4K UHD & Multi-HD Encoder and Bonded Cellular Transmitter

The Haivision Pro460 is our latest generation mobile video encoder and transmitter designed for live broadcasters and news gathering professionals looking to contribute high-quality video from any location. Multi-camera HD and pristine 4K UHD encoding, including in HDR are combined with reliable low latency mobile transmission capabilities in this 5G compliant solution.

With its compact form factor, the Pro460 includes the latest generation of hardware accelerated H.265/HEVC encoding for premium video quality with optimized data usage and end-to-end latency as low as 200ms. The widely adopted H.264/AVC codec is also supported for interoperability with all types of video destinations. Our innovative design is suited for a variety of broadcast contribution workflows from single camera HD sources for news, to multi-camera HD (up to 4) for live sports, and 4K UHD content for premium events coverage.

The Pro460 offers a full set of advanced features for live broadcast contribution and remote production. This includes perfect video synchronization and lip sync from multiple cameras and across all video streams to guarantee seamless camera switching and efficient video editing at the receiving end, in the remote production studio. The Pro460 can connect to network-based devices such as PTZ cameras and tally lights for remote control by a Haivision StreamHub receiver, even during live transmissions. The Pro460 also supports low latency and high-quality video returns including teleprompting information or studio feeds. A bi-directional audio intercom (IFB) is also available for real-time communication between field and production staff.

The Pro460 embeds six globally compliant 3G/4G/5G cellular modems with our high efficiency and patented antennas. Video transmissions can also be sent over other types of IP network including WiFi, Ka or Ku band satellite, an IP leased line and the public internet. Our Emmy® awarded SST Technology (Safe Stream Transport) offers advanced and dynamic network aggregation, adaptive packet retransmission (ARQ) and forward error correction (FEC) to maximize network throughput and optimize the quality of service.

Available in a compact ruggedized enclosure, the Pro460 offers standard V-Mount or Gold-Mount plates for direct mounting on professional cameras or can be used with the included specially designed backpack.

Simple
The Pro460 is extremely user-friendly and features an intuitive touch-screen user interface enabling camera operators to begin broadcasting live video with just 2 taps.

Versatile
The Pro460 is a versatile all-in-one solution for mobile video contribution and remote production. Encode and transmit a single 4K UHD source or four simultaneous HD sources with up to 10-bit pixel depths, 4:2:2 chroma subsampling, and in HDR.

High Performance
By implementing an ultra-low latency H.265/HEVC hardware encoder in a compact design enclosure, the Pro460 enables video professionals to provide seamless and pristine video for news and events coverage.

Any Network
Leveraging the Emmy® award winning SST and SRT protocols, the Pro460 can reliably transmit high-quality broadcast contribution video over bonded cellular and IP networks with fluctuating conditions.

Main Functions

Premium Live Video up to 4K UHD The Haivision Pro460 offers the highest-quality video performance and the latest generation of HEVC encoding technology for pristine HD and UHD video transmission over mobile networks including 5G. Built on the two-time award-winning SST cellular bonding technology, the Pro460 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 video transmission over 4G and 5G networks supported by its 6 internal modems and antennas, the Pro460 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 Pro460 can also receive a high-quality HD feed from the production studio during a live broadcast or in standby mode. With sub-second latency streaming, Pro460 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 Pro460's advanced recording and file forwarding enables fast and error-free video delivery over any mobile or IP network.

VIDEO

Standards
UHD: 2160p60/59.94/50/30/29.97/25
HD: 1080p60/59.94/50/30/29.97/ 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 80 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

Cellular
6 x 3G/4G/5G world-wide compliant modems
    - Sub 6GHz bands
    - SA (Stand Alone) and NSA (Non Stand Alone)
    - Internal high efficiency antennas

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

Wi-Fi
Dual band Wi-Fi modem 802.11a/b/g/n/ac (2.4GHz and 5 GHz)
    - Client & Hot Spot modes
    - High-efficiency embedded antenna

Transport Protocol
SST over Cellular/Ethernet/WiFi (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
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
Simultaneous Live and IP traffic (for remote camera control)
Geolocation (GPS)
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)
6 x micro SIM slots
1 x mini jack for IFB/intercom headset
1 x micro SD card slot

CONTROL & MONITORING

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

POWER

Power Supply
DC input 18V
External battery with V-mount or Gold-mount plates

Consumption
4 hours with battery (90 Wh)
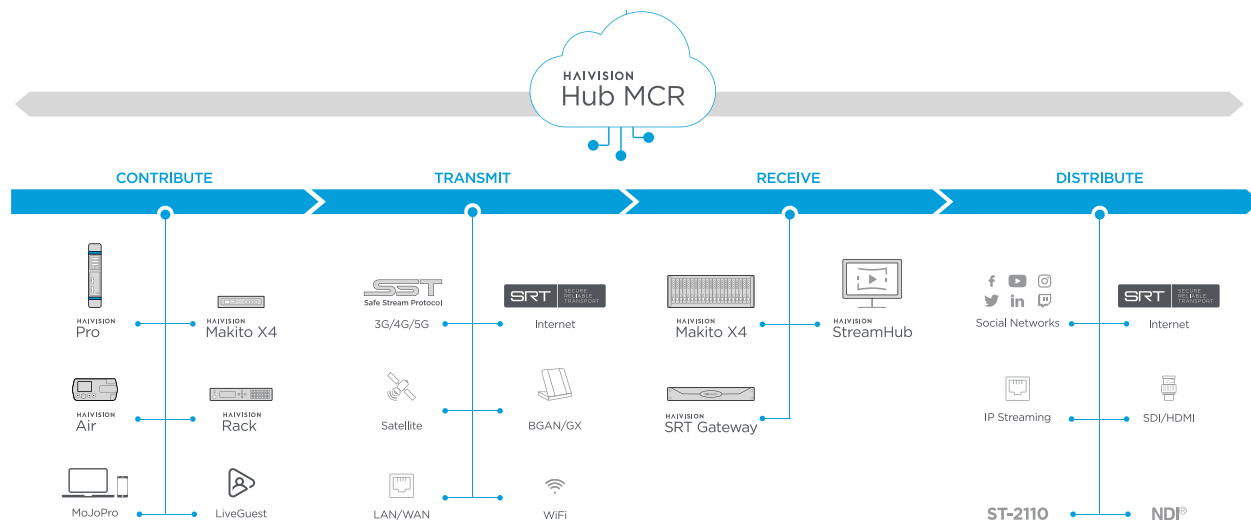
PHYSICAL

