

SEL-1DEC2-EES

# MPEG-2/H.264 Universal Decoder

The Selenio SEL-1DEC2 Universal Decoder module can decode any CODEC video streams from H.264 or MPEG-2, SD or HD in both 8 and 10 bit modes, and supports up to eight audio streams, as well as the processing of any supporting data insertion via VBI, VANC, or Serial Data.

The flexibility of the Selenio decoder makes it ideal for production and distribution applications. Coupled with other modules in the Selenio™ MCP series, this multi-function decoder addresses applications such as multiformat satellite decoding, confidence monitoring, and much more.

## Features

- Supports receiving a single transport stream from any of the following sources:
  - Over IP using UDP or RTP protocols and SMPTE 2022 error protection
  - DVB-ASI from the rear I/O interface
- Supports decoding of constant bit rate and variable bit rate streams:
  - H.264 High 422 Profile (4:2:2 8-bit and 10-bit) at Level 4.2
  - H.264 High 10 Profile (4:2:0 10-bit) at Level 4.2
  - AVC1-50: H.264 High 10 Intra Profile (4:2:0 10-bit) at Level 4.0 and 3.2
  - AVC1-100: H.264 High 4:2:2 Intra Profile (4:2:2 8-bit and 10-bit) at Level 4.1
  - H.264 High Profile @ up to L4.2 (80 Mb/s max)
  - H.264 restricted to Main Profile @ up to L4.2
  - H.264 restricted to Baseline Profile @ up to L1.3
  - MPEG-2 422 profile @ up to High Level (80 Mb/s max)
  - MPEG-2 restricted to Main Profile @ up to High Level
- Supports any legal horizontal resolution
- Supports output video formats:
  - 1080p/59.94 / 1080p/50 – SMPTE 424/235 Level A and B
  - 1080i/59.94, 1080i/50 – SMPTE 292
  - 720p/59.94, 720p/50 – SMPTE 292
  - 480i/59.94 – SMPTE 259
  - 576i/50 – SMPTE 259

\*For additional broadcast-quality post-processing, refer to the following application modules:

- Supports cross-conversion in the following cases\*:
  - SD NTSC or PAL) to HD (1080i, 720p) at the same frame rate as the source maintaining aspect ratio by letter/pillar boxing, as necessary
  - HD to SD at the same frame rate as the source maintaining aspect ratio by letter/pillar boxing, as necessary
  - HD to HD (1080i to/from 720p) at the same frame rate as the source
  - Mobile streams (vertical resolution below 480) displayed as either full screen with letter/pillar boxing, as necessary, or centered with no vertical scaling
  - 3 Gb/s to HD
  - Decoded video can be synchronized to the clock recovered from the input bit stream, or genlocked to the frame reference
  - Conversion (SEL-2XD1 and SEL-1XD1)
  - Frame sync (SEL-1FS1 and SEL-2FS1)

- Supports audio decoding including either:
  - Eight stereo pairs of MPEG-1 Layer 2, AAC-LC, HE-AAC, including SBR and parametric stereo, SMPTE 302 (AES-3 over MPEG)
  - Six stereo pairs of Dolby® Digital
  - Two Surround Sound 5.1 Dolby® Digital or AAC
  - Two Dolby® E
  - Passthrough of SMPTE 337 pre-compressed audio streams
- VANC processing
  - VANC passthrough – SMPTE 2038/RDD-1
  - EIA-608/708 closed captions
  - AFD
  - SCTE-104 from SCTE-35 splice points
  - DVITC timecode
  - OP-47 teletext
  - Audio metadata
- VBI processing
  - EIA-608 closed captions
  - AFD
  - WST teletext
  - SMPTE timecode
  - AMOL-48 or AMOL-98
  - VPS
    - Lossless data (luma)
    - Test pattern generation
- Rear I/O connections
  - 2x HD-BNC – ASI input
  - 2x HD-BNC – SDI output
  - 2x HD-BNC – ASI loop-through
  - 8x HD-BNC – Primary AES audio outputs
  - 2x serial outputs – serial data and audio metadata
  - GP outputs

## Specifications

Specifications and designs are subject to change without notice

ASI INPUT	
Number of Inputs	1
Standard	EN 50083-9
Connector	HD-BNC
Data Rate	0 to 210 Mb/s
Minimum Sensitivity	200 mV
Maximum Input Voltage	88 mV pk-pk
Minimum Discrete Connector	-15 dB (0.3 MHz to 1 GHz)
SERIAL VIDEO OUTPUT (SDI, HD-SDI, 3 GB/S)	
3 Gb/s HD-SDI Outputs	
Number of Outputs	2
Standard	SMPTE 424M
Connector	HD-BNC
Impedance	75 ohms
Signal Level	800 mV ±10%
DC Offset	0 V ±0.5 V
Rise and Fall Time	<135 ps (20% to 80%), differ by no more than 50 ps
Overshoot	<10% of amplitude

