

L816AE

8x 1Gb RJ45, 8x SD/HD/3G-SDI, 1x LTC



PHYSICAL

Dimensions (W x H x D)	43.40 cm x 4.28 cm x 66.37 cm 17.09 in x 1.69 in x 26.13 in
Weight	17.16 kg (Unit) 22.16 kg (Gross)
ECCN	4A994
USHTS Code	8471.50.0150

ELECTRICAL

Max Potential Power	351 Watts (Max)
Heat Dissipation	1197.66 BTU/hr (Max)
AC Power Option	100 - 240 VAC (Input Voltage) 50 - 60 Hz (Line Frequency)

AC PSU Connector C14



DC Power Option -48 to - 60 VDC (Input Voltage)

DC PSU Connector Saf-D Grid



DC option ships with two 3m length power cables with a mating Saf-D-Grid connector and terminates to bare leads

ENVIRONMENTAL

Operating Conditions	10 to 35 °C (50 to 95 °F) 10% to 80% RH (non-condensing)
Storage Conditions	-40 to 65 °C (-40 to 149 °F) 5% to 95% RH (non-condensing)
Noise Level	63 dBA (Max)
Electromagnetic Compliance	EN 55032 EN 55024 EN 61000
Safety Compliance	EN 60950 EN 62311 IEC 60950

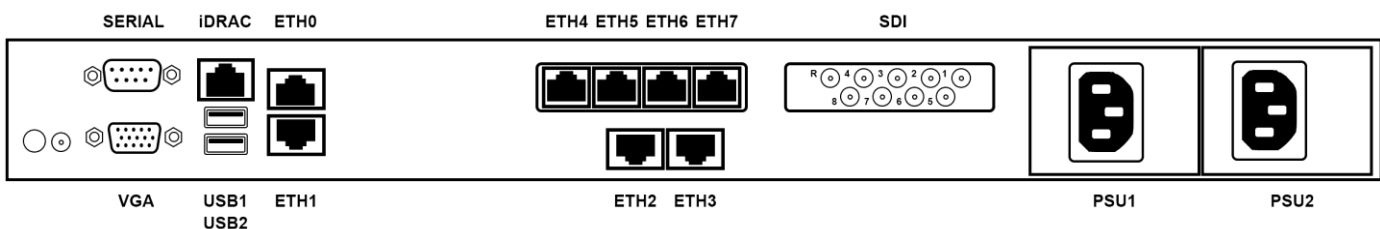
SYSTEM

System Management	iDRAC9 Enterprise
Storage Capacity	480GB Redundant Storage
I/O Interfaces	6x 1Gb RJ45 8x SD/HD/3G-SDI 1x LTC 2x 10Gb SFP+

System ships with:
2x 1000BASE-T RJ45 Transceiver

See next page for qualified SFP add-ons

PORT CONFIGURATION



QUALIFIED SFP ADD-ONS

Transceiver	Form Factor	Mode	Link Distance	Spare P/N	OEM	OEM Part Number
1000BASE-T RJ45 (Default)	SFP	N/A	100 m	SP426	FS	SFP-GB-GE-T
10GBASE-LR Fiber Optic	SFP+	Single Mode	10 km	SP431	Intel	E10GSFPLR
10GBASE-SR Fiber Optic	SFP+	Multimode	300 m	SP412	Intel	E10GSFPSR

INPUT SUPPORT

Live Input

- Single and Multiple Program Transport Streams (SPTS, MPTS) over UDP/IP and RTP/IP with FEC and SMPTE ST 2022-7 seamless protection switching
- TR-01 with JPEG-2000 compression, PCM audio, and captions
- SDI (uncompressed), optional: SD-SDI, HD-SDI, 3G-SDI, Quad 3G-SDI (4K), Interleave (4K)
- AWS Elemental MediaConnect, SRT protocol (caller mode)
- Packaged network inputs: Apple HLS TS with muxed audio and video
- Video codecs:
 - H.264 up to 4:2:2 10 bit
 - H.265 up to 4:2:2 10 bit including High Dynamic Range (HDR)
 - MPEG-2
 - Apple ProRes®
 - RAW
 - JPEG-2000
- Audio codecs:
 - AC-3 (Dolby Digital)
 - EAC-3 (Dolby Digital Plus) *
 - Dolby E *
 - AAC
 - MPEG-1 Layer II
 - PCM

Live Input Redundancy

- Input integrity: Generate repeat, black, slate, or color when input is missing
- Input failover, including seamless Hot Backup up to 4K ** (dual decode, single encode)

Live Input Redundancy Trigger Conditions

- User-configurable
- Time-based errors ("Input Loss", "Video Loss", "Audio Silence", "Video Freeze", "Video Black")
- Event-based errors ("Transport Error Indicator Flag", "Continuity Counter Errors", "RTP Packet Loss")

