








## greenMachine callisto Package Dual 3G/HD/SD Frame Synchronizer



1x greenMachine callisto

	<b>2x Frame Synchronizer</b>
	<b>2x Embed/De-embed</b>
	<b>1x Audio Proc</b>
	<b>1x Timing</b>
	<b>2x Video Adjust</b>
	<b>2x Test Gen</b>
	<b>1x MiniNova</b>

## Features

- Dual channel frame synchronizer
- Supports video formats up to 3Gbit (auto-detect)
- Bi-Level or tri-level reference input, auto detect, cross lock compatible
- Robust “flywheel” frame synchronizer functionality
- Up to 30 frames of output delay per video channel
- 4 Audio inputs and outputs switchable between analog and digital
- Up to 1.3s of programmable audio delay per audio pair
- HDMI input and output
- Test signal generator per video processing channel
- Optional video fiber I/O, basic fiber or CWDM with all 18 wavelengths selectable
- Optional Ethernet LAN Fiber connection (basic or CWDM)
- Integrated local control panel for configuration and monitoring
- Extensive monitoring features such as image previews and audio level meters available on the local control panel and control software
- CustomControl Panels
- Full SNMP v2 support
- Full remote control using greenGUI control software
- Optional redundant power protection
- Optional 19” rack frame

## Description

The greenMachine Dual Frame Synchronizer Package includes a greenMachine callisto hardware appliance and the necessary APPs to form a fully featured dual channel frame synchronizer.

This package is designed for applications that require compact, robust and dependable broadcast quality frame synchronization with full audio processing capability. Any video input (SDI, HDMI or Fiber) can be assigned to either video processing path.

The audio processing capabilities are extensive. This solution de-embeds all audio as well as providing support for four external audio inputs or outputs which individually can be configured to be analog or digital interfaces. Multiple internal crossbars allow for extensive audio shuffling. It also provides content aware audio processing, DolbyE synchronization, full audio processing as well as multiple adjustable user delays.

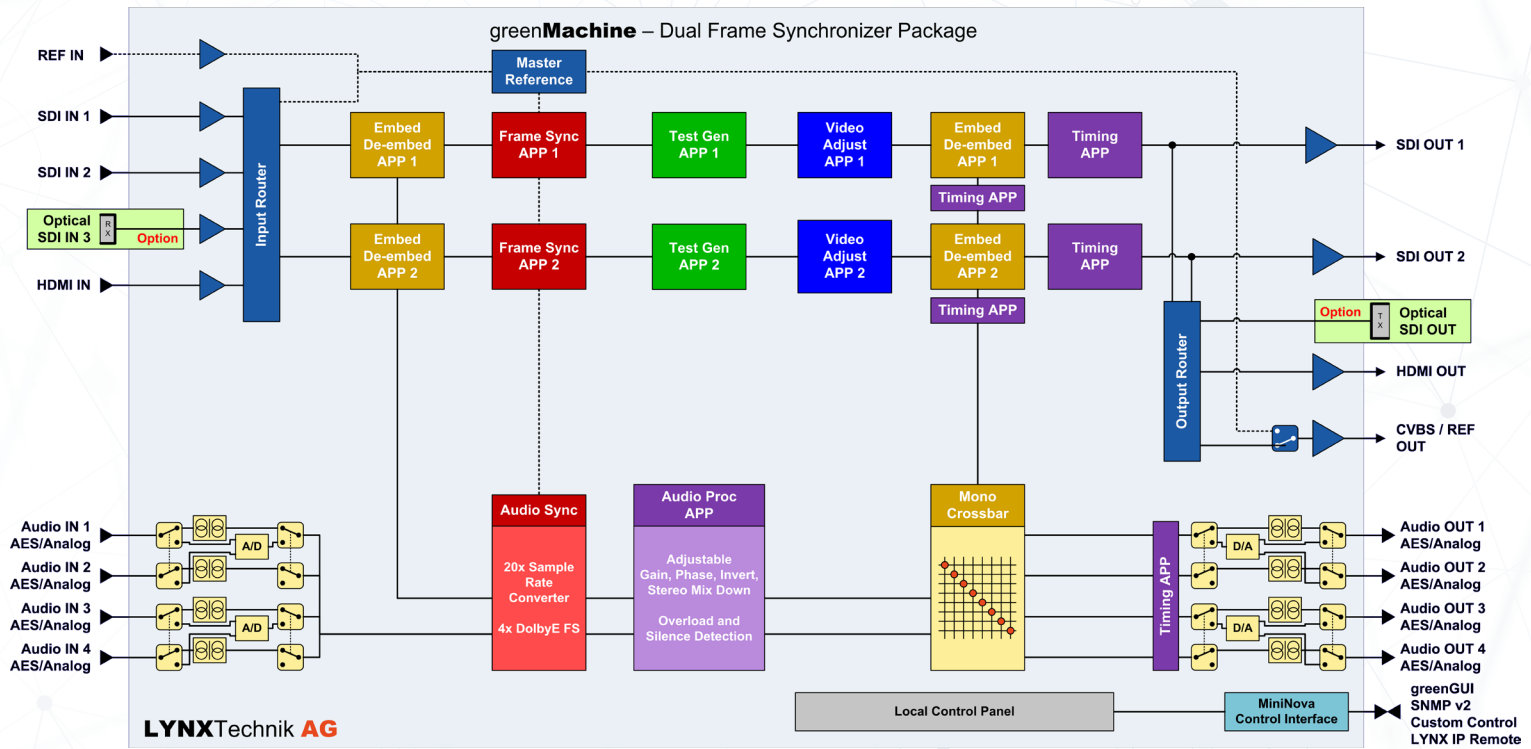
The greenMachine callisto hardware comes with a fully featured local control interface with an LCD which displays image previews and audio level meters of the processed video paths in addition to the graphical user interface.