Dimensions (W x H x D)
26,6 cm x 8,4 cm x 12,5 cm
(10.47" x 3.30" x 4.92")

Weight
1.5 Kg / 3.3 lbs

Operating Temperature
0°C to 45°C (32°F to 113°F)

System Overview

HAIVISION
Hub MCR

CONTRIBUTE   TRANSMIT   RECEIVE   DISTRIBUTE

CONTRIBUTE	TRANSMIT	RECEIVE	DISTRIBUTE
HAIVISION Pro	SST Safe Stream Protocol — 3G/4G/5G	HAIVISION Makito X4	Social Networks
HAIVISION Makito X4	SRT SECURE RELIABLE TRANSPORT — Internet	HAIVISION StreamHub	SRT SECURE RELIABLE TRANSPORT — Internet
HAIVISION Air	Satellite	HAIVISION SRT Gateway	IP Streaming
HAIVISION Rack	BGAN/GX		SDI/HDMI
MoJoPro	LAN/WAN		ST-2110
LiveGuest	WiFi		NDI®

Ultra-Compact Video Encoder and Bonded Cellular Transmitter

Haivision Air is a range of mobile video transmitters for broadcasting live news, sports and other types of events from anywhere over bonded cellular and IP networks. Designed to be extremely compact and portable, the Haivision Air transmitter encodes high quality video from SDI and HDMI sources, to H.265/HEVC or H.264/AVC at very low latency. Real-time video streams can then be transmitted with SST (Safe Streams Transport) over a bonded pair of 3G/4G or 5G modems, depending on the model. Haivision Air can also transmit live video over the public internet the SRT protocol with Ethernet or WiFi connectivity.

Other advanced features include the ability to simultaneously record live broadcasts which can be forwarded on as a progressive file, automatically sent as a clip once a recording has finished or stored on a local SD card. Haivision Air operators also benefit from receiving low latency return feeds to an external display and bidirectional IFB audio for real-time interaction with the production team. All of these features and more can be easily accessed from the Haivision Air's intuitive front panel display.

Simple
Haivision Air features an intuitive user interface enabling camera operators to broadcast live in seconds.

Versatile
Compact, lightweight, and featuring a rechargeable battery, the Haivision Air is the ideal travel companion for camera operators and mobile journalists who need to go live at any time.

High Performance
Encode, record, and transmit HD video in HEVC or H.264 at very low latency for reliable and high-quality sports, news, and live event coverage.

Any Network
Haivision Air supports the Emmy® award winning SST (Safe Stream Transport) and SRT (Secure Reliable Transport) protocols for reliable video streaming over bonded cellular and IP networks.

	AIR320-5G	AIR220-5G	AIR220	AIR200
H.265/HEVC encoder	●			
H.264/AVC encoder	●	●	●	●
Embedded cellular modems	5G/4G/3G	5G/4G/3G	4G/3G	
4 extension links (Wi-Fi, Ethernet, USB)	●	●	●	●

Main Functions

Live & Auto-Record Broadcast premium quality video live over bonded cellular and IP networks: 5G/4G/3G, Ethernet, Wi-Fi, and satellite Ka and Ku Bands. Live broadcasts can be simultaneously recorded on an SD card.

Rec & Progressive Fwd For non-live applications, video files can be shared with production as they are being recorded or automatically forwarded once a recording is complete.

Data Bridge Leverage SST's bidirectional data support by using a Haivision Air as a mobile router for establishing a high-speed internet connection from anywhere.

Video Return and IFB Ensure communication between the producer, camera operator & on-air talent with high-quality HD return feeds and bidirectional audio intercom.

VIDEO
Standards
    HD: 1080p25/29.97/30/50/59.94/60,
            1080i50/59.94/60,
            720p50/59.94/60
    SD: PAL, NTSC
Encoding
    H.265/HEVC 4:2:0, 8-bit
    H.264/AVC 4:2:0, 8-bit
    Dynamic resolution adjustment
Bitrates
    200 Kbps to 20 Mbps
    Constant Bitrate (CBR)
    Variable Bitrate (VBR)
Inputs
    SDI, HDMI

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

NETWORK CONNECTIONS
Cellular
    2 x 5G/4G/3G or 2 x 4G/3G worldwide compliant modems with high gain
        custom antennas (sub-6 GHz).
    Extensible with external modems (2 x USB ports).
Ethernet
    Gigabit Ethernet port
        - LAN, WAN
        - Portable satellite (BGAN, Ka and Ku Band)
Wi-Fi
    Dual band Wi-Fi modem 802.11b/g/n/ac (MIMO 2.4 GHz and 5 GHz)
        - Client & Hot Spot modes
        - High-efficiency embedded antenna
Transport Protocols
    SST over Cellular/Ethernet/Wi-Fi (bonding)
    SRT over Ethernet (caller and listener modes)

ADVANCE 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
    Network links priorities (user configurable)
    Data Bridge for switching the device as a mobile router
    Hot folder mode for enabling smart and automatic files Forward
    AES scrambling
    Geolocation (GPS and Galileo)

