greenMachine®

Testor

Video and Audio Testing

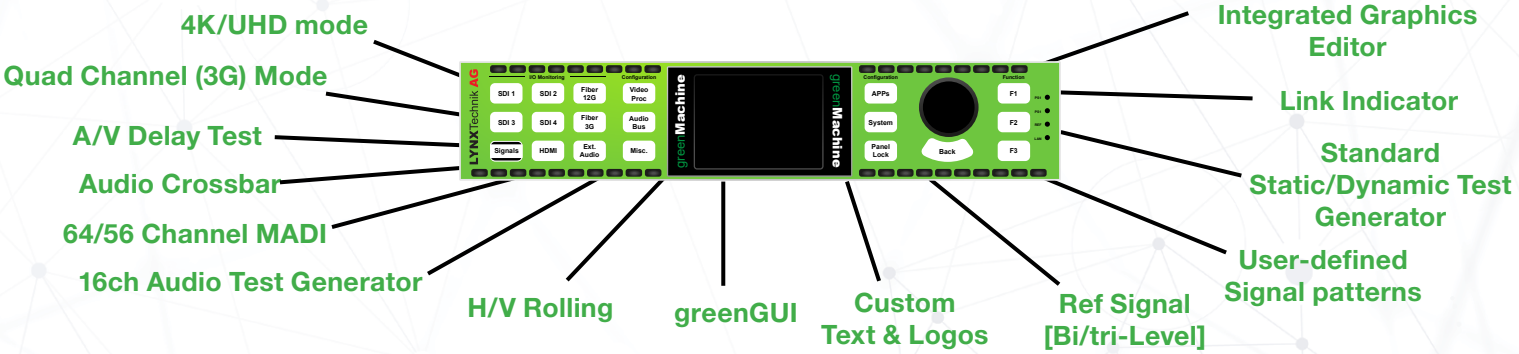
Description

The greenMachine Testor is a feature-rich and user-friendly multi-format test signal generator. It is an ideal troubleshooting A/V solution for technicians & engineers working in field such as on studio applications and for line-up tasks in master control rooms.

The greenMachine Testor is a video and audio test signal generator and supports two configurations:

1. Single Channel 4K/UHD (up to 3840 x 2160p) – 12Gbit/s SDI and quad-link (2SI)
2. Four independent (quad) channels up to 3G SDI

Along with standard static and dynamic video test signals & patterns, greenMachine Testor also provides the flexibility to users to upload their own user-defined signal patterns. Logos and text can be added to the test signals as well.



Features

Processing Channels: Single channel 4K/UHD or four quad-channel (3G) mode.

Test Signals: Standard static and dynamic video test signals and patterns.

User-defined Signal Patterns: For added flexibility, users can upload their own user-defined signal patterns. Logos and text can also be added to test signals. It is useful for channel identification.

HDR Test signals: It offers test signals for various HDR standards (PQ, HLG, SLOG3). Currently, the HDR test patterns are only available in 4K/UHD mode.

Integrated Graphics Editor: The integrated graphics editor provides a tool for users to place image & logos, add text, and even add user-defined signals, patterns, and graphics. All items can be moved and edited simply with a computer mouse.

Audio Test Generator: It includes a 16-channel audio test generator with adjustable level, phase, frequency, mix-down, and an EBU/AV sequence. All the audio measures are embedded into the SDI video or output to the external audio outputs of greenMachine.

A/V Delay Test: It provides AV delay test signal generator which are compatible with AV delay measurements.

H/V Rolling: It provides horizontal and verticle rolling with speed adjustments.

Link Indicator: For UHD signals, this feature will allow indication of 2SI link on each quad link channel.

MADI Signal: It can also generate 64/56 channel MADI Signal (via 3G fiber) with each channel freely assignable to the 16-channel audio test generator.

Audio crossbar: Through the audio crossbar all audio generator channels can be individually assigned to the embedder inputs and the external audio outputs (AES or analog).

Ref signal: The timing of the audio and the video test signals including the output reference signal (Bi-level SD or Tri-level HD) can be individually set in relation to an attached input reference signal.

