

ENCODING/TRANSCODING

The logo for Appear TV, featuring the word "Appear" in a bold, italicized sans-serif font and "TV" in a similar font, with three orange dots of varying sizes above the "A".

Appear TV

ENCODING/TRANSCODING

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PRODUCT BRIEF

Appear TV's encoding and transcoding functionality is the continuation of AppearTV universal head-end solutions. This functionality means that Appear TV solutions now provide total flexibility and control over inputs, outputs, encoding and transcoding, so that the company's head-ends are truly universal, being capable of taking any input and providing any output.

Total flexibility in the Appear TV head-end has been achieved by the production of the new real-time, high-quality broadcast video encoding and transcoding modules for the DC1000/DC1100, SC2000/SC2100 and MC3000/MC3100 chassis. The universal head-ends save space and provide the level of functionality required as broadcast architectures gain in complexity.

High density broadcast quality encoding

HD/SD SDI Encoder

AppearTV's new MPEG-2 and MPEG-4 AVC (also known as Part 10 or H.264) encoder solution is able to encode digital video data in all common distribution profiles from SD to HD. Input is SDI/HDSDI with embedded audio. The encoder comes in three variants: Quad SD Encoder, Dual HD/Quad SD Encoder, and Dual SD/HD Encoder with AES input option. If only SD encoding is required, with no need for upgrading to HD at a later date, the Quad SD Encoder is the optimal solution. If on the other hand HD encoding support will be required in the future, the Dual HD/Quad SD Encoder can be upgraded to support HD at a later date.

Finally, if HD encoding is needed from the beginning or AES/EBU input is required, the Dual SD/HD Encoder with AES input option should be selected. For the Dual SD/HD Encoder with AES input option, audio can be received embedded in the SDI/HDSDI or as AES/EBU input.

High performance rate and format conversion

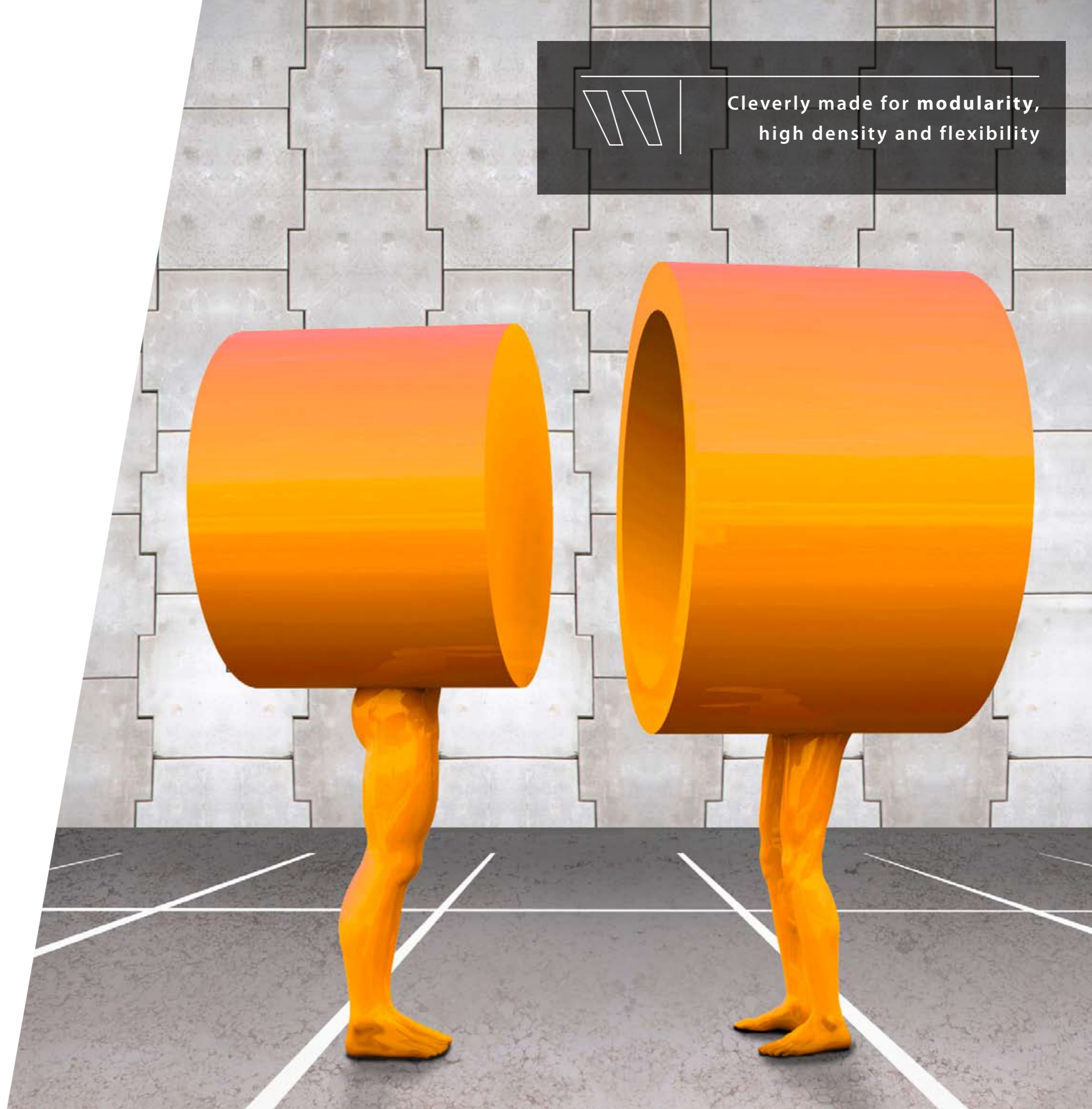
SD/HD Transcoder

Appear TV's Transcoder solution is able to transcode digital video data in all common distribution profiles from SD to HD. The transcoder module is able to transcode AVC to MPEG-2, MPEG-2 to MPEG-2, MPEG-2 to AVC, and AVC to AVC. It supports transcoding of 4 SD channels or 2 HD channels. The module is SW upgradeable from 4 SD to 2 HD. The transcoder operates in three different encoder rate control modes: Constant Bit Rate (CBR), Capped Variable Bit Rate (CVBR), as well as Statistical Multiplexing (in future release).

The new multi-format encoder and transcoder modules fit into all the existing Appear TV chassis' and can be used in combination with any input and output modules available, thus eliminating the need for an external encoder or transcoder unit.



