



## AVP 4000



In a fast changing, highly competitive market, media organisations need encoding solutions that deliver high quality, high reliability and operational flexibility. The number of channels continues to increase. HD is growing fast, offering a better quality viewing experience. Consumers are buying larger and larger TV sets and now plans are being laid for Ultra High Definition TV. All that means, media organisations need to make the most efficient use of bandwidth and ensure consumers get a quality viewing experience.

The Ericsson AVP 4000 system encoder answers all those needs, delivering high quality system encoding for IPTV, Cable, Satellite and Broadcast. Part of the multiple award winning Ericsson AVP encoder range, the AVP 4000 also incorporates the rich toolset of Ericsson's market leading VPC system encoder.

A compact 1RU form factor offers up to six hot swappable option slots, for combinations of encoding and auxiliary modules. Dual power supplies protect services and an on-board video monitor gives instant operator feedback.

Unlike conventional 'box per application' encoder products, the AVP 4000 shares a common toolset, common chassis and common interface with the rest of Ericsson's award winning AVP products. That means media organisations can use a common encoder for a wide range of encoding needs, without the cost and complexity of a multi-vendor 'mix and match' approach. The AVP 4000 is equally suitable for deployment as a system component, or as part of an Ericsson multi-platform or multiscreen system solution.

### **Powered by Ericsson**

The AVP 4000 is powered by Ericsson's first ever video processing chip.



This completely new 10 bit Ericsson designed and built encoding chip, builds on two decades of market leadership in encoding algorithms and techniques, delivering outstanding picture quality at HD and SD, in both MPEG-2 and MPEG-4 AVC.

Codecs and resolutions can be upgraded via software, removing the need for complex hardware changes. The Ericsson chip is multi-codec, multi-profile and multi resolution, offering both encoding and transcoding. The AVP 4000 delivers levels of quality, performance and operational flexibility, not found on conventional encoding products. All of these benefits translate to the bottom line.

## THE AVP 'ONE PLATFORM' PHILOSOPHY

### A new approach to encoding

The Ericsson AVP 'one encoding platform' approach represents a modern approach to encoding product design.

In the media industry, the speed of change is increasing. New requirements and workflows are emerging. That's why it's important not to put unnecessary constraints on products. For example limiting a product to 8 bit operation, or 4:2:0 or a single codec, or a single workflow, may satisfy today's immediate requirements but maybe not tomorrow's.

With the AVP 'one platform approach', there are no such restrictions, as 10 bit, 4:2:2, and 3DTV are available today. SDI, HD-SDI, 3G, IP, ASI and IP connectivity are all supported. Legacy interfaces include Analogue, G.703 and GPI. UHDTV workflow at 4K is also supported.

A rich common toolset allows media organisations with differing encoding applications, to deploy AVP in a wide range of roles, including DSNG, Contribution, Distribution and delivery to the home. That offers potential cost savings in commissioning, integration, training and support, compared to a multi-vendor 'mix and match' approach.

## AVP 4000 BASE UNIT FEATURES

- Six slot 1AC PSU AVP4000/BAS/1AC FAZ 101 0196/40
  - Supports up to 4 encoder or transcoder modules
- Four slot 2AC PSU AVP4000/BAS/2AC FAZ 101 0196/41
  - Supports up to 4 encoder or transcoder modules
- Six slot dual 2AC PSU with flying leads AVP4000/BAS/2ACFL FAZ 101 0196/42 Supports up to 4 encoder or transcoder modules
- Six slot 1DC PSU AVP4000/BAS/1DC FAZ 101 0196/85
  - Supports up to 4 encoder or transcoder modules
- Six slot 2DC DC PSU AVP4000/BAS/2DC FAZ 101 0196/105
  - Supports up to 4 encoder or transcoder modules
- Six slot 1AC/ED PSU AVP4000/BAS/1AC/ED FAZ 101 0196/106
  - Supports up to 6 encoder or transcoder modules
  - (Check availability with Ericsson)
- SI table generation

### Platform Capacities

- Up to four encoders or transcoder modules per chassis (for six check availability with Ericsson)
- Feature set, resolution and Codec licensable by software
- Multiple concurrent I/O options

### Base Chassis Functionality Includes:

- Control via 2x electrical Ethernet (100/1000BaseT)
- Data I/O via 4x electrical Ethernet (100/1000BaseT)
- Multiplexing and MPEG-2 Transport Stream generation

## HARDWARE OPTIONS

### EI9001 Encoder Module

#### (AVP/HWO/EI9001 FAZ 101 0196/69)

- One slot per module. Up to four modules per chassis depending on configuration
- 3G/HD/SD-SDI, video input
- MPEG-2 Video and MPEG-4 AVC encoding capabilities
- Up to eight stereo pairs of audio encoding
- VANC data extraction and support for generic VANC (SMPTE 2038)
- Includes 2 pairs of MPEG-1 layer II audio coding
- ABR encoding option

