

Selenio Network Processor (SNP)

IP Media Processing Platform

Selenio™ Network Processor (SNP) is the industry's first pure-IP media processing platform, supporting uncompressed UHD based on SMPTE ST 2110. This high-density, scalable platform enables media companies to seamlessly transition from SDI to all-IP networks, while adhering to the SMPTE ST 2022-6 and ST 2110 standards. The standards-based SNP interoperates with Imagine's other UHD- and IP-ready solutions, as well as with commercial off-the-shelf (COTS) IP switches, providing media companies the flexibility to work with a variety of technology suppliers for a seamless end-to-end production workflow.

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Benefits

- Implement a fully scalable, future-ready, standards-based IP production or playout system
- Carry UHD Native (single streams) over ST 2110-20 IP video for simple routing and clean-switching
- Reduce operational complexity with multiple processing functions in one compact frame
- Transition smoothly from a hybrid to full-IP network
- Access agile and flexible processing capabilities for different events and applications
- Incorporate UHD in end-to-end IP production workflows

Features

- ST 2110-20 Video
- ST 2110-30 PCM Audio
- ST 2110-31 AES3 Transparent Transport
- ST 2110-40 Data
- ST 2022-6 SDI over IP
- ST 2022-7 seamless protection switching of IP streams
- ST 2022-8 timing of ST 2022-6 streams in ST 2110 systems
- NMOS IS-04 discovery and registration

- NMOS IS-05 device connection management
- UHD over single ST 2110-20 stream
- UHD over 12G-SDI or Quad-SDI (2SI and SQD)
- HD/3G and UHD clean and quiet switching
- IP to SDI mode
- SDI to IP mode
- IP to IP mode
- Frame synchronization to PTP with adjustable output phasing and delay
- Video proc amp, frame delay, and color correction
- Audio proc amp and delay adjustment
- 4 independent processing blocks for various operations (synchronization, conversion, UHD remap of SQD/2SI)
- HD/3G/UHD up/down/cross conversion (licensed option)
- HD Proxy (as separate 1080i or 1080p ST 2110-20 stream) for UHD signal monitoring (licensed option)
- SDR/HDR (HLG, PQ, S-Log3) conversion (licensed option)
- MADI Audio Processing (via optional SFP) (licensed option)
- Audio embedding and de-embedding between SDI, ST 2022-6, and ST 2110
- Flexible channel support of audio IP streams
- Basic frame rate conversion (add/drop frame) in Conversion personality
- Sharpness control in down conversion
- On screen display (text overlay)
- Preset save/recall
- Black Burst (BB) output generated, synchronized to received PTP timing
- Dual QSFP28 Flexible Ethernet up to 100GbE
- 32 HD-BNC (8 are 12G capable) connectors for SDI I/O
- I/O Expansion via SFP (MADI, 3G coaxial and optical)
- Redundant power supplies in single assembly or hot-swappable independent units
- Front-serviceable main processing board and power supply

Applications



[Selenio™ Network Processor House of Worship Application Note](#)



[Selenio™ Network Processor Connecting Facilities Application Note](#)



[Selenio™ Network Processor Conversion Application Note](#)



[Selenio™ Network Processor Multiviewer Application Note](#)

SNP is optimized for UHD production via redundant 100-Gigabit data connections capable of delivering eight uncompressed UHD signals in each direction — improving overall efficiency and power-consumption, while preserving picture quality and system latency.

SNP also provides critical synchronization and integration of signals into the production environment, ensuring interoperability with all other standards-compliant equipment.

Along with powerful, IP-enabled video processing, SNP offers all the capabilities required in today's complex production environments, including audio processing, color space adjustments and HD-UHD up-, down- and cross-conversion, as well as High Dynamic Range (HDR) adaptations and conversions required for integrating UHD and HD signals.

Ideal for fast-paced mobile live production, SNP features four integral processing blocks, each of which can be assigned a separate application and reprogrammed on the fly. The multipurpose nature and quick-configuration capabilities of the SNP significantly reduce equipment requirements and enable production companies to respond to the demands of the current job, and then quickly reconfigure to tackle future assignments.