Cleverly made for modularity,
high density and flexibility





Universal distribution head-ends
for broadcast and IP television,
The Appear TV way

FEATURES

- 1RU and 4RU chassis
- Encoding
- Transcoding
- Input options:
 - IP - ASI - DVB-S/S2
 - DVB-T/T2 - DVB-C/J.83 - 8VSB
- Any combination of inputs in the same chassis. Maximum (4RU):
 - 18 IP inputs - 48 ASI inputs
 - 30 DVB-S/S2, DVB-T/T2, DVB-C or 8VSB inputs
- PSI/SI/PSIP input analysis
- MPEG output options with multiplexing support:
 - IP - ASI - QAM Annex A,B or C
 - DVB-T/T2
- PSI/SI/ATSC regeneration
- ProMPEG FEC on IP in and IP out (enhanced HW)
- Up to 30 DVB common interface slots for DVB descrambling
- Bulk descrambler with DVB and AES SW descrambling
- Support DVB and AES scrambling, simulcrypt interface based
- Audio levelling
- EPG regeneration
- Hot-swappable modules (4 RU only)
- Intuitive web-based user control
- Dual redundant hot-swappable power supplies (option, 4RU only)
- Monitoring of power and fans (4 RU only)
- SNMP Alarm MIB
- SOAP/XML Interface for external control

CHASSIS

4RU

- Modular configuration with up to 16+2 board positions
- WEB based configuration, SNMP Alarms, SOAP/XML interface
- Forced air-cooling (through back of 4RU)
- Dual redundant hot-swappable power supply
- 4 individually monitored hot-swappable fans
- Hot-swappable modules

1RU

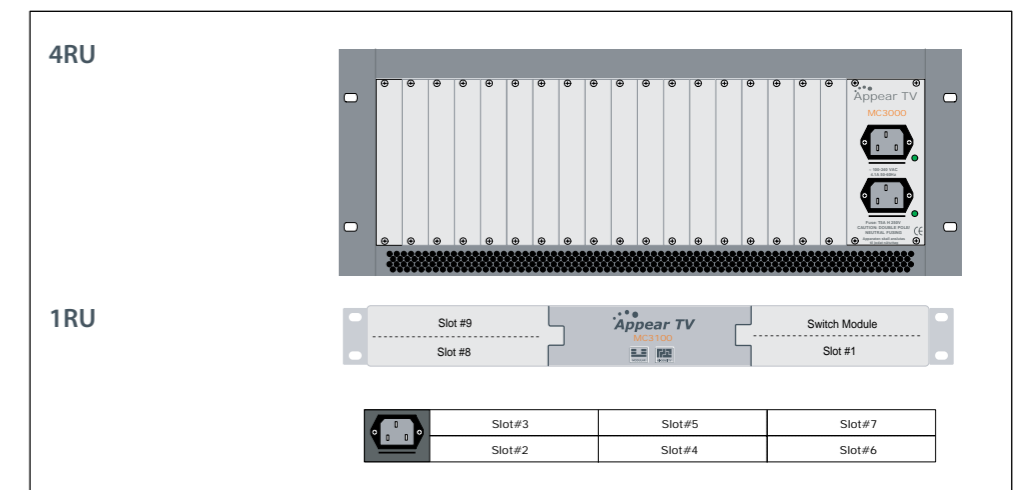
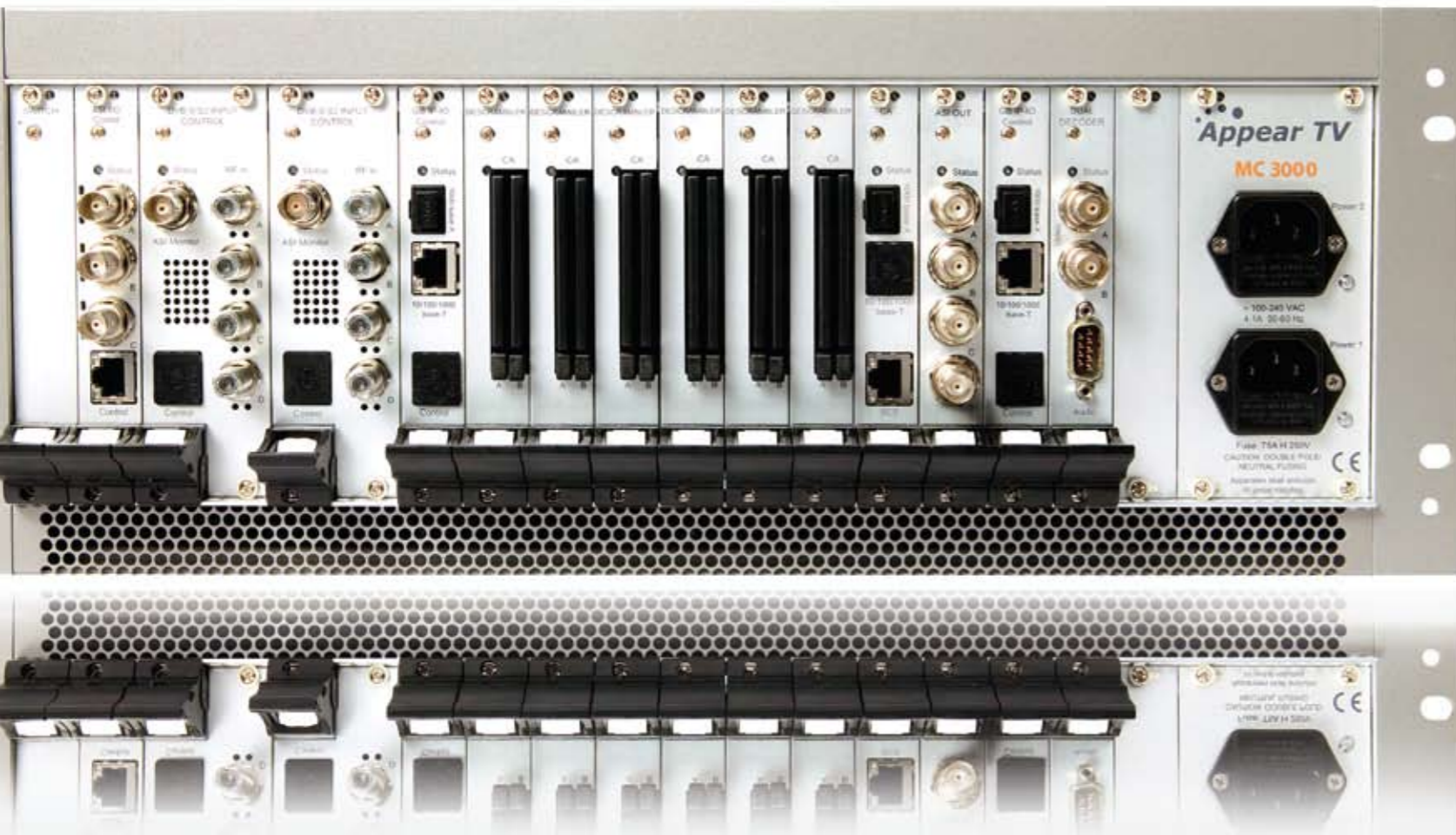
- Modular configuration with up to 9+1 board positions
- WEB based configuration, SNMP Alarms, SOAP/XML interface
- Forced air-cooling (through sides of 1RU)
- Swappable modules in back
- Optional IP IO or descrambler in front

DIMENSIONS

4RU (w*h*d mm) 440 (480 with ears) * 180 * 400 (+ connectors)

1RU (w*h*d mm) 440 (480 with ears) * 45 * 480 (+ connectors)

Standard 19 inch rack mounting, 4RU high



SWITCH MODULES

Switch Module*

- Gbit/s routing between modules in a chassis
- 1 slot wide



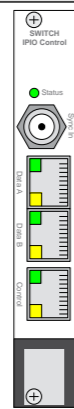
Switch Module with Management*

- Gbit/s routing between modules in a chassis
- Enables WEB management
- 10/100/1000BaseT management port (RJ45)
- 1 slot wide



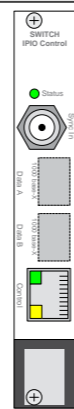
Switch Module with Management 2x 10/100/1000 Base-T input and Video Sync*