File Input

- Containers: MXF (AS-02, OP-1a-c, OP-2a-c, OP-3c), QuickTime, MPEG-4
- Packaged files: HLS
- Discrete audio and caption inputs
- OP-47 captions from 436M track of input MXF files

File Input Features

- Separate audio and video files
- Audio delay offset
- Audio PID tracking
- Audio language tracking
- Audio track selection
- MPEG-2 deblocking
- Source file clipping
- Fast seek
- Merge multiple sources to single output
- Channel selection for multitrack inputs
- Audio only input
- Amazon S3 support
- Static image overlay per input

Multichannel Audio Input

- Per clip audio channel assignment
- Unlimited audio tracks

Timecode

- Time code source embedded
- Time code source use local system clock
- Override time code date
- Start encoding at specified timecode
- External reference connector

Captions

- Ancillary, DVB-Sub, SCTE-20, null, SCC, SMI, SRT, STL, Teletext, TTML, ARIB, EBU-TT-D
- Source CC channel
- 608 to 708 upconvert
- SCTE-27 pass-through support

Ad Avail

- ESAM
- SCTE-35 splice insert
- SCTE-35 with APOS
- SCTE-35 Pullup
- SCTE-104 digital cue tone passthrough
- Ad avail blanking
- Black-out capability

Nielsen

- Nielsen ID3 certification
- Nielsen RTVOD C3/C7 watermarking *

Notifications

- Web callback
- Email

Scripting

- Pre and post processing scripts
- Blank output during ad avail

608 Extended Data Services

- Line 21 passthrough, rewrite, strip, insert

Copy and Redistribution Control Packets

- Line 21 passthrough, rewrite, strip, insert

OUTPUT FORMATS

Video	<ul style="list-style-type: none">- H.264 (Baseline, Main, High up to 4:2:2*), 4:2:2 High Profile Intra 10 bit *- H.265 (Main, Main10 up to 4:2:2*) including HDR 10, HLG, and Dolby Vision HDR *- MPEG-2- Apple® ProRes (up to 4:2:2 10 bit)- Frame capture to JPEG (thumbnail creation)- I-frame only mode- Uncompressed
Audio	<ul style="list-style-type: none">- AAC-LC, AAC-HEV1, AAC-HEV2 (MPEG-2, MPEG-4, LATM/LOAS)- Uncompressed WAV, AIFF- AC-3 (Dolby Digital) *, AC-3 passthrough- EAC-3 (Dolby Digital Plus) *, EAC-3 passthrough- Dolby Atmos passthrough- DTS Express *- MPEG-1 Layer II- Audio only output support (TS, HLS, MSS, RTMP)
Multichannel Audio Output	<ul style="list-style-type: none">- Per clip audio channel assignment- Unlimited audio tracks
Multilanguage Support	<ul style="list-style-type: none">- Follow input type (ISO 639)- Insert audio type (ISO 639)- Follow language code- Insert language code
Output Locking	<ul style="list-style-type: none">- Apple HLS, Microsoft Smooth, and TS outputs
Live Streaming Outputs	<ul style="list-style-type: none">- Adobe RTMP Streaming (RTMP, RTMPS)- Apple HTTP Adaptive Streaming (HLS)- Microsoft Smooth Streaming (ISMV)- MPEG DASH (ISOBMFF)- MPEG-2 Part 1, Systems, CableLabs compliant (EBIF passthrough, EBP, PSI, RAI segmentation marker) (MPEG-TS)- Real Time Protocol (RTP)- Single and Multiple Program Transport Streams (SPTS, MPTS) over UDP/IP and RTP/IP with FEC- AWS Elemental MediaConnect, Zixi push protocol
File Outputs	<ul style="list-style-type: none">- Apple QuickTime and ProRes (MOV)- Sony XDCAM MXF (XDCAM)- RAW YUV or RGB formats (Uncompressed)- MPEG-4 Part 10 (MP4)

Apple HTTP Adaptive Streaming (HLS)

- TS or fMP4 segment types
- Byte range offset
- Single file / multiple segments
- Segment length
- Minimum segment length
- Auto upload to CDN
- Content base URL
- Manifest base URL
- Use subdirectories
- Disable caching
- Floating point manifests
- Resolution tag
- Compressed manifests
- Use Pantos 7 CODEC identifiers
- Program-Date-Time flag
- Closed-caption tag
- Ad markers - Adobe
- Ad markers - Simple
- Ad markers - SCTE-35 enhanced
- SMPTE ST 2038 ancillary data
- Alternate manifest destination
- File transfer protocols (HTTP push, Akamai, Webdav) with ULL chunked transfer

Encryption

- AES CBC, CTR, EBC
- Key providers - 1Mainstream, Conax, Inside Secure, Irdeto, Pikel, PlayReady, Secure media, Cisco, Verimatrix, SPEKE

MPEG DASH (ISOBMFF)