### EI9001T Encoder/Transcoder Module

#### (AVP/HWO/EI9001T FAZ 101 0196/70)

- One slot per module. Up to four modules per chassis depending on configuration
- 3G/HD/SD-SDI, video input
- MPEG-2 Video and MPEG-4 AVC encoding capabilities
- Up to eight stereo pairs of audio encoding
- VANC data extraction and support for generic VANC (SMPTE 2038)
- Includes 2 pairs of MPEG-1 layer II audio coding
- ABR encoding option
- Confidence monitor loop through of I.P. input
- License upgrade from Encoder functionality to Transcoder functionality

### External Synchronization Module

#### (AVP/HWO/EXTSYNC, FAZ 101 0196/98)

- One slot per module. Up to one module per chassis
- Supports synchronization of all encoders in the chassis to an external clock reference
- 10 MHz or HSYNC input

### ASI Module

#### (AVP/HWO/ASI/2IN2OUT, FAZ 101 0196/97)

- One slot per module
- 2 x ASI MPEG-2 Transport Stream outputs configured as mirrored or independent

### GPI Module

#### (AVP/HWO/GPI, FAZ 101 0196/72)

- One slot per module
- Provides relay contacts (in) for manually triggered SCTE-35 insertion
- Provides relay contacts (out) for Alarm status

## SOFTWARE OPTIONS

### **MPEG-2 SD Encoding License**

**(AVP/SWO/MP2 FAZ 101 0196/47)**

- Enables MPEG-2 SD encoding on EI9001 and EI9001T
- 2 licenses required for multiplatform outputs

### **MPEG-4 SD Encoding License**

**(AVP/SWO/MP4 FAZ 101 0196/48)**

- Enables MPEG-4 SD encoding on EI9001 and EI9001T
- 2 licenses required for multiplatform outputs

### **HD Encoding License**

**(AVP/SWO/HD FAZ 101 0196/45)**

- Enables HD encoding on either MPEG-2 or MPEG-4 on EI9001 and EI9001T
- Maximum 1 license per EI9001 and EI9001T

### **Premium Quality Enhancements for SD Codecs**

**(AVP/SWO/SD/PREMIUM FAZ 101 0196/90)**

- Enables bit rate efficiencies and Picture Quality improvements on SD Codecs
- 1 license required per encoding channel

### **Premium Quality Enhancements for HD Codecs**

**(AVP/SWO/HD/PREMIUM FAZ 101 0196/91)**

- Enables bit rate efficiencies and Picture Quality improvements on HD Codecs
- 1 license required per encoding channel
- Requires AVP/SWO/SD/PREMIUM

### **Reflex™ Statistical Multiplexing License**

**(AVP/SWO/Reflex FAZ 101 0196/7)**

- Adds internal Statistical Multiplexing for encoders in the chassis
- 1 license required per encoding channel, maximum 1 per EI9001 and EI9001T

### **Mezzanine Basic Encode Pack**

**(AVP/SWO/MEZZ/BASIC FAZ 101 0196/151)**

- Enables high quality Mezzanine 4:2:2 10-bit encode for MPEG-4
- Includes BISS encryption
- 1 license required per EI9001

### **Mezzanine Advanced Encode Pack**

**(AVP/SWO/MEZZ/ADVANCED FAZ 101 0196/153)**

- Enables high quality Mezzanine 4:2:2 10-bit encode for MPEG-4
- Includes BISS encryption
- Includes PAA (Phase Aligned Audio)
- Includes 1 x **AVP/SWO/M1L2** to provide 5.1 in conjunction with PAA
- Includes 1 x **AVP/SWO/PROFEC**
- 1 license required per EI9001

### **Pro FEC Protection License**

**(AVP/SWO/PROFEC FAZ 101 0196/86)**

- Adds Pro FEC protection (SMPTE 2022) to output transport streams
- Ideally suited for remote stat-mux applications
- 1 license required per transport stream

### **PSIP CAROUSEL Download License**

**(AVP/SWO/PSIP FAZ 101 0196/92)**

- Allows insertion of MPEG PSI and PSIP data
- Supports Triveni Digital Guide Builder
- For ATSC systems only
- 1 license required per chassis

### **Transcoding License**

**(AVP/SWO/TRANS FAZ 101 0196/49)**

- Enables Transcoding on AVP/HWO/9001T

### **PIP License**

**(AVP/SWO/PIP FAZ 101 0196/89)**

- Enables PIP insertion up to 192 x 192 for MPEG-4 AVC only
- 1 license required per transport stream.