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. The full collection of test signals can be shared with all the greenMachine devices in a network (greenUniverse).

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.

Standard Test Patterns

The Standard test patterns which are pre-installed and will be available for use are:

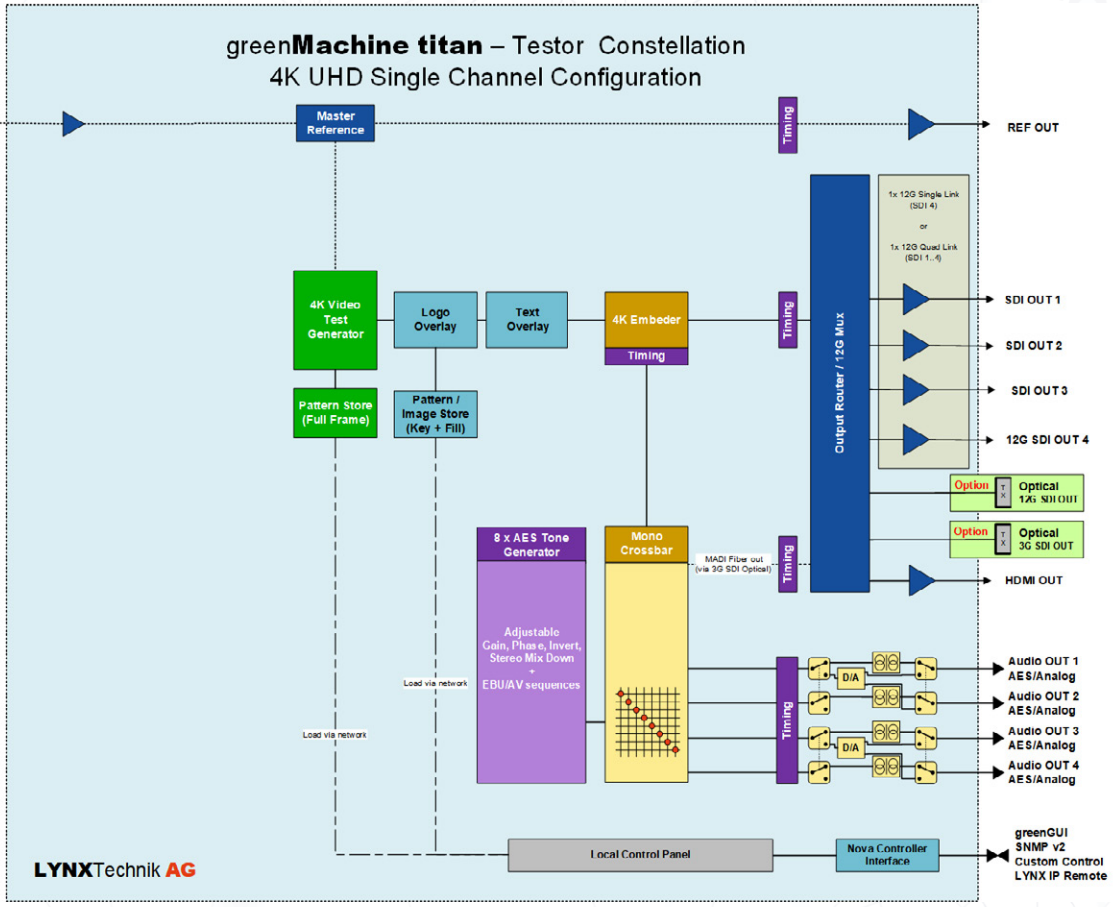
- Center Sweep
- Color Temperature
- Color Bar 100%
- Color Bar 75%
- Color Bar 75% over Red
- Colorbar SMPTE
- Convergence Grille
- EBU AV Sync
- Field Pattern Colorbar/Red
  Only Available for Interlaced standard (SD and 1080i)
- Field Pattern Red/ Colorbar
  Only Available for Interlaced standard (SD and 1080i)
- Flash Black
- Flash White
- Four-Level PLUGE
- Frequency Sweep
- Full field Black
- Full field Blue
- Full field Cyan
- Full field Green
- Full field Magenta
- Full field Red
- Full field White
- Full field Yellow
- Grey 15%
- Multiburst
- Pathological EQ
- Pathological EQ/ PLL
- Pathological PLL
- Persistence Test
- Ramp Down Y
- Ramp Up CB
- Ramp Up CR
- Ramp Up Y
- Ramp Up YCbCr
- Staircase
- Zoneplate
- Zoneplate Moving