- 2xGbit input or output port for data
- Up to 850 Mbit/s per data port TS
- Supports UDP/RTP Multicast/Unicast
- Supports reception of MPTS and SPTS
- Supports streaming of MPTS and SPTS
- Multiplexing on output with PSI/SI regeneration
- Service filtering
- FEC encoding and decoding (optional)
- Enables WEB management
- 10/100/1000BaseT management port (RJ45)
- 1 slot wide



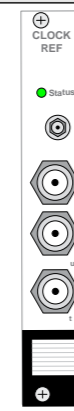
Switch Module with Management Dual SFP input and video sync*

- 2xGbit input or output port for data
- Up to 850 Mbit/s per data port TS
- Supports UDP/RTP Multicast/Unicast
- Supports reception of MPTS and SPTS
- Supports streaming of MPTS and SPTS
- Multiplexing on output with PSI/SI regeneration
- Service filtering
- FEC encoding and decoding (optional)
- Enables WEB management
- 10/100/1000BaseT management port (RJ45)
- 1 slot wide



Clock Reference Module

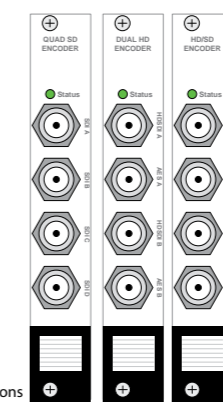
- GPS antenna input
- 1 pps input reference
- 10 MHz test output
- 1pps test output
- 1 slot wide



ENCODING/TRANSCODING MODULES

HD/SD SDI Encoder

- Encodes up to 2 HD or 4 SD channels
- 2 HD-SDI or up to 4 SD-SDI inputs, BNC connectors
- 1 slot wide
- Available in 3 variants:
 - Quad SD Encoder
 - Dual HD Encoder with AES option
 - Quad SD upgradeable to Dual HD



Note: Same module supports MPEG-2 and MPEG-4 AVC
Picture-in-Picture for IPTV portal, Monitoring or Mobile applications

SD/HD Transcoder

- Transcodes up to 2 HD or 4 SD channels
- Full decode and re-encode
- Operates in three different Encoder Rate Control modes:
 - Constant Bit Rate (CBR)
 - Capped Variable Bit Rate (CVBR)
 - Statistical Multiplexing (in future release)
- 1 slot wide



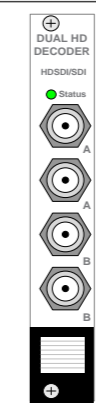
Please note that card ejector will not be mounted for modules installed in 1RU chassis. Modules mounted in front of 1 RU chassis are not hot-swappable.

DECODER MODULES

(* Product codes)

MPEG 2/4 Decoder with SDI Output*

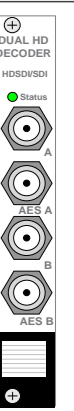
- 2 SDI/HDSDI outputs per decoder
- MPEG2 and MPEG4 (H264) SD and HD
- VBI re-insertion (WSS, WST/EBU Teletext, VPS, VITS)
- DVB and EBU subtitling
- 1 slot wide



*MC/ADMSDISD *MC/ADMSDISDOSDM
*MC/ADMSDIHD *MC/ADMSDIHDOSDM

MPEG 2/4 Decoder with SDI output & AES audio option*

- 2 decoders per module
- MPEG2 and MPEG4 (H264) SD and HD
- VBI re-insertion (WSS, WST/EBU Teletext, VPS, VITS)
- DVB and EBU subtitling
- 1 SD/HDSDI output per decoder
- 1 AES audio output per decoder
- 1 slot wide

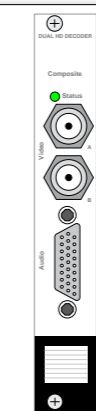


*MC/ADMSDIAUDSD *MC/ADMSDIAUDSDOSDM
*MC/ADMSDIAUDHD *MC/ADMSDIAUDHDOSDM

*For MPEG output specifications please see DC1000/DC1100 product brochure

MPEG 2/4 Decoder with Composite Output*

- 2 decoders per module
- MPEG2 and MPEG4 (H264) SD and HD
- VBI re-insertion (WSS, WST/EBU Teletext, VPS, VITS)
- DVB and EBU subtitling
- Composite PAL Video output – BNC connectors
- Balanced Stereo Audio output – D-sub connector
- 1 slot wide*



For MPEG2/4 decoder product code please contact Appear TV.

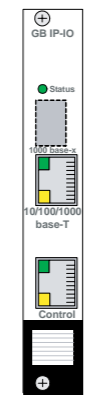
For all switch product codes and software options, please contact Appear TV. *4RU switch module must be placed in slot 0. Redundant module in slot 17

INPUT MODULES

(*Product codes)

Ethernet Input

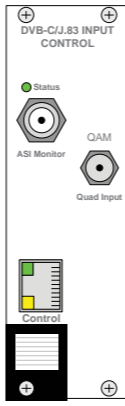
- 10/100/1000BaseT input card (RJ45)
- Mini-GBIC interface (SFP) for optical input
- Supports UDP/RTP Multicast/Unicast reception
- Supports reception of MPTS and SPTS
- Service filtering
- 10/100/1000BaseT management port (RJ45)
- Enables WEB management
- Supports FEC (SMPTE 2022)
- 1 slot wide



*MC/GBIPIN-MMI

DVB-C Input w/Management

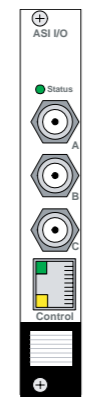
- 4xQAM inputs
- F connector
- 0.87-6.9 Ms/s
- Supports reception of MPTS and SPTS
- Service filtering
- ASI monitoring port
- 10/100/1000BaseT management port (RJ45)
- Enables WEB management
- 2 slots wide



*MC/4QAM-MMI

ASI Input w/Management

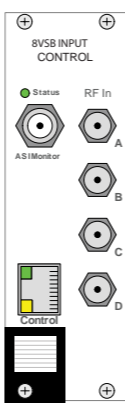
- 3xASI input
- BNC connectors
- 213 Mbit/s per input
- Supports reception of MPTS and SPTS
- Service filtering
- 10/100/1000BaseT management port (RJ45)
- Enables WEB management
- 1 slot wide



*MC/3ASI-MMI

8VSB Input w/ Management

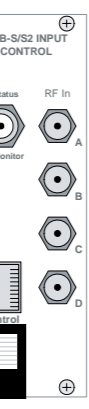
- 4x8VSB Inputs
- F connectors
- 50 to 860 MHz Frequency Range
- Supports reception of MPTS and SPTS
- ASI monitoring port
- Service Filtering
- 10/100/1000 BaseT management port (RJ45)
- Enables WEB management
- 2 slots wide



*MC/4x8VSB-MMI

DVB-S/S2 Input w/Management

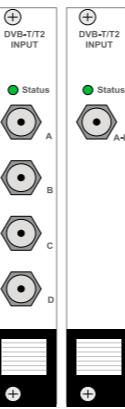
- 4xDVB-S/S2 inputs
- F connectors
- DVB-S, DVB-S2 QPSK and 8PSK modes
- 950 – 2150 MHz Frequency Range
- 1-45 MSym/s (mode dependent)
- 1/2, 2/3, 3/4, 5/6, 7/8, 8/9, 9/10 FEC (mode dependent)
- Supports reception of MPTS and SPTS
- Service filtering
- ASI monitoring port
- 10/100/1000BaseT management port (RJ45)
- Enables WEB management
- 2 slots wide



