



Dynamic HDR to SDR converter

Description

The greenMachine HDR Evie (Enhanced Video Image Engine), 1 RU half 19" rackmount, is a real-time frame-by-frame broadcast-quality High Dynamic Range (HDR) to Standard Dynamic Range (SDR) converter, with frame sync supporting formats up to 4K UHD (3840x2160). It is the world's first system which uses the advanced algorithm for global dynamic tone mapping in real-time which automatically analyzes HDR stream and applies optimal corrections on a frame by frame basis.

This unique capability is unlike any other solution today and is the perfect real-time production tool for sports or any live broadcast event needing high-quality real-time HDR to SDR conversions. HDR EVIE fits best in the single native HDR workflow reducing cost on equipment and manual operations.

Features

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

BT.2020, BT. 709

Operation Modes

- 3G Quad channel configuration
- 4K UHD single channel configuration

Other included features

- 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

HDR EVIE provides 4 x 3G or 1x 4K/UHD processing channels supporting down-conversion from HDR transfer characteristics to SDR through appropriate dynamic tone mapping. It also supports **Wide Color Gamut (WCG)** needs of broadcasters, and professional AV live events requirement. HDR Evie package also includes HDR **Static** configuration for Static HDR <> SDR conversions, which performs static tone mapping to realize UP/Down/Cross conversions between HDR and SDR, suited best for the studios or the environments where the light conditions do not change dynamically.

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

Dynamic Processing

- *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 a user to adjust tone mapping calculation speed to get 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*

Color Processing

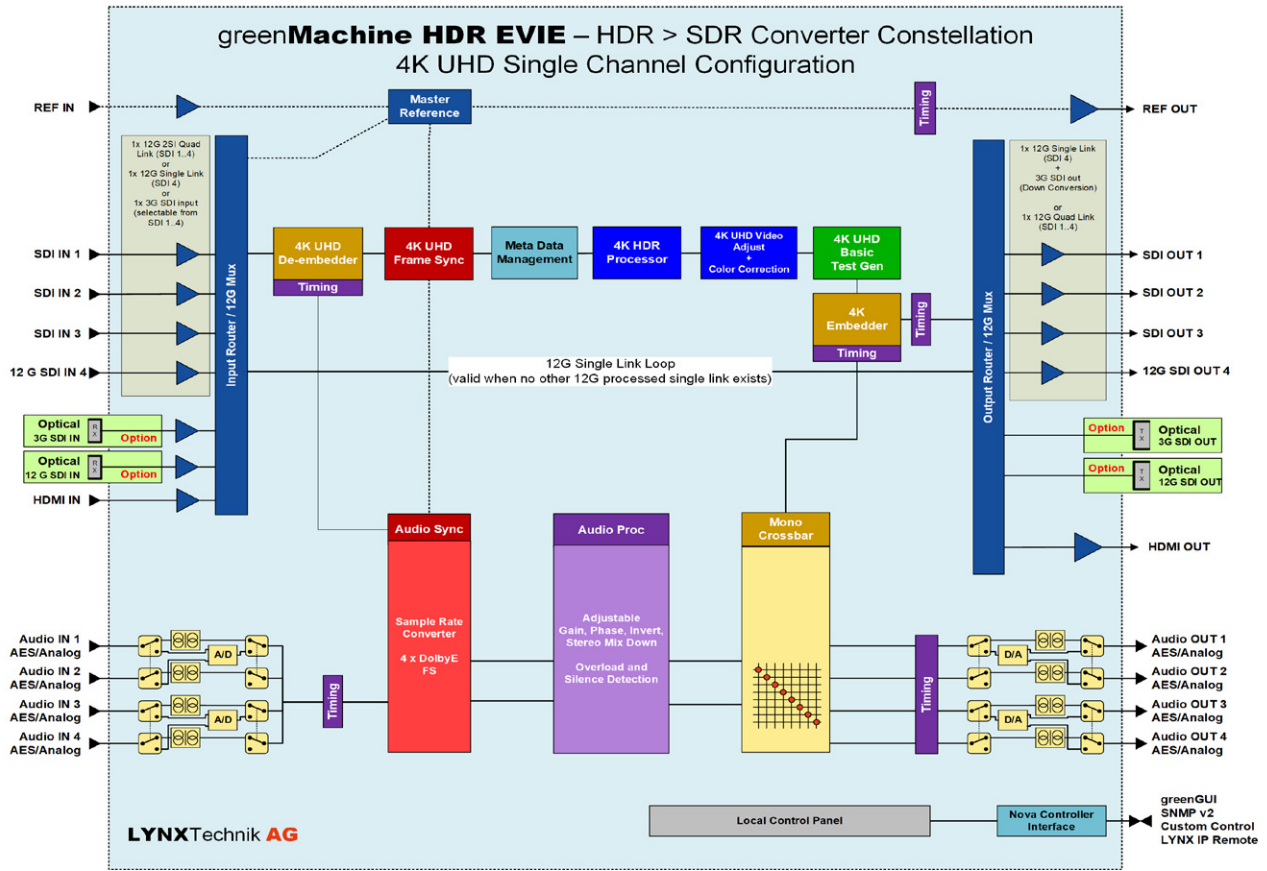
- RGB gain and offset adjustment
- CMYW gain and offset adjustment