Specifications

12G/3G/HD-SDI INPUT SPECIFICATIONS

12G/3G/HD-SDI INPUT SPECIFICATIONS

| | |
|------------------|--|
| Number of Inputs | 32 (bi-directional port shared with output) (8 are 12G-capable) |
| Connector Type | HD-BNC |
| Standard | 12G: SMPTE ST 2082-1 and Amendment 1 to SMPTE ST 2082-1 3G: SMPTE 424M (1080p50/59.94) HD: SMPTE 292M (1.485, 1.485/1.001 Gb/s) |
| Impedance | 75Ω |
| Signal Level | 800 mV ± 10% |
| Return Loss | 12G: >15 dB, from 5 MHz to 1.485 GHz, >10 dB to 3 GHz, >7 dB to 6 GHz, and >4 dB to 12 GHz, all typical 3G: >15 dB, from 5 MHz to 1.485 GHz, and >10 dB to 3 GHz, all typical HD: >15 dB, typical, from 5 MHz to 1.485 GHz |
| Equalization | 12G: Adaptive cable equalization for >164ft (50m) typical, of Belden 1694A coaxial cable 3G: Adaptive cable equalization for >426ft (130m) typical, of Belden 1694A coaxial cable HD: Adaptive cable equalization for >590ft (180m) typical, of Belden 1694A coaxial cable |

12G/3G/HD-SDI OUTPUT SPECIFICATIONS

| | |
|--------------------|--|
| Number of Outputs | Up to 32 (bi-directional port shared with input) (8 are 12G-capable) |
| Connector Type | (High-Density) HD-BNC |
| Standard | 12G: SMPTE ST 2082-1 and Amendment 1 to SMPTE ST 2082-1 3G: SMPTE 424M (1080p50/59.94) HD: SMPTE 292M (1.485, 1.485/1.001 Gb/s) |
| Impedance | 75Ω |
| Return Loss | 12G: >15 dB, from 5 MHz to 1.485 GHz, >10 dB to 3 GHz, >7 dB to 6 GHz, and >4 dB to 12 GHz, all typical 3G: >15 dB, from 5 MHz to 1.485 GHz, and >10 dB to 3 GHz, all typical HD: >15 dB, typical, from 5 MHz to 1.485 GHz |
| Signal Level | 800 mV ± 10% |
| DC Offset | 0.0V ± 0.5 V |
| Rise and Fall Time | 12G: <45 ps (20% to 80%) 3G: <135 ps (20% to 80%) HD: <270 ps (20% to 80%) |
| Overshoot | < 10% of amplitude (all outputs terminated) |

12G/3G/HD-SDI OUTPUT SPECIFICATIONS

| | |
|--------|---|
| Jitter | Timing jitter: 12G: <8 UI peak to peak 3G: <2 UI peak to peak HD: <1 UI peak to peak Alignment jitter: 12G: <0.3 UI peak to peak 3G: <0.3 UI peak to peak HD: <0.2 UI peak to peak |
|--------|---|

QSFP28 (DATA) SPECIFICATIONS

| | |
|----------------------------------|---|
| Standard | SFF-8665 and SFF-8636. Electrically compliant with IEEE802.3bm chip-to-module 100 Gb/s four-lane Attachment Unit Interface (CAUI-4) standard. |
| Connector | 2x hot pluggable QSFP28 MSA form factor |
| Voltage | 3.3V |
| Power consumption | <4.5W typical. Individual per type used |
| Case operating temperature range | 0°C to 70°C |

SFP (BASEBAND I/O EXPANSION) SPECIFICATIONS

| | |
|----------------------------------|--|
| Standard | SFF-8431 and SFF-8432 |
| Connector | Quad Cage hot pluggable SFP+ non-MSA form factor |
| Voltage | 3.3V |
| Power consumption | <2W per device. Individual per type used |
| Case operating temperature range | Individual per type used |

MANAGEMENT CONTROL

| | |
|----------------------|---|
| Number of Connectors | 2 |
| Connector Type | RJ-45 |
| Type | 10/100/1000 Base-T Ethernet as defined by IEEE 802.3-2008 |

Note: Shielded (screened) Ethernet cable should be used with this product.

ENVIRONMENTAL

| | |
|-------------|---|
| Temperature | The operating temperature of the SNP is 32°F to 86°F (0°C to 30°C) with relative humidity of 10% to 90% non-condensing. The non-operating temperature is -20 to 70 degrees C. |
|-------------|---|

MECHANICAL

| | |
|------------|-----------------|
| Dimensions | |
| Height | 1RU or 1.75 in. |

| MECHANICAL | |
|-----------------------|---|
| Width | 17.5 in. (44.45 cm) without ears, 19 in. (48.3 cm) with ears for rack mounting |
| Depth | 23 3/8 in. (59.4 cm) from front rail to back of box (including connectors but not cables) No more than 1.5 inches from front rail to absolute front of installed unit (including screws and pushbuttons) <i>Note: SNP requires at least 2.5 in. (6.3 cm) of space behind the unit for cooling and cabling.</i> |
| Weight | 16.5 lbs (7.5 kg) |
| POWER CONSUMPTION | |
| Number | Two independent, load-sharing power supplies Two IEC C14 power inlets, one for each power supply |
| Input voltage | 100 to 240 VAC Operating range |
| Frequency | 50 to 60 Hz Operating 47 to 63 Hz |
| Inrush current | At 264 VAC, at 25°C cold start, 15 Apk typical |
| Efficiency | Typical 93% @230VAC |
| Power factor | At 240 VAC, full load, typical 0.98 |
| Harmonic distortion | Complies with the requirements of EN61000-3-2 |
| Power consumption | Less than 350 watts total, as measured across both of the AC mains cords |
| Maximum input current | 4.5 A per input |
| Heat dissipation | 367 W |