*MC/4DVBS-MMI *MC/4DVBS2-MMI

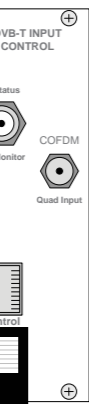
DVB-T/T2 Input

- Standards ETSI EN 300 744 and EN 302 755
- 4 x DVB-T/T2 receivers per module.
- Input ports option:
 - 1 F connector, signal is split and distributed internally
 - 4 F connectors, one per demodulator
- Frequency range 47-862MHz
- Carrier mode:
 - DVB-T: 2k, 8k
 - DVB-T2: 1k, 2k, 4k, 8k, 16k, 32k
- Modulation:
 - DVB-T: QPSK, 16QAM, 64QAM
 - DVB-T2: QPSK, 16QAM, 64QAM, 128QAM, 256QAM
- Supports reception of MPTS and SPTS
- Service filtering on input (requires new switch module)



DVB-T Input w/Management

- 4xCOFDM inputs
- F connector
- 1/2, 2/3, 3/4, 5/6, 7/8 FEC
- 2k and 8k carrier mode
- QPSK, 16QAM, 64QAM modulation
- Supports reception of MPTS and SPTS
- Service filtering
- ASI monitoring port
- 10/100/1000BaseT management port (RJ45)
- Enables WEB management
- 2 slots wide




*MC/4COFDM-MMI

PROCESSING MODULES

(*Product codes)

Bulk Descrambler


- Descrambles up to 250 services (850 Mbit)
- Integrated with soft clients for ECM handling (no smart card required)
- Support for both DVB-CA and AES descrambling
- BISS descrambling
- 1 slot wide



*MC/BDESC25, *MC/BDESC50, *MC/BDESC100,
*MC/BDESC150, *MC/BDESC200, *MC/BDESC250

Descrambler


- 2xDVB Common interface
- Descrambling of 10 services per CAM (depends on common interface)
- Support for all major CA systems and CAMS
- 1 slot wide



*MC/2C1

Scrambling


- DVB CA compliant scrambling (CSA) and AES compliant scrambling
- Scrambles up to 250 services, maximum 850 Mbit/s
- Support scrambling of MPEG-2 and H264 in SD & HD
- DVB Simulcrypt compliant
- 10/100/1000BaseT IP interface towards CA system (RJ45)
- Handles up to 250 ECM's
- 1 slots wide



*DVB Scrambler with SCS, MC/DVBMCSXX
*AES Scrambler with SCS, MC/AESMCSXX

EPG

- Re-generation of EIT schedule on selected output port
- Gathers EIT information from all input ports
- EPG data is filtered and regenerated to reflect new channel plan
- Supports multiple of networks
- Configurable play out rate with prioritization
- Configurable period to be played out
- EIT reception from multiple of ATV units (later release)
- 1 slot wide




*MC/EPG

Digital Audio Leveling

- For equalisation of audio in TV and Radio services within a digital head-end
- Audio volume control in an MPEG domain
- Audio leveling of 250 channels
- Supports MPEG 1, layer 1 / 2 audio
- Adjustment range +- 30 dB
- 1 slot wide

Note: For Dynamic audio levelling (Interface options), please contact Appear TV.



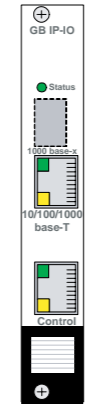
*MC/AUDLEV25, *MC/AUDLEV75,
*MC/AUDLEV150, *MC/AUDLEV250

OUTPUT MODULES

(*Product codes)

Ethernet Output

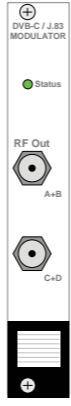
- 10/100/1000BaseT output card (RJ45)
- Mini-GBIC interface (SFP) for optical output
- Supports UDP/RTP Multicast/Unicast transmission
- Supports multiple of output cards
- Streaming of up to 850 Mbit/s
- Maximum 250 service per output card
- Supports streaming of SPTS
- Support streaming of MPTS with Multiplexing (optional)
- PSI/SI regeneration
- Supports FEC (SMPTE 2022)
- 1 slot wide



*MC/GBIPOUT

QAM Output

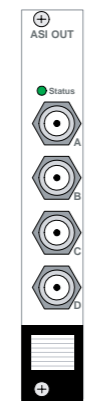
- 16 QAM modulators, 4 and 4 paired
- Full digital modulation and up-conversion
- DOCSIS 3.0 RF compliant
- 32 / 64 / 128 / 256 QAM modulation
- Frequency range of 47 – 862 MHz
- Supports multiplexing and transparent pass through
- PSI/SI/PSIP regeneration
- 2 x 75 ohm RF output (EN/IEC 60728-5) - F connector
- ITU-TJ83. Annex A/B/C
- 1 slots wide



*MC/16QAMOUTMX

ASI Output

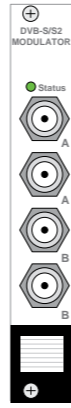
- 4xASI outputs
- BNC connectors
- 213 Mbit/s per output
- 4 different multiplexed outputs
- PSI/SI regeneration
- 1 slot wide



*MC/4ASIOUTMX

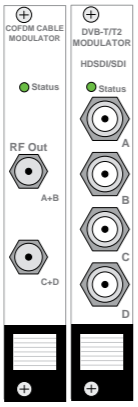
DVB-S/S2 Modulator

- 2 DVB-S/S2 modulated carriers per module
- Based on ETSI EN 300 421 and ETSI EN 302 307 standards
- Output options: - IF
- L-band
- Modulation: - DVB-S > QPSK
- DVB-S2 > QPSK, 8-PSK, 16-APSK, 32-APSK
- Code rates: - DVB-S > 1/2, 2/3, 3/4, 5/6, 7/8
- DVB-S2 > 1/4, 1/3, 2/5, 1/2, 3/5, 2/3, 3/4, 4/5, 5/6, 8/9, 9/10
- Symbol rate: - DVB-S > 0.5-45 Mbaud
- DVB-S2 > 0.5-48 Mbaud
- Supports multiplexing and transparent pass-through
- PSI/SI/PSIP regeneration
- 4 BNC output ports

