The single PMC UltraCompression-2 Transcoder advances Ericsson's market leadership in the IPTV space. It supports multi-format MPEG-2 and MPEG-4 AVC, SD and HD input streams and uses Ericsson's best-in-class next-generation AVC platform to transcode them to either MPEG-4 AVC SD or HD output.

Up to six UltraCompression-2 transcoders are supported in a 1RU iPlex™ video processing platform, giving the iPlex market leading density and low power consumption per channel. By supporting transcoding, the iPlex video processing platform ensures the integrity of metadata in the transport streams (closed captioning, teletext etc.) and maximizes the alignment of lip sync with subtitles. In addition, when used in conjunction with bulk descrambling receivers, the iPlex transcoding architecture reduces the cost of the overall headend design and improves video quality.

Ericsson's integrated transcoding solution replaces disparate, box-on-box solutions. It converts an incoming SD or HD, MPEG-2 or MPEG-4 AVC transport stream to digital baseband, performs video pre-processing for picture and compression optimization, and then encodes the stream into MPEG-4 AVC, all on a single sub-module. The integrated design also allows for increased signal processing control, increasing the compression performance.

Ancillary data, such as Teletext and Closed Captions, are left intact, allowing the UltraCompression-2 Transcoder sub-module to conform with country-specific requirements. It also elegantly packages video transcoding needs with audio transcoding and pass-through, and Picture-in-Picture (PiP) images are generated alongside the main video stream. Increased density lowers a service provider's upfront equipment costs, eliminates cabling, reduces power costs, improves overall system reliability and minimizes rack space.

In addition to transcoding, the same sub-module supports transrating functionality for MPEG-4 AVC SD and HD programming. This feature is of importance when preparing MPEG-4 AVC SD or HD streams transmitted over a satellite for the CBR environment of xDSL and FTTx access infrastructures.

The Clarus™ pre-processing options, which use Ericsson's latest patented advanced pre-processing technology, can significantly improve compression performance when only poor quality source content is available. Clarus noise reduction and Clarus input de-blocking filter (which removes blocking artifacts from the input video) allow the MPEG-4 AVC Compression process in the UltraCompression-2 transcoder to achieve the same compression performance with traditionally problematic sources that conventional technologies can only achieve with “clean” sources.

**KEY BENEFITS**

**High Picture Quality at Low Bit-rates**
- Ericsson’s transcoder has been optimized for extraordinary picture quality at low bit-rates. The integrated Transcoding approach minimizes information loss along the processing path.
- The solution outperforms disparate, box-on-box designs and the performance of software based designs.

**CAPEX Savings**
- With six main video streams and 6 PiP streams per RU, Ericsson offers the densest transcoding solution available.
- The compact design reduces equipment costs, especially when used in combination with bulk descrambling receivers, eliminates cabling, minimizes rack space, reduces power costs and improves overall system reliability and MTBF compared with solutions using disparate decoders and encoders.

**Pass-through Enabled**
- Audio can be passed through. Important data such as Teletext, closed captioning, active format description, and Wide Screen Signaling is preserved.

**Advanced Pre-processing Technology**
- Clarus™ noise reduction and input de-blocking filter are effective tools to improve the quality of video source material. Clarus allows the transcoder to achieve the same compression performance with traditionally problematic sources that conventional technologies can only achieve with “clean” sources.
BASE UNIT FEATURES

**MPEG-4 AVC HD UltraCompression-2 Transcoder Sub-module [N012057]**
- Integrated receiver/decode module for MPEG-2 and MPEG-4 AVC standard definition (SD) and high definition (HD)
- User selectable MPEG-4 AVC SD or HD output
- Video Processing powered by Ericsson’s next-generation MPEG-4 AVC UltraCompression-2 Encoding technology
  - Advanced Multi-Pass Encode
  - CBR and VBR rate control
  - Supports all commonly required video resolutions
  - Advanced Ancillary Data Service handling: Pass-through and time synchronization of packetized VBI information (eg Teletext, WSS, DVB subtitles), Transcoding of Closed captioning, WSS-AFD.
- Audio service pass-through and advanced audio transcoding features
- Gain Control (Audio levelling) +/-12dB
- Single PMC design