The greenMachine Dual Frame Synchronizer Package also includes the MiniNova APP which enables the module to be remotely controlled and monitored via third party master control software.

Get the full story at [www.green-machine.com](http://www.green-machine.com)

## Functional Diagram

(With all APPs in the package deployed)



## Included APPs

(More APPs are available at the greenStore™)



**2x Frame Synchronizer** This utilizes robust “flywheel” synchronization that will accommodate a wide variety of low quality asynchronous SDI sources. All embedded audio is extracted and delayed automatically to match the video processing delay. Audio is free from disturbances even when dropping and adding frames.



**2x Embed/De-embed** A high quality multi-format audio embedder and de-embedder application which can embed and / or de-embed up to 16 mono audio channels of the SDI channel. The embedder can also embed DolbyE signals which in conjunction with the Frame Synchronizer APP will always maintain the guardband.



**2x Test Gen** The test generator APP is a basic audio & video test signal generator with a wide range of still video test patterns available for each processing channel. The test generator can be configured to work in conjunction with the Frame Synchronizer APP to output a test pattern on TRS errors.



**1x Audio Proc** This APP provides a multitude of audio processing functionality. Each mono audio channel has gain adjustment, mute, inversion, stereo to mono mix-down. In addition each mono channel has a silence and overload monitoring as well as a 1 kHz test signal generator.



**2x Video Adjust** The Video Adjust APP provides a range of video processing functionalities. These include saturation, gain, black and hue adjustments, blanking interval deletion, horizontal image flip, aperture correction and YCrCb headroom clipping. The Video Adjust APP can be used for each processing channel.



**1x Timing** The Timing APP is a powerful video and audio delay tool. Each video and AES audio channel can be individually delayed. The available video delay per channel is 30 frames and is adjustable in pixel, line and frame increments or milliseconds. The available audio delay is 1.3 seconds per AES audio channel.

