**4K UHD & Multi-HD Encoder**

The Haivision Rack400 is a compact video encoder for multi-camera HD, 4K UHD, and HDR remote production of live sports and news. The Rack400 includes hardware accelerated H.265/HEVC and H.264/AVC encoding for premium video quality with optimized bandwidth usage and end-to-end latency as low as 200ms.

For multi-camera broadcast contribution, up to four HD encodes, the Rack400 supports video and audio stream synchronization for seamless camera switching at production. The Rack400 can also connect to PTZ cameras and tally lights for remote control by a Haivision StreamHub receiver, even during live transmissions. To facilitate communications between field operators and production staff, the Rack400 offers video return feeds and a bidirectional audio intercom (IFB).

Designed for both fixed and mobile deployments, the Rack400 can be used as a standalone appliance or up to 2 units can be rackmounted in a 1RU space making it ideally suited for installation in OB vans. Rack400 encoders can be directly connected over wired IP networks, to mobile networks using the Haivision Quad CellLink active cellular antennas, or Ka satellite transmitters, enabling live video broadcasting from anywhere.

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**Main Functions**

**Premium Live Video up to 4K UHD** The Haivision Rack400 offers the highest-quality video performance and the latest generation of HEVC encoding technology for pristine HD and UHD video transmission over all types of IP networks. Supporting SRT for safe and reliable streaming over the internet as well as SST for cellular bonding technology using an optional Haivision Quad CellLink antenna, the Rack400 can transmit live video with bitrates up to 80Mbps for high-quality broadcast contribution.

**Multi-camera Remote Production** Bring your remote production and REMI workflows to the next level with four frame-synced HD feeds and simultaneous remote control of IP-based equipment including PTZ cameras. Thanks to high bandwidth and low-latency IP video transmission, the Rack400 enables multi-camera remote production from anywhere.

**IFB & Video Return** Ensure two-way audio communication between the producer, camera operator & on-air talent thanks to a seamless and robust intercom system. The Rack400 can also receive a high-quality and encrypted HD feed from the production studio during a live broadcast or in standby mode. With sub-second latency streaming, Rack400 return feeds can be used for watching on-air programs, teleprompting information or confidence monitoring from the field.

**Record & Progressive Forward** Record UHD/HD broadcast-grade quality video on an SD card, and optimize your file forwarding time by with progressive uploads while the live recording is still in progress. The Rack400’s advanced recording and file forwarding enables fast and error-free video delivery over any IP network.
VIDEO Standards
- UHD: 2160p60/59.94/50/30/29.97/25
- HD: 1080p60/59.94/50/29.97/25
- 1080i60/59.94/50
- 720p60/59.94/50

Density
- Single UHD/HD
- Quadruple HD

Encoding
- H.265/HEVC 4:2:0/4:2:2, 8/10-bit
- H.264/AVC 4:2:0, 8-bit

Dynamic resolution adjustment
- High Dynamic Range (HLG & PQ)

Bitrates
- 2 Mbps to 60 Mbps for UHD
- 300 Kbps to 20 Mbps for HD

Constant Bitrate (CBR)
Variable Bitrate (VBR)

Inputs
- SDI

AUDIO Encoding
- AAC-LC

Bitrates
- 32 Kbps to 256 Kbps

Mode
- Mono, Stereo

Density
- Up to 4 Mono or up to 4 Stereo

INPUTS
- Embedded over SDI

NETWORK CONNECTIONS Ethernet
- 2 x Gigabit Ethernet ports
  - LAN, WAN
- Portable satellite (Ka & Ku Band)

Cellular
- With optional Haivision Quad CellLink
  - 4 x 3G/4G-LTE world-wide compliant modems
  - High efficiency embedded antenna

Transport Protocol
- SST over Cellular/Ethernet (bonding)
- SRT over Ethernet

ADVANCED FEATURES
- Dual encoding for simultaneous Live & Record (single HD mode)
- Sub-second glass-to-glass latency (down to 200 ms in single encoder mode and down to 500 ms in multi-encoder mode)
- Video and Audio level preview
- Intercom/IFB with AES encryption
- Video return from studio (full HD, sub-second latency, AES encryption)
- Automatic Live Start
- Networks Links priorities (user configurable)
- Data Bridge for switching the device as mobile router
- SMPTE-12M timecode passthrough

INTERFACES
- 1 x 12G/3G-SDI input and 3 x 3G-SDI inputs (BNC)
- 1 x 12G-SDI output (BNC)
- 1 x HDMI 1.4 output
- 1 x GenLock input (BNC)
- 2 x RJ-45 Ethernet
- 2 x USB 3.0 (type-A), 1 x USB 3.0 (type-C)
- 1 x mini jack for IFB/intercom headset
- 1 x micro SD card slot

CONTROL & MONITORING
- Embedded touch screen
- Web UI (through laptop, smartphone, etc.)
- From Haivision StreamHub transceiver
- From Haivision Manager

POWER
- Power Supply
- Dual DC input 18V
- Consumption
  - 34W max (25W to 30W typical)