Package includes HDR Static*

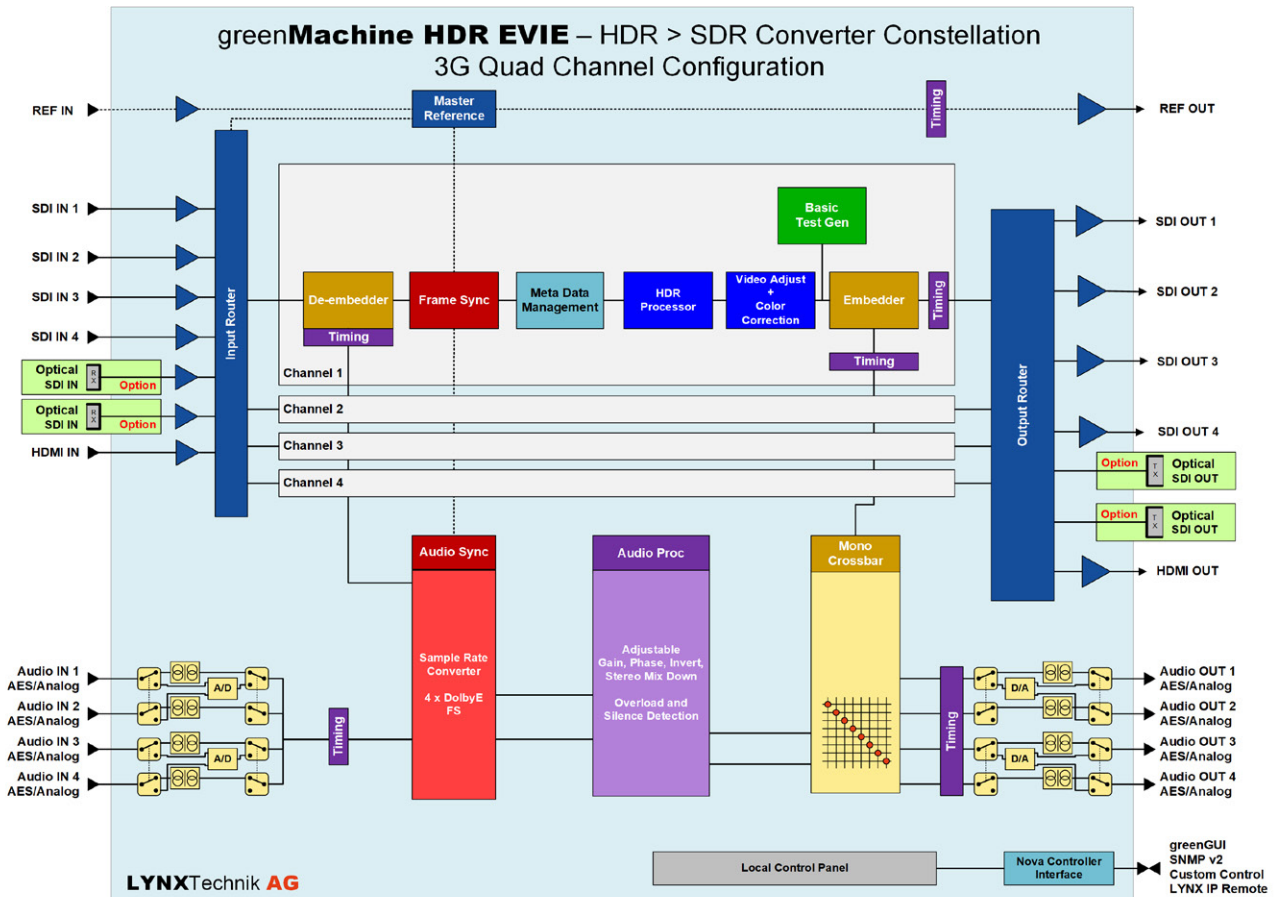
- Static HDR <> SDR Conversion- provides the best "roundtrip" (HDR>SDR>HDR or SDR>HDR>SDR)
- 3G Quad channel or 4K UHD single channel configuration
- MADI input and output

*The greenMachine hardware will support only one configuration at a time. It can be either be used in HDR Evie configuration or HDR Static configuration.