<b>SERIAL VIDEO OUTPUT (SDI, HD-SDI, 3 GB/S)</b>	
Jitter	Timing jitter: 2 UI pk-pk Alignment jitter: 0.3 UI pk-pk
<b>1.5 GB/S HD-SDI OUTPUTS</b>	
Number of Outputs	2
Standard	SMPTE 292M (1.485, 1.485/1.001 Gb/s)
Connector	HD-BNC
Impedance	75 ohms
Signal Level	800 mV $\pm$ 10%
DC Offset	0 V $\pm$ 0.5 V
Rise and Fall Time	<270 ps (20% to 80%)
Overshoot	<10% of amplitude (all outputs terminated)
Jitter	Timing jitter: <1 UI pk-pk Alignment jitter: <0.2 UI pk-pk
<b>SD-SDI OUTPUTS</b>	
Number of Outputs	2
Standard	SMPTE 259M-C (270 Mb/s, 525/625 component video)
Connector	HD-BNC
Impedance	75 ohms
Signal Level	800 mV $\pm$ 10%
DC Offset	0 V $\pm$ 0.5 V
Rise and Fall Time	400 to 1500 ps (20% to 80%)
Overshoot	<10% of amplitude (all outputs terminated)
Jitter	<0.2 UI pk-pk
<b>DIGITAL AUDIO OUTPUTS</b>	
Unbalanced AES Output	
Standard	AES-3, SMPTE 276M
Type	Unbalanced, AC coupled
Connector	HD-BNC
Impedance	75 ohms
Signal Amplitude	1 V pk-pk @ 10% into 75 ohms load
Audio Rate	48 kHz
Rise and Fall Time	30 to 44 ns (10% to 90%)
Bits	24, 20 or 16
Channel Status and User Bit	Maintained, but professional mode, 48 kHz
<b>ASI OUTPUTS</b>	
Number of Outputs	2
Standard	EN 50083-9
Connector	HD-BNC
Data Rate	0 to 210 Mb/s
Output Voltage	800 mV $\pm$ 10% pk-pk

ASI OUTPUTS	
Clock Rate	270 MHz ±100 ppm
Deterministic Jitter	10% pk-pk
Random Jitter	8% pk-pk
Maximum Rise and Fall Time	1.2 ns (20% to 80%)
ELECTRICAL	
Power Consumption	40 W maximum

## Ordering Information

DECODER HARDWARE ONLY	
<b>SEL-1DEC2-EES</b>	<b>MPEG-2/H.264 CONTRIBUTION DECODER WITH HD-BNC CONNECTORS FOR ASI INPUT, 2 ASI OUTPUTS, 2 SDI VIDEO OUTPUTS, 8 AES (UNBALANCED OUTPUTS)</b>
DECODER MODULE TYPES	
<b>SEL-SK-DE2-BSC</b>	<b>SW DEC2, MPEG-2, H.264, 4:2:0 SUPPORT, 8-BIT</b>
<b>SEL-SK-DE2-STD</b>	<b>SW DEC2, MPEG-2, H.264, 4:2:0 AND 4:2:2, 8-BIT</b>
<b>SEL-SK-DE2-PRO</b>	<b>SW DEC2, MPEG-2, 4:2:0 AND 4:2:2 8-BIT, H.264, 4:2:0 AND 4:2:2, UP TO 10-BIT</b>
DECODER OPTIONS	
SELOPT-SK-D2-AUD4	Software-keyed option for additional 4 stereo pairs of audio available on-board
SELOPT-SK-D2-BISS	Software-keyed option for DVB Fixed-key Scrambling modes BISS-1
SELOPT-SK-D2-DDD	Software-keyed option for support of Dolby® Digital (AC-3) stereo or 5.1 decoding (5.1 decoding uses 3 of the available 4 or 8 stereo pairs) for DEC2
SELOPT-SK-D2-DED	Software-keyed option for support for Dolby® E on 4 stereo pairs of audio
SELOPT-SK-D2-S302	Software-keyed option to support for up to 8 stereo pairs of SMPTE-302 pass-through audio
SELOPT-SK-D2-HITL	Software keyed option for DEC2 – Support for Hitless Switching on SMPTE-2022 IP input using redundant streams

## Images/Diagrams



PROD - MCP MODULE - SEL-1DEC2 - SWATCH