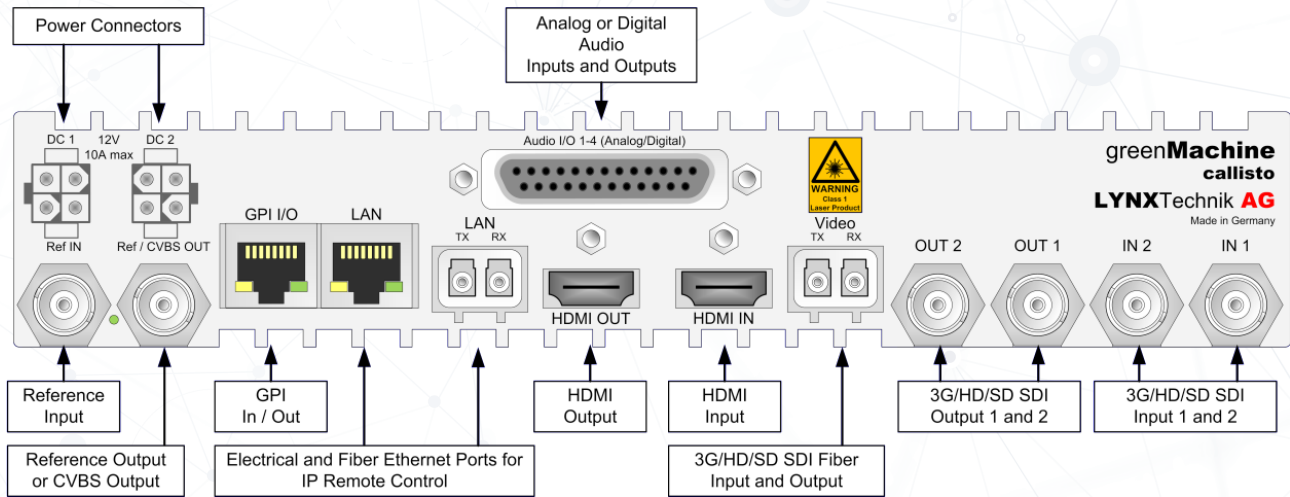


**1x MiniNova** The MiniNova APP adds the remote interfaces including full SNMP v2 as well as LYNX IP remote control protocol. MiniNova also includes CustomControl which enables the user to design customized control panels. The custom panels can be accessed from a computer or an iPad.

For more details and to see the complete portfolio of APPs available, please visit:

[www.lynx-technik-greenstore.com](http://www.lynx-technik-greenstore.com)

## Connections



## Options

### RFR 6000 - 1RU 19" Rack Mount Chassis

The RFR 6000 is a compact 19" rack mounting solution occupying 1RU of vertical rack space. It can be configured to accommodate one or two greenMachines. In either configuration the RFR 6000 also provides innovative mounting options for one or two of the external RPS 6120 "brick" power supplies both of which can be securely mounted within the 19" 1RU footprint.



### RPS 6120 - Redundant Power Supply

Each greenMachine includes the RPS 6120 primary power supply, an external desktop "brick" style power supply. An optional second power supply can be added for redundant protection.

The greenMachines support seamless auto changeover between primary and redundant power supply. LEDs on the front control panel of the greenMachine hardware indicate the status of the supplies.



## Fiber Options

The greenMachine callisto is equipped with two SFP sockets. One socket is for SDI connectivity and the other is for Ethernet. Both can accommodate a variety of plug in SFP fiber I/O options.

SFPs for simple point to point connections (singlemode or multimode versions) as well as SFPs for multiplexed bidirectional CWDM applications with up to 18 wavelengths are available.



Fiber options can be added at any time.

