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SEP48

Simulcast Edge Processor

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RGB Simulcast Edge Processor

RGB's Simulcast Edge Processor (SEP) delivers the industry's most complete solution for digital simulcast edge decoding applications, offering the ability to MPEG decode, NTSC modulate and upconvert multiple video streams in a single rack unit chassis. Based on a highly flexible, scalable, modular platform, the SEP is the ideal solution for simplifying digital simulcast deployments and making a smooth transition to fully digital networks.

The Intelligent Digital Simulcast Solution

- The first digital solution to combine MPEG decoding, NTSC modulation and upconversion in a single rack unit platform.
- Greatly simplifies network architecture and lowers both capital costs and total cost of operations.
- With support for up to 48 channels per rack unit, saves considerable rack space and power at the edge.
- Offers full chassis, network and Gigabit Ethernet port redundancy.
- Supports Emergency Alert System (EAS) crawl overlays, as well as override, based on SCTE 18 standard.
- Based on RGB's Video Intelligence Architecture™ (VIA), dramatically lowers the cost of delivering advanced services in digital video environments.

RGB's Simulcast Edge Processor (SEP) is the industry's first product to combine high density MPEG-2 decoding, NTSC modulation and upconversion in a single rack unit device for use in digital simulcast applications. It receives and decodes multiple MPEG-2 programs and outputs the programs over multiple RF-modulated NTSC channels. Based on RGB's Video Intelligence Architecture (VIA) and its flexible video processing platform, the SEP streamlines the decoding, modulation, and upconversion process at the edge of the network (local headend or hub) and provides operators with many advantages in the construction of their simulcast networks.

In a simulcast environment, operators convert all analog channels to digital at the headend and distribute and process them in digital format throughout the network. At the edge, the content intended for analog subscribers is decoded and distributed as NTSC RF signals, while digital subscribers receive a full digital line-up over digital QAM. Instead of supporting two parallel network operations—one digital and one analog—operators maintain and manage only a single digital network, freeing up bandwidth to support advanced services. Simulcasting with the high density SEP allows operators to reclaim distribution bandwidth and support all subscribers while realizing significant operational efficiencies and cost savings. With its advanced features, the SEP simplifies digital simulcasting and the transition to all-digital.

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Simplifying Digital Simulcast

Combining multi-channel MPEG-2 decoding and NTSC modulation in a single, high density platform greatly simplifies the design and support of the digital simulcast environment. The multi-function SEP platform eliminates the need for multiple boxes (decoder, modulator, and upconverter), as well as the mess of interconnect wiring between them. Set-up is greatly simplified through a single, intuitive graphical user interface for all decoding and modulation configuration, eliminating the tedious task of configuring multiple decoders and baseband modulators.

High Density Platform

The high density SEP can receive up to 48 MPEG-2 video streams over IP through multiple Gigabit Ethernet interfaces. The video streams are simultaneously decoded, NTSC modulated and upconverted, and are then directed to up to 12 RF output interfaces. Each of the 12 RF interfaces can support from one to four NTSC analog program channels through block upconversion.

Significant Power and Space Savings

With RGB's SEP, operators can enjoy significant savings in both power and rack space consumption. The SEP requires less than 500 Watts for the support of up to 48 NTSC modulated and upconverted channels, compared to more than 5000 Watts for multi-box solutions offering decoding, modulation and upconversion. A single SEP, occupying only a single rack unit space, can replace the equivalent of a full 7-foot rack of equipment performing similar functions.

Emergency Alert System (EAS) Support

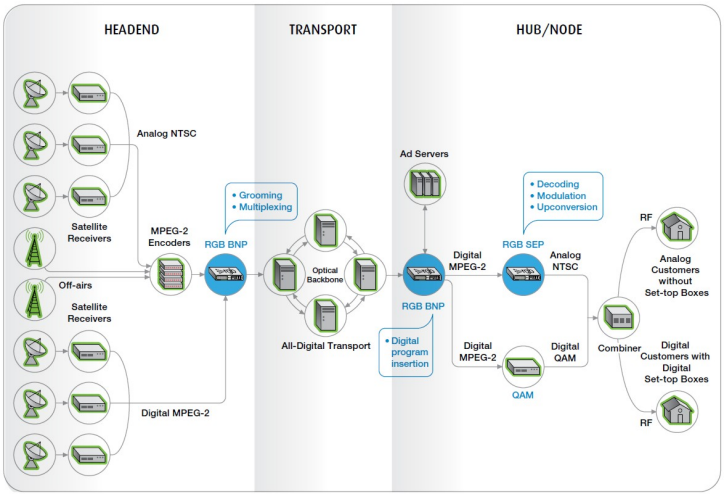
The inherent Gigabit Ethernet and IP-enabled design of the SEP allows for the support of digital, network-based EAS program switching based on the SCTE 18 standard. The SEP facilitates EAS override video and alert signaling over its multiple Gigabit Ethernet interfaces. It supports the EAS switching functionality by allowing the operators to configure a global EAS channel to which all or any of the NTSC channels decoded by the device can be tuned during the EAS condition. The information regarding the EAS channel crawls and override, and the selection of programs that switch during the EAS condition, are configured via the SEP's graphical user interface or can be received through SCTE 18 messages.