**MPEG-4 AVC SD UltraCompression-2 Transcoder Sub-module [N012056]**
- Integrated receiver/decode module for MPEG-2 and MPEG-4 AVC standard definition (SD)
- MPEG-4 AVC SD output
- Video Processing powered by Ericsson’s next-generation MPEG-4 AVC UltraCompression-2 Encoding technology
  - Advanced Multi-Pass Encode
  - CBR and VBR rate control
  - Supports all commonly required video resolutions
  - Advanced Ancillary Data Service handling: Pass-through and time synchronization of packetized VBI information (eg Teletext, WSS, DVB subtitles), Transcoding of Closed captioning, WSS-AFD.
- Audio service pass-through and advanced audio transcoding features
- Gain Control (Audio levelling) +/-12dB
- HD upgradeable by software license key
- Single PMC design

**COMMON SOFTWARE OPTIONS**

**Dolby Digital® (AC-3) Audio Encoding [N011040]**
- Each license enables one stereo channel of Dolby Digital® (AC-3) audio encoding.
- Maximum eight licenses per sub-module.
- Each audio channel may be configured as either Stereo or Mono
- For every three stereo channels enabled, the user may configure the transcoder to generate a Dolby Digital (AC-3) 5.1 surround sound encoded audio channel

**AAC Audio Encoding [N012050]**
- Each license enables 1 stereo channel of Low Complexity Advanced Audio Coding (AAC-LC) or High Efficiency Audio encoding (HE-AAC).
- Maximum 8 licenses per sub-module.
- Each audio channel may be configured as either Stereo or Mono
- For every three stereo channels enabled, the user may configure the transcoder to generate a AAC 5.1 surround sound encoded audio channel
  - Bit-rates: AAC-LC mono 32 - 160 Kbps; stereo 56 - 320 Kbps
  - Bit-rates: HE-AACv1 mono 16 - 64 Kbps; HE-AACv1 stereo 16 - 128 Kbps; HE-AACv2 stereo 16 - 56 Kbps
  - MPEG-2 (ADTS) and MPEG-4 (LATM/LOAS) audio encapsulation supported
  - Transcoder sub-modules provide ability to convert Dolby® Digital and MPEG-1 Layer II to AAC

**Clarus™ Advanced Noise Reduction [N012024]**
- Pre-processing technology for noise sources
- Allows the transcoder to achieve the same compression performance with noisy sources that conventional technologies can only achieve with “clean” sources
- Can be coupled with Clarus™ Input de-blocking filter

**Clarus™ Input De-blocking Filter [N012044]**
- Pre-processing technology for input de-blocking
- Allows the transcoder to achieve the same compression performance with sources displaying blocking artifacts that conventional technologies can only achieve with “clean” sources
- Can be coupled with Clarus™ noise reduction filter

**Picture-in-Picture (PIP) [N012017]**
- License enables the generation of a simultaneous lower resolution version of the main video service for picture-in-picture type applications
- MPEG-4 AVC MP@L3 encoding
- Resolutions: 96x96 to 352x240/288
- Bit-rates: 100 Kbps - 2 Mbps

**Picture-in-Picture Plus (PIP Plus) [N012025]**
- License enables the generation of a simultaneous full resolution version of the main video service for picture-in-picture type applications (HD enabled device only)
- MPEG-4 AVC MP@L3
- Resolutions: 96x96 to Full SD
- Bit-rates: 100 Kbps - 10 Mbps

**Stand alone VBR [N012051]**
- License enables stand alone automatic variable bit-rate generation based on user configurable target quality and bitrate settings.
COMMUNITY SPECIFICATIONS

**Transcoder Input Formats**

**Input Transport Stream**
Input via any iPlex™ input interface available on the unit. MPEG-2 or MPEG-4 transport stream, either DVB or ATSC syntax compliant. Up to 20 Mbps

**Transcoder Video Decoding**
- SD Video decoding: MPEG-2 MP@ML; MPEG-4 AVC MP@L3 or HP@L3
- SD Resolution/frame: 480i29.7 / NTSC, PAL-M; 57625 (PAL)
- HD Video decoding: MPEG-2 MP@HL; MPEG-4 AVC MP@L4 or HP@L4
- HD Resolution/frame: 720p59.94, 720p50; 1080i29.7, 1080i25

**Transcoder Audio Decoding**
- Audio Decoding: MPEG-1 Layer II (mono, stereo); Dolby Digital (AC-3) (mono, stereo, 5.1); AAC-LC (mono, stereo, 5.1); HE-AACv1 (stereo, 5.1)
- Two channels MPEG-1 Layer II as standard
- Selectable mono, stereo and joint stereo modes
- Bit-rates: mono 32 - 192 Kbps; stereo 64 - 384 Kbps
- Audio pass-through
- Adjustable lip sync –500ms to 2000ms