### **ABR SD License**

**(AVP/SWO/ABR/SD FAZ 101 0196/109)**

- Enables ABR profile generation for SD resolution, up to 576/25Hz, 480/29.97Hz
- 1 license required per EI9001/T configured for ABR generation
- Up to 10 ABR profiles depending on resolution
- Maximum 2 licenses per chassis

### **ABR HD License**

**(AVP/SWO/ABR/HD FAZ 101 0196/110)**

- Enables ABR profile generation for HD resolution, above 576/25Hz, 480/29.97Hz
- 1 license required per EI9001/T configured for ABR generation
- Up to 10 ABR profiles depending on resolution
- Maximum 2 license per chassis
- Requires AVP/SWO/ABR/SD

\* Check availability with Ericsson



#### **DPI License**

##### **(AVP/SWO/DPI FAZ 101 0196/102)**

- Digital program insertion splice point license
- Allows SCTE-35 stream splicing triggered from SCTE-104 in VANC or IP control network
- Maximum 1 license per EI9001 and EI9001T

#### **Capped VBR License**

##### **(AVP/SWO/CAPPEDVBR FAZ 101 0196/101)**

- Enables capped variable bit rate encoding
- 1 license required per encoding channel

#### **AAC 2.0 Audio Encoding License**

##### **(AVP/SWO/AAC FAZ 101 0196/50)**

- Enables one pair of Advanced Audio Coding (AAC-LC, HE-AAC, HE-AACv1) stereo audio encoding
- Up to 8 per EI9001 and EI9001T depending on configuration

#### **8 Channel Dolby® E Decoder License**

##### **(AVP/SWO/DOLBY/DEC FAZ 101 0196/52)**

- Enables 8 channels of Dolby® E decoding
- Maximum 2 licences per EI9001 and EI9001T

#### **2.0 Dolby® Digital Encoding License**

##### **AVP/SWO/DOLBY/AC3 FAZ 101 0196/53**

- Enables one 1.0 (centre from left), 1.0 (centre from right), 1.0 (L+R/2) or 2.0 encode of Dolby® Digital (AC3)
- For 5.1 encoding 3 license required
- Up to 8 licenses per EI9001 and EI9001T depending on configuration

#### **2.0 Dolby® Digital Plus Encoding License**

##### **AVP/SWO/DOLBY/PLUS FAZ 101 0196/79**

- Enables one 1.0 (centre from left), 1.0 (centre from right), 1.0 (L+R/2) or 2.0 encode of Dolby® Digital Plus
- For 5.1 encoding 3 license required
- Up to 8 license per EI9001 and EI9001T depending on configuration

#### **Dolby® Digital Decoder License**

##### **AVP/SWO/DOLBY/AC3/DEC FAZ 101 0196/54**

- Enables one decode of Dolby® Digital (AC3) or Dolby® Digital Plus up to a maximum of a 5.1 mix
- Maximum 2 licences per EI9001 and EI9001T

#### **Additional MPEG-1 layer II Encoding License**

##### **(AVP/SWO/M1L2) FAZ 101 0196/55)**

- Enables one 1.0 (centre from left), 1.0 (centre from right), 1.0 (L+R/2), 1+1 Mono, or a 2.0 encode of MPEG 1 Layer II encoding
- Up to 6 licences per EI9001 and EI9001T
- *NOTE: This is in addition to the 2 licences that are FOC with each encoder*

#### **ALC Automatic Loudness Control License**

##### **(AVP/SWO/ALC FAZ 0196/51)**

- Corrects short term and sustained audio level mismatches between interstitials and main program content
- Each license enables ALC per stereo pair in the linear PCM domain
- Maximum 8 licences per EI9001 and EI9001T

## EI9001 EI9001T ENCODER SPECIFICATIONS

### Video Encoding

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#### Input

- SDI and HD-SDI serial digital video
- Up to 8 stereo pairs embedded in HD-SDI
- Audio Sampling 48kHz

#### Profiles

- SD MPEG-2 Main Profile Main Level 4:2:0 8bit 0.5-15Mbit/s requires AVP/SWO/MP2
- SD H.264 Main Profile Level 3.0 4:2:0 8bit 0.5-10Mbit/s requires AVP/SWO/MP4
- SD H.264 High Profile Level 3.0 4:2:0 8bit 0.5-12.5Mbit/s requires AVP/SWO/MP4
- HD MPEG-2 Main Profile High Level 4:2:0 8bit 2-80Mbit/s requires AVP/SWO/MP2 + AVP/SWO/HD
- HD H.264 Main Profile Level 4.0 4:2:0 8bit 1-20Mbit/s requires AVP/SWO/MP4 + AVP/SWO/HD
- HD H.264 High Profile Level 4.0 4:2:0 8bit 1-25Mbit/s requires AVP/SWO/MP4 + AVP/SWO/HD
- HD H.264 High Profile Level 4.1 4:2:0 8bit 1-62.5Mbit/s requires AVP/SWO/MP4 + AVP/SWO/HD
- HD H.264 Hi 422 Profile Level 4.1 4:2:2 10-bit 1-62.5Mbit/s requires AVP/SWO/MP4 + AVP/SWO/HD + AVP/SWO/MEZZ/BASIC

