Selenio X100

Dual-Channel Frame Synchronizer and Converter

Selenio X100™ offers a wide array of analog and digital real-time baseband video and audio processing capabilities. Standard features in this versatile 1RU include dual-channel frame sync/delay and up/down/cross-conversion, color correction and clipping, dual logo generation/insertion, VANC data and metadata processing, and time code insertion and extraction. For audio functionality, Selenio X100 provides two 16-channel SDI de-embedders and embedders, 16 AES input or output ports, 8-channel input and output analog audio interfaces, and 32-channel internal audio processing.

Benefits

- Delivers exceptional quality and dependability, building on the legacy of Imagine's award-winning series of 1RU processors
- Features program delay, ensuring profanity avoidance for live events
- Allows branding of content through animated logo generator/inserter
- Provides built-in web server, enabling easy-to-use control and monitoring

Features

- Intelligent dual-channel frame sync/delay, proc amp, noise reduction, clipping and color correction
- Animated logo generator/inserter (1/9th screen size) with up to 80 seconds for 1080p, 160 seconds for 1080i/720p, 900 seconds for 480i/576i
- Program delay up to 20 seconds for 1080p, 40 seconds for 1080i/720p, 220 seconds for 480i/576i
- Dolby® Digital Plus codecs and RTLL Real Time Loudness Control
- Video thumbnails support for the input and output of the 2 processing channels
- Insertion of closed captioning data from serial port
- Support for continuous numbering of SCTE-104 messages (remap mode) when mixing messages from GPI trigger and embedded SCTE-104 packets
- Support for more SFPs (dual-channel HD-BNC inputs and outputs, combination of HD-BNC and optical input and output, SD/HD to DVI converter, SD/HD to HDMI converter)
- Support for all 1080p/psf production formats (23.98, 24, 25, 29.97, 30)
- True optional dual-channel processing for analog video
- Data Wrangler VANC processing for known and unknown data types
- Rules Engine for custom signal flow management
- Fast frame sync, fast conversion, delay (lock to one input), program delay and time base corrector (TBC) modes
- Advanced 3D adaptive 10-bit motion detection for up/down/cross/aspect ratio conversion
- Basic frame rate conversion built-in and optional single-channel linear frame rate conversion
- Two switchable auto-sensing 3G/HD/SD inputs
- Dual up/down/cross/aspect/basic ratio conversion
- Noise reduction (mosquito and block), sharpness and texture controls
- Two aspect ratio converters with full control over H/V size and position with AFD support
- Built-in video test and audio tone generators
- Redundant power supplies
- Dual logo generator/inserters
  - Static built-in, can be used for a trouble slide
  - Optional 1/9th screen animated logos
- I-Wings side bar insertion when upconverting
- Audio de-embed/embed, sync, delay, gain, invert and delay with 32 channels (eight groups) processing
- PCM and non-PCM (Dolby® Digital Plus, Dolby® Digital, Dolby® E) passthrough
- Options for Dolby® Digital Plus, Dolby® Digital, Dolby® E decode and encode (up to 2 Dolby decoders and encoders)

- Video Interfaces:
  - Auto-sensing for SD-SDI, HD-SDI, 3G-SDI
  - Two SDI inputs (2 HD-BNC, Dual SFP)
  - Four SDI Outputs (4 HD-BNC, Dual SFP)
  - EDH/CRC error monitoring and insertion
  - HDMI output
  - Optional dual channel composite and component analog video
- Audio Interfaces
  - Eight-channel analog audio
  - 2 x 4 groups embedded audio
  - 16 AES (75 ohms) configurable ports
- Data and Metadata
  - Up to 16 services including:
    - CC (CEA608/708), Teletext (OP47) captions
    - ARC data (WSS/VI/AFD)
    - Audio metadata (Dolby)
    - User cue data GPI trigger insertion/extraction using SCTE-104 or BT-1865
    - BrandNet
    - LIDIA
    - Timecode
    - ARIB audio mode
    - Pass up to 10 user DID/SDID when converting video
- Control and Monitoring
  - 100/100BT Ethernet connectivity
  - SNMP-compliant
  - Built-in web control and monitoring
  - Local control panel
  - CCS™-compliant
  - Magellan™ network control panels
  - Magellan CCS™ Navigator
  - Four customizable GPI inputs and outputs