INTERFACES
    1 x 3G-SDI input (BNC), 1 x 3G-SDI output (BNC)
    1 x HDMI 1.4 input, 1 x HDMI 1.4 output
    1 x RJ-45 Ethernet
    2 x USB 3.0 (type-A)
    1 x 3.5 mm audio jack (for IFB / intercom headset)
    2 x mini XLR balanced (for analog audio)
    1 x SD card slot
    4 x micro SIM slots

CONTROL & MONITORING
    On screen display
    Web GUI (through laptop, smartphone, etc.)
    from Haivision Manager Management System
    from Haivision Streamhub Transceiver

POWER
Power Supply
    Internal 48Wh battery (up to 3 hours)
    DC input 19V

PHYSICAL
Dimensions (W x H x D)
    15.8 cm x 6.6 cm x 12.0 cm
    (6.22" x 2.36" x 4.72")
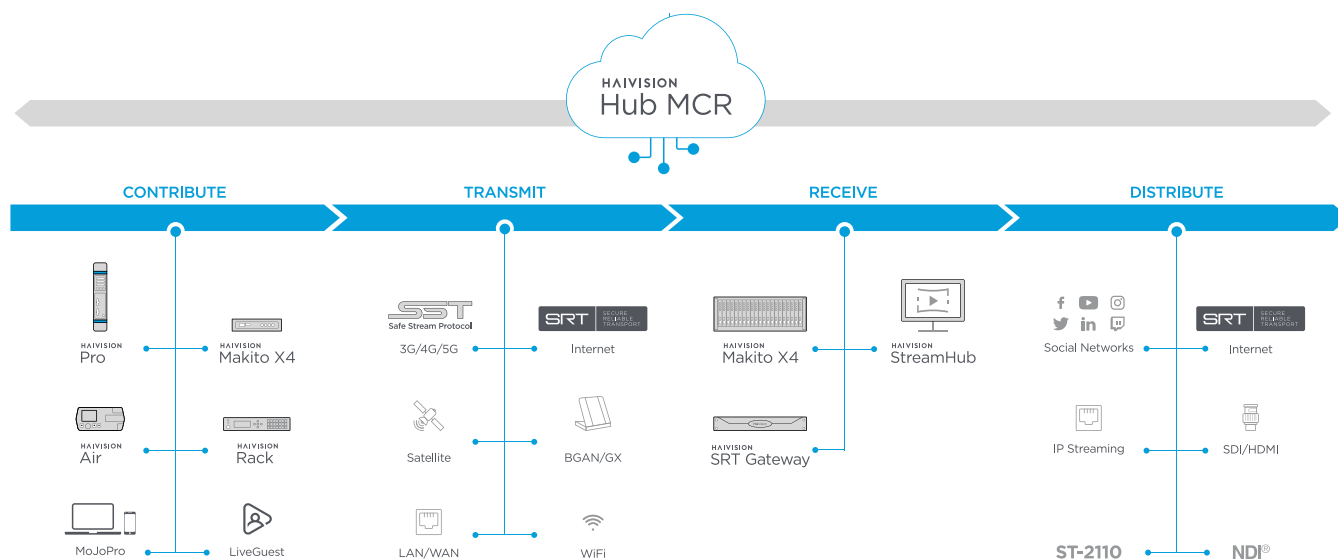*Weight*
    AIR3: 1.21 Kg / 2.67 lbs (w/ battery)
            0.97 Kg / 2.14 lbs (w/o battery)
    AIR2: 1.08 Kg / 2.38 lbs (w/ battery)
            0.85 Kg / 1.87 lbs (w/o battery)
Operation Temperature
    0°C to 45°C (32°F to 113°F)

System Overview

info@haivision.com | North America: 1.877.224.5445
haivision.com | International: +1.514.334.5445

HAIVISION

4K UHD and HD Video Encoder for Low Latency, Broadcast Quality Streaming.

Secure, low latency, broadcast quality video encoders for live sports and news, real-time corporate communications, and mission critical defense applications.

Haivision Makito X4 is a highly versatile real-time HEVC/H.265 and AVC/H.264 video encoder available as a compact standalone appliance or as a rackmountable blade. Designed for the most demanding live video applications, the Makito X4 can encode up to four 1080p50/60 HD inputs or a full 2160p50/60 4K UHD video source with 10-bit pixel depth, 4:2:2 chroma subsampling, as well as up to 32 channels of digital audio. Robust and reliable, the Makito X4 offers 8 powerful encoding cores that can securely deliver simultaneous low latency multi-bitrate streams over any network, including the public internet.

4K Broadcast Quality Video Encode live video in HD or 4K UHD, up to 60 frames per second, with excellent picture quality even at low bitrates. For workflows where color precision is needed, the Makito X4 offers 4:2:2 chroma subsampling to ensure that color fidelity can be maintained, and artefacts prevented, in downstream workflows.

High Dynamic Range In addition to SDR, 10-bit pixel depths, and wide color gamut support (WCG), the Makito X4 can also encode live content for HDR workflows with HLG or PQ (ST 2084) transfer functions.

Ultra-Low Latency Streaming Up to 8 encoding cores can encode and stream HEVC and H.264 video with very low latency, which makes the Makito X4 ideally suited for interactive video applications such as field contribution, live interviews, return feed confidence monitoring as well as streaming synchronized camera feeds for remote productions.

High Density HEVC Encoding Processing video from multiple cameras is challenging when physical space is limited. The Makito X4 is a compact, easily portable appliance making it perfect to deploy in remote locations and on mobile platforms. When used in conjunction with Haivision rack-mountable enclosures, the Makito X4 offers the highest channel density available, giving facilities up to 84 HD or 21 UHD video sources within a single 4RU rack module.

Flexible and Future Proof With a powerful encoding engine built on top of a programmable platform, the Makito X4 video encoder addresses a wide range of live production applications today and tomorrow, including 4K, HDR and SMPTE ST 2110, ensuring that your production workflows address today's critical needs, and are flexible enough to adapt to your future infrastructure requirements.

