Selenio™ BNP 2XR+

Broadcast Network Processor

Imagine Communications' Selenio Broadcast Network Processor (BNP) 2XR+ delivers the industry's highest density digital video processing solution for grooming, transrating and digital program insertion (DPI). A dedicated unit can be used for emergency alert, operator messaging services and digital graphic overlays. Based on a flexible, scalable and modular platform, the Selenio BNP 2XR+ simplifies and expedites deployments of advanced video services, simplifies operation and management, and reduces operational and capital costs.

An ideal solution for digital video environments, including digital simulcast, the Selenio BNP 2XR+ supports a variety of services and applications including standard definition (SD) and high definition (HD) digital broadcast, switched digital video, zoned and targeted ad insertion, Enhanced TV (ETV), emergency alert and operator messaging services, digital graphic overlays, program substitution and local channel insertion. Receiving input through its Gigabit Ethernet or ASI interfaces, this advanced product can statistically multiplex hundreds of SD and HD MPEG programs while performing concurrent grooming and digital ad insertion. The Selenio BNP 2XR+ is fully MPEG-compliant and interoperable with leading cable industry equipment.

The high density of the Selenio BNP 2XR+ simplifies and facilitates the operation and management of centralized DPI systems by enabling operators to manage multiple ad zones from a single, central location. This simplified and centralized management allows operators to expand and customize ad zones resulting in increased operational revenue.

Benefits

- Based on Imagine Communications' architecture, the Selenio BNP 2XR+ dramatically lowers the cost of delivering advanced services in digital video environments
- The first high-density product capable of supporting grooming, transrating, and splicing, delivering simplicity and cost-efficiency
- Transrates MPEG-2 video programs with impressively high video quality
- Support of multiple ad zones from a single device simplifies operation and management
- Powerful digital overlay technology allows dynamic incorporation of graphics and text on any MPEG-2 program, providing an elegant solution for critical enhanced messaging applications, such as Emergency Alert Services (EAS)
- Standards-based control of program substitution enables customized regional program line-ups using external scheduler management
- Offers Enhanced TV (ETV) application processing for EBIF and EISS with bound, pre-bound and late-binding support
- Simplified product architecture improves manageability

Features

The Selenio BNP's digital overlay technology enables the dynamic incorporation of graphics and text on any program providing incremental ad revenue, as well as support for service announcements, logo branding and many other enhanced applications. Offering an all-MPEG, compressed video solution, the Selenio BNP 2XR+ is

ideal for use by cable operators, broadcasters and programmers, eliminating the need for a secondary decode-encode cycle as required by less efficient video baseband processing equipment.

Furthermore, the Selenio BNP's simplified product architecture provides full processing scalability designed to grow with each operator's changing environment. Just as the Selenio BNP's high density is an ideal solution in a centralized environment, its scalability offers an equally compelling solution for distributed DPI environments where density requirements may vary.

The Selenio BNP 2XR+ is configurable through an easy-to-use, web-based graphical user interface or through SNMP using standard network management applications.

Details

High-Density Platform Improves Manageability and Generates Significant Savings
The Selenio BNP 2XR+ supports over 1500 dynamically created input transport streams and processes hundreds of SD and HD MPEG programs over its input interfaces, performing grooming, transrating and digital program insertion on incoming programs and then routing them out through its output interfaces.

The high-density video processing offered by Selenio BNP 2XR+ enables operators to build a centralized DPI architecture and manage multiple ad zones from a single, central location, thus simplifying manageability and reducing operational costs. Furthermore, a single Selenio BNP 2XR+, occupying only one rack unit, can replace the equivalent of a full rack of today's equipment performing similar functions. The industry-leading density offered by the Selenio BNP 2XR+ translates into ease of manageability and significant space savings, which in turn reduce capital and operational costs.

Advanced Transrating and Digital Ad Insertion Improve and Simplify Operations
Based on Imagine Communications' architecture, the Selenio BNP 2XR+ transrates and delivers video streams of the highest quality in the industry. The architecture enables transrating of more programs into an output multiplex than any existing solution without compromising video quality. The Selenio BNP 2XR+ can transrate hundreds of SD and HD MPEG-2 video streams in a single rack unit. It also offers multiple QoS priority levels on any program stream enabling selection of the desired level of priority for transrating.