Applications

Specifications

Specifications and designs are subject to change without notice.	
COMPOSITE VIDEO INPUT (X100 OPTAVIO REQUIRED)	
Standard	NTSC (SMPTE170M) PAL-B (ITU624-2) PAL-M
Connector	HD-BNC
Quantization	12 bits (NTSC, PAL-B, PAL-M) TBC mode: 8 bits (all standards)
Input level	1 V pk-pk
Impedance	75 ohms
Return Loss	>40 dB, 0.1 to 6 MHz
Common Mode Range	5 V
CMRR	60 dB @ 50/60 Hz, 5 V pk—pk
Setup Level Range	±7.5 IRE

COMPOSITE VIDEO INPUT (X100 OPTAVIO REQUIRED)	
Frequency Response	±0.1 dB, 0.1 to 6 MHz
SNR	62 dB, typical
Y/C Gain Error	<0.1 dB
Y/C Delay Error	<10 ns

COMPONENT VIDEO INPUT (X100 OPTAVIO REQUIRED)	
Format	YPbPr (Betacam/SMPTE), RGB
Connector Amphenol	HD-BNC
Quantization	12 bits
Input level	1 V pk—pk
Impedance	75 ohms
Return Loss	>40 dB, 1 kHz to 6 MHz
SNR	>60 dB

3G/HD/SD-SDI VIDEO INPUT	
Number of inputs	2
Standard	3G: SMPTE 424M (2.97, 2.97/1.001 Gb/s) HD: SMPTE 274M, SMPTE 292M (1.485, 1.485/1.001 Gb/s) SD: SMPTE 259M-C (270 Mb/s, 525/625 component video)
Connector	HD-BNC
Impedance	75 ohms
Return Loss	>10 dB, typical, from 1485 to 2970 MHz >15 dB, typical, from 5 to 1485 MHz >20 dB, typical, from 5 to 270 MHz
Equalization	3G: Adaptive cable equalization for up to 492 ft (150 m), typical, of Belden 1694A coaxial cable HD-SDI: Adaptive cable equalization for up to 607 ft (185 m) typical, of Belden 1694A coaxial cable SD-SDI: Adaptive cable equalization for up to 1310 ft (400 m) typical, of Belden 8281 coaxial cable

FIBER VIDEO IN (VIA SFP PORT)	
Number of Inputs	2
Standard	3G: SMPTE 424M HD-SDI: SMPTE 292M SD-SDI: SMPTE 259M
Connector	LC
Laser	Safety Level Class 1

AUDIO INPUT	
Unbalanced AES Input	
Number of Inputs	16, 14, 12 … 2 (shared with AES outputs, software configurable)

AUDIO INPUT

Connector	HD-BNC
Impedance	75 ohms
Return Loss	>25 dB, 0.1 to 6.0 MHz
Sensitivity	<100 mV
Input Audio Sampling Rate	32 to 108 kHz

BALANCED AES INPUT (WITH EXTERNAL BALUN)

Number of Inputs	16, 14, 12 … 2 (shared with AES outputs, software configurable)
Connector	XLR with external balun
Sensitivity	<200 mV
Impedance	110 ohms ±20% (0.1 to 6 MHz)
Maximum Input Signal	10 V pk-pk
Common Mode Rejection	0 V to 7 V (0 to 20 kHz)
Input Audio Rate	32 to 108 kHz

ANALOG AUDIO INPUT

Number of Inputs	8 mono channels
Type	Balanced
Connector	DB-25, Tascam-style cable snake for balanced 8-channel audio
Input Audio Level	28 dBu to 12 dBu (adjustable in 1 dB increments)
Input Impedance	High-Impedance or 600 ohms, jumper selectable
CMRR	>80 dB @ 60 Hz, typical
Linearity	<±0.5 dB, typical
Frequency Response	<±0.1 dB (20 Hz to 20 kHz), typical
THD	>90 dB (20 Hz to 20 KHz), typical
SNR	>100 dB, typical

VIDEO OUTPUT

Fiber Video Output (Via SFP Port)