Secure Content Encryption, Reliable Streaming The Makito X4 can encrypt video streams with up to 256-bit AES key lengths using the SRT protocol, which is critical when sharing valuable content over the internet. Moreover, to ensure reliable and continuous streaming, even when network conditions are unpredictable, the Makito X4 Encoder adapts to fluctuating network bandwidth in real-time, limiting packet loss and ensuring uninterrupted high-quality video.

FEATURES / BENEFITS

FEATURES	BENEFITS
4K UHD Video	Efficient real-time HEVC/H.265 and H.264/AVC video encoding up to 3840x2160p 50/60 with 4:2:2 chroma subsampling and 10-bit pixel depth for impeccable picture quality for HDR workflows.
Ultra-Low Latency	Extremely low latency encoding and streaming enabling interactivity for live bi-directional interviews and field contribution.
High-Density Form Factor	4 inputs per appliance/blade, up to 84 inputs and 168 encoding cores per 4RU rack ideal for constrained spaces and high-density environments where Size, Weight and Power considerations are critical.
Flexible and Future Proof	The versatility of the Makito X4 enables future migration from HD to 4K, SDR to HDR, and SDI to SMPTE ST 2110 via its SFP+ port for dual NIC support.
Secure, Encrypted Video	Protect valuable video content with SRT and AES-128/256 encryption.
SRT Protocol for Reliable Streaming	Deliver live streams to decoders and cloud-based workflows without packet loss over fluctuating bandwidth networks including the internet.

HAIVISION
Makito X4
ENCODER

VIDEO INTERFACES
(Quad mini-BNC Inputs)
SD-SDI   SMPTE 259M-C
HD-SDI   SMPTE 292M
             SMPTE 274M
             SMPTE 296M
3G-SDI   SMPTE 424M (Level A Only)
             SMPTE 425M
6G-SDI   SMPTE 2081 (1 input only)
12G-SDI SMPTE 2082 (1 input only)
SMPTE ST 2110 (with 10G SFP+ transceiver)

VIDEO RESOLUTIONS
3840x2160p 60/59.94/50 Hz *
3840x2160p 30/29.97/25 Hz
1920x1080p 60/59.94/50/30/29.97/25/24/23.98 Hz
1920x1080i 60/59.94/50 Hz **
1280x720p 60/59.94/50/30/29.97/25 Hz
720x480/576i 60/59.94/50 Hz **

VIDEO ENCODING
8-bit or 10-bit pixel depth
Chroma sub-sampling 4:2:0 or 4:2:2
BT.709 color space and WCG (BT.2020)
SDR and HDR - HLG or PQ (ST 2084)
Configurable Group of Picture (GOP) size
I, IP, IBP, IBBP, IBBBP, IBBBBP Framing
Bitrates from 32 kbps to 120 Mbps***
Configurable frame rate
Intra-refresh
Slice-based encoding

H.264/AVC Profiles:
MPEG-4 AVC part 10 / ISO/IEC 14496-10
Baseline, Main, High, High 10-Bit and High 4:2:2
    10-Bit Profiles up to Level 5.2 (3840x2160p60)
    and lower intermediate levels
H.265/HEVC Profiles:
ISO/IEC 23008-2
Main, Main 10-Bit, Main 4:2:2 10-Bit Profiles
    up to Level 5.1 (3840x2160p60) and lower
    intermediate levels

* SMPTE ST 2110 input up to 2160p30
** Interlaced video encoding shown in fields per second and supported in HEVC only
*** max bitrate depends on configuration

AUDIO INTERFACES
Embedded Audio:
SD-SDI SMPTE 272M HD/3D-SDI SMPTE 299M
AUDIO ENCODING
Compression Standard:
MPEG-2 AAC-LC ISO/IEC 13818-7
MPEG-4 AAC-LC ISO/IEC 14496-3
Audio Channels:
32 (16 stereo pairs) embedded (SDI) audio inputs
Bit Rates:
From 14 to 576 kbps per audio pair
Frequency Response:
From 20 Hz to 22 kHz

METADATA
Input Metadata:
CoT to KLV conversion
KLV or CoT over UDP
KLV over SDI (SMPTE 336)
SMPTE 336M compliant
MISB 0601.10 compliant
MISB 0604.2 compliant
SMPTE ST 352 Payload ID (HDR)
SMPTE 12M Timecode
SMPTE 334-1/2 Closed Captioning
Output Metadata:
Asynchronous & synchronous modes
    as per MISB 0604.2
High precision timecode insertion
    as per MISB 0604.2
KLV Metadata Processing (SMPTE 336,
    MISB 0601, 0102 and 0605 support)

IP NETWORK INTERFACES
Standard:
Single Ethernet 10/100/1000
Base-T, auto-detect, Half/Full-duplex
Unicast streaming IPv4/IPv6
Multicast streaming (IGMPv3 & IPv6)
Multiple unicast streaming
Path Redundancy – SRT across multiple networks
SFP+ port - second NIC with MSA compliant
    1G/10G SFP+ transceiver
H.264 Streaming Protocols:
MPEG Transport Stream
Secure Reliable Transport (SRT)
TS over SRT, UDP or RTP
RTSP/RTP
HEVC Streaming Protocols:
MPEG Transport Stream
Secure Reliable Transport (SRT)
TS over SRT, UDP or RTP
RTSP/RTP

MANAGEMENT INTERFACES
IP/Ethernet (IPv4 and IPv6)
Management:
HTTPS (web browser)
Haivision EMS and Hub
Command line over SSH/Telnet
SFTP/TFTP/SCP
SNMP v3