The Selenio BNP 2XR+ can groom and perform seamless splicing of SD and HD programs, eliminating the need to dedicate multiple devices to these functions. This unique ability simplifies installation, wiring and configuration, thus reducing system deployment time. The Selenio BNP 2XR+ is fully compliant with SCTE 30, SCTE 35 and SCTE 130 standards and is interoperable with the leading DPI ad servers and ad management services.

This flexible product can also perform SCTE 30 to SCTE 35 conversion to support remote digital ad insertion at the hub. With a high degree of flexibility, the Selenio BNP 2XR+ is a solution for centrally located DPI systems at the headend facility, as well as for distributed DPI systems. Additionally, the Selenio BNP 2XR+ can support blackouts or create customized program line-ups using program substitution based on SCTE 30 management. An external scheduling manager can control the Selenio BNP's ability to switch between primary and secondary program feeds allowing operator's to cater to regional audiences and comply with local regulations.

Simplified Architecture Provides Scalability and Flexibility
The Selenio BNP's modular and programmable platform is designed to provide operators with full processing scalability to meet their specific processing requirements today and in the future. The program density of the Selenio BNP 2XR+ is software-configurable and upgradeable, allowing operators to start at lower densities and upgrade to the full hardware capacity through software licenses as their stream densities and network needs grow.

This scalability reduces capital costs and allows operators to allocate budgets accordingly. By paying for processing on an as needed basis, operators can wisely plan budgets based on today's requirements and avoid over allocation to meet future needs. The programmable and upgradeable architecture of the Selenio BNP 2XR+, as well as its high processing power, eliminates hardware changes and will simplify and expedite future

deployments of new video processing applications.

The Selenio BNP 2XR+ supports both ASI and Gigabit Ethernet interfaces, allowing operators who have deployed Gigabit Ethernet networks to profit from the increased cost-efficiency offered with this transport, while still providing support for operators with legacy ASI networks. This flexibility enables operators with ASI networks to continue with their existing infrastructures while providing an upgrade path for a future transition to an IP-based network.

The Selenio BNP 2XR+ has eight Gigabit Ethernet interfaces and is scalable to support up to 18 ASI interfaces using up to three ASI modules. The Gigabit Ethernet interfaces are part of the Selenio BNP's base configuration and no additional hardware or licensing is required to utilize these ports. Providing added flexibility, each ASI interface is software configurable as input or output via an easy-to-use graphical user interface.

Significant Power Savings
With the Selenio BNP 2XR+, operators can also enjoy significant savings in power consumption. The Selenio BNP requires significantly less power compared to thousands of Watts for other solutions requiring multiple devices to process the same number of programs. This power savings results in considerable cost savings over time.

Increased Availability and Reliability
System and program downtime cost operators precious time, money and resources, adversely affecting their revenues. To reduce system downtime, the Selenio BNP 2XR+ has been designed to support multiple levels of redundancy to provide operators with increased uptime and availability of services. The Selenio BNP 2XR+ features service level redundancy and one-to-one chassis redundancy. The Selenio BNP's service level redundancy provides the ability to automatically switch to backup programs in case of a program service failure. Its one-to-one redundancy enables full hardware redundancy and automatic failover in case of any software or hardware failure in the primary chassis. The Selenio BNP 2XR+ also offers IGMPv3 input source redundancy.

Intuitive Graphical User Interface Eases and Simplifies Management
The Selenio BNP 2XR+ is configurable through a web-based graphical user interface or through SNMP using standard network management applications. The easy-to-use interface offers a variety of features that simplify the set-up and operation of the Selenio BNP 2XR+, including program and transport level drag and drop grooming; simultaneous bit rate analysis of input and output transport streams and programs; alarms and system logs; and full configurability of ASI and Gigabit Ethernet ports.