#### HD Resolutions Requires AVP/SWO/HD

- 1,920/1,440 x 1,080i 25
- 1,920/1,440 x 1,080i 29.97
- 1,280/960 x 720p 50
- 1,280/960 x 720p 59.94

#### SD Resolutions

- 720/704/640/576/544/528/480/352 i25
- 720/704/640/576/544/528/480/352 i29.97

GOP processing includes adaptive GOP structure and adaptive GOP length

#### ABR Resolutions

- HD input:-  
Maximum output 1,280 x 720 p50/59.94  
Minimum output 288 x 128 p25/29.97
- SD input:-  
Maximum output 1,024 x 576 p25/29.97  
Minimum output 288 x 128 p25/29.97
- Horizontal up-scaling for SD inputs only

#### ABR Profiles

- High 1Mb/s to 17.5Mb/s.
- Main 0.75Mb/s to 14Mb/s.
- Baseline 0.15Mb/s to 4Mb/s.

### Audio Encoding

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2 pairs of MPEG1 Layer2 encoding included as standard (not seen as licences)

#### AAC requires AVP/SWO/AAC

- AAC-LC 64-512kbit/s
- HE-AAC 48-192kbit/s
- HE-AACv2 32kbit/s

#### Dolby® Digital requires AVP/SWO/DOLBY/AC3

- Mono 1.0 centre from left 56-640kbit/s
- Mono 1.0 centre from right 56-640kbit/s
- Mono 1.0 (L+R/2) 56-640kbit/s
- Stereo 2.0 96-640kbit/s
- Multi-channel 5.1 224-640kbit/s
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#### Dolby® Digital Plus requires AVP/SWO/DOLBY/PLUS

- Mono 1.0 centre from left 32-640kbit/s
- Mono 1.0 centre from right 32-640kbit/s
- Mono 1.0 (L+R/2) 32-640kbit/s
- Stereo 2.0 64-640kbit/s
- Multi-channel 5.1 192-640kbit/s

#### MPEG1 LAYERII requires AVP/SWO/M1L2

- Mono 1.0 centre from left 32-192kbit/s
- Mono 1.0 centre from right 32-192kbit/s
- Mono 1.0 (L+R/2) 32-192kbit/s
- 1+1 Dual Mono 64-384kbit/s
- Stereo 2.0 64-384kbit/s
- Joint Stereo 2.0 64-384kbit/s

#### VANC Data Extraction HD

- SMPTE 334-1 Closed Captions
- SMPTE 2016-3 AFD and Bar Data
- SMPTE-2031 Teletext
- OP47 Teletext Subtitles

#### VANC Data and VBI Extraction SD

- World Standard Text (WST –ETS300472) 625 only
- Closed Captioning EIA-608, EIA-708 and SCTE20
- SMPTE-334-1
- SMPTE 2016-3 AFD and Bar Data



## CHASSIS SPECIFICATIONS

### Transport Stream Interfacing

**Input**

2x Electrical Ethernet (100/1000BaseT)

**Output**

2x Electrical Ethernet (100/1000BaseT)

Physical port redundancy with active-active and active-standby operation

Multicast streaming

### Management

2x Electrical Ethernet (100/1000BaseT)

SNMP v1/v2/v3, for alarm traps

User management via web browser

Support for nCompass management system

### Physical and Power

**Dimensions (W x H x D)**

17.40 x 1.75 x 23.50 inches

(44.20 x 4.45 x 59.69 cm)

**Weight**

8.0 kg (17.6 lbs) unpopulated

**Input Voltage**

100-240 VAC 50/60 Hz (AC chassis)

-48 VDC (DC Chassis)

**Input Power**

70W (chassis only)

80W per each EI9001

90W per each EI9001T

### Environmental Conditions

**Operating Temperature**

-10°C to +50°C (14°F to 122°F) 1–2 EI9001/  
EI9001T fitted

-10°C to +45°C (14°F to 113°F) 3–4 EI9001/  
EI9001T fitted

-10°C to +35°C (14°F to 95°F) 5–6 EI9001/  
EI9001T fitted (AVP4000/BAS/1AC/ED only)

**Storage Temperature**

-40°C to +85°C (-40°F to 185°F)

**Relative Operating Humidity**

10% to 90% (non-condensing)

### Compliance

CE marked in accordance with EU Low Voltage and EMC Directives

**EMC Compliance**

EN55022, EN55024, AS/NZS3548, EN61000-3-2 and FCC CFR47 Part 15B Class A

**Safety Compliance**

EN60950, IE60950