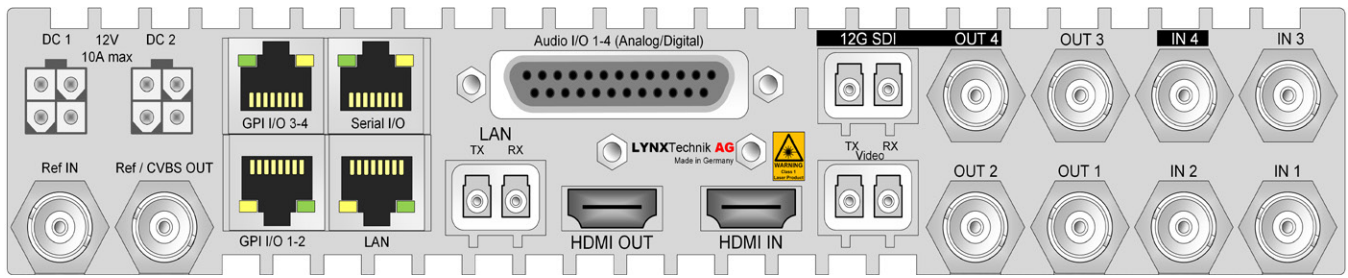
Functional Diagram Single 4K UHD Channel



Functional Diagram Quad 3G Channel



Hardware Specifications



SDI Inputs	3x 3G SDI video on 75 Ohm BNC connector (SMPTE, 292M, 424M, 259M) with automatic video format and standard detection	Ethernet (LAN)	1x 10/100/1000 BaseT RJ45 Connector
Return Loss:	>15dB from 5MHz to 1.5GHz, >10dB from 1.5GHz to 3GHz	Optical Ethernet (Optional)	IEEE 802.3z 1000Base-X Gbit/s Ethernet over Fiber at 1 Gbit/s (125 MB/s)
Automatic cable EQ (Belden 1694A):	340m@270Mbit/s, 150m@1.5Gbit/s, 110m@2.97Gbit/s	GPI I/O	<ul style="list-style-type: none"> • 4x general purpose inputs (RJ45 Connector) • 4x general purpose outputs (RJ45 Connector)
12G SDI Input	1x 12G SDI video on 75 Ohm BNC connector (SMPTE 292M, 424M, 259M, 2081, 2082) with automatic video format and standard detection	Reference Input	<ul style="list-style-type: none"> • 1x analog video reference on 75 Ohm BNC connector • Analog bi-level (SDTV) or tri-level (HDTV) auto detect
Return Loss:	same as 3G SDI; >7dB to 6GHz; >4dB to 12GHz	Reference Output	<ul style="list-style-type: none"> • 1x analog video reference on 75 Ohm BNC connector • Analog bi-level (SDTV) or ri-level (HDTV), cross lock capability
SDI Output	3x SDI video on 75 Ohm BNC connector (SMPTE, 292M, 424M, 259M)	Serial Data	EIA/ETA RS232C / RS422 /RS 485 (selectable through greenGUI) - RJ45 connector ESD protection for up to 16kV
Timing jitter:	< 0.2 UI @ 270Mbit/s, < 1.0 UI @ 1.5Gbit/s, < 2.0 UI @ 2.97Gbit/s	Audio I/O	4x input and 4x output on Sub-D 25 female connector
Alignment jitter:	< 0.2 UI @ 270Mbit/s, < 0.2 UI @ 1.5Gbit/s, < 0.3 UI @ 2.97Gbit/s	Analog:	input impedance >10k Ohm, Output Impedance 150 Ohm
Return Loss:	>15dB from 5MHz to 1.5GHz, >10dB from 1.5GHz to 3GHz	Analog I/O full scale level:	selectable 12, 15, 18, 20, 22, 24 dBu
12G SDI Output	1x 12G SDI video on 75 Ohm BNC connector (SMPTE 292M, 424M, 259M, 2081, 2082)	Digital:	AES3 balanced transformer isolated; Digital output level: 4V peak to peak nom
Return Loss:	same as 3G SDI; >7dB to 6GHz; >4dB to 12GHz	64 channel MADi supported on selected constellations (optional MADi SFP required for this)	
HDMI	<ul style="list-style-type: none"> • 1x Input 10 bit HDMI 1.4b • 1x Output 10 bit HDMI 1.4b 	Power	12VDC @ 45W nominal (supports 7 - 24VDC input range) 2x power connections for redundant power supply
Optical I/O (Optional)	<ul style="list-style-type: none"> • 1x 3G SDI SFP Transceiver (SMPTE 297M - 2006) • 1x 12G SDI SFP Transceiver (SMPTE 292M, 424M , 2081 2082) - no SD SDI (270MBit) 	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