- Single file / multiple segments with ULL chunked transfer
- Fragment length
- Segment length
- ULL chunked encoding
- HbbTV 1.5 support
- Base URL
- Minimum buffer time

Encryption

- DASH-CENC
- Key providers - Widevine, Pikel, SPEKE, PlayReady

Microsoft Smooth Streaming (ISMV)

- Manifest level encoding (UTF-8, UTF-16)
- Collapse identical audio streams

Encryption

- AES CTR
- PlayReady support
- Key providers - Conax, Inside Secure, Seachange, Pikel, Irdeto, SPEKE

Reliable TS Output

- Deliver to AWS Elemental MediaConnect
- Zixi push protocol

Encryption

- AES-128, AES-192, AES-256

SYSTEM CONTROL

CDN	- Integrated CDN support: Basic PUT, WebDav, and Akamai
Load Balancing	- Manual or automated load balancing options - Notifications and alerts
Monitoring	- System resource and statistics monitoring
User Authentication	- Multiple authentication tiers, Amazon S3 public and private keys
AWS Elemental Conductor Live	- Separate management system for control, monitoring and worker failure recovery in a multi-system configuration - Provision and operate channels using templates
Network Management	- SNMP version 2c
Real-time Controls	- Stop, pause and resume individual streams as well as archived files - Audio gain adjustment for real-time control of audio volume - Video and audio preview

IMAGE ENHANCEMENT

Anti-aliasing Scaling	- Reduce distortion artifacts when downscaling
Lanczos Scaling	- Multivariate interpolation
Deblocking and Denoise	- Remove common blocking and noise video artifacts
Deinterlacing	- Motion adaptive interpolation - Motion adaptive blend - Motion adaptive interpolation with ticker
Inverse Telecine	- Removes 2-3 frame format, restores original 24 fps frame rate
Telecine	- None, soft or hard
Adaptive Quantization	- Intraframe perceptual QP variation, Machine Learning driven auto Adaptive Quantization mode
Scene Change	- Scene change detection
Look Ahead	- Look ahead rate control
Gaming Optimizations	- Fast complexity changes and rapid quality recovery during transitions
Noise Reduction	- Noise filtering capability (Bilateral, Mean, Gaussian, Lanczos, Sharpen, Conserve, Perceptual)
Static Logo Insertion	- Up to eight static image overlays (BMP, PNG or TGA format), SDR or HDR - Apply image overlay to a single input, a single output, or globally - Specify z-order and opacity
Motion Logo Insertion	- Motion graphic overlay (HTML, MOV, PNG sequence or SWF format), SDR or HDR - Overlay HTML motion graphics generated by third party authoring tools. Switch overlays on or off with SCTE-35 signals. - Using SWF and Adobe® ActionScript® code, manipulate the video for effects such as squeezeback

Thumbnail Creation	- Create thumbnail JPEG images for any single frame or at custom intervals
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Color Correction	- Brightness, contrast, hue, saturation - Full swing range or passthrough - 601, 709 color space conversion - HDR to SDR down conversion
MPEG-2 Error Concealment	- Temporal pixel substitution
Cropping	- Select pixel locations to crop
Timecode Burn In	- Text, font size, position

AUDIO ENHANCEMENT

Level Adjustment	- Volume control
Audio Loudness Management	- Audio loudness monitoring and correction; results stored to file (CALM compliant) *
Channel Mixing and Mapping	- Manual audio remixing - Broadcaster mixed AD
Rate Conversion	- Adjust audio sample rate and frequency
Formats	- Encode multiple formats simultaneously
Multiple Audio Tracks	- Support for multiple audio streams for each video stream (SAP)

OTHER FEATURES

Metadata

- VBI passthrough (V-Chip, CGMS-A)
 - KLV Data
-

Caption Extraction and Passthrough

- Inputs:
 - Embedded
 - SCC
 - Teletext
 - Transcription Outputs:
 - CFF-TT
 - DVB-sub
 - Embedded
 - Embedded+SCTE-20
 - SCTE-20+Embedded
 - SCC
 - SMI
 - SMPTE-TT
 - SRT
 - Teletext
 - TTML
 - WebVTT
 - Open caption support
 - Caption burn in
 - Language flag insertion
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Processing

- Rate control
 - CBR encoding
 - QVBR (Quality-Defined Variable Bitrate) encoding
 - VBR encoding
 - Statmux encoding *
- Insert / respond to AFD
- Scene change detect
- Minimum I-frame interval
- Force interlace mode
- Variable GOP support
- Content-adaptive B frames
- HDR 10 support (ST.2084, ST.2086, MaxFALL, MaxCLL)
- HLG (Hybrid Log Gamma) BT.2020
- Dolby Vision (Certified for Profile 5 and Profile 8.1) *
- Conversion between SDR, HDR 10, and HLG
- Rec.2020 color support
- RTMP metadata insertion
- EBIF passthrough
- EBP, PSI, RAI segmentation marker

* Available with Optional License

** Hardware Dependent