



3G UPXD

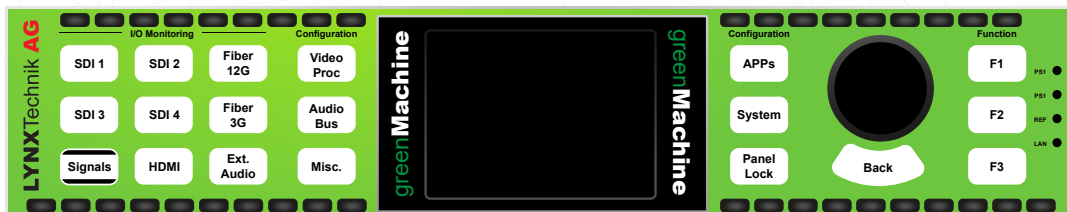
Up/Down/Cross Converter



Description

The greenMachine 3GUPXD is a broadcast-quality video processing unit that has a quad-channel up/down/cross converter with frame synchronizer supporting formats up to 3G-SDI (1920 x 1080) per channel. It includes full audio processing capabilities, scalars for the spatial conversion of the video signals including a versatile region of interest (ROI) selection and high-performance deinterlacers on two processing channels.

The greenMachine 3GUPXD provides 4x3G processing channels with independent embedder & de-embedder, audio processing, Dolby E® decoding, color correction and many more features on each channel. It comes with a fully-featured local control interface with LCD which displays image previews and audio level meters of the processed video paths in addition to the graphical user interface called greenGUI. It is also supported by the Nova controller which enables the module to be remotely controlled and monitored via third party master control software.



Features

Processing Channels: Four independent 3G channels (4x3G)

3G Scaler: A spatial converter with a powerful region of interest (ROI) selection and scaling. The conversion modes supported are: *Pillar box/Letterbox, Center cut, 14:9 conversion, Stretch to fill, and Custom ROI.*

Deinterlacer: Deinterlacers on channel 1 and channel 2 performing broadcast-quality deinterlacing on SD and HD video formats.

Motion adaptive filtering: Motion adaptive filtering allows deinterlacer to create a sequence of output frames at the same rate as the sequence of input fields eliminating feathering or flickering artefacts.

3G level A/B: It provides automatic detection of 3G level A/B and allows 3G level A <> 3G level B dual-link conversion. (3G level A acc. to SMPTE ST425-1/4:2:2, 10Bit)

Frame Synchronizer: One of the best synchronizers in the industry utilizing the external reference with a robust "flywheel" function for the synchronization of SDI sources. All embedded audio is extracted and delayed automatically to match the video processing delay, then embedded via a matrix into the SDI output.

Metadata Management: This functionality manages the embedded metadata in the video signals. **Time code, Closed captions,** and Teletext can be monitored and/or converted.

Video Adjustment: It includes **saturation, gain black and hue adjustments, blanking interval deletion and aperture correction.** It also provides a horizontal flip and YCrCb headroom clipping functionality.

Color correction: It allows adjustments in gain, offset, lift, and gamma for Red, Green, and Blue (RGB). It also provides gain and offset adjustments for Cyan, Magenta, Yellow, and White (CMYW).

Embedder/De-embedder: A multi-format audio embedder and de-embedder provide access to all the channels in the input SDI and allow shuffling and embedding them to the output(s).

Audio Processing: It provides **gain adjustment, mute, inversion, and stereo to mono-mix** on each mono audio channel including **silence and overload monitoring.** It has a 1kHz test signal as well.

Dolby E® decoder: Two Dolby E® decoders can be used to decode all 8 channels contain in a Dolby E® stream. The Dolby® metadata can be mapped to VANC acc. to SMPTE 2020-3 and SMPTE 2020-2.

MADI in/out: This provides a MADI input and output. All incoming MADI signals are routed to the internal audio crossbar. The outgoing MADI signal can be completely re-arranged in the internal audio crossbar.