Number of Outputs	2
Standard	3G: SMPTE 424M HD-SDI: SMPTE 292M SD-SDI: SMPTE 259M
Connector	LC
Output Wavelength	1310 ±30 nm
Output Power	-7 dBm (typical) to 0 dBm
Rise/fall Time	3G: <105 ps/120 ps, typical

VIDEO OUTPUT

Jitter	3G: <45 ps, typical HD-SDI: <60 ps, typical SD-SDI: <110 ps, typical
Laser	Safety Level Class 1

HDMI OUTPUT

Number of outputs	1
Standards	1080p/60, 1080p/59.94, 1080p/50, 1080p/30, 1080p/29.97, 1080p/25, 1080p/24, 1080p/23.98 1080i/60, 1080i/59.94, 1080i/50, 1080psf/24, 1080psf/23 720p/60, 720p/59.94, 720p/50 525, 625, 640 x 480p
Compliance	HDMI 1.4a
Connector	HDMI type A

COMPOSITE VIDEO OUTPUT (X100 OPTAVIO REQUIRED)

Standard	NTSC, PAL-B, PAL-M
Connector	HD-BNC
Quantization	12 bits
Impedance	75 ohms
Return Loss	>40 dB, 0.1 to 6 MHz
Frequency Response	±0.1 dB to 5.5 MHz, typical
DC Offset	<0.5 mV
Differential Gain	<0.5%
Differential Phase	<1°, typical
Y/C Gain	<1°, typical
Y/C Delay	NTSC: <10 ns, typical PAL: <20 ns, typical
Transient Response	<0.5% K Factor
SNR	>60 dB to 5.5 MHz

COMPONENT VIDEO OUTPUT (X100 OPTAVIO REQUIRED)

Format	YPbPr (Betacam/SMPTE)
Connector	HD-BNC
Quantization	12 bits
Impedance	75 ohms
Return Loss	>40 dB, 1 kHz to 6 MHz
DC offset	<0.5 mV
SNR	>60 dB, typical

3G/HD/SD-SDI OUTPUT

3G/HD/SD-SDI OUTPUT

3G/HD/SD-SDI Output Video

Number of outputs	2
Standard	3G: SMPTE 424M (2.97, 2.97/1.001 Gb/s) HD: SMPTE 274M, SMPTE 292M (1.485, 1.485/1.001 Gb/s) SD: SMPTE 259M-C (270 Mb/s, 525/625 component video)
Connector	HD-BNC
Impedance	75 ohms
Return Loss	>10 dB, typical, from 1485 to 2970 MHz >15 dB, typical, from 5 to 1485 MHz >20 dB, typical, from 5 to 270 MHz
Signal Level	800 mV ±10%
DC Offset	0 V ±0.5V
Rise and Fall Time	3G: <135 ps (20% to 80%) HD: <270 ps (20% to 80%) SD: 400 – 1500 ps (20% to 80%)
Overshoot	<10% of amplitude (all outputs terminated)
Jitter Timing jitter:	3G: <2 UI pk-pk HD: <1 UI pk-pk SD: <0.2 UI pk-pk
Alignment jitter:	3G: <0.3 UI pk-pk HD: <0.2 UI pk-pk SD: <0.2 UI pk-pk

AUDIO OUTPUT

Unbalanced AES Output

Number of outputs	16, 14, 12 … 2 (shared with AES outputs, software configurable)
Standard	AES 3, SMPTE 276M
Type	Unbalanced, AC coupled
Connector	HD-BNC
Impedance	75 ohms
Return Loss	>25 dB, 0.1 to 6 MHz
Signal Amplitude	1.0 V pk-pk, 10% into 75 ohms load
Audio Sampling Rate	48 kHz
Rise/Fall Time	30 ns to 44 ns (10 to 90%)
Bits	24, 20, or 16
Channel Status and User Bit	Maintained, but professional mode, 48 kHz

BALANCED AES OUTPUT (WITH EXTERNAL BALUN)

Number of Outputs	16 (shared with AES inputs, software configurable)

BALANCED AES OUTPUT (WITH EXTERNAL BALUN)

Type	Balanced, transformer coupled
Connector	XLR with external balun
Impedance	110 ohms, 20% (0.1 to 6 MHz)
Signal Amplitude	1.0 V pk-pk, 10% into 75 ohms load
Audio Sampling Rate	48 kHz
Rise/Fall Time	30 ns to 44 ns (10 to 90%)
Bits	24, 20, or 16
Channel Status and User Bits	Maintained, but professional mode, 48 kHz.

