green**Machine**®
Package

green**Machine titan** HDR <> SDR Converter

The greenMachine approach is unique. The hardware itself is a powerful general purpose audio and video processing appliance that can perform many different functions using one of the available greenMachine configurations (constellations) Each constellation includes a combination of processing functions to perform high level processing including FS, UPXD, HDR etc.

greenMachine titan

The greenMachine HDR <> SDR Converter Package consist of the greenMachine titan HW and the HDR STATIC constellation.

Below you can find some basic information about the greenMachine titan.

For more information about the greenMachine titan please visit:

www.lynx-technik.com

Description

The greenMachine HDR STATIC Constellation is a fully featured broadcast quality HDR to SDR, SDR to HDR or cross standard HDR to HDR converter, with a frame sync and up/down/cross converters supporting formats up to 4K UHD (3840x2169). The HDR STATIC applies colour and contrast parameters equally throughout a specific piece of content, i.e. an average brightness/color range is determined across an entire program.

The HDR STATIC Constellation must be used on the greenMachine titan 4-channel HW platform. It provides either a single 12G 4K-UHD processing channel, or four independent processing channels for SDI signals up to 1080p 3Gbit/s.

Modern image sensors offer significantly wider dynamic color ranges than classic TV devices can reproduce. The color ranges are defined as High Dynamic Range (HDR) and Standard Dynamic Range (SDR). SDR describes the older dynamic range in SD and HD-TV standards. With HDR there are completely new possibilities for broadcast and AV productions to provide an increased dynamic range for the viewer, including brighter highlights and more details in the dark areas of the image resulting in more brilliant and realistic images. One of the major challenges when introducing HDR with its tremendous image enhancements is to maintain good backward compatibility with existing SDR displays and receivers.

The greenMachine HDR-STATIC Constellation is a powerful tool for handling dynamic ranges and color gamuts, presenting viewers with more dynamic images than previously seen, even without an up-to-date HDR display. It provides conversion functionality, simultaneously combining it with a static (real time) tone mapping algorithm. This application allows the user to carry out up-, down- and cross-conversions between common input and output curves including Gamma, PQ, HLG and slog3 and conversions between full and narrow ranges through appropriate static tone mapping. Conversion between color spaces including Rec. 601, Rec. 709 and Rec. 2020 are also possible. HDR content can also be displayed, by contrast compression, on non HDR-capable TV monitors thus producing a high level of HDR-enhanced image quality for all possible display types.

This greenMachine HDR STATIC constellation also includes spatial Up, Down and Cross conversions up to 4K UHD, audio processing and shuffling, color correction, timing adjustment, Meta Data processing and the Nova controller which enables the greenMachine to be remotely controlled and monitored via third party master control software. CustomControl is also included providing simplified customised screen panels offering direct access to user selected parameters.

Included Features

HDR <> SDR Conversion
Allows for HDR to SDR, SDR to HDR and HDR to HDR conversions. Supports Gamma, PQ, HLG and SLog3.
Supported Color spaces: Rec. 601, Rec.709 and Rec. 2020.

4K UHD / 3G Scaler
The Scaler is a high quality spatial converter with powerful Region of Interest (ROI) selection and scaling.

DeInterlacer (only in 4K UHD mode)
The De-Interlacer will perform broadcast quality deinterlacing for incoming interlaced SD and HD video formats and applies motion adaptive filtering resulting in superb image quality.

Frame Synchronizer
The Frame synchronizer utilises an external Ref. with a robust "flywheel" function for synchronization of SDI sources up to 4K UHD. All embedded audio is extracted and delayed automatically to match the video processing delay, then embedded via a matrix into the SDI output.

3G Level A/B
This provides automatic detection of 3G-SDI level A or Level B inputs and can convert a 3G Level A input signal (acc. to SMPTE ST425-1/4:2:2, 10 Bit) into a 3G Level B Dual Link output signal, or vice versa.

Embedding / De-embedding
A high quality multi-format audio embedder and de-embedder which can access all audio channels in the input SDI channel(s), shuffle and embed them in to the output(s). It can also embed DolbyE™ signals which in conjunction with the Frame Synchronizer will always maintain the guardband. It is also possible to incorporate separate AES and/or analogue audio inputs and outputs.

Basic Audio & Video Test Generator
The test generator is a basic audio & video test signal generator with a wide range of still video test patterns. It can be configured to work in conjunction with the Frame Synchronizer to output a test pattern on TRS errors.

Audio Processing
Each mono audio channel has gain adjustment, mute, inversion and stereo to mono mix-down. In addition, each mono channel has silence and overload monitoring as well as a 1 kHz test signal.

MetaData Management
The MetaData function manages the embedded metadata of the video signals. Time Code, Closed Captions and Teletext can be monitored and/or converted.

Video Adjustments
Video Adjustments include saturation, gain, black and hue adjustments, blanking interval deletion, and more.

Color Matching
This feature provides gain and offset adjustment for:
Red, Green, Blue, Cyan, Magenta, Yellow and Black.
This makes it the ideal tool to correct the color balance of monitors for example.

Timing
Each video and AES audio channel can be individually delayed. The available video delay per channel is 30 frames, the available audio delay is 1.3 seconds per AES audio channel.

