

# Selenio™ BNP 3XR

## BROADCAST NETWORK PROCESSOR



Imagine Communications' Selenio Broadcast Network Processor (BNP) 3XR delivers the industry's highest density digital video processing solution for grooming, statistical multiplexing, transrating, digital program insertion (DPI), emergency alert and operator messaging services, and digital graphic overlays. Based on a flexible, scalable and modular platform, the Selenio BNP 3XR 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 3XR 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, digital ad insertion and text and graphic overlays. The Selenio BNP 3XR is fully MPEG-compliant and interoperable with leading cable industry equipment.

The high density of the Selenio BNP 3XR 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

#### Simplified, Grooming, Transrating, DPI, EAS and Digital Overlays

- Based on Imagine Communications' architecture, the Selenio BNP 3XR dramatically lowers the cost of delivering advanced services in digital video environments
- The first high-density product capable of supporting grooming, statistical multiplexing, transrating, splicing, and overlays, delivering simplicity and cost-efficiency
- Transrates video programs with impressively high video quality
- Redundant, hot-swappable power supplies and fans offer high availability
- 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 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
- DVB conditional access scrambling support allows for deployment worldwide

### 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 BNP 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 3XR 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 3XR supports over 1500 dynamically created input transport streams and processes hundreds of SD and HD MPEG programs over its input interfaces, performing grooming, statistical multiplexing, transrating, digital program insertion and overlays on incoming programs and then routing them out through its output interfaces.

The high-density video processing offered by the Selenio BNP 3XR 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 3XR, occupying only two 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 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 3XR 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 3XR can transrate hundreds of SD and HD 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 3XR can groom, statistically multiplex, perform seamless splicing and digital overlays 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 3XR 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 3XR is a solution for centrally located DPI systems at the headend facility, as well as for distributed DPI systems. Additionally, the Selenio BNP 3XR 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 3XR 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 3XR, 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 3XR supports both ASI and Gigabit Ethernet interfaces, allowing operators who have deployed Gigabit Ethernet networks to benefit 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 3XR 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 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.

The Selenio BNP 3XR also allows operators to encrypt their digital services through its support for DVB conditional access scrambling.

### Significant Power Savings

With the Selenio BNP 3XR, operators can also enjoy significant savings in power consumption. The Selenio BNP 3XR 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 3XR has been designed to support multiple levels of redundancy to provide operators with increased uptime and availability of services. The Selenio BNP 3XR 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 3XR also offers IGMPV3 input source redundancy.

### Intuitive Graphical User Interface Eases and Simplifies Management

The Selenio BNP 3XR 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 3XR, 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	Two 10/100BaseT control and management interfaces
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
Digital EAS	SCTE 18 (Emergency Alert message for cable)
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) DVB-CA, CSA and SimulCrypt support
Regulatory Compliance	CE Mark - EN55022:2006+A1:(2007) and EN55024:1998 +A1:2001+A2:2003
Safety	UL 60950-1, 1st Edition; CSA C22.2 No. 60950-1-03; TUV/GS, cTUVus: IEC 60950-1:2001 (1st Edition), EN 60950-1:2001+ A11
Electromagnetic Emissions	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, 3.5A/1.8A DC: -48 VDC @ 10A (-35 to -75 VDC range)
Line Frequency	50-60 Hz
Power Consumption	Redundant power supplies; 335 W maximum – fully loaded at 115 VAC
Dimensions (H X W X L)	2RU – 3.5 x 19 x 23.25 in. (88 x 444 x 590.4 mm)
Weight	38.7 lbs. (17.6 kg)
Cooling	Redundant fan modules; front to back; BTU: 2900 BTU/hour maximum

## OPERATIONAL ENVIRONMENT

Storage Temperature	-40° to 70°C
Operating Temperature	0° to 50°C
Humidity	5% to 95% (non-condensing)