Optimal Redundancy

The RGB SEP supports multiple levels of redundancy that greatly improve the reliability and availability of the digital simulcast architecture, including:

- *Chassis Redundancy*: The RGB Redundancy Docking Station (RDS) facilitates 1:1 chassis redundancy.
- *Network Redundancy*: The chassis supports multiple Gigabit Ethernet input interfaces that can support redundant network connections.
- *Gigabit Ethernet Port Redundancy*: Each Gigabit Ethernet interface can be configured as a redundant port for any other Gigabit Ethernet port.

RGB's Products in the Digital Simulcast Architecture



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Configuration Flexibility

The SEP chassis supports up to 12 physical RF interfaces. The platform's flexible architecture enables each RF interface to support up to four modulated contiguous NTSC channels, for a maximum of 48 analog channel outputs in a single rack unit. Input video streams are delivered to the SEP as MPEG over UDP/IP via eight Gigabit Ethernet interfaces. To ensure clear and consistent transmissions, the SEP can recover from up to 100 ms of jitter on the IP network.

Standards-Based Management

The SEP configuration is performed through RGB's VIA Element Manager, a simple and logical SNMP-based graphical user interface. Additionally, the SEP can be remotely configured through any SNMP standards-compliant management application. RGB's element management application allows operators to remotely configure RF, Gigabit Ethernet and IP parameters. Operators can also modify EAS configuration on a per channel basis and configure or enable redundancy when using RGB's Redundancy Docking Station (RDS) in the 1:1 redundancy environment.

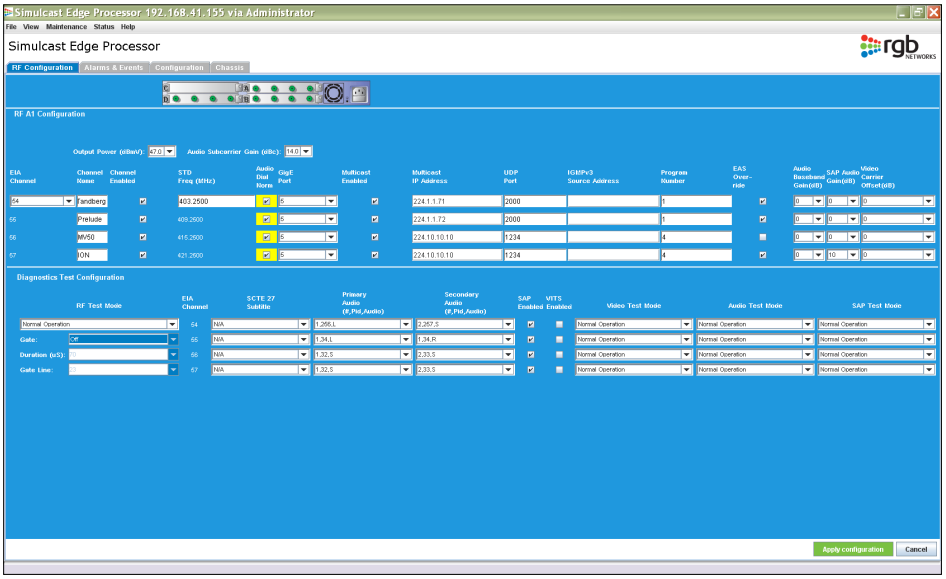
Compatibility and Standards Compliance

The RGB SEP supports both single program transport stream (SPTS) and multi-program transport stream (MPTS) video input over UDP/IP through its eight Gigabit Ethernet interfaces. The SEP supports both multicast and unicast MPEG transports over IP, and can be automatically configured at start-up through DHCP. In an IP multicast environment, the SEP supports IGMPv3 and IGMPv2 for optimal compatibility with different configurations and environments. The product also supports closed captioning based on SCTE 20 and SCTE 21 standards, as well as AMOL and TV Guide VBI processing.