SIZE, WEIGHT, POWER
(single height appliance)
Dimensions:
24mm H x152mm W x 192mm D
0.94" H x 5.98" W x 7.56" D
Weight:
1.08 kg (2.37 lbs)
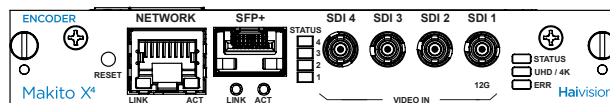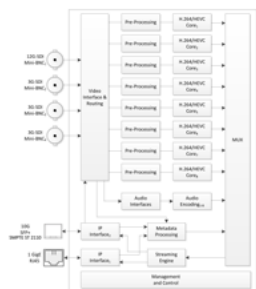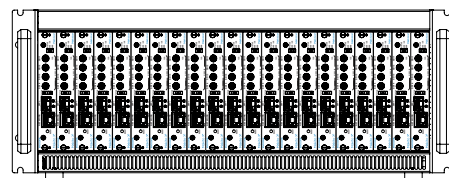*Power:*
12 VDC Nominal, 18W
Temperature:
Operating: 0° to 40°C (32° to 104°F)
Non-operating: -30° to 70°C (-22° to 158°F)
Humidity: 0-95% non-condensing

Compatible with Haivision MB6x and MB21x multi-blade chassis.

Software Version: 1.4

Makito X4 Encoder

Compatible with
Haivision MB21x multi-blade chassis

Makito X4 Product Portfolio & Ordering Information **

Makito X4 Blade - HD	**B-MX4E-SDI4**	Makito X4 SDI Encoder Blade - H.264/AVC & H.265/HEVC IP Video Encoder – Quad channel 3G/HD/SD-SDI
Makito X4 Appliance - HD	**S-MX4E-SDI4**	Makito X4 SDI Encoder Appliance - H.264/AVC & H.265/HEVC IP Video Encoder – Quad channel 3G/HD/SD-SDI
Makito X4 Blade - UHD	**B-MX4E-SDI4-UHD**	Makito X4 SDI Encoder Blade - H.264/AVC & H.265/HEVC IP Video Encoder up to 4K UHD
Makito X4 Appliance - UHD	**S-MX4E-SDI4-UHD**	Makito X4 SDI Encoder Appliance - H.264/AVC & H.265/HEVC IP Video EncoderSDI up to 4K UHD
Makito X4 KLV and CoT Metadata	**SWO-MX4-KLVCOT**	Software license option – Support KLV and CoT metadata
Makito X4 UHD - upgrade	**SWO-MX4-UHD**	Software license option - Upgrade from HD to 4K UHD
HDR License	**SWO-MX4-HDR**	Software license option – Support HLG and PQ (ST 2084) transfer function
ST 2110 License	**SWO-MX4-2110**	Software license option – Enable SMPTE ST 2110 input with MSA compliant 10G SFP+ transceiver

** For complete pricing and ordering, contact us at sales@haivision.com or your certified Haivision reseller.

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.

Simple
The Rack400 is extremely user-friendly and features an intuitive touch-screen user interface enabling camera operators to begin broadcasting live video with just 2 taps.

Versatile
The Rack400 is a versatile all-in-one solution for mobile video contribution and remote production. Encode and transmit a single 4K UHD source or four simultaneous HD sources with up to 10-bit pixel depths, 4:2:2 chroma subsampling, and in HDR.

High Performance
By implementing an ultra-low latency H.265/HEVC hardware encoder in a compact design enclosure, the Rack400 enables video professionals to provide seamless and pristine video for news and events coverage.

Any Network
Leveraging the Emmy® award winning SST and SRT protocols, the Rack400 can reliably transmit high-quality broadcast contribution video over any network even with fluctuating conditions.

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: 1080p60/59.94/50/30/29.97/25
　　　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 80 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
　　- 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
　Simultaneous Live and IP traffic (for remote camera control)
　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
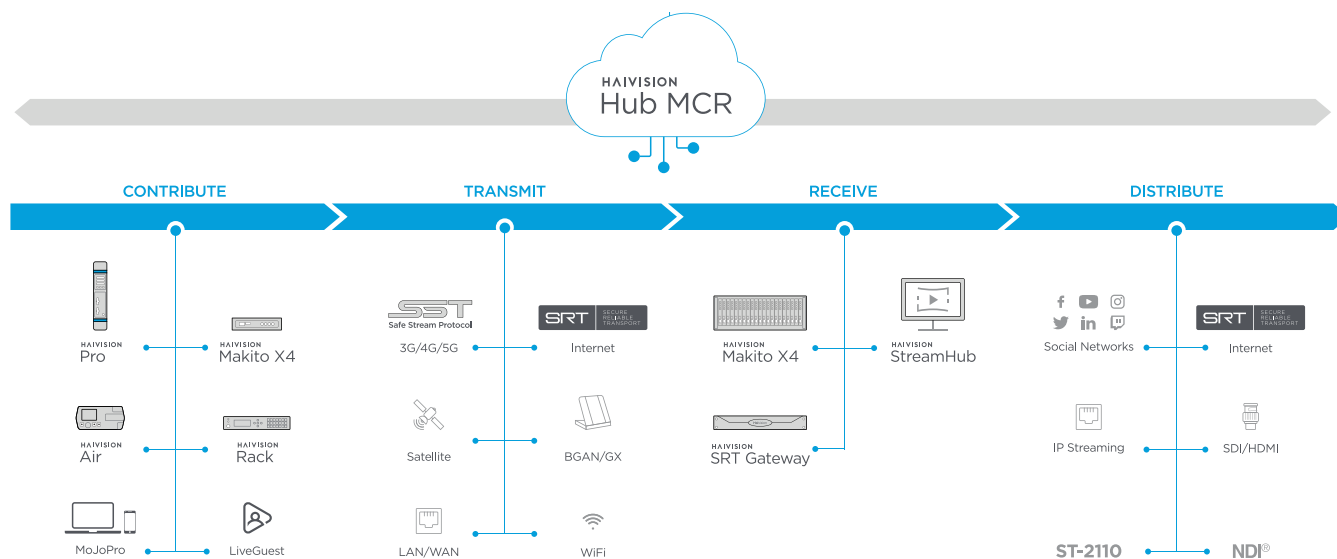　34W max (25W to 30W typical)