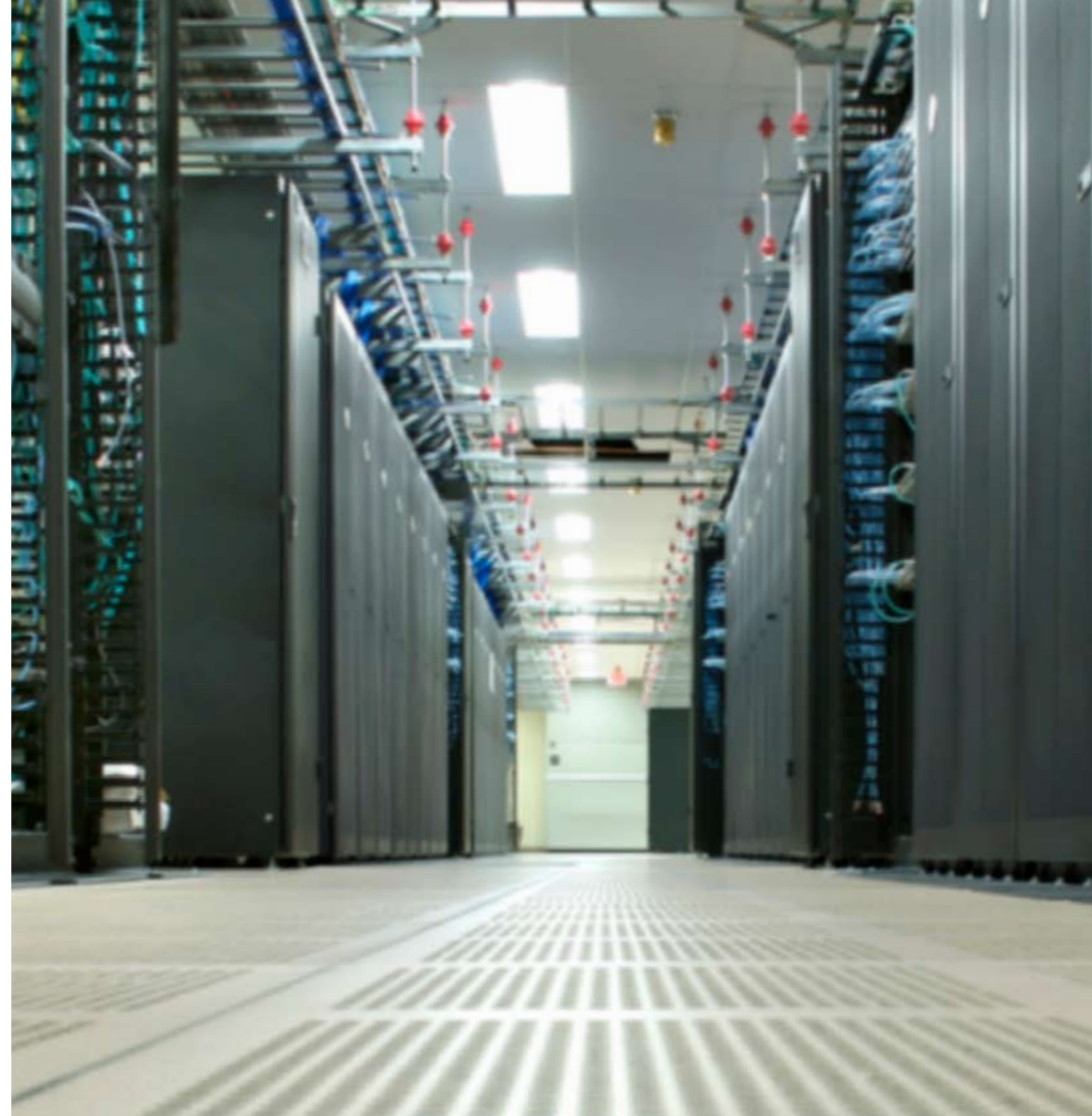


DVB-T/T2 Modulator

- 2 (DVB-T2) or 4 (DVB-T) outputs per module
- All carriers are fully agile
- 3 different output options:
 - CATV, 75 ohm F, 47-862 MHz
 - VHF/UHF, 50 ohm BNC, 47-862 MHz
 - L-band, 75 ohm F, 950-1450 MHz
- Based on ETSI EN 300 744 and ETSI EN 302 755 standards
- Supports multiplexing and transparent pass-through
- PSI/SI regeneration
- Support for MISO (later release)
- Support for SFN (later release)
- Support for multiple PLPs (later release)



For all DVB-S/S2 and DVB-T/T2 product codes and software options, please contact **Appear TV**.



Superior performance, modular architecture, single management system, flexibility and high density

Professional TV delivery

SWITCH MODULE SPECIFICATIONS

Switch Module	Bitrate Placement	: Gbit/s routing between modules in a chassis : 1 slot wide (4RU switch module must be placed in slot 0; redundant module in slot 17)
IP Input/Output	Interface Maximum data rate per port Maximum number of services Data format Transport stream Service filtering Video format	: 2x10/100/1000 Base-T Ethernet or Dual SFP : Optical SFP (class 1 laser product) : Up to 850 MBit/s per port TS : 250 : UDP/RTP Multicast/Unicast : SPTS and MPTS : Yes : Transport stream, MPEG-2 SD/HD and MPEG-4 SD/HD
IP Input	Network de-jittering using PCR Forward Error Correction	: Yes : Up to 125 input streams per data port (optional)
IP Output	Multiplexing Forward Error Correction Tables Supported - PSI - SI - PSIP	: Yes (Option) : Up to 250 output streams per data port (optional) : PAT, PMT, CAT : SDT, NIT, EITpf ,TOT, TDT : MGT, TVCT,CVCT
Management	10/100/1000 Base-T Ethernet	
Video Sync Input	Interface	: Accepts Tri-Level or black burst sync
Clock Reference		
GPS reference input	Antenna connector Impedance 1 pps timing accuracy Active Antenna Voltage output Internal reference hold-over	: SMA female : 50 ohm : < 100 ns RMS : TBD (3V or 5V), depending on GPS module : <=1us in 4 hrs @ΔT= 0°C
1 pps reference input	Number of Input ports Input connector type Impedance Input level 1 pps (1Hz) Internal reference hold-over	: 1 : BNC female : TTL or 50 ohm : TTL : <=1us in 4 hrs @ΔT= 0°C

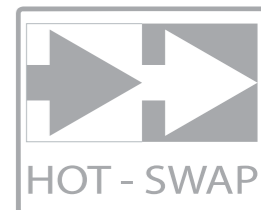
ENCODING/TRANSCODING SPECIFICATIONS

Video Input	HD Resolutions (SMPTE 292M) SD Resolutions (SMPTE 259M)	: 1080i - 29.97Hz or 25Hz : 720p - 59.97Hz or 50Hz : 480i - 29.97Hz : 576i - 25Hz
Video Encoder	Number of channels per module MPEG-2 profiles MPEG-4 AVC profiles Rate Control Modes Rate Range Horizontal Rescaling GOP structure Clock Modes Picture-In-Picture	: Up to 2 HD or 4 SD channels : MP@HL (HD) : MP@ML (SD) : MP@L4.1, HP@L4.1 (HD) : MP@L3.0, HP@L3.0 (SD) : Constant Bit Rate (CBR) : Variable Bit Rate (VBR) : Capped VBR (CVBR) : Statistical Multiplexing (in future release) : From 250kbps to limit by profile/level (max 40Mbps) : From 1920 to 1440, 1280 or 960 : From 1280 to 960 or 640 : From 720 to 704, 640, 544, 528, 480 or 352 : Automatic or Manual : Locked to input : Free-running : Genlock (Reference input on Switch Module) : 416x240, 352x288, 352x240, 192x192, 128x128 or 96x96
Video Pre-processing	Inverse Telecine Detection De-blocking Filter Motion Compensated Temporal Filter (MCTF)	: Yes : Adjustable : Adjustable
Ancillary Data and VBI	VANC processing VBI	: Closed Captioning (EIA 608/EIA 708) : AFD (SMPTE 2016) : Teletext (OP47) : DPI (SCTE 104) : VPID (SMPTE 352M) : Closed Captioning (EIA 608) : WSS (ETSI EN300 294 v1.4.1)
Audio Inputs	Embedded Audio AES 3	: SMPTE 272M (SD), SMPTE 299M (HD) : 75 Ohm BNC (Dual HD version only)
Audio Encoder	Number of encoded stereo pairs per video Audio CODECS	: 2 (1 for Quad SD version) : MPEG-1 Layer 2 Stereo : AAC-LC Stereo : HE-AAC v1 Stereo : HE-AAC v2 Stereo : Dolby Digital Pass-thru
Transcoder	Number of channels MPEG-2 profiles MPEG-4 AVC profiles Encoder Rate Control Modes Rescaling Encoder GOP Control Modes	: 2 HD or 4 SD channels : Ranging from MP@ML (SD) to MP@HL (HD) : Ranging from MP@L3.0, HP@L3.0 (SD) to MP@L4.0, HP@L4.0 (HD) : Constant Bit Rate (CBR) : Capped Variable Bit Rate (CVBR) : Statistical Multiplexing (in future release) : Contact Appear TV's Sales Team for more information : Static or Dynamic