Specifications

INPUT/OUTPUT INTERFACES	
Gigabit Ethernet	8 SFP interfaces – copper or optical
Fast Ethernet	One 10/100BaseT control and management interface
ASI	Up to 18 ASI ports per chassis Up to 3 ASI modules with 6 ASI ports each Software configurable as input or output 213 Mb/s data rate/port

MPEG PROCESSING

Transrating	SD and HD MPEG-2 video streams; VBR and CBR support; QoS – Ability to set priority for the level of transrating desired
Multiplexing & Table Processing	MPEG-2 and MPEG-4 H.264/AVC multiplexing and re-multiplexing; MPTS, SPTS, multicast and unicast support; CBR and VBR support; PID filtering and re-mapping; PCR re-stamping and de-jitter; PAT and PMT generation; Generation and pass-through of PSIP tables
Digital Program Insertion (DPI)	Seamless SD and HD splicing Program substitution scheduling management based on SCTE 30 splice accuracy SCTE 30 (DVS-380, DVS-638) and SCTE 35 (DVS-253)-compliant SCTE 30 to SCTE 35 conversion
Digital Overlays	Text and graphical crawl messages, and graphical logo overlays for MPEG-2 video
Digital EAS	SCTE 18 (Emergency Alert message for cable) for MPEG-2 video
Closed Captioning	SCTE 21 to SCTE 20 conversion
Jitter Tolerance	+/- 100 ms
EBIF (Binary Interchange Format)	Bound, pre-bound and late-binding

VIDEO FORMATS

MPEG Profile and Level	MPEG-2 MP@ML (SD) and MP@HL (HD) MPEG-4 H.264/AVC (all profiles supported)
All SD and HD Resolutions	SD – 720 x 576, 720 x 480, 704 x 480, 544 x 480, 528 x 480, 352 x 480 HD – 1080i x 1920, 1080i x 1440, 1080i x 1280, 720p x 1280, 480p x 720, 480p x 704, 480p x 640
Frame Rates	24, 25, 29.97, 30, 50, 59.94, 60
Audio Formats	Dolby AC-3, MPEG-1 Layer 2 (Musicam, MP2), MPEG-2 Layer 2
Digital Broadcast	ATSC PSIP (A/52B, A/53E, A/58, A/65) DVB (DVB-SI, DVB-SUB, DVB-TXT)
Regulatory Compliance	CE Mark - EN55022:1998 and EN55024:1998
Safety	UL, TUV/GS, cTUVus; UL 60950-1, 1st Edition; CSA C22.2 No. 60950-1-03; IEC 60950-1:2001 (1st Edition), EN 60950-1:2001+ A11
Electromagnetic Emissions	FCC Part 15, Class A, EN55022, EN55024; FCC - Title 47 CFR Part 15 Subpart B; Canada - ICES-003, Issue 2, April 1995
Hazardous Substances	RoHS-compliant (Restricted use of Hazardous Substances)

ELECTRICAL/MECHANICAL

Input Power (Normal Temperature)	AC: 100-240 VAC @ 3.0A/1.5A DC: -48 VDC @ 7A (-36 to -75 VDC range)
Line Frequency	50-60 Hz
Power Consumption	330 W maximum – fully loaded at 115 VAC
Dimensions (H X W X L)	1RU – 1.75 x 19 x 23 in. (43.6 x 433 x 583)
Weight	25 lbs. (11.34 kg)
Cooling	Front to back

OPERATIONAL ENVIRONMENT

Storage Temperature	-40° to 70°C
Operating Temperature	0° to 40°C
Humidity	5% to 95% (non-condensing)

Ordering Information
Selenio™ BNP 2XR+

BNP2XR+ WITH GROOMING, DPI, MPTS & SPTS OUTPUTS	
SBP-2+-2-AC	Selenio BNP2XR+ 2x40Mbps MUX Platform (80Mbps) - Selenio BNP2XR+ Chassis, GBP3, 1 PROC3, AC-PS
SBP-2+-2-DC	Selenio BNP2XR+ 2x40Mbps MUX Platform (80Mbps) - Selenio BNP2XR+ Chassis, GBP3, 1 PROC3, DC-PS
SBP-2+-4-AC	Selenio BNP2XR+ 4x40Mbps MUX Platform (160Mbps) - Selenio BNP2XR+ Chassis, GBP3, 1 PROC3, AC-PS
SBP-2+-4-DC	Selenio BNP2XR+ 4x40Mbps MUX Platform (160Mbps) - Selenio BNP2XR+ Chassis, GBP3, 1 PROC3, DC-PS
SBP-2+-13-AC	Selenio BNP2XR+ 13x40Mbps MUX Platform(520Mbps) - Selenio BNP2XR+ Chassis, GBP3, 2 PROC3, AC-PS
SBP-2+-13-DC	Selenio BNP2XR+ 13x40Mbps MUX Platform (520Mbps) - Selenio BNP2XR+ Chassis, GBP3, 2 PROC3, DC-PS
SBP-2+-25-AC	Selenio BNP2XR+ 25x40Mbps MUX Platform (1000Mbps) - Selenio BNP2XR+ Chassis, GBP3, 3 PROC3, AC-PS
SBP-2+-25-DC	Selenio BNP2XR+ 25x40Mbps MUX Platform (1000Mbps) - Selenio BNP2XR+ Chassis, GBP3, 3 PROC3, DC-PS