## Specifications

Basic SDI Video Fiber Transmitter		Power	
<b>OH-TX-1-LC / ST / SC</b>	SDI Fiber TX SFP - LC / SC or ST (1310nm)	-5dBm	
SDI Video Fiber Receiver		Sensitivity	
<b>OH-RX-1-LC / ST / SC</b>	SDI Fiber RX SFP - LC / SC or ST (1270-1610nm)	-16dBm	
Basic SDI Video Fiber Transceiver		Power / Sensitivity	
<b>OH-TR-1</b>	SDI Fiber Transceiver Singlemode (1310nm)	-5dBm	-18dBm
<b>OH-TR-0-850</b>	SDI Fiber Transceiver Multimode (850nm)	-5dBm	-15dBm
CWDM SDI Video Fiber Transmitter (singlemode)		Power	
<b>OH-TX-4-XXXX</b>	SDI Video Fiber Transmitter SFP CWDM 18 wavelengths available according to ITU T G692.2 1270nm through 1610nm. <b>XXXX</b> = wavelength	-1dBm	
CWDM SDI Video Fiber Transceiver (singlemode)		Power / Sensitivity	
<b>OH-TR-4-XXXX</b>	SDI Video Fiber Transceiver SFP CWDM 18 wavelengths available according to ITU T G692.2 1270nm through 1610nm. <b>XXXX</b> = wavelength	-1dBm	-20dBm
Basic Ethernet Fiber Transceiver		Power / Sensitivity	
<b>OH-TR-51</b>	Ethernet Fiber Transceiver Singlemode - 1310nm	-3dBm	-21dBm
CWDM Ethernet Fiber Transceiver (singlemode)		Power / Sensitivity	
<b>OH-TR-54-XXXX</b>	Ethernet Fiber Transceiver SFP CWDM 18 wavelengths available according to ITU T G692.2 1270nm through 1610nm. <b>XXXX</b> = wavelength	0dBm	-21dBm

<b>SDI Input</b>	2x SDI video on 75 Ohm BNC connector SMPTE, 292M, 424M, 259M with automatic video format and standard detection Electrical Return Loss: >15dB from 5MHz to 1.5GHz, >10dB from 1.5GHz to 3GHz Automatic cable EQ (Belden 1694A cable) 340m @ 270Mbit/s, 150m @ 1.5Gbit/s, 110m @ 2.97Gbit/s
<b>HDMI Input</b>	1x 10 bit HDMI 1.4a 24 bit (3x8 bit) and 30 bit (3x10 bit) deep color (R,G,B / Y,Cr,Cb / X,Y,Z)
<b>Optical I/O (Optional)</b>	1x Video SFP Transceiver (SMPTE 297M - 2006)
<b>Ethernet (LAN)</b>	1x 10/100/1000 BaseT RJ45 Connector
<b>Optical Ethernet (Optional)</b>	IEEE 802.3z 1000Base-X Gbit/s Ethernet over Fiber at 1 Gbit/s (125 MB/s)
<b>GPI I/O</b>	2x general purpose inputs + 2x general purpose outputs - RJ45 Connector
<b>Reference Input</b>	1x analog video reference on 75 Ohm BNC connector Analog bi-level (SDTV) or tri-level (HDTV) auto detect and cross lock capability
<b>SDI Output</b>	2x 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 Electrical Return Loss: >15dB from 5MHz to 1.5GHz, >10dB from 1.5GHz to 3GHz
<b>HDMI Output</b>	1x 10 bit HDMI 1.4a 24 bit (3x8 bit) and 30 bit (3x10 bit) deep color (R,G,B / Y,Cr,Cb / X,Y,Z)
<b>Ref / CVBS Output</b>	1x analog video reference on 75 Ohm BNC connector Analog bi-level (SDTV) or CVBS video: 525/59.94Hz, 625/50Hz
<b>Audio I/O</b>	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 nominal
<b>Power</b>	12VDC @ 25W nominal (supports 7 - 24VDC input range) 2x power connections for redundant power supply
<b>Mechanical</b>	W: 218mm (1/2 19"), H: 44mm (1.75"), D: 225mm (8.86") - incl. connectors Weight: 1.1kg (2.43lb)
<b>Ambient</b>	Temperature: 5°C to 40°C (41°F to 104°F) maintaining specification Humidity: 90% maximum, non-condensing
<b>Model #</b>	GMP DualFS EU - (EAN# 4250479324794) GMP DualFS UK - (EAN# 4250479324800) GMP DualFS US - (EAN# 4250479324817)
<b>Includes</b>	greenMachine, primary power supply and AC power cord, SubD 25 audio adapter PCB and quick reference guide

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**