Note: Preliminary specifications, subject to change.

INPUT INTERFACE SPECIFICATIONS

IP Input	<p>Interface</p> <p>Maximum data rate</p> <p>Data format</p> <p>Transport stream</p> <p>Network de-jittering using PCR</p> <p>FEC (SMPTE 2022)</p> <p>Management</p>	<p>: 10/100/1000 Base-T Ethernet and SFP interface</p> <p>: Optical SFP (class 1 laser product)</p> <p>: Up to 850 MBit/s</p> <p>: UDP Multicast/Unicast, RTP</p> <p>: SPTS and MPTS</p> <p>: Yes</p> <p>: 125 services</p> <p>: 10/100/1000 Base-T Ethernet</p>	DVB-T2	<p>Standard</p> <p>FFT Size</p> <p>Guard Interval</p> <p>FEC frame</p> <p>FEC code rate (PLP)</p> <p>Constellation (PLP)</p> <p>Channel bandwidth</p> <p>Pilot pattern</p> <p>SISO and MISO transmission</p> <p>Single and Multiple-PLPs</p> <p>Spectral inversion</p> <p>Rotated constellation</p>	<p>: ETSI EN 302755, Nordig 2.1</p> <p>: 1k, 2k, 4k, 8k, 8k extended, 16k, 16k extended, 32k, 32k extended</p> <p>: 1/4, 19/128, 1/8, 19/256, 1/16, 1/32, 1/128</p> <p>: Normal (64k), Short (16k)</p> <p>: 1/2, 3/5, 2/3, 3/4, 4/5, 5/6</p> <p>: QPSK, 16-QAM, 64-QAM, 256-QAM</p> <p>: 5, 6, 7 or 8 MHz</p> <p>: P1 - P8</p> <p>: Automatic</p> <p>: Automatic</p>
ASI Input (EN 50083-9)	<p>Connector</p> <p>Number of inputs per module</p> <p>Maximum bit-rate per port</p> <p>Management</p>	<p>: BNC female, 75Ω</p> <p>: 3</p> <p>: Up to 213.7Mbit/s (burst)</p> <p>: 10/100/1000 Base-T Ethernet</p>	DVB-T/T2	<p>Number of DVB-T/T2 inputs per module</p> <p>Input connector</p> <p>Input frequency range</p> <p>Input level range</p> <p>Return loss</p>	<p>: 4</p> <p>: F-female, 75 ohm</p> <p>: 47-862 MHz</p> <p>: -65 to -10 dBm (256 QAM, 5/6 code rate)</p> <p>: -12 dBm</p>
DVB-S/S2 Input	<p>DVB-S Constellation</p> <p>Code Rate</p> <p>Symbol rate</p>	<p>: QPSK</p> <p>: 1/2, 2/3, 3/4, 5/6, 7/8</p> <p>: 1-45 MSym/s</p>	Note: Preliminary specifications, subject to change.		
DVB-S2	<p>DVB-S2 Constellation</p> <p>Symbol rate DVB-S2</p> <p>Decoding</p> <p>Code Rate</p> <p>DVB-S2 FEC frames</p> <p>Multiple streams</p>	<p>: QPSK, 8-PSK, 16-APSK</p> <p>: 1-45 MSym/s</p> <p>: LDPC and BCH (16-APSK)</p> <p>: 1/4, 1/3, 2/5, 1/2, 3/5, 2/3, 3/4, 4/5, 5/6, 8/9, 9/10</p> <p>: Short and Normal frames</p> <p>: (later release)</p>	DVB-C Input (EN 300 429)	<p>Connector</p> <p>Number of inputs per module</p> <p>Frequency range</p> <p>Channel bandwidth</p>	<p>: F female, 75Ω</p> <p>: 4 demodulators (one connector)</p> <p>: 51 – 858 MHz (center frequency)</p> <p>: 7 and 8 MHz (6 MHz optional)</p>
DVB-T input w/Management	<p>Connector</p> <p>Number of inputs per module</p> <p>Input level</p> <p>Frequency range</p> <p>Channel bandwidth</p> <p>Guard interval</p> <p>Carrier mode</p> <p>Hierarchy stream</p> <p>Hierarchy mode</p> <p>Carrier modulation</p> <p>FEC rate</p> <p>FEC</p> <p>Spectrum</p> <p>Management</p>	<p>: F female, 75Ω</p> <p>: 4 demodulators (one connector)</p> <p>: -20 to -65 dBm</p> <p>: 49 – 861 MHz (center frequency)</p> <p>: 7 and 8 MHz (6 MHz optional)</p> <p>: 1/4, 1/8, 1/16, 1/32</p> <p>: 2k, 8k</p> <p>: High and low priority</p> <p>: All</p> <p>: QPSK, 16QAM, 64QAM</p> <p>: 1/2, 2/3, 3/4, 5/6, 7/8</p> <p>: Reed Solomon & Viterb Fully compliant with ETS 300 744 and NorDig 2 specifications</p> <p>: Non-inverted and inverted</p> <p>: 10/100/1000 Base-T Ethernet</p>	<p>QAM Mode</p> <p>Symbol rate</p> <p>FEC</p> <p>Spectrum</p> <p>Management</p> <p>Input power level</p>	<p>: 4, 16, 32, 64, 128, 256 QAM</p> <p>: 0.87-6.9 Mbaud</p> <p>: ITU-T J83 annex A, B and C And ETS 300 429</p> <p>: Non-inverted and inverted</p> <p>: 10/100/1000 Base-T Ethernet</p> <p>: -20 to -50 dBm*</p>	
DVB-T/T2 Channel coding and Modulation	<p>DVB-T</p> <p>Standard</p> <p>FFT Size</p> <p>Guard Intervals</p> <p>FEC code rate</p> <p>Constellation</p> <p>Channel bandwidth</p> <p>Hierarchy stream</p> <p>Hierarchy mode</p> <p>Spectral inversion</p>	<p>: ETSI EN 300744, Nordig 2.0</p> <p>: 2k, 8k</p> <p>: 1/4, 1/8, 1/16, 1/32</p> <p>: 1/2, 2/3, 3/4, 5/6, 7/8</p> <p>: QPSK, 16-QAM, 64-QAM</p> <p>: 6, 7, or 8 MHz</p> <p>: High and Low priority</p> <p>: All</p> <p>: Automatic</p>	8-VSB Input (ATSC A/53)	<p>Connector</p> <p>Number of inputs per module</p> <p>Input Level</p> <p>Frequency range</p> <p>Modulation</p> <p>Band</p> <p>Management</p>	<p>: F female, 75Ω</p> <p>: 4</p> <p>: -34 to +40 dBmV</p> <p>: 50 – 860 MHz</p> <p>: 8-VSB</p> <p>: Broadcast</p> <p>: 10/100/1000 Base-T Ethernet</p>