RGB VIA Product Family

The SEP is a member of RGB's groundbreaking VIA product family of intelligent video processors. Based on RGB's flexible Video Intelligence Architecture (VIA), the VIA product family leverages standards-based Gigabit Ethernet and IP data networking technologies to easily integrate with existing infrastructure and dramatically lower the cost of delivering advanced video services in today's digital video environments. This multi-function platform is programmable and upgradeable, making the future-proof VIA product family an intelligent choice to help enable the transition to all-digital.

VIA Element Manager



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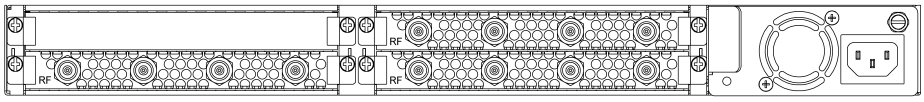

RGB SEP48 Rear View

RGB SEP48 Specifications

INPUT INTERFACES	
Gigabit Ethernet	8 SFP interfaces with support for copper or optical
Fast Ethernet	1 10/100BaseT control and management interface
OUTPUT INTERFACES	
RF Interface	F-Type 75 Ω connector
Number of RF Interfaces	12 RF interfaces per chassis, 4 per STP module
Modulation	NTSC modulation, up to 4 NTSC channels per RF interface
PROCESSING	
Maximum Number of Streams	Up to 48 input streams decoded and modulated per chassis
Processing Capabilities Supported	Closed Caption processing, VBI re-insertion, Vertical Interval Test Signal (VITS) insertion, AMOL and TV Guide VBI support, EAS override, crawl overlays (per SCTE 18) and subtitling support (per SCTE 27)
VIDEO	
Video Processing	VBR and CBR, MPTS or SPTS
Jitter Tolerance	+/- 100 ms
MPEG-2 Level and Profile	MPEG-2, MP@ML
Resolution	720 x 480, 704 x 480, 544 x 480, 528 x 480, 352 x 480, 640 x 480 at 29.97 fps
AUDIO	
Audio Input Format	Dolby Digital (AC3) or MPEG audio (Musicam) Primary AC3 5.1 or 2 channel stereo Secondary AC3 5.1 or 2 channel stereo Musicam stereo at 48 kHz sampling rate
Audio Output Format	BTSC, A2 (optional) Stereo primary, monaural secondary SAP, dual mono
Audio Bit Rates	32 kb/s to 448 kb/s each, primary or secondary audio
Stereo Frequency Response	50 Hz to 14 kHz, ± 1 dB
SAP Frequency Response	50 Hz to 10 kHz, ± 1 dB
RF	
Center Frequency	54 to 860 MHz
Frequency Band Plan	STD, HRC and IRC
Output Level Adjustment Range	44 to 58 dBmV per NTSC channel for up to 2 NTSC channels per RF port 41 to 55 dBmV per NTSC channel for up to 4 NTSC channels per RF port
Attenuation Step Size	0.5 dB
Output Impedance	75 Ω
Output Return Loss	> 8.5 dB for 5 to 50 MHz and 860 MHz to 1 GHz
In-Band Gain Flatness	± 0.25 dB
External Clock Reference	6.0000 MHz or 6.0003 MHz
Reference Input Return Loss	> 16 dB
Reference Input Level	10 to 40 dBmV
Carrier-to-Noise Ratio (CNR)	Typical 69.0 dB for 1 channel
REGULATORY COMPLIANCE	
Safety	UL and TUV
ELECTRICAL/MECHANICAL	
Input Power	AC: 100-127 VAC @ 5.0A to 200-240 VAC @ 2.5A DC: 48 VDC @ 11A (range 36-75 VDC)
Line Frequency	50 to 60 Hz
Power Consumption	500 W maximum; 1000 W for two chassis in 1:1 redundancy mode in Redundancy Docking Station (RDS)
Dimensions	1 rack unit – 1.75″ H x 19″ W x 23″ L (43.6 H x 433 W x 583 L mm)
Weight	30 lbs. (11.34 kg)
MTBF	100,000 Hours
ENVIRONMENTAL	
Storage Temperature	-40° to 70° C
Operating Temperature	0° to 40° C
Humidity	5% to 95% (non-condensing)

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