Nova Controller (included in basic GM hardware)
This adds full SNMP v2 as well as LYNX IP remote control protocol. Mini-Nova also includes CustomControl which enables the user to design customized control panels for a computer or an iPad, giving simplified direct access to user selected parameters. CustomControl is particularly useful in live environments where instant access to a regularly used set of parameters is required without the distraction or risk of accessing all the system settings.

Functional Diagram Single 4K UHD Channel

green**Machine HDR STATIC** – HDR <> SDR Converter Constellation
4K UHD Single Channel Configuration
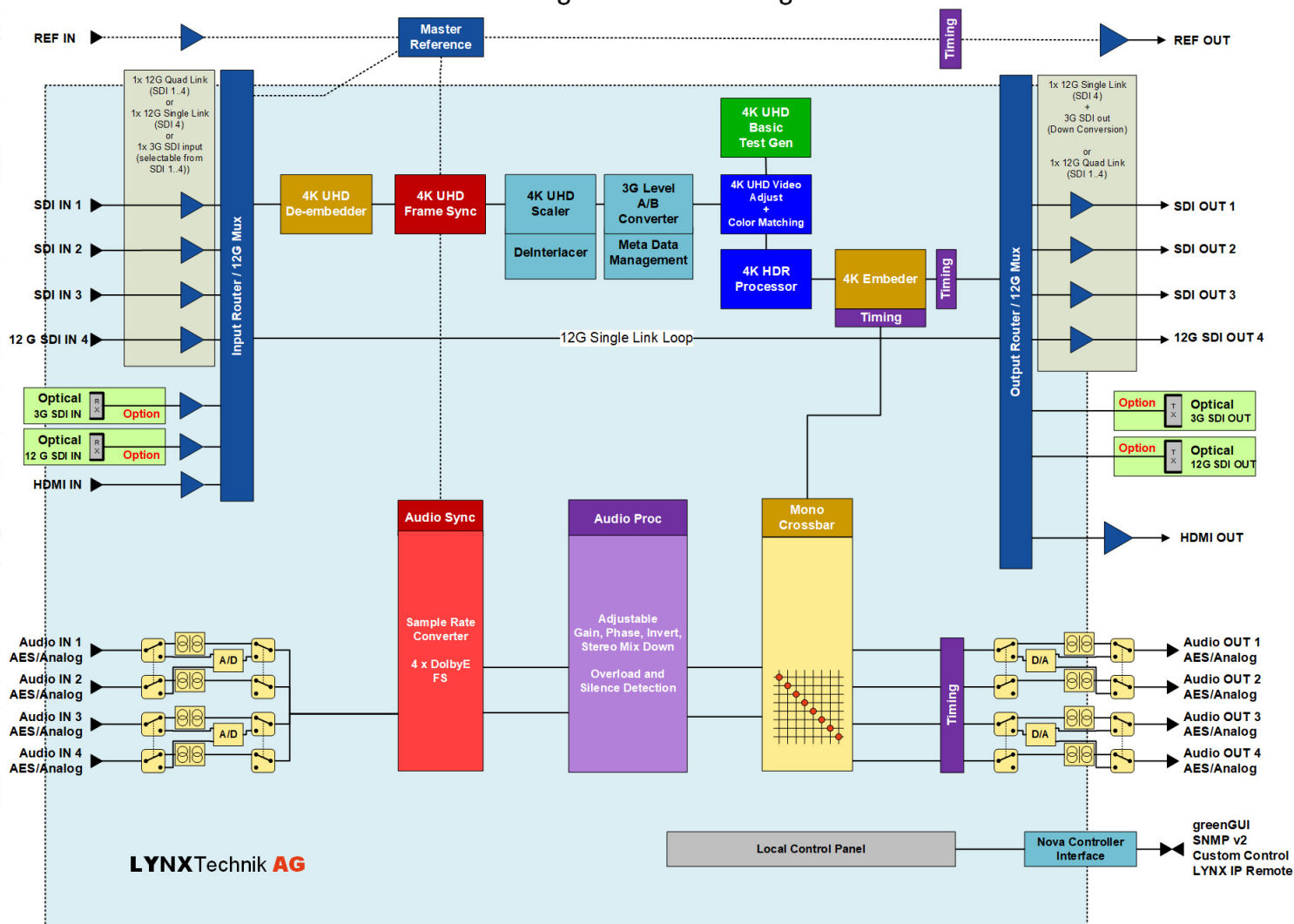
The greenMachine HDR STATIC - HDR <> SDR Converter Consteallation consists of two individual Configurations. One for a single 12G 4K-UHD processing channel, the other for four independent 3G processing channels of SDI signals up to 3Gbit/s configuration.

When deploying this constellation the user will be asked what configuration (4K UHD or 4x3G) he would like to deploy.
The user can deploy the constellation via the greenMachine front panel or within the greenGUI running on a network connected PC or MAC.

The NOVA controller is already included in the basic GM hardware.

Functional Diagram Quad 3G Channel

green**Machine HDR STATIC** – HDR <> SDR Converter Constellation
3G Quad Channel Configuration

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LOEWE
Exzellente Forschung für Hessens Zukunft

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in cooperation with:

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