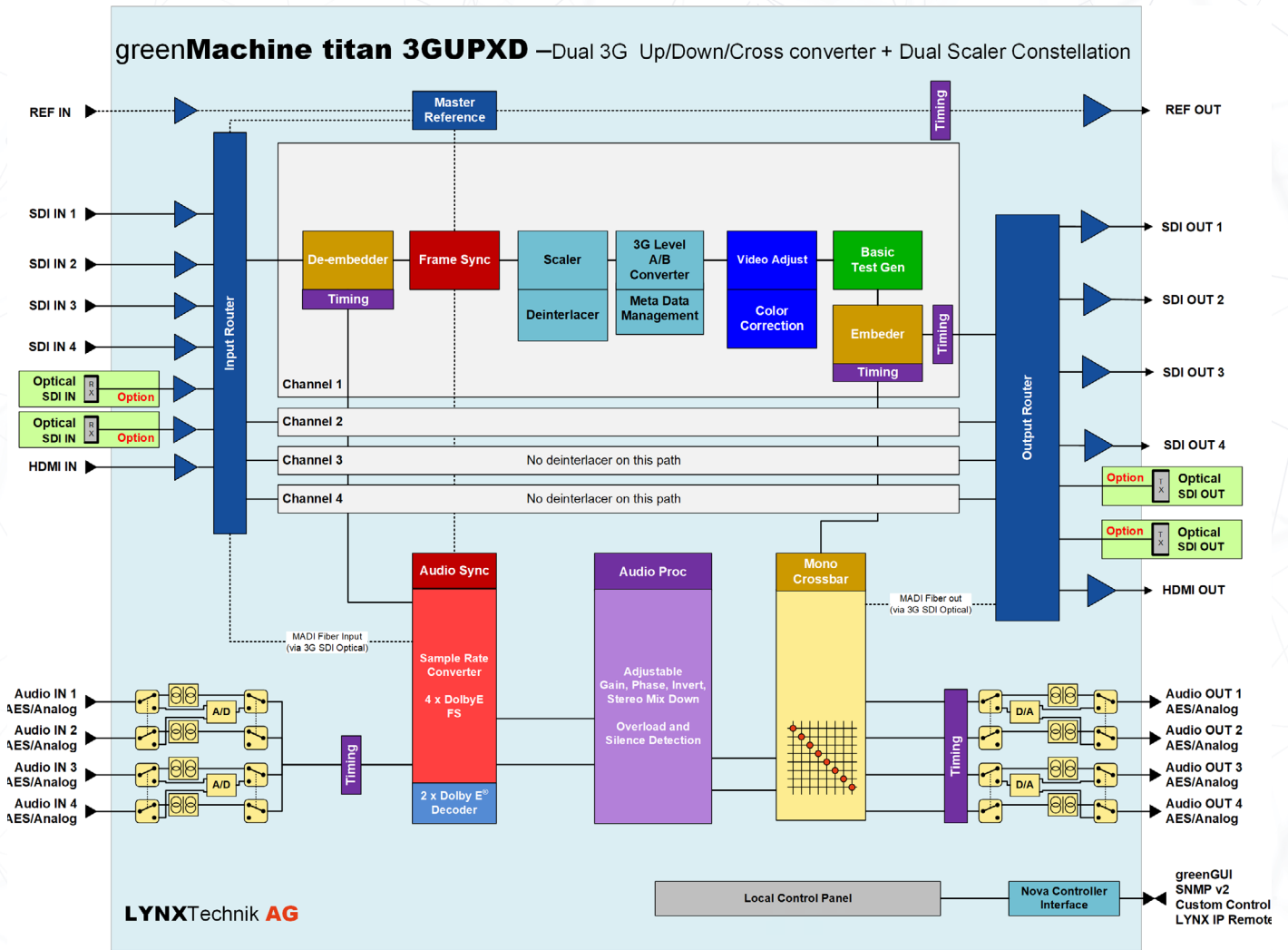
Basic Audio & Video Test Generator The test generator is a basic audio & video test signal generator with a wide range of still video test patterns. It can be configured to work in conjunction with the Frame Synchronizer to output a test pattern on TRS errors.