Ordering Information

| HARDWARE PART NUMBER | |
|-----------------------|---|
| SNP-PLATFORM-4A | SNP Platform Base – Hardware REV A – 4 Application Processors, Central ST2110/2022-6/2022-7 Interface. Requires additional Software keys (SNP-PSX-xxx) for any functionality. Redundant, Hot-Swappable Power Supplies |
| SNP-PLATFORM-2AU | SNP Platform BASE – Hardware REV A – 2 Application Processors, can be upgraded to 4. Central ST2110/2022-6/2022-7 Interface. Requires additional Software keys (SNP-PSX-xxx) for any functionality. Redundant, Hot-Swappable Power Supplies |
| 100G QSFP PART NUMBER | |
| OP+QSFP+TRMM+100G | 100GB/S QSFP28 SR4, MTP/MPO Optical connector, 70 m with OM3 and 100 m with OM4 |
| OP+100G+CWDM4+2K | 100G QSFP28 CWDM4, 2 km, over SMF |

| 100G QSFP PART NUMBER | |
|-----------------------|---|
| OP+QSFP+100G+10K | 100GB/S QSFP28 LR4, LC Optical connector, 10 km with SMF |
| OP+100G+LANWDM+40K | 100G QSFP28 LAN WDM, 30 km (40 km with FEC) over SMF |
| AQSFP-100G-SR4 | ARISTA 100GB/S QSFP28 SR4, MTP/MPO Optical connector, 70 m with OM3 and 100 m with OM4 |
| AQSFP-100G-PSM4 | ARISTA 100GBASE-PSM4 QSFP Transceiver, up to 500 M over parallel single-mode fiber |
| 100G AOC PART NUMBER | |
| AAOC-Q-Q-100G-5M | ARISTA QSFP28 to QSFP28 100GBE active optical cable 5 meter |
| AAOC-Q-Q-100G-30M | ARISTA QSFP28 to QSFP28 100GBE active optical cable 30 meter |
| MADI SFP PART NUMBER | |
| SFP+MADI+2RX | MADI Coaxial Dual Receiver, Non-MSA, HD-BNC |
| SFP+MADI+2TX | MADI Coaxial Dual Transmitter, Non-MSA, HD-BNC |
| OP+SFP+MADI+2RX | SFP Series*Dual Optical Input – MADI* |
| OP+SFP+MADI+2TX | SFP Series*Dual Optical Output – MADI* |
| 3G SDI PART NUMBER | |
| OP+SFP+TT+13+13 | SFP Series: Dual-channel optical outputs of SD/HD/3G 1310 nm wavelength |
| OP+SFP+RR | SFP Series: Dual-channel optical inputs of SD/HD/3G PIN Receiver |
| SFP+2ETX | SFP Series: Dual-channel HD-BNC outputs of SD/HD/3G (reclocked output) |
| SFP+2ERX | SFP Series: Dual-channel HD-BNC inputs of SD/HD/3G (reclocked output) |
| 12G SDI PART NUMBER | |
| OP+SFP+RR+12G | 12G/6G/3G/HD/SD-SDI UHD VIDEO SFP, OPTICAL, DUAL RECEIVER, NON-MSA, LC, RECLOCKED |
| OP+SFP+TT+12G | 12G/6G/3G/HD/SD-SDI UHD VIDEO SFP, OPTICAL, DUAL TRANSMITTER, NON-MSA, LC, RECLOCKED |
| SFP+2ETX+12G | 12G/6G/3G/HD/SD-SDI UHD VIDEO SFP, COAXIAL, DUAL TRANSMITTER, NON-MSA, HD-BNC, RECLOCKED |
| SFP+2ERX+12G | 12G/6G/3G/HD/SD-SDI UHD VIDEO SFP, COAXIAL, DUAL RECEIVER, NON-MSA, HD-BNC, RECLOCKED |
| HDMI PART NUMBER | |
| SFP+HDMI+IN | SFP Series: HDMI to SD/HD Converter + Cable |
| SFP+HDMI+OUT | SFP SERIES: SD/HD TO HDMI CONVERTER |
| SFP+HDMI20+OUT+CAB | 12G/3G/HD-SDI TO HDMI 2.0 TRANSMITTER SFP+, 8 AUDIO CH (HDMI), NON-MSA WITH TYPE D TO A CABLE |