BALANCED AES OUTPUT (WITH EXTERNAL BALUN)

Number of Outputs	16, 14, 12 … 2 (shared with AES outputs, software configurable)
Type	Balanced, transformer coupled
Connector	XLR with external balun
Impedance	110 ohms, 20% (0.1 to 6 MHz)
Signal Amplitude	2 to 7 V pk-pk into 110 ohms load
Audio Rate	48 kHz
Jitter	±20 ns
Rise/Fall Time	5 ns to 30 ns (10 to 90%)
Bits	24, 20 or 16
Channel Status and User Bits	Maintained, but professional mode, 48 kHz.

ANALOG AUDIO OUTPUT

Number of Inputs	8 mono channels
Type	Balanced
Connector	DB-25, Tascam-style cable snake for balanced 8-channel audio
Output Audio Level	28 dBu to 12 dBu (adjustable in 2 dB increments)
Output Impedance	66 ohms
Frequency Response	<±0.2 dB (20 Hz to 20 kHz), typical
THD	>90 dB (20 Hz to 20 kHz), typical
SNR	>93 dB, typical
Crosstalk	>95 dB, 20 Hz to 20 kHz, typical
Linearity	<±1.0 dB (to -100 dBFS), typical

MISCELLANEOUS

Genlock

Connector	HD-BNC

MISCELLANEOUS

Impedance	75 ohms
Return Loss	>40 dB 25 Hz to 10 MHz (SMPTE 318M-1999) >45 dB 25 Hz to 10 MHz >40 dB 10 MHz to 30 MHz
Common Mode Range	5.5 V pk-pk
CMRR	60 dB @ 60 Hz, 5 V pk-pk
Input Level	NTSC/PAL-B: 1 V pk-pk, -6.0 dB to +6.0 dB Tri-Level Sync: ±300 mV, -6.0 dB to +6.0 dB 1080i: 59.94/50 1080p: 29.97/25/23.98 1080psf: 23.98 720p: 59.94/50
Signal Type	NTSC/PAL-B Analog Composite ±300 mV Tri-Level Sync
Standards	SMPTE 170M (NTSC) ITU-R BT.470-6 (PAL-B) SMPTE 274M (1080i, 1080p) SMPTE 292M (720p)

DARS INPUT

Standard	AES3, SMPTE 276M
Type	Unbalanced, AC-coupled
Connector	HD-BNC
Sensitivity	100 mV
Impedance	75 ohms
Return Loss	>25 dB, 0.1 to 6 MHz
Sampling Rate	48 kHz

RS-232/422/485

Number of Rx Ports	2 RS-422/485 or RS-232
Number of Tx Ports	2 RS-422/485 or RS-232
Electrical	EIA-232-C, EIA-422-B, EIA-485-A
Connector	Samtec TFM-110-01-L-D-RE1-WT 20 pin-connector RS-232/422/485 switchable from user control RS-422 termination through jumpers

LAN

Number of Connectors	1
Connector	RJ-45
Type	10/100 Base-T Ethernet as defined by IEEE 802.3

GENERAL PURPOSE INTERFACE

GENERAL PURPOSE INTERFACE	
Connector	6-position screw terminal (Weidmuller 1607080000)
Inputs	+5 V
Outputs	Relay controlled contact closure Power On: Circuit normally open Power Off: Circuit closed
Signal Level	+/-75 V w.r.t to GPO common
Power Consumption	The Selenio X100 provides redundant power; during normal operation, both power supplies are on. However, only one is powering the frame at any time. The line voltage is auto-detected
Temperature	14° to 113° F (-10° to 45° C), with a relative humidity of <95% non-condensing.
Power Use	100-240 VAC, @ 47-63 Hz, 2.5 A (X2)
FRAME DIMENSIONS	
Height	1RU
Width	19 in. (48.3 cm)
Depth	front mounting ear to end of longest rear connector 24.2 in. (61.5 cm)