PHYSICAL
Dimensions (W x H x D)
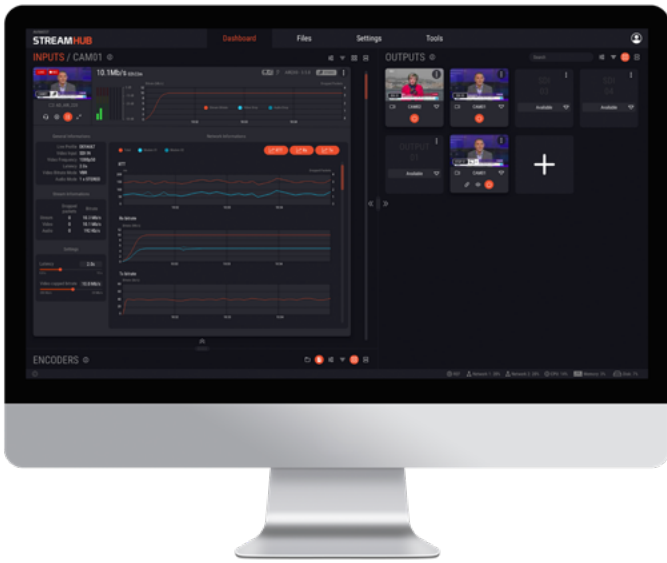　22,2 cm x 4,4 cm x 11,5 cm
　(8.66" x 1.57" x 4.33")
Weight
　1.36 Kg / 3.00 lbs
Operating Temperature
　0°C to 40°C (32°F to 104°F)

System Overview

Versatile Broadcast Contribution Receiver and Decoder Solution

Haivision StreamHub is a versatile solution for receiving IP video streams over mobile networks and the internet. StreamHub can receive and decode live video from Haivision Pro and Air mobile transmitters, and Haivision Rack encoders using the two-time Emmy award winning SST technology for network aggregation. StreamHub can also receive live streams from the Haivision MoJoPro mobile application, LiveGuest browsed-based interviews, and SRT streams from Haivision encoders as well as from third party sources. Its intuitive web user interface enables users to easily control and manage remote field units, optimize configurations, and monitor video transmissions with video thumbnails and advanced statistics.

StreamHub has been designed to meet the demanding requirements of broadcasters deploying video contribution systems over mobile and IP networks. Supporting both H.264 and HEVC with resolutions up to 4K UHD, StreamHub can be deployed on-premise or in the cloud for low latency transcoding and decoding to SDI, NDI, ST-2110, SRT and other IP outputs.

Key Features

Mobile Video Receiver and Decoder StreamHub supports a rich set of IP protocols and can receive up to 16 concurrent incoming SST streams from remote Haivision mobile encoders and transmitters or third party sources through RTMP, RTSP/RTP, SRT, NDI, HLS, TS/IP streaming protocols. Up to 8 videos can be simultaneously decoded to 8 SDI outputs with genlock for multi-camera sychronization. StreamHub also features video transcoding capabilities for adapting incoming feeds to desired output formats.

IP Distribution StreamHub supports multiple streaming protocols including SST, RTMP, RTMPS, RTSP/RTP, HLS, TS/IP, SRT, and NDI so that video content can be easily distributed over IP networks for all types of destinations. Up to 32 outputs are supported, included duplicate streams, for sharing live content over LANs, WANs, CDNs, cloud platforms, Social Networks, and to other StreamHub receivers.

Video Recording And File-based Transcoding StreamHub combines video recording functions with a file-based video transcoder that enables media profesionals to adapt content formats and resolutions for each destination.

Story Centric Workflows & Metadata StreamHub can be used to manually or automatically manage projects & metadata for smooth integration with news production workflows. Using the highly intuitive user interface, broadcasters and media producers can quickly and easily identify recorded content and live sources.

IP Data Bridge The StreamHub DataBridge feature provides direct access to the Internet from a field unit. Optimized for remote production workflows, it also allows for remote control of IP based devices such as PTZ cameras.

IFB and Video Returns StreamHub includes a two-way IFB or audio intercom that enables broadcasters to communicate in real-time with up to 16 remote field unit operators. StreamHub can also manage video returns for providing remote operators with studio feeds, confidence monitoring, and teleprompters.

Multiviewer Monitoring The grid view includes preview thumbnails of video sources that can be assigned to a multiviewer output displaying up to 16 video sources on a single monitor. Broadcast professionals can define audio sources, output standards, and add information overlays for each source.

PLATFORM
Physical
1 RU server platform
Software
Linux 64-bit server
Virtualized
Available as a Virtual Machine or Docker Instance
Running on AWS, Google Cloud, or any public/private cloud

VIDEO
Resolutions
4K/UHD: 25/29.97/30/50/59.94/60
HD: 1080p 25/29.97/30/50/59.94/60
1080i 50/59.94/60
720p 25/29.97/30/50/59.94/60
SD: PAL, NTSC, 480p, 576p
Decoding
Codec: H.264/AVC (4:2:0 8bits), H.265/HEVC (up to 4:2:2 10bits)
Bitrates: 100 kbps up to 160 Mbps
Regulation mode: VBR and CBR
Up to 8x HD or 1x 4K decoding (StreamHub Ultra)
Encoding
Codec: h.264/AVC 4:2:0 8bits
Bitrates: 100 kbps up to 20 Mbps
Regulation mode: CBR
Up to 8 HD live encoding (StreamHub Ultra)
Processing
Video Down-scaling & Upscaling
Deinterlacing