MPEG OUTPUT SPECIFICATIONS

IP Output	Interface	: 10/100/1000 Base-T Ethernet output and SFP interface : Optical SFP (class 1 laser product) : Up to 850 MBit/s *
	Maximum data rate	: 250
	Maximum number of services	: 250
	Data format	: UDP Multicast/Unicast, RTP
	Video format	: Transport stream, MPEG-2 SD/HD and MPEG-4 SD/HD
	PCR regeneration	: Yes, According to EN50083_9
	Multiplexing	: Yes (Option)
	FEC (SMPTE 2022)	: 250 services
	Tables Supported	
	- PSI	: PAT, PMT, CAT
	- SI	: SDT, NIT, EITpf ,TOT, TDT
	- PSIP	: MGT, TVCT,CVCT

ASI Output	Connectors	: 4 BNC female, 75Ω
	Number of outputs per module	: 4 different Transport Streams
	Maximum bit-rate per port	: up to 213.7Mbit/s
	Transport stream output	: SPTS and MPTS
	Number of services per card	: 250 (sum of all 4 ports)
	Multiplexing	: Yes, per port
	Output format	: Constant bit-rate
	PCR Regeneration	: Yes, According to EN50083_9
	PSI/SI handling	: Automatically regenerated
	Tables Supported	
	- PSI	: PAT, PMT, CAT
	- SI	: SDT, NIT, EITpf ,TOT, TDT
	- PSIP	: MGT, TVCT,CVCT

QAM Output	Interface	: 2 x F connector female, 75 ohm
	Number of QAM frequencies per module	: 16 different channels according to EN 300 429 8 per port
	Number of services per card	: 250 services (sum of all 16 channels)
	Multiplexing	: Yes, per port
	Transparent pass-through	: Yes, per port
	Modulation	: 32 / 64 / 128 / 256 - QAM
	Symbol rate	: 4,7 to 7,00 Mbaud (Annex A and C)
	Frequency range	: 47 – 862 MHz
	Frequency step size	: 1 Hz
	Frequency stability	: 2 ppm
	Output level with 16 carriers on	: -9,2 to +2,2dBm
	Output level adjustment step size (GUI)	: 0,5 dB
	PCR Regeneration	: Yes, According to EN50083-9
	Tables Supported	
	- PSI	: PAT, PMT, CAT
	- SI	: SDT, NIT, EITpf ,TOT, TDT
	- PSIP	: MGT, TVCT,CVCT

Channel Coding and Modulation

DVB-S	Constellation	: QPSK
	Modulation mode	: Constant
	FEC outer	: RS (188, 204)
	FEC inner	: Viterbi
	Code rates	: 1/2, 2/3, 3/4, 5/6, 7/8
	Frame length	: 188 bytes
	Symbol rate	: 0.5-45 Mbaud

DVB-S2	Constellation	: QPSK, 8-PSK, 16-APSK, 32-APSK
	Modulation mode	: CCM, VCM, ACM
	FEC outer	: BCH
	FEC inner	: LDPC
	Code rates	: 1/4, 1/3, 2/5, 1/2, 3/5, 2/3, 3/4, 4/5, 5/6, 8/9, 9/10
	Frame length	: 16200 bits (short), 64800 bits (long)
	Symbol rate	: 0.5-48 Mbaud

RF Output Specification

DVB-S/S2	Number of DVB-S/S2 outputs per module	: 2
	Number of output ports	: 4
	Output connector	: BNC
	Impedance	: 50 ohm
	Output frequency	: 50-200 MHz
	Frequency setting step size	: 1 Hz
	Output level (max)	: 2 dBm
	Output level adjustment range	: 30 dB
	Output level stability	: +/- 0.5 dB
	Frequency accuracy	: 2 ppm
	Return loss	: >18 dB

Channel Coding and Modulation

DVB-T	FFT size	: 2k, 8k
	Guard intervals:	1/4, 1/8, 1/16, 1/32
	Code rates:	1/2, 2/3, 3/4, 5/6, 7/8
	Constellation	: QPSK, 16-QAM, 64-QAM
	Channel spacing	: 5, 6, 7, or 8 MHz
	SFN	: Supported in a later release
DVB-T2	FFT size	: 1k, 2k, 4k, 8k, 8k extended, 16k, 16k extended, 32k, 32k extended
	Guard intervals	: 1/4, 19/128, 1/8, 19/256, 1/16, 1/32, 1/128
	FEC frame	: Normal (64k), Short (16k)
	FEC code rate	: 1/2, 3/5, 2/3, 3/4, 4/5, 5/6
	Constellation (PLP)	: QPSK, 16-QAM, 64-QAM, 256-QAM
	Channel spacing	: 5, 6, 8, or 10 MHz
	Pilot pattern	: P1 - P8
	Number of PLPs	: 1, multiple in a later release
	MISO	: Supported in a later release
	T2MI (SFN functionality for DVB-T2)	: Supported in a later release

RF Output Specification

Terrestrial / CATV	Number of DVB-T/T2 outputs per module	: DVB-T = 4; DVB-T2 = 2
	Number of output ports	: 4 (Terrestrial) / 2 (CATV: 2 channels combined per port for DVB-T)
	Output connector	: BNC (Terrestrial) / F-type (CATV)
	Impedance	: 50 ohm (Terrestrial) / 75 ohm (CATV)
	Output frequency	: 47-862 MHz
	Frequency setting step size	: 1 Hz
	Output level (max)	: 2 dBm
	Output level adjustment range	: 20 dB
	Output level stability	: +/- 0.5 dB
	Frequency accuracy	: 2 ppm
	Return loss	: >16 dB

L-band	Number of DVB-T/T2 outputs per module	: 2
	Number of output ports	: 2
	Output connector	: F-type
	Impedance	: 75 ohm
	Output frequency	: 950-1450 MHz



Advanced architecture designed to save
space, energy and resources



IP Forward Error Correction

Preserving Quality

In today's networks, IP is becoming more prevalent. However, IP-based networks are not without imperfections – data packets transmitted can become corrupted or go missing at the receiving end. This could be due to failure when switching, sometimes caused by cable breaks or hardware failures in the network. In this scenario, a form of Forward Error Correction (FEC) is useful to correct these errors, improving quality of service.

The deployment of Appear TV's FEC solution enables operators to deliver high quality error-resilient streams from the head-end.

