

KEY FEATURES

- Decoding card for Electra® and Ion™ encoder product lines
- Supported models include Electra 7000, Electra 5400, Electra 5000 and Ion AVC
- Dense and versatile, decode up to two services per card
- Decodes SD and HD MPEG-2 video
- DVB / ATSC
- MPEG-2 TS RTP/UDP over IP input (achieved with an optional input card module)
- MPEG-2 TS over ASI input (achieved with an optional input card module)
- CBR and VBR decoding
- Dolby® AC-3, AAC, HE AAC, and MPEG1 Layer II audio pass through, up to 8 channels
- Vertical Interval Data Services pass through
- Confidence monitoring video port
- Controlled via NMX Digital Service Manager™

With the ever-expanding rollout of new digital services and the acceleration of HD and MPEG-4 AVC deployments, the level of complexity in traditional headends has increased significantly. Today's baseband architectures are ill-equipped to handle this transition smoothly, as content is coming from multiple sources and in many formats. In addition, cable, satellite and telco operators are embracing video-over-IP technology at a rapid pace, and are looking for a solution that can enable them to seamlessly migrate to an IP-based service. Harmonic's DiviCom® FLEX™ dual decoder module is a powerful solution that addresses these issues.

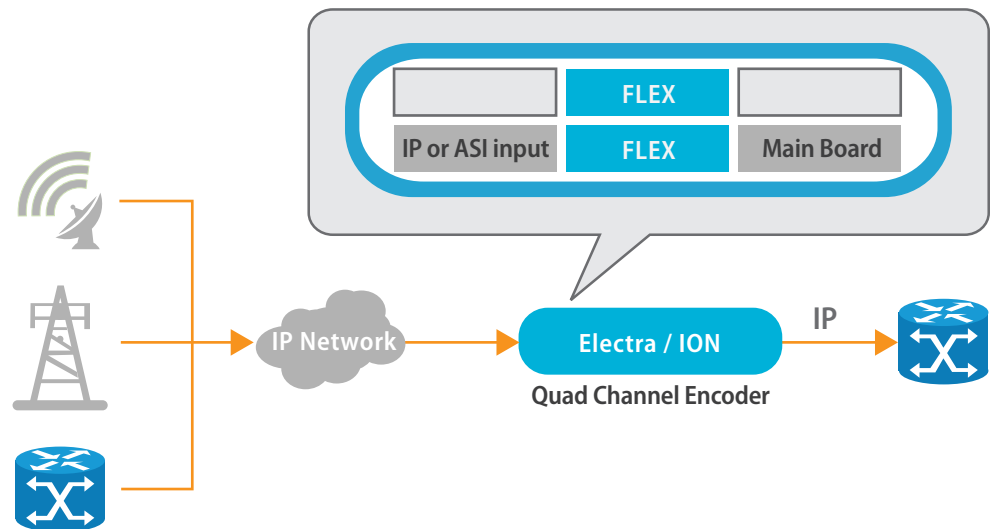
This highly flexible "any-to-any" video re-encoding solution alleviates complex workflow issues, is quickly deployable, and includes IP input functionality, enabling operators to focus on quality of service and other differentiators critical to their success.

FLEX delivers video decoding capability and is easily integrated into Harmonic's Electra® or Ion™ encoder chassis. A single FLEX module is able to decode up to two (2) incoming channels, and an appropriately configured encoder can deliver up

to four (4) channels in a single rack-unit (1-RU). The highly versatile FLEX decoder module will decode MPEG-2 in both standard definition (SD) or high definition (HD) formats, thereby eliminating the dependency on ingress formats.

FLEX is a unique gateway designed with the flexibility to deliver any type of pre-compressed video to any Electra or Ion encoder. FLEX supports both ASI or IP inputs, the most efficient interfaces used to route and transport pre-compressed video feeds.

By offering an IP input interface to the encoder, FLEX delivers a key technology required for the industry's continued migration to all-IP headends. A simple upgrade to Harmonic's existing encoder chassis enables operators to source content from IP networks or IP-ready RF demodulators/descramblers. This highly innovative solution greatly reduces overall system cost and complexity, supports the most common video and audio formats in use today, and was developed to meet the current and future needs of multi-service providers.