AUDIO
Decoding
AAC-LC, AAC-HE v2, MPEG-1 L2, OPUS
Encoding
AAC-LC, MPEG1-L2, OPUS

STREAMING PROTOCOLS
Inputs
TS/IP (SPTS), RTSP/RTP, RTMP push and pull,
HLS, SRT, IP Bonding (AVIWEST SST), NDI
Outputs
TS/IP (SPTS), RTSP/RTP, RTMP, RTMPS push and pull
HLS, SRT, IP Bonding (AVIWEST SST), NDI
SMPTE ST 2110 (up to 2 x 25Gbs)

ADVANCED FEATURES
Metadata support for Live and Forward
SIP-based and legacy intercom
AVIWEST SST protocol
IP Data Bridge Gateway
MPEG2-TS and MP4 recording
Transmuxing stream processing
Streaming to all major Social Media Platforms including Youtube, Facebook, and Twitch
Multi-view output
Video Return Management

PHYSICAL INTERFACES
StreamHub Lite
Dual GigE network interfaces
1x 3G-SDI or 1x HDMI output
StreamHub Standard
Dual GigE network interfaces
4 x 3G-SDI outputs (SD/HD) with genlock
StreamHub Ultra
Dual GigE network interfaces
Up to 8 x 3G-SDI outputs or 4 x 12G-SDI outputs with genlock
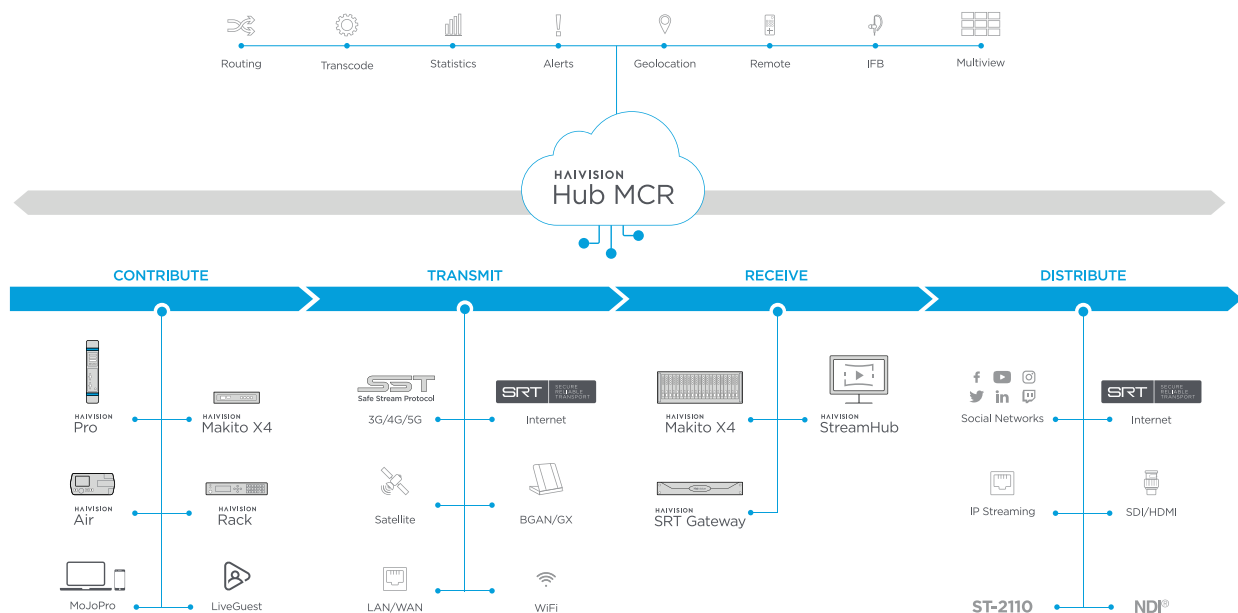
MONITORING
Web-based GUI
Comprehensive RESTfull API for third-party Management System integration
Integrated with AVIWEST MANAGER

POWER
Redundant power supply

System Overview

Manage All Your Devices, Workflows, And Live Broadcast Teams

Haivision Hub MCR is an easy-to-use cloud solution for remotely managing devices, users, and all available video sources and destinations. Haivision Hub MCR enables real-time device monitoring, configuration, and control in support of remote production workflows. To ensure that contribution feeds are sent to the right destination, live video sources can be assigned from any mobile transmitter, encoder or mobile app to any Haivision StreamHub receiver and decoder, whether on-premise or in the cloud.

Configure And Remotely Control Devices including Haivision Pro, Haivision Air, and Haivision Rack appliances, as well as MoJoPro mobile apps, so that your on-site camera crews and remote talent can focus on capturing great live content.

Manage All Receivers And Decoders with visual thumbnails and direct access to real-time statistics and settings from a single browser window. Configure, control, and monitor multiple StreamHub receivers and output streams SDI, NDI, ST-2110, SST and SRT and other IP outputs providing maximum flexibility for any workflow. Furthermore, you can spin up and start StreamHub cloud instances for occasional use situations such as IP gateway rerouting and stream duplication.

Easy Video Routing of live streams over mobile and IP networks with an intuitive drag and drop user interface. Preview thumbnails enable you to immediately identify video content for each input and output in order to make sure that your live contribution sources are being streamed to the right destination. Take out the guesswork for field reporters and camera operators by pre-defining routes for file-forwarding.

Organize field devices, receivers, and users into groups dedicated to specific live broadcast productions. Apply different roles and privileges on a permanent or temporary basis. Whether you are broadcasting a single event or multiple events simultaneously, Haivision Hub MCR can be easily scaled up to meet demand.