PHYSICAL
- Dimensions (W x H x D)
  - 22.2 cm x 4.4 cm x 11.5 cm
  - (8.66" x 1.57" x 4.33")
- Weight
  - 1.36 Kg / 3.00 lbs
- Operating Temperature
  - 0°C to 40°C (32°F to 104°F)

INTERFACES
- 1 x 12G/3G-SDI input and 3 x 3G-SDI inputs (BNC)
- 1 x 12G-SDI output (BNC)
- 1 x HDMI 1.4 output
- 1 x GenLock input (BNC)
- 2 x RJ-45 Ethernet
- 2 x USB 3.0 (type-A), 1 x USB 3.0 (type-C)
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- Embedded touch screen
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  - 0°C to 40°C (32°F to 104°F)

INTERFACES
- Ethereal
  - 2 x Gigabit Ethernet ports
  - LAN, WAN
- Portable satellite (Ka & Ku Band)

Cellular
- With optional Haivision Quad CellLink
  - 4 x 3G/4G-LTE world-wide compliant modems
  - 4 SIM slots
  - High efficiency embedded antenna

Transport Protocol
- SST over Cellular/Ethernet (bonding)
- SRT over Ethernet

ADVANCED FEATURES
- Dual encoding for simultaneous Live & Record (single HD mode)
- Sub-second glass-to-glass latency (down to 200 ms in single encoder mode and down to 500 ms in multi-encoder mode)
- Video and Audio level preview
- Intercom/IFB with AES encryption
- Video return from studio (full HD, sub-second latency, AES encryption)
- Automatic Live Start
- Networks Links priorities (user configurable)
- Data Bridge for switching the device as mobile router
- SMPTE-12M timecode passthrough

INTERFACE
- 1 x 12G/3G-SDI input and 3 x 3G-SDI inputs (BNC)
- 1 x 12G-SDI output (BNC)
- 1 x HDMI 1.4 output
- 1 x GenLock input (BNC)
- 2 x RJ-45 Ethernet
- 2 x USB 3.0 (type-A), 1 x USB 3.0 (type-C)
- 1 x mini jack for IFB/intercom headset
- 1 x micro SD card slot

CONTROL & MONITORING
- Embedded touch screen
- Web UI (through laptop, smartphone, etc.)
- From Haivision StreamHub transceiver
- From Haivision Manager

POWER
- Power Supply
- Dual DC input 18V
- Consumption
  - 34W max (25W to 30W typical)

PHYSICAL
- Dimensions (W x H x D)
  - 22.2 cm x 4.4 cm x 11.5 cm
  - (8.66" x 1.57" x 4.33")
- Weight
  - 1.36 Kg / 3.00 lbs
- Operating Temperature
  - 0°C to 40°C (32°F to 104°F)

SYSTEM OVERVIEW
- Ethereal
  - 2 x Gigabit Ethernet ports
  - LAN, WAN
- Portable satellite (Ka & Ku Band)

Cellular
- With optional Haivision Quad CellLink
  - 4 x 3G/4G-LTE world-wide compliant modems
  - 4 SIM slots
  - High efficiency embedded antenna

Transport Protocol
- SST over Cellular/Ethernet (bonding)
- SRT over Ethernet

ADVANCED FEATURES
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INTERFACES
- 1 x 12G/3G-SDI input and 3 x 3G-SDI inputs (BNC)
- 1 x 12G-SDI output (BNC)
- 1 x HDMI 1.4 output
- 1 x GenLock input (BNC)
- 2 x RJ-45 Ethernet
- 2 x USB 3.0 (type-A), 1 x USB 3.0 (type-C)
- 1 x mini jack for IFB/intercom headset
- 1 x micro SD card slot

CONTROL & MONITORING
- Embedded touch screen
- Web UI (through laptop, smartphone, etc.)
- From Haivision StreamHub transceiver
- From Haivision Manager

POWER
- Power Supply
- Dual DC input 18V
- Consumption
  - 34W max (25W to 30W typical)

PHYSICAL
- Dimensions (W x H x D)
  - 22.2 cm x 4.4 cm x 11.5 cm
  - (8.66" x 1.57" x 4.33")
- Weight
  - 1.36 Kg / 3.00 lbs
- Operating Temperature
  - 0°C to 40°C (32°F to 104°F)

SYSTEM OVERVIEW
- Ethereal
  - 2 x Gigabit Ethernet ports
  - LAN, WAN
- Portable satellite (Ka & Ku Band)

Cellular
- With optional Haivision Quad CellLink
  - 4 x 3G/4G-LTE world-wide compliant modems
  - 4 SIM slots
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Transport Protocol
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- Data Bridge for switching the device as mobile router
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INTERFACE
- 1 x 12G/3G-SDI input and 3 x 3G-SDI inputs (BNC)
- 1 x 12G-SDI output (BNC)
- 1 x HDMI 1.4 output
- 1 x GenLock input (BNC)
- 2 x RJ-45 Ethernet
- 2 x USB 3.0 (type-A), 1 x USB 3.0 (type-C)
- 1 x mini jack for IFB/intercom headset
- 1 x micro SD card slot