SOLUTION BENEFITS

- **Saves cost and time** – Operators can quickly and efficiently launch new services and re-balance current lineups by reducing the cost and time per channel without sacrificing quality and up time.
- **“No-compromise” transcoding** – Highest decoding quality combined with Harmonic’s robust and proven compression technology result in the highest re-encoding quality.
- **Audio service** – FLEX supports pass through of all major audio formats, including MPEG Layer II, Dolby® Digital, AAC, and HE AAC. Stereo and multi-channel audio is also supported.

TECHNICAL ADVANTAGES

- **Simplified management and fewer single points of failure** – Integrating decoding functionality into Harmonic’s encoder chassis and a simple migration path to IP results in reduced system complexity as well as lower OPEX and CAPEX.
- **Density** – By decoding up to two (2) channels per card, FLEX integrated in an Electra or Ion encoder delivers up to four (4) HD or SD channels per RU, significantly less space than required by standalone single channel decoders.
- **Unconstrained video, audio and vertical interval format conversions** – FLEX offers unequalled flexibility to support the full spectrum of video, audio and vertical interval services. Operators are not constrained by bit rate or resolution.
- **Robust decoding capability** – FLEX is based on robust and field proven SoC technology. The optional IP module is capable of FEC reception, a key feature required of all IP video contribution and distribution systems.
- **New applications** – FLEX is particularly well suited for new or transitioning headend architectures. The turnaround of pre-compressed feeds is now greatly simplified. Operators can take a given input feed and multicast it in both MPEG-2 and AVC formats for new service introductions to tiered set-top boxes.
- **Support for all-IP infrastructure** – Harmonic pioneered IP-enabled video delivery with the industry’s first encoders with native IP output. FLEX expands the IP capability of Harmonic’s product line by offering native IP input functionality in Harmonic’s best-in-class Electra and Ion platforms. The result is a more scalable and lower-cost transition to IP-based service. IP is the new “must have” input to the encoder.
- **Network management** - Harmonic’s NMX Digital Service Manager simplifies mass configuring, monitoring and automated redundancy in both centralized and distributed architectures.

VIDEO SPECIFICATIONS

Video Decoding	MPEG-2 MP@ML MPEG-2 MP@HL VBR, CBR
Aspect Ratios	4:3 and 16:9
Video Formats	480i29.97, 576i25, 720P59.94, 720P50, 1080i29.97 and 1080i25
Vertical Interval Data Services (Pass through only)	WST (Teletext), Inverted WST, WSS, VPS, AFD, VITC, Closed Captioning per CEA-608 and 708

AUDIO PASS THROUGH SPECIFICATIONS

Number of Channels	Up to 8 stereo PIDs per video service
Audio Formats	MPEG Layer II, Dolby Digital (AC-3), AAC, and HE AAC
Audio Processing	Pass-through
Operating Modes	Mono, dual channel, stereo, joint stereo, 5.1 multi-channel

INPUTS

Transport Stream Inputs	MPEG-2 TS
ASI Interface (optional module)	
Connector	4 x BNC, 75Ω
MPEG Format	188/204 Bytes per TS packet
Processing	1 MPTS/SPTS per port Up to 160 Mbps per port
ASI Ports	4
IP Interface (optional module)	
Type	Gigabit Ethernet
IP Ports	2 independent ports
Connector	2 x SFP (multi mode, single mode, copper)
Speed	1 x 1000 Mbps per port
IP Encapsulation	MPEG-2 TS over UDP/IP 1 to 7 TS/ IP
MPEG Format	188 Bytes per TS packet
MPEG-2 TS	MPTS and SPTS
Maximum Bit-Rate per Socket	80 Mbps
Addressing	Unicast and multicast
Management	IGMP, ARP, ICMP
Forward Error Correction	SMPTE 2022-1 and -2

OUTPUTS

Video Outputs	1 per decoded channel with video only, SDI or HD-SDI. 1 additional per channel for confidence monitoring only
Connector Type	DIN 1.0-2.3 (DIN 1.0/2.3 to BNC adapters available)

SYSTEM MANAGEMENT

NMX Digital Service Manager	
Web control when running in standalone mode on Ion AVC	

POWER (AS HOUSED BY THE ENCODER CHASSIS)

Input Voltage Range	85-132 VAC or 170-264 VAC 42-60 VDC (please refer to the hosting encoder datasheet)
Line Frequency	47-63 Hz (please refer to the hosting encoder datasheet)
Typical Consumption	24 W per FLEX module

ENVIRONMENTAL AND PHYSICAL

Please refer to the datasheet of the hosting encoder chassis	
Compliant with RoHS Directive 2002/95/EC	

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