Ordering Information

X100-1RU-2PS	1RU dual-channel intelligent frame sync and converter with advanced audio processing
ANIMATED LOGO GENERATOR INSERTER AND PROGRAM DELAY OPTIONS	
X100OPT-1ALG-8GB	Single-channel Animated Logo Generator/Inserter, includes one X100OPT-SK-ALG software license, X100OPT-MEMMOD-8GB memory module (80 seconds for 1080p, 160 seconds for 1080i/720p, 900 seconds for 480i/576i)
X100OPT-2ALG-16GB	Dual-channel Animated Logo Generator/Inserter, includes two X100OPT-SK-ALG software licenses, X100OPT-MEMMOD-16GB memory module (80 seconds for 1080p, 160 seconds for 1080i/720p, 900 seconds for 480i/576i)
X100OPT-1PD-8GB	Single-channel Program Delay, includes one X100OPT-SK-PD software license, X100OPT-MEMMOD8GB Memory Module (20 seconds for 1080p, 40 seconds for 1080i/720p, 220 seconds for 480i/576i)

ANIMATED LOGO GENERATOR INSERTER AND PROGRAM DELAY OPTIONS	
X100OPT-ALG-PD-16	Single-channel Animated Logo Generator/Inserter and Program Delay, includes one X100OPT-SK-ALG software license, one X100OPT-SK-PD software licenses and X100OPT-MEMMOD-16GB Memory Module (maximum animated logo: 80 seconds for 1080p, 160 seconds for 1080i/720p, 900 seconds for 480i/576i; maximum program delay: 20 seconds for 1080p, 40 seconds for 1080i/720p, 220 seconds for 480i/576i)
X100OPT-SK-ALG	Single-channel Animated Logo Generator/Inserter, software license only, X100OPT-MEMMOD-8GB or X100OPT-MEMMOD-16GB memory module required
X100OPT-SK-PD	Single-channel Program Delay software license only, X100OPT-MEMMOD-8GB or X100OPT-MEMMOD-16GB memory module required
X100OPT-MEMMOD16GB	Memory Module with 16GB memory, required for Program Delay and/or Animated Logo Generator/Inserter software licenses
X100OPT-MEMMOD8GB	Memory Module with 8GB memory, required for Program Delay and/or Animated Logo Generator/Inserter software licenses
X100OPT-MEM-8GB	Spare or field upgrade 8GB of storage for X100OPT-MEMMODxxGB memory module

Notes:
1)   The animated and static logo generators can be used at the same time
2)   Dual program delay and dual animated logo configurations are not allowed

OPTIONS	
X100OPT-AVIO	Plug-in dual-channel analog video input and output module option
X100OPT-SK-SC	One channel linear frame rate conversion software key license option
X100OPT-ADVAUD	Plug-in advanced audio submodule option (required for Dolby and DTS options)
X100OPT-SK-DDPD	Software Key License for Dolby Digital Plus Decoder (7.1, 5.1 + 2.0, 2.0 + 2.0) for Selenio X100, X100OPT-ADVAUD required
X100OPT-SK-DDPE	Software Key License for Dolby Digital Plus Encoder (7.1, 5.1 + 2.0, 2.0 + 2.0) for Selenio X100, X100OPT-ADVAUD required
X100OPT-SK-RTLL	Software Key License for Real Time Loudness Control for Dolby Digital Plus Encoder (5.1 + 2.0, 2.0 + 2.0) for Selenio X100, X100OPT-ADVAUD and X100OPT-SK-DDPE required

Notes:
The Dolby Digital Plus option includes Dolby Digital (for those who already have Dolby Digital, the Dolby Digital Plus features are added)

X100OPT-SK-DDE	One Dolby Digital encoder software key license option, requires X100OPT-ADVAUD
X100OPT-SK-DED	One Dolby E decoder software key license option, requires X100OPT-ADVAUD
X100OPT-SK-DDD	One Dolby Digital decoder software key license option, requires 100OPT-ADVAUD
X100OPT-SK-DEE	One Dolby E encoder software key license option, requires