BNP2XR+ WITH GROOMING, MPTS & SPTS OUTPUTS (NO DPI)	
SBP-2+-A-2-AC	Selenio BNP2XR+ 2x40Mbps MUX Platform w/o DPI (80Mbps) - Selenio BNP2XR+ Chassis, GBP3, 1 PROC3, AC-PS
SBP-2+-A-2-DC	Selenio BNP2XR+ 2x40Mbps MUX Platform w/o DPI (80Mbps) - Selenio BNP2XR+ Chassis, GBP3, 1 PROC3, DC-PS
SBP-2+-A-4-AC	Selenio BNP2XR+ 4x40Mbps MUX Platform w/o DPI (160Mbps) - Selenio BNP2XR+ Chassis, GBP3, 1 PROC3, AC-PS
SBP-2+-A-4-DC	Selenio BNP2XR+ 4x40Mbps MUX Platform w/o DPI (160Mbps) - Selenio BNP2XR+ Chassis, GBP3, 1 PROC3, DC-PS
SBP-2+-A-13-AC	Selenio BNP2XR+ 13x40Mbps MUX Platform w/o DPI (520Mbps) - Selenio BNP2XR+ Chassis, GBP3, 2 PROC3, AC-PS
SBP-2+-A-13-DC	Selenio BNP2XR+ 13x40Mbps MUX Platform w/o DPI (520Mbps) - Selenio BNP2XR+ Chassis, GBP3, 2 PROC3, DC-PS
SBP-2+-A-25-AC	Selenio BNP2XR+ 25x40Mbps MUX Platform w/o DPI (1000Mbps) - Selenio BNP2XR+ Chassis, GBP3, 3 PROC3, AC-PS
SBP-2+-A-25-DC	Selenio BNP2XR+ 25x40Mbps MUX Platform w/o DPI (1000Mbps) - Selenio BNP2XR+ Chassis, GBP3, 3 PROC3, DC-PS

BNP2XR+ WITH GROOMING, SPTS OUTPUTS (NO DPI, NO MPTS OUTPUTS)

SBP-2+-4-SPTS-AC	Selenio BNP2XR+ 4x40Mbps SPTS Platform w/o DPI (160Mbps) - Selenio BNP2XR+ Chassis, GBP3, 1 PROC3, AC-PS
SBP-2+-4-SPTS-DC	Selenio BNP2XR+ 4x40Mbps SPTS Platform w/o DPI (160Mbps) - Selenio BNP2XR+ Chassis, GBP3, 1 PROC3, DC-PS
SBP-2+-13-SPTS-AC	Selenio BNP2XR+ 13x40Mbps SPTS Platform w/o DPI (520Mbps) - Selenio BNP2XR+ Chassis, GBP3, 2 PROC3, AC-PS
SBP-2+-13-SPTS-DC	Selenio BNP2XR+ 13x40Mbps SPTS Platform w/o DPI (520Mbps) - Selenio BNP2XR+ Chassis, GBP3, 2 PROC3, DC-PS
SBP-2+-25-SPTS-AC	Selenio BNP2XR+ 25x40Mbps SPTS Platform w/o DPI (1000Mbps) - Selenio BNP2XR+ Chassis, GBP3, 3 PROC3, AC PS
SBP-2+-25-SPTS-DC	Selenio BNP2XR+ 25x40Mbps MUX Platform w/o DPI (1000Mbps) - Selenio BNP2XR+ Chassis, GBP3, 3 PROC3, DC-PS

BNP2XR+ CHASSIS USED FOR MPEG-2 VIDEO OVERLAY ONLY (NO GROOMING FUNCTIONALITY)