CONTROL & MONITORING
- Embedded touch screen
- Web UI (through laptop, smartphone, etc.)
- From Haivision StreamHub transceiver
- From Haivision Manager

POWER
- Power Supply
- Dual DC input 18V
- Consumption
  - 34W max (25W to 30W typical)

PHYSICAL
- Dimensions (W x H x D)
  - 22.2 cm x 4.4 cm x 11.5 cm
  - (8.66" x 1.57" x 4.33")
- Weight
  - 1.36 Kg / 3.00 lbs
- Operating Temperature
  - 0°C to 40°C (32°F to 104°F)
Live HD Video Encoding

Haivision Rack 200 and 300 video encoders are designed for space-constrained outside broadcast and remote production workflows. Haivision Rack encoders can be deployed in fixed locations connected to an IP network, offering a cost-effective alternative to satellite or fiber. Rack encoders can also be installed in OB vans or trucks, connected to a roof-mounted Haivision Quad CellLink with 4 active 3G/4G antennas or to a Ka satellite transmitter, enabling live video contribution from any location, even with unpredictable network conditions.

Equipped with a user-friendly, intuitive touchscreen, Haivision Rack supports multiple modes of operation including live, record, live and record, file forward, and data bridge for high-speed internet connectivity.

Haivision Rack is an HEVC and H.264 video encoder for low bitrate and high quality HD video streaming at sub-second latency. Powered by the two-time Emmy award winning SST protocol, Haivision Rack reliably delivers pristine quality video over multiple networks to ensure that sufficient bandwidth is always available and that video transmissions are uninterrupted. As a Haivision product, the Rack series of encoders also natively supports the SRT protocol for flawless video streaming, even in the face of packet loss, jitter and fluctuating network bandwidth.

**Main Functions**

**Live Video Encoding**  Broadcast pristine quality live video over bonded IP networks with low latency: 3G/4G, Ethernet, Wi-Fi, BGAN, GX and Ka satellite bands.

**IFB & Video Return**  Ensure two-way audio communication between camera operators, production crews & on-air talent with advanced intercom features. Receive and watch high quality HD feeds from the studio during live sessions or when the device is idled. With sub-second latency delivery, it is especially designed for receiving on-air program, teleprompting information or ensuring confidence monitoring from the field.

**Auto-Record and Progressive Forwarding**  You can simultaneously stream live video while recording to an SD card with different resolutions and bitrates to ensure an optimal and constant video quality. Forward file recordings while recording is in progress, enabling quick and efficient broadcast production and creating a backup in the case of transmission interruption.

**Data Bridge**  Leveraging the transmitter’s aggregated networks connections, a Rack appliance can be used as a mobile router providing high-speed internet connectivity from anywhere.
VIDEO
Standards
- HD: 1080p60/59.94/50/30/29.97/25
  1080i60/59.94/50
- SD: PAL, NTSC
Encoding
- H.265/HEVC 4:2:0, 8-bit
- H.264/AVC 4:2:0, 8-bit
Dynamic resolution adjustment
Bitrates
- Variable Bitrate (VBR)
Inputs
- SDI, HDMI

AUDIO
Encoding
- AAC-LC
Bitrates
- 32 Kbps to 256 Kbps
Mode
- Mono, Dual Mono, Stereo 2.0
Density
- Up to 4 Channels
Inputs
- Embedded (SDI, HDMI), Analog (L/R)

NETWORK CONNECTIONS
Ethernet
- Gigabit Ethernet ports
- portable satellite (BGAN, GX, Ka & Ku Band)
Cellular
- With Haivision Quad CellLink
- 4x 3G/4G-LTE world-wide compliant modems
- 4x SIM slots
- Internal high efficiency antennas
Transport Protocol
- SST over Cellular/Ethernet (bonding)
- SRT over Ethernet

ADVANCED FEATURES
- Dual encoding for simultaneous Live & Record
- Sub second glass-to-glass latency (down to 500 ms)
- Video and Audio level preview
- Intercom/IFB
- Video return from Studio (full HD, sub-second latency)
- Automatic Live Start
- Networks Links priorities (user configurable)
- Data Bridge for switching the device as mobile router
- Hot Folder for smart and automatic file forwarding
- AES scrambling

INTERFACES
- Embedded touch screen
- Web UI from any browser
  - From Haivision StreamHub transceiver
  - From Haivision Manager

POWER
- Power Supply
- Dual DC input 18V (XLR input hot swap)
- Consumption
  - 30W max (24W to 28W typical)

PHYSICAL
- Dimensions (W x H x D)
  - Rack200: 22.2 cm x 4.4 cm x 12.5 cm
  - Rack300: 22.2 cm x 4.4 cm x 12.5 cm
- Weight
  - Rack200: 1.22 Kg / 2.69 lbs
  - Rack300: 1.32 Kg / 2.91 lbs
- Operating Temperature
  - -5°C to 45°C (23°F to 113°F)

System Overview