	X100OPT-ADVAUD
X100-PSU-200W	Spare/Replacement power supply
X100OPT-TOOL-CABLE	HD-BNC cable insertion and extraction tool
X100OPTCAB-HDBNC-A	HD-BNC plug to BNC Jack adaptor cable for audio (12″ / 0.3m)
X100OPTCAB-HDBNC-V	HD-BNC plug to BNC Jack adaptor cable for video (12″ / 0.3m)
X100OPT-75-TERM	75 ohms precision HD-BNC Terminator
OP+SFP+RR	Small Form Factor (SFP) for Imagine Communications fiber optic products. Dual PIN receiver with pathological support for baseband video.
OP+SFP+TT+13+13	Small Form Factor (SFP) for Imagine Communications fiber optic products. 1310 nm and 1310 nm wavelength dual transmitter with pathological support for baseband video.
OP+SFP+TT+27+29	Small Form Factor (SFP) for Imagine Communications fiber optic products. 1270 nm and 1290 nm CWDM wavelength dual transmitter with pathological support for baseband video
OP+SFP+TT+31+33	Small Form Factor (SFP) for Imagine Communications fiber optic products. 1310 nm and 1330 nm CWDM wavelength dual transmitter with pathological support for baseband video
OP+SFP+TT+35+37	Small Form Factor (SFP) for Imagine Communications fiber optic products. 1350 nm and 1370 nm CWDM wavelength dual transmitter with pathological support for baseband video
OP+SFP+TT+43+45	Small Form Factor (SFP) for Imagine Communications fiber optic products. 1430 nm and 1450 nm CWDM wavelength dual transmitter with pathological support for baseband video
OP+SFP+TT+47+49	Small Form Factor (SFP) for Imagine Communications fiber optic products. 1470 nm and 1490 nm CWDM wavelength dual transmitter with pathological support for baseband video
OP+SFP+TT+51+53	Small Form Factor (SFP) for Imagine Communications fiber optic products. 1510 nm and 1530 nm CWDM wavelength dual transmitter with pathological support for baseband video
OP+SFP+TT+55+57	Small Form Factor (SFP) for Imagine Communications fiber optic products. 1550 nm and 1570 nm CWDM wavelength dual transmitter with pathological support for baseband video
OP+SFP+TT+59+61	Small Form Factor (SFP) for Imagine Communications fiber optic products. 1590 nm and 1610 nm CWDM wavelength dual transmitter with pathological support for baseband video
SFP+2ERX	SFP Series, Dual-channel HD BNC inputs of SD/HD/3G (reclocked output)
SFP+2ERX+NR	SFP Series, Dual-channel HD BNC inputs of SD/HD/3G (Non-reclocked output)
SFP+2ETX	SFP Series, Dual-channel HD BNC outputs of SD/HD/3G (reclocked output)
SFP+2ETX+NR	SFP Series, Dual-channel HD BNC outputs of SD/HD/3G (Non-reclocked output)
SFP+DVI+OUT	SFP Series: SD/HD to DVI Converter

SFP+EORX	SFP Series, Dual-channel inputs of SD/HD/3G (reclocked output). One over Optical (PIN receiver) and one over HD BNC Electrical.
SFP+EOTX	SFP Series, Dual-channel outputs of SD/HD/3G (reclocked output). One over Optical (1310nm wavelength) and one over HD BNC Electrical.
SFP+HDMI+OUT	SFP Series: SD/HD to HDMI Converter
REMOTE CONTROL PANELS	
Magellan Panel with OLED Displays, Rotary Control and LCD Pushbuttons (user programmable LCD pushbuttons)	
RCP-24LCD-OLED-II*	1RU control panel with 24 wide view LCD buttons and OLED display
RCP-48LCD-OLED-II*	2RU control panel with 48 wide view LCD buttons and OLED display
Magellan Panel with OLED Displays, Rotary Control and Pushbuttons (user prints out legends for the pushbuttons)	
RCP-32PB-OLED*	1RU control panel with one OLED display, one control knob and 32 push buttons
RCP-64PB-OLED*	2RU control panel with two OLED displays, two control knobs and 64 push buttons
Software Key for Magellan Panels *	
RCP-PROCMV-OPT	Software key license that enables control of Imagine Communications multiviewers and processing devices on Magellan Remote Control Panels (OLED display with LCD programmable push button and OLED display with pushbutton versions only)