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

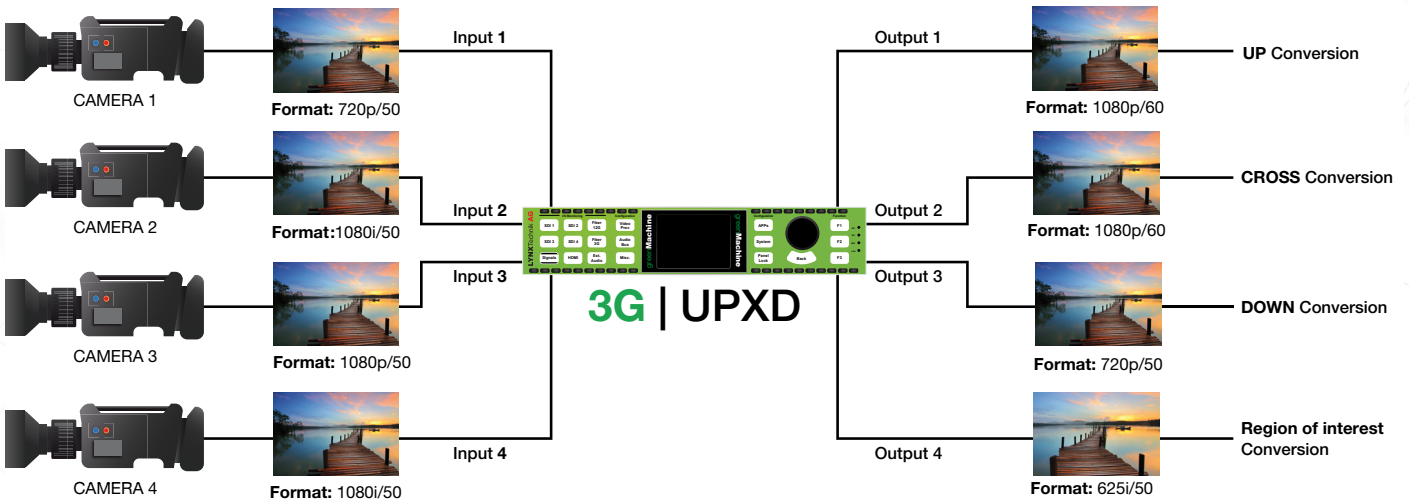
greenGUI greenGUI is a control software that provides remote control and status monitoring and event (error) reporting for all the greenMachines installed on a network.

Nova Controller It adds full SNMP v2 along with LYNX IP remote control protocol functionality to the system. It enables CustomControl feature that allows users to design customized control panels for a computer, giving specific simplified user-specific controls.

Functional Diagram



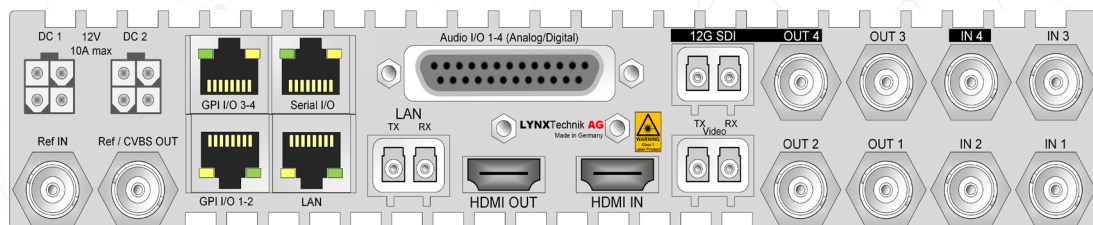
Example: 3GUPXD Workflow



4 processing channels operating independently from each other.