SBP-2+-OV-1P-AC	Selenio BNP2XR+ Chassis with Overlay only, 1 PROC3, GBP3, 320MBPS, AC-PS
SBP-2+-OV-1P-DC	Selenio BNP2XR+ Chassis with Overlay only, 1 PROC3, GBP3, 320MBPS, DC-PS
SBP-2+-OV-2P-AC	Selenio BNP2XR+ Chassis with Overlay only, 2 PROC3, GBP3, 640MBPS, AC-PS
SBP-2+-OV-2P-DC	Selenio BNP2XR+ Chassis with Overlay only, 2 PROC3, GBP3, 640MBPS, DC-PS
SBP-2+-OV-3P-AC	Selenio BNP2XR+ Chassis with Overlay only, 3 PROC3, GBP3, 960MBPS, AC-PS
SBP-2+-OV-3P-DC	Selenio BNP2XR+ Chassis with Overlay only, 3 PROC3, GBP3, 960MBPS, DC-PS

BNP2XR+ HOT-STANDBY UNIT (SHARING LICENSE FROM PRIMARY UNIT)

SBP-2+-R-AC	Selenio BNP2XR+ Redundant Backup Unit - Selenio BNP2XR+ Chassis, GBP3, 1 PROC3, AC PS
SBP-2+-R-DC	Selenio BNP2XR+ Redundant Backup Unit - Selenio BNP2XR+ Chassis, GBP3, 1 PROC3, DC PS
SBP-2+-2R-AC	Selenio BNP2XR+ Redundant Backup Unit - Selenio BNP2XR+ Chassis, GBP3, 2 PROC3, AC PS
SBP-2+-2R-DC	Selenio BNP2XR+ Redundant Backup Unit - Selenio BNP2XR+ Chassis, GBP3, 2 PROC3, DC PS
SBP-2+-3R-AC	Selenio BNP2XR+ Redundant Backup Unit - Selenio BNP2XR+ Chassis, GBP3, 3 PROC3, AC PS
SBP-2+-3R-DC	Selenio BNP2XR+ Redundant Backup Unit - Selenio BNP2XR+ Chassis, GBP3, 3 PROC3, DC PS

BNP2XR+ GROOMING BANDWIDTH LICENSE UPGRADES (UP TO 480MBPS MAX/ PROC3 CARD) - REDUCED PROCESSING BW WHEN USING MESSAGING

SBP-2+-MUX-1	Selenio BNP2XR+ upgrade for 40Mbps of MUX bandwidth
SBP-2+-A-MUX-1	Selenio BNP2XR+ upgrade for one 40Mbps MPTS Mux w/o DPI on a Selenio BNP2XR+-A Platform
SBP-2+-SPTS-40-1	Selenio BNP2XR+ upgrade for 40Mbps of SPTS bandwidth w/o DPI on a Selenio BNP2XR+-SPTS Platform

BNP2XR+ LICENSE UPGRADES (FOR MESSAGING AND DPI)

SBP-2+-A-DPI-1	Selenio BNP2XR+ upgrade for enabling DPI per 40Mbps MUX on a Selenio BNP2XR+-A Platform
SBP-2+-DPI	Selenio BNP2XR+ upgrade for enabling DPI on one program with Selenio BNP2XR+-A or Selenio BNP2XR+-SPTS licensing

BNP2XR+ ACCESSORIES AND FIELD-REPLACEABLE MODULES	
SBP-SFP-001	SFP Module, Copper, 1Gbps for BNP, VMP, SEP
SBP-SFP-002	SFP Module, 1310nm FIBER, 2Gbps for BNP, VMG, SEP
SBP-SFP-007	SFP Module, 850nm FIBER, 2.125Gbps for BNP, VMG, SEP
SBP-PROC3-MOD	PROC3 Module for Selenio BNP 2XR+, Selenio BNP 3XR and BNE Platform (for spares)
SBP-ASI-6	6-port ASI Module for Selenio BNP2XR, BNP2XR+, BNP3XR, BNE, MMC
SBP-PS2-AC-1	AC Power Supply for 1RU Chassis
SBP-PS2-DC-1	DC Power Supply for 1RU Chassis
SBP-CH-BACK-PLATE	Blank Panel Cover for 1RU & 2RU Chassis