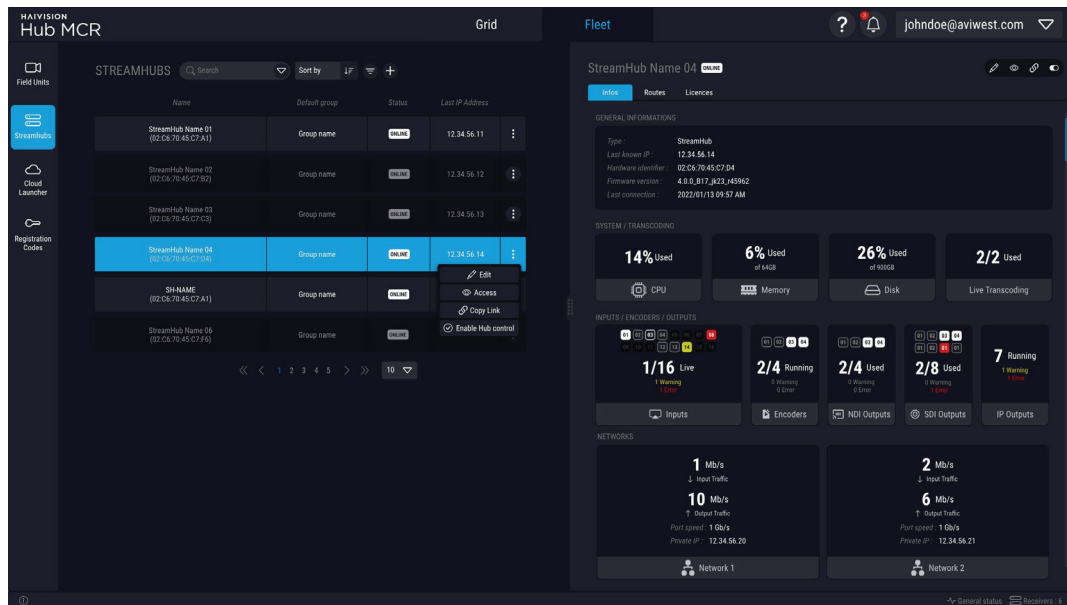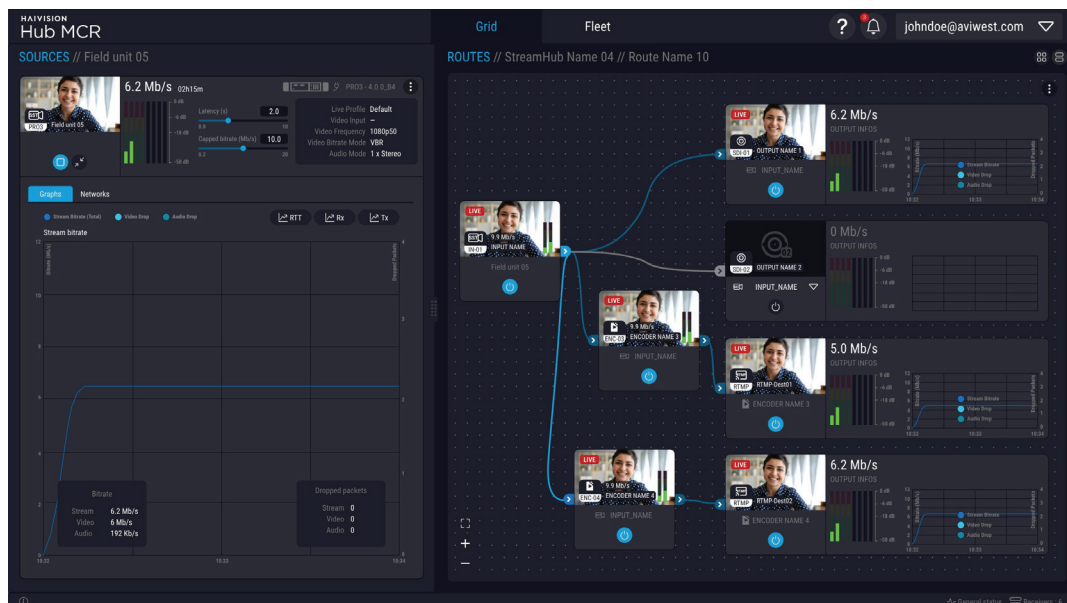| FEATURES	BENEFITS
Fleet Management	Monitor the real-time status of all your field units, encoders, and mobile apps from a single browser window.
Remote Configuration	Set remote field units to the correct configurations including picture settings, resolutions, and choice of codec.
Remote Device Control	Start and stop a live video stream while providing IFB and return feeds to remote talent and camera operators.
Manage Destinations	Configure and monitor all your StreamHub receivers, from a single browser window, for SDI, IP, and cloud workflows.
Stream Settings	Set StreamHub inputs and outputs for SDI, SST, RTMP, RTMPS, RTSP/RTP, HLS, TS/IP, SRT, SDI, NDI, and ST-2110.
Video Routing	Easily create live streaming routes between video contribution sources and StreamHub destinations.
File Forwarding	Define file forwarding routes so that the camera operator or news reporter can easily send content to the right place.
Organize Projects	Group devices and users, permanent and temporary, for specific live broadcasts.

FLEET MANAGEMENT

The Fleet view provides real-time status information on each field unit and StreamHub receiver including activity status, CPU usage, disk space, and current configuration. Detailed statistics are also available for resources optimization and troubleshooting.

VIDEO ROUTING

The Grid view shows all your video sources and destinations along with preview thumbnails and device settings. Creating routes is extremely simple -just drag and drop.

Supported Devices for Fleet Management:

- Haivision Pro mobile transmitters and encoders
- Haivision Rack portable encoders
- Haivision Air mobile transmitters and encoders
- Haivision StreamHub appliance and cloud
- LiveGuest browser-based interviews with StreamHub
- MoJoPro mobile app for iOS and Android

** For complete pricing and ordering, contact us at sales@haivision.com or your certified Haivision reseller.