Supported SDI Formats

SDTV Formats	525 / 59.94Hz 625 / 50Hz		
HDTV Formats	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
3GBit/s Formats Level A and B	1080p / 50Hz 1080p / 59.94Hz 1080p / 60Hz		

12GBit/s Formats Single Link	3840 x 2160p / 50Hz 3840 x 2160p / 59.94Hz 3840 x 2160p / 60Hz
12GBit/s Formats Quad Link 2SI Level A and B (4 x 3Gbit/s)	3840 x 2160p / 50Hz 3840 x 2160p / 59.94Hz 3840 x 2160p / 60Hz

Options

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 environmental influences. With its 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.

The hard shell case protects your greenMachine® from most impacts in an average, busy work environment, while the inner foam coating prevents it from being scratched by cables, connectors or other equipment that can also be stored inside the case.

The foam pocket inside the top lid of the case is ideal for storing quick reference guide, notes or any documentation.



RPS A100 - AC to DC Power Supply 12V/8A

The RPS A100 AC to DC Desktop power supply unit provides 100 watts of continuous output power. The power supply is equipped with IEC320-C14 AC inlet.

Plugs are available for regions EU, US and UK as well as an option without a power plug (N). When ordering just add the region shorthand at the end of the module name.



Fiber Options

Basic 3G SDI Video Fiber Transmitter & Receiver		Power / Sensitivity	
OH-TX-1-LC/ST/SC	SDI Fiber TX SFP - LC/SC or ST - 1310nm	-5dBm	
OH-RX-1-LC/ST/SC	SDI Fiber RX SFP - LC/SC or ST - 1270 - 1610nm	-16dBm	
3G SDI Video Fiber Transceiver		Power / Sensitivity	
OH-TR-1-LC	SDI Fiber Transceiver, Singlemode - LC - 1310nm	-5dBm	-18dBm
OH-TR-0-850-MM	SDI Fiber Transceiver, Multimode - LC - 850nm	-5dBm	-15dBm
CWDM SDI Video Fiber Transmitter (TX) and Transceiver (TR) (12G variants support 1.5G/3G/6G and 12G SDI)		Power / Sensitivity	
OH-TR-4-XXXX-LC XXXX = Wavelength	SDI Fiber Transceiver, Singlemode - CWDM capable - 40km* - LC 18 wavelengths acc. to ITU T G692.2: 1270nm through 1610nm.	-1dBm	-
Basic Ethernet Fiber Transceiver		Power / Sensitivity	
OH-TR-51-LC	Ethernet Fiber Transceiver, Singlemode - 10km* - LC - 1310nm	-3dBm	-21dBm
CWDM Ethernet Fiber Transceiver		Power / Sensitivity	
OH-TR-54-XXXX-LC XXXX = Wavelength	Ethernet Fiber Transceiver, Singlemode - CWDM capable - 40km* - LC 18 wavelengths acc. to ITU T G692.2 1270nm through 1610nm.	0dBm	-21dBm

* 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.

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in cooperation with:



RFR 6000 - 1RU 19" Rack Mount Chassis

Rack mounting hardware which can accommodate one or two greenMachines in 1RU of rack space which also securely mounts the power supplies.

Note: Two power supplies can be mounted onto one RFR 6000. Please see more information in the RFR 6000 quick reference guide.



One greenMachine in Rack Mount

RXT 6001 19" Rack Extension for RFR 6000

The greenMachine is ideally suited for standalone applications but this powerful processing platform reaches its full potential when used within a system design. 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.



RXT 6001 installed in RFR 6000

Ordering Information

greenMachine Titan Hardware and HDR EVIE License		
GMPT HDR EVIE EU	Dynamic HDR to SDR Converter EU (H/W & License)	EAN: 4250479326392
GMPT HDR EVIE UK	Dynamic HDR to SDR Converter UK (H/W & License)	EAN: 4250479326408
GMPT HDR EVIE US	Dynamic HDR to SDR Converter US (H/W & License)	EAN: 4250479326415
HDR EVIE License Only		
GMC-HDR-EVIE-titan	Dynamic HDR > SDR converter Constellation (License only- includes no hardware)	EAN: 4250479326187
Accessories and Power Supply		
R FR 6000	1 RU 19" Rack Mount Chassis	EAN: 4250479324466
RXT6001	19" Rack Frame Extension for RFR 6000	EAN: 4250479326507
RPS A100 (N/EU/US/UK)	AC to DC Desktop Power Supply Module 12V/8A (with None / EU / US / UK plug)	EAN: 4250479327955

For greenMachine the following regulatory and safety standards apply:

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