HDR Test Patterns

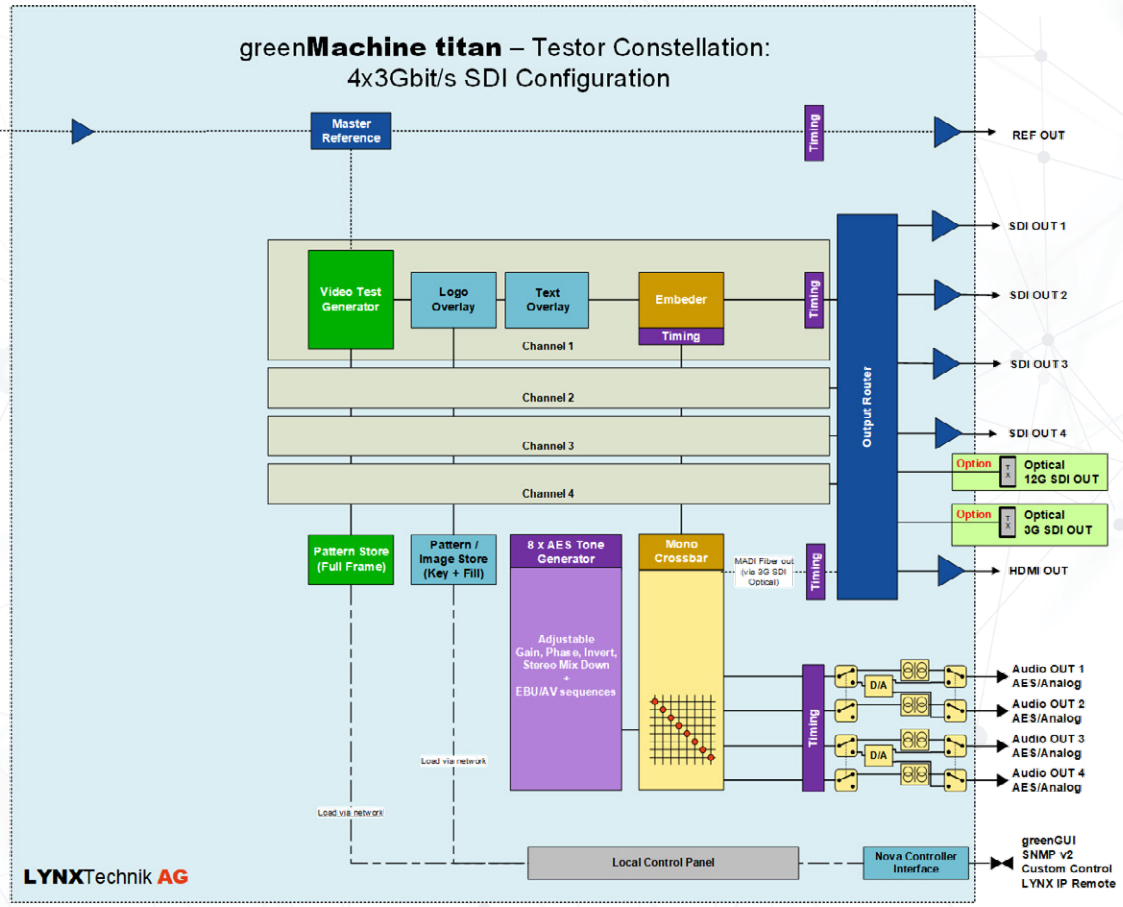
HDR Test Patterns are only available in 4K/UHD mode.