**Ancillary Data**
- Closed captioning (CEA 608B)
- Teletext (WST System B)
- WSS
- DVB Subtitles

**Outputs**
- Output via any iPlex output interface available on the unit

**System Management**
- nCompass Control by Ericsson
- Web based control / GUI

**Physical and Power**
- Dimensions of card (LxWxH): 5.866” x 2.913” x 0.509” ; 149.0 x 74.0 x 12.9 mm
- Maximum power draw: 45 Watts per card
- Average power draw: 40 Watts

VERSION SPECIFICATIONS

**HD Video Transcoder**
- Applies to N012057, MPEG-4 AVC HD, main and high profile at Level 4 compression
- CBR and VBR rate control
- User selectable bit-rate 2 - 20 Mbps
- Advanced Multi-Pass Encode
- Single slice encoding
- Scene-cut and fade/dissolves detection
- GOP management (adaptive I/B-frame placement)
- Supports Video Resolutions (HD):
  - 1080i x 1920 / 1440 / 720 25 fps
  - 1080i x 1920 / 1440 / 720 29.97fps
  - 1080i x 1920 / 1440 / 720 30 fps
  - 720p x 1280 / 960 / 640 50 fps
  - 720p x 1280 / 960 / 640 59.94 fps
  - 720p x 1280 / 960 / 640 60 fps

**SD Video Transcoder**
- Applies to N012056, MPEG-4 AVC SD, main and high profile at Level 3 compression
- CBR and VBR rate control
- Interlace & progressive encoding support
- Single slice encoding
- Scene-cut and fade/dissolves detection
- GOP management (adaptive I/B-frame placement)
- Motion compensated temporal filter (MCTF) noise reduction as standard
- Supports Video Resolutions (SD):
  - 576i x 720 / 704 / 576 / 704 / 528 / 480 / 352 29.97 fps
  - 576i x 720 / 704 / 576 / 704 / 528 / 480 / 352 30 fps
  - 480i x 720 / 704 / 576 / 528 / 480 / 352 25 fps
  - 480i x 720 / 704 / 576 / 528 / 480 / 352 29.97 fps
  - 480i x 720 / 704 / 576 / 528 / 480 / 352 30 fps

OPTIONS SPECIFICATIONS

**Dolby® Digital (AC-3) Stereo Audio Encoding [N011040]**
- Enables 1 stereo/mono channels of Dolby® Digital (AC-3) audio encoding. Maximum eight licenses per sub-module
- Bit-rates: mono 56 - 640 Kbps; stereo 96 - 640 Kbps
- For every three stereo channels enabled, the user may configure the transcoder to generate a Dolby Digital® (AC-3) 5.1 surround sound HD encoded audio channel. Bit-rates: 96 - 640 Kbps

**AAC Audio Encoding [N012050]**
- Each license enables one stereo/mono channel of Low Complexity Advanced Audio Coding (AAC-LC) or High Efficiency Advanced Audio Coding (HE-AAC V1 or V2)
- Maximum eight licenses per sub-module
- Bit-rates: AAC LC mono, 32 - 160 Kbps
- AAC LC stereo, 64 - 320 Kbps
- Bit-rates: HE-AACv1 mono 16 - 64 Kbps; HE-AACv1 stereo 16 - 128 Kbps; HE-AACv2 stereo 16 - 56 Kbps
- MPEG-2 (ADTS) and MPEG-4 (LATM/LOAS) audio encapsulation supported
- For every three stereo channels enabled, the user may configure the transcoder to generate a AAC-LC 5.1 or HE AAC 5.1 surround sound encoded audio channel
- Bit-rates: AAC-LC, 160 - 640 Kbps; HE AAC V1 or V2, 64 - 160 Kbps

**Picture-in-Picture (PiP) [N012017]**
- License enables the generation of a simultaneous lower resolution version of the main video service for picture-in-picture type applications
- MPEG-4 AVC MP@L3 encoding
- Resolutions: 96x96, 128x128, 192x144, 192x192 and 352x240/288
- Bit-rates: 100 Kbps - 2 Mbps

**Picture-in-Picture Plus (PiP Plus) [N012025]**
- License enables the generation of a simultaneous full resolution version of the main HD video service for picture-in-picture type applications
- MPEG-4 AVC MP@L3 encoding
- Resolutions: 352x480/576, 480x480/576, 528x480/576, 544x480/576, 640x480/576, 704x480/576 and 720x480/576
- Bit-rates: 100 Kbps - 10 Mbps