| LICENSE KEY | |
|--|--|
| SNP-PLAT-UPG-2A4A | SNP Platform upgrade key – adds 2 Application Processors to an existing PLATFORM-2AU, creating the equivalent of PLATFORM-4A |
| SNP-PSK-SYNC | SNP Platform Software Key – enables SYNC and REMAP AP Personalities, supporting eight (8) 1080P or two (2) UHD Frame Synchronizers, or supporting two UHD SQD/2SI REMAP functions. One Key per AP. (MAX 4 PER SNP) HDR Conversion or HD Downscale require additional related keys. |
| SNP-PSK-2CONVUHD | SNP Platform Software Key – enables DUAL-CONV AP personality, supporting two UHD conversions on one AP (Max 4 per SNP). HDR Conversion or HD Downscale outputs require additional keys. This Key alternately enables QUAD-3GCONV personality. |
| SNP-PSK-4CONV3G | SNP Platform Software Key – enables QUAD-3GCONV AP personality, supporting four 1080P conversions on one AP (Max 4 keys per SNP). HDR Conversion requires additional related key. |
| SNP-PSK-MV | SNP Platform Software Key – enables MV (and MV-PORT) AP Personalities supporting two Landscape (or one portrait) UHD-output multiviewer. HD downscale output is included (does not require the PSK-DOWNHD key). One Key per multiviewer AP. (MAX 4 PER SNP). HDR Conversion requires additional HDR key. |
| SNP-PSK-HDR | SNP Add-On Feature Key – Adds HDR Conversion and Adjustment to Sync, Remap, MV, Dual-Conversion, or Quad-Conversion AP. Max 4 per SNP. |
| SNP-PSK-DOWNHD | SNP Add-On Feature Key – Adds output of two HD-Downscaled streams to Sync, Remap, or Dual-Conversion AP. Max 4 per SNP |
| SNP-PSK-MADIEXP | SNP Add-On Feature Key – Adds 128 additional audio channels to Sync or Remap AP. Max 4 per SNP. MADI SFPs sold separately |
| "Note: Pooled/shared licenses (up to four per type) can be applied to any processor within the same SNP unit. They are issued to the serial number of the SNP unit." | |

| FIELD-REPLACEABLE SPARES | |
|--------------------------|---|
| SNP-MAIN-PCB-ASSY | SNP field-replaceable spare main PCB assembly; same part number for both SNP-GW-3GX32 and SNP-GW-3GX32-HSQF frames |
| SNP-350W-ACPS-ASSY | SNP field-replaceable spare redundant 350 W AC power supply assembly for SNP-GW-3GX32 frames |
| SNP-400W-ACPS-HS | SNP field-replaceable single hot-swappable 400 W AC power supply for SNP-GW-3GX32-HS-QF (two per SNP) |
| SNP-FPNL-HS-HQF | SNP field-replaceable spare front panel assembly with access door and quiet fans for both SNP-GW-3GX32 and SNP-GW3GX32-HS-QF frames |
| SNP-HW-UPGRADE-KIT | SNP Field Upgrade Kit to increase & improve internal air flow for SNP-GW-3GX32 & SNP-GW-3GX32-HS-QF (Note: Since Nov. 2019, all SNP-GW-3GX32-HS-QF units shipped from the factory included this modification.) This kit includes SNP-FPNLHS-HQF and (2) air guides for Main PCB assembly. This is required for Multiviewer personality. |
| SNP-SPARE-FPFAN | Replacement Fan for SNP Front Panel. Compatible with 3GX32-HS-QF and 3GX32-HS-HQF models. This fan is an internal part and should be replaced by a competent technician following factory-provided instructions. Each SNP includes four of this fan component. |
| SNP-SPARE-BBFAN | Replacement Fan for SNP BB FPGA. This fan is an internal part and should be replaced by a competent technician following factory-provided instructions. Each SNP includes four pcs of this fan component. |

FIELD-REPLACEABLE SPARES

SNP-SPARE-IPFAN

Replacement Fan for SNP IP FPGA. This fan is an internal part and should be replaced by a competent technician following factory-provided instructions. Each SNP includes one of this fan component

Images/Diagrams



SNP hardware (front)



SNP hardware (front) with the hot swap-able power supply option



Rear of SNP hardware