Hardware Specifications

| | | | |
|------------------------------------|--|-------------------------|---|
| SDI Inputs | 3x 3G SDI video on 75 Ohm BNC connector - SMPTE, 292M, 424M, 259M 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@2.97Gbit/s | 12G SDI Output | 1x 12G SDI video on 75 Ohm BNC connector - SMPTE 292M, 424M, 259M, 2081, 2082 Return Loss: same as 3G SDI; >7dB to 6GHz; >4dB to 12GHz |
| 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 Return Loss: same as 3G SDI; >7dB to 6GHz; >4dB to 12GHz | Serial Data | EIA/ETA RS232C / RS422 /RS 485 (selectable through greenGUI) - RJ45 connector ESD protection for up to 16kV |
| HDMI Input / Output | 1x 10 bit HDMI 4K/UHD 1.4b | Reference Output | 1x analog video reference on 75 Ohm BNC connector Analog bi-level (SDTV) or ri-level (HDTV), cross lock capability |
| Optical I/O (Optional) | 1x 3G SDI SFP Transceiver (SMPTE 297M - 2006) 1x 12G SDI SFP Transceiver (SMPTE 292M, 424M, 2081, 2082) - no SD SDI (270Mbit) | Audio I/O | 4x input and 4x output on Sub-D 25 female connector Analog: input impedance >10k Ohm, Output Impedance 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 |
| Ethernet (LAN) | 1x 10/100/1000 BaseT RJ45 Connector | Power | 12VDC @ 45W nominal (supports 7 - 24VDC input range) 2x power connections for redundant power supply |
| Optical Ethernet (Optional) | IEEE 802.3z 1000Base-X Gbit/s Ethernet over Fiber at 1 Gbit/s (125 MB/s) | Mechanical | W: 218mm (1/2 19"), H: 44mm (1.75"), D: 225mm (8.86") - including connectors. Weight: 1.4kg (3.09lb) |
| GPI I/O | 4x general purpose inputs + 4x general purpose outputs - RJ45 Connectors | Ambient | Temperature: 5°C to 40°C (41°F to 104°F) maintaining specification Humidity: 90% maximum, non-condensing |
| Reference Input | 1x analog video reference on 75 Ohm BNC connector Analog bi-level (SDTV) or tri-level (HDTV) auto detect | Model # | <i>GMPT 3GUPXD EU - (EAN# 4250479326514)</i> <i>GMPT 3GUPXD UK - (EAN# 4250479326538)</i> <i>GMPT 3GUPXD US - (EAN# 4250479326545)</i> |
| SDI Output | 3x SDI video on 75 Ohm BNC connector (SMPTE, 292M, 424M, 259M) Timing jitter: < 0.2 UI @ 270Mbit/s, < 1.0 UI @ 1.5Gbit/s, < 2.0 UI @ 2.97Gbit/s Alignment jitter: < 0.2 UI @ 270Mbit/s, < 0.2 UI @ 1.5Gbit/s, < 0.3 UI @ 2.97Gbit/s Return Loss: >15dB from 5MHz to 1.5GHz, >10dB from 1.5GHz to 3GHz | Includes | greenMachine Titan: GM6840 3G UPXD Constellation: GMC-3GUPXD Primary Power Supply: R PS 6120 with EU/UK/US power cord |



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 / 23.98Hz 720p / 24Hz 720p / 25Hz | 720p / 29.97Hz 720p / 30Hz 720p / 50Hz 720p / 59.94Hz 720p / 60Hz |
| 3Gbit/s Formats Level A | 1080p / 50Hz 1080p / 59.94Hz 1080p / 60Hz | | |

Other Configuration Variants

- **GMC-HDR-EVIE:** Dynamic HDR > SDR converter
- **GMC-HDR-Static:** Static HDR <> SDR converter
- **GMC-TESTOR:** Audio & Video Test signal generator in 4K UHD or Quad 3G mode including HDR test patterns
- **GMC-4KUPXD:** 4K Up/down/cross converter
- **GMC-Quad3G-FS:** 4x3Gbit/s Frame Synchronizer
- **GMC-BiDi-Transport:** Bi-directional Transport (requires two greenMachine working in Master & slave configuration).

*The greenMachine hardware can be configured for a different broadcast application independent of 3GUPXD via the purchase of perpetual licenses and application deployment on the greenMachine.

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 sturdy 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.