- HDR Colorbar BT.2111 HLG Narrow
- HDR Colorbar BT.2111 PQ Full
- HDR Colorbar BT.2111 PQ Narrow
- HDR Colorbar BT.2111 Slog3 Full
- HDR PLUGE BT.814 HLG
- HDR PLUGE BT.814 PQ

Functional Diagram Single 4K UHD Channel



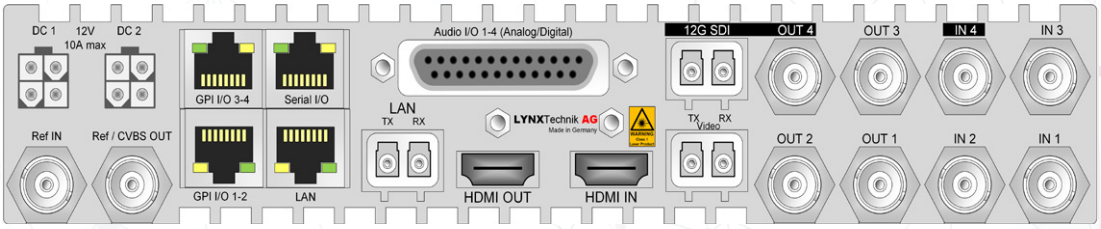
Functional Diagram Quad 3G Channel



Hardware Specifications

SDI Inputs	3x 3G SDI video on 75 Ohm BNC connector - SMPTE, 292M, 424M, 259M with automatic video format and standard detection
	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 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
HDMI Input / Output	1x 10 bit HDMI 4K/UHD 1.4b
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)
Ethernet (LAN)	1x 10/100/1000 BaseT RJ45 Connector
Optical Ethernet (Optional)	IEEE 802.3z 1000Base-X Gbit/s Ethernet over Fiber at 1 Gbit/s (125 MB/s)
GPI I/O	4x general purpose inputs + 4x general purpose outputs - RJ45 Connectors
Reference Input	1x analog video reference on 75 Ohm BNC connector
	Analog bi-level (SDTV) or tri-level (HDTV) auto detect
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

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
Serial Data	EIA/ETA RS232C / RS422 /RS 485 (selectable through greenGUI) - RJ45 connector ESD protection for up to 16kV
Reference Output	1x analog video reference on 75 Ohm BNC connector
	Analog bi-level (SDTV) or ri-level (HDTV), cross lock capability
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
Power	12VDC @ 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
Model #	GMPT TESTOR EU - (EAN# 4250479326262)
	GMPT TESTOR UK - (EAN# 4250479326279)
	GMPT TESTOR US - (EAN# 4250479326286)
Includes	greenMachine Titan: GM6840 Testor Constellation: GMC-TESTOR-titan 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 /23.98 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		

Other Broadcast Applications

- ***GMC-HDR-EVIE:*** Dynamic HDR > SDR converter
- ***GMC-HDR-Static:*** Static HDR <> SDR converter
- ***GMC-4KUPXD:*** 4K Up/down/cross converter
- ***GMC-3GUPXD:*** 3G 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 Testor 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 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. 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.

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

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.

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)		**Power / Sensitivity**	
OH-TR-12G-XXXX-Y-LC **XXXX** = Wavelength	12G SDI Fiber Transceiver - CWDM capable - 10km* - LC 18 wavelengths acc. to ITU T G692.2 1270nm through 1610nm.	-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 18 wavelengths acc. to ITU T G692.2 1270nm through 1610nm	-2...+3 (dBm)	–
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		**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.

Ordering Information

greenMachine Titan Hardware and Testor License		
GMPT TESTOR EU	4K UHD or 4 x 3G SDI Audio & Video Test Signal Generator (H/W & License)	EAN: 4250479326262
GMPT TESTOR UK	4K UHD or 4 x 3G SDI Audio & Video Test Signal Generator (H/W & License)	EAN: 4250479326279
GMPT TESTOR US	4K UHD or 4 x 3G SDI Audio & Video Test Signal Generator (H/W & License)	EAN: 4250479326286
Testor License Only		
GMC-TESTOR-titan	greenMachine titan Testor constellation (License only- includes no hardware)	EAN: 4250479326101
Accessories and Power Supply		
RFR 6000	1 RU 19" Rack Mount Chassis	EAN: 4250479324466
RXT 6001	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