GMC-4KUPXD*: UHD Up/Down/Cross converter
- *GMC-3GUPXD*: Dual 3G Up/Down/Cross converter and Dual scaler

The greenMachine hardware can be configured for a different broadcast application independent of HDR Evie via the purchase of perpetual licenses and application deployment on the greenMachine.

Applicable regulatory and safety standards for greenMachine:
CE: EN 55103-1/1996, EN 55103-2 /1996, EN 60950-1/2006 Following the provisions of 2004/108/EC and 2006/95/EC directives.
FCC: This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15, Subpart B of the FCC Rules.

The RPS A100 power supply (EA11011D-1200) complies with the following safety standards:
UL/cUL 62368-1, TUV EN 62368-1, CB IEC 62368-1, FCC, CE, BSMI, PSE, RCM, IRAM

SFP Fiber Options

12G SDI Video Fiber Transmitter		Power		
OH-TX-12G-LC	12G-SDI Fiber TX SFP - LC - 10km* - 1310nm	-5 dBm		
12G SDI Video Fiber Receiver		**Sensitivity**		
OH-RX-12G-LC	12G-SDI Fiber RX SFP - LC - 10km* - 1270-1610nm	-10 dBm (12G)	-14 dBm (3G)	-16 dBm (1.5G)
12G SDI Video Fiber Transceiver		**Power**	**Sensitivity**	
OH-TR-12G-LC	12G-SDI Fiber Transceiver, Singlemode - 10km* - LC - 1310nm	-5/+0.5 dBm	-10 dBm (12G)	-14 dBm (3G/1.5G)
CWDM SDI Video Transceiver (TR)		**Power**	**Sensitivity**	
OH-TR-4-XXXX-LC **XXXX** = Wavelength	3G-SDI Fiber Transceiver, Singlemode CWDM capable - 40km* - LC 18 wavelengths acc. to ITU T G692.2: 1270 - 1610nm.	-4 ... +2 dBm	-20 dBm (3G/1.5G/SD)	
OH-TR-12G-XXXX-LC **XXXX** = Wavelength	12G-SDI Fiber Transceiver, Singlemode CWDM capable - 10km* - LC 18 wavelengths acc. to ITU T G692.2: 1270 - 1610nm.	-2/+3 dBm	-10 dBm (12G)	-14 dBm (3G/1.5G)

* **Distance is an approximation.** Actual distances achieved can be longer or shorter depending on the type of fiber cable and accumulated optical losses in the fiber link. Determine link losses and perform optical budget calculations to ensure correct operation.
More SFP options are available.