Fiber Options

| Basic 3G SDI Video Fiber Transmitter | | Power |
|--|--|--|
| OH-TX-1-Y-LC/ST/SC | SDI Fiber TX SFP - LC/SC or ST - 1310nm | -5dBm |
| Basic 3G SDI Video Fiber Receiver | | Sensitivity |
| OH-RX-1-LC/ST/SC | SDI Fiber RX SFP - LC/SC or ST - 1270-1610nm | -16dBm |
| Basic 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 |
| 12G SDI Video Fiber (support 1.5G/3G/6G and 12G SDI) | | Power / Sensitivity |
| OH-TR-12G-LC | 12G SDI Fiber Transceiver, Singlemode - LC - 1310nm | -5dBm -12dBm |
| OH-TX-12G-LC | 12G SDI Fiber Transmitter, Singlemode - LC - 1310nm | -5dBm - |
| OH-RX-12G-LC | 12G SDI Fiber Receiver, Singlemode - LC | - -12dBm |
| CWDM SDI Video Fiber Transmitter (TX) and Transceiver (TR) (12G variants support 1.5G/3G/6G and 12G SDI) | | Power / Sensitivity |
| OH-TR-12G-XXXX-Y-LC XXXX = Wavelength | 12G SDI Fiber Transceiver - CWDM capable - 10km* - LC 17 wavelengths acc. to ITU T G692.2 1270nm through 1590nm. | -2...+3 (dBm) -10dBm (6G,12G) -14dBm (1.5G,3G) |
| OH-TX-12G-XXXX-LC XXXX = Wavelength | 12G SDI Fiber Transmitter - CWDM capable - 10km* - LC 8 wavelengths acc. to ITU T G692.2: 270nm-1330nm & 1550nm-1610nm | -3dBm - |
| OH-TX-4-XXXX-Y-LC XXXX = Wavelength | SDI Fiber Transceiver, Singlemode - CWDM capable - 40km* - LC 18 wavelengths acc. to ITU T G692.2: 1270nm through 1610nm. | -1dBm - |
| 12G SDI Video Fiber Bidirectional Transceiver (support 1.5G/3G/6G and 12G SDI) | | Power / Sensitivity |
| OH-BD-12G-1270-LC | SDI Fiber Bidirectional Transceiver - WDM capable - 10km* - LC OH-BD-12G-1330-LC required at opposing end | -3...+3 dBm -10dBm (6G,12G) -14dBm (1.5G,3G) |
| OH-BD-12G-1330-LC | SDI Fiber Bidirectional Transceiver - WDM capable - 10km* - LC OH-BD-12G-1270-LC required at opposing end | -3...+3 dBm -10dBm (6G,12G) -14dBm (1.5G,3G) |
| 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.

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

RXT6001 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 6120 power supplies.



RXT 6001 installed in RFR 6000

RPS 6120 - Redundant Power Supply

The second external in line power supply for redundant power protection.



Ordering Information

| greenMachine Titan Hardware and 3GUPXD License | | |
|--|--|--------------------|
| GMPT 3GUPXD EU | Dual 3G Up/Down/Cross Converter + Dual Scaler EU (H/W & License) | EAN: 4250479326514 |
| GMPT 3GUPXD UK | Dual 3G Up/Down/Cross Converter + Dual Scaler UK (H/W & License) | EAN: 4250479326538 |
| GMPT 3GUPXD US | Dual 3G Up/Down/Cross Converter + Dual Scaler US (H/W & License) | EAN: 4250479326545 |
| 3GUPXD License Only | | |
| GMC-3GUPXD | greenMachine titan 3GUPXD constellation: Dual 3G Up/Down/Cross Converter + Dual Scaler (License only - includes no hardware) | EAN: 4250479326521 |
| 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 |
| R PS 6120 EU | Desk Power supply with EU cord | EAN: 4250479324343 |
| R PS 6120 UK | Desk Power supply with UK cord | EAN: 4250479324350 |
| R PS 6120 US | Desk Power supply with US cord | EAN: 4250479324367 |

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 6120 power supply (EA11011H-120) complies with the following safety standards:
UL CCC PSE