FEATURES

IP Input

- 125 Services, 1 Gbps standards compliant FEC decoding
- Recovers all recoverable packets regardless of loss, reordering, duplication
- Iterative algorithm - recovered packets are used to recover more packets
- Adaptive buffering for best effort decoding of VBR services
- SMPTE 2022 (Pro MPEG FEC COP3)

IP Output

- 250 Services, 1Gbps FEC encoder with VBR support
- Standards compliant and set top box compatible
- Fully configurable, all FEC modes supported
- FEC packet linearization to avoid packet bursts
- SMPTE 2022 (Pro MPEG FEC COP3)

PROCESSING MODULES SPECIFICATIONS

User data pass through	AFD and Bar Data Closed Captions	: SMPTE 2016-3 : EIA-708B : EIA-608B over EIA-708B
Audio	Pass-Through	: Dolby Digital (AC-3) : MPEG-1 Layer 2 : AAC-LC
	Audio transcoding	: Can be implemented upon request
Bulk Descrambling	Interface	: SW based smart card
	CA system support	: Please contact Appear TV
	BISS support	: Mode 1
	Maximum data rate	: Up to 850 MBit/s
	Number of services per module	: 250
DVB Descrambling	Scrambling algorithms	: DVB-CA and AES
	Interface	: DVB Common Interface
	CA system support*	: BetaCrypt, Conax, Cryptoworks, Irdeto, Mediaguard, Viaccess, NDS Viasat, Nagra
	Number of services per CAM	: 10 (requires multi service CAM)

* Appear TV aim to integrate with all major CA providers. Please contact Appear TV for an updated list over integrated CA systems.

Scrambling	Scrambling algorithm	: DVB-CA and AES
	Maximum data rate	: Up to 850 MBit/s
	Number of services per scrambler card	: 250 (depending on SW license)
	Video format	: Transport stream, MPEG-2 SD/HD and MPEG-4 SD/HD
	Interface towards CA System	: Simulcrypt interface
	Number of CA systems	: 4 CA systems simultaneously
	EMM	: Yes
Entropy reduction		: Yes for DVB No for AES
	EPG	: EIT table from any port
	(ETSI EN 300 458 V1.9.1)	: Re-generated EIT table
(ETSI TR 101 211 V1.9.1)	Maximum data-rate	: Maximum data-rate playout rate: 40
	Number of services per module	: Number of services per module: 250

OUTPUT PROCESSING SPECIFICATIONS

PSI/SI	Function	: PSI/SI input analysis, regeneration based on input and operations performed on the signal
	Pass-through of scrambled services PSI/SI handling Tables supported	: Yes, on TS level. For SPTS output only : Automatically regenerated : PAT, PMT, CAT, SDT, NIT, EIT p/f, TDT, TOT
PSIP	Function	: PSIP input analysis
	Tables supported	: PAT, PMT, MGT, VCT, EIT, ETT, STT
Multiplexing	Supported on	: ASI output (standard) and IP output (option)
	Video format	: Transport stream, MPEG-2 SD/HD and MPEG-4 SD/HD

ENVIRONMENTAL SPECIFICATIONS

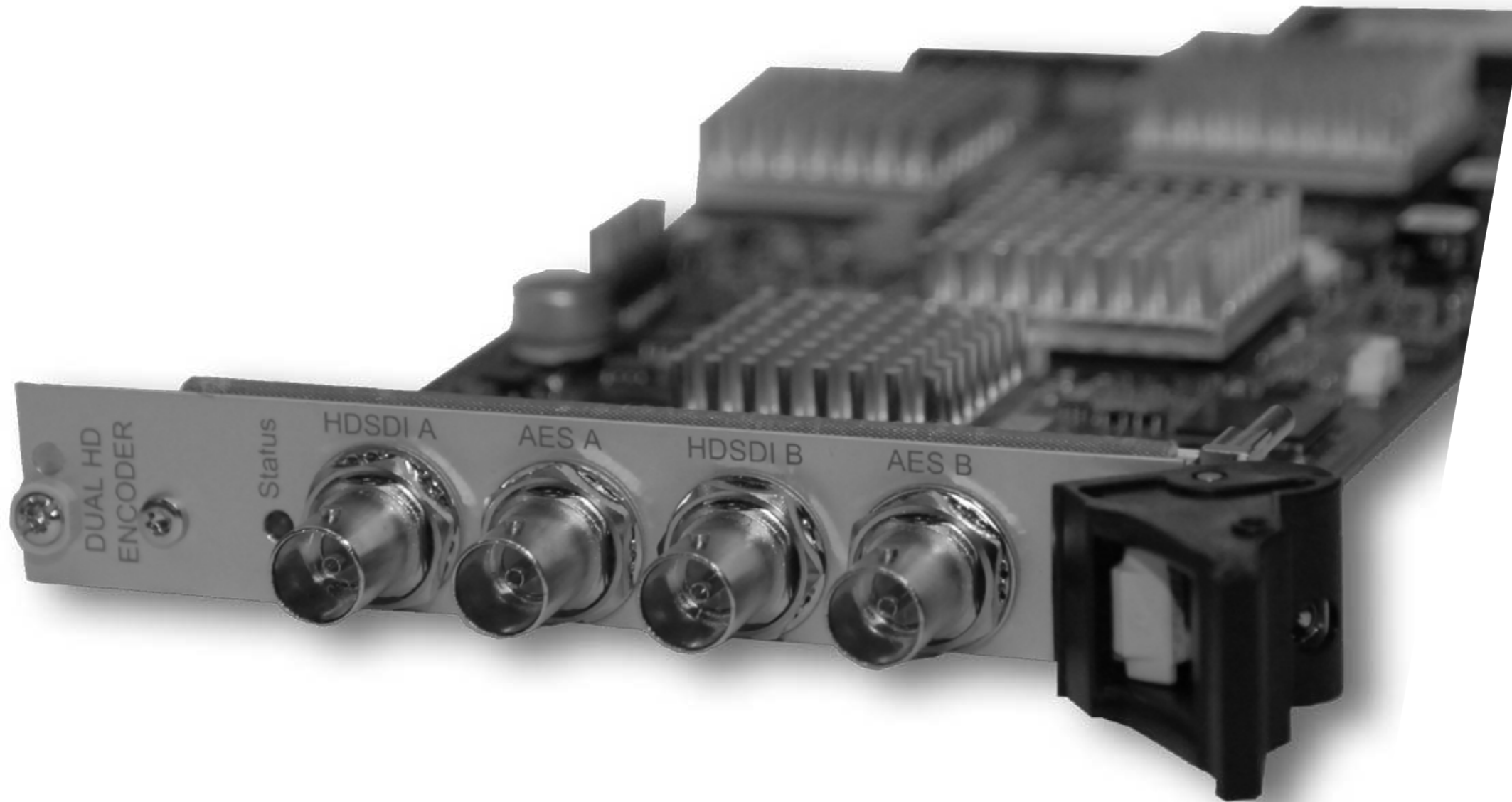
Conditions	Operational temperature	: 0°C to +40°C
	Operational humidity	: 0% to 95% (non-condensing)
Power	Storage temperature	: -20°C to +70°C
	Storage humidity	: 5% to 95% (non-condensing)
AC Power 4RU and 1RU DC Power 4RU AC Power supply rating 4 RU chassis	Control 4RU chassis	: Input voltage 110V/240V, 50/60 Hz : Input voltage -35 to -75 V DC, F250 16A fuse : Option 1. 300W each, T250V 5A fuse : Option 2. 400W each, T250V 6A fuse : Power supplies are monitored from GUI and via LEDs on chassis
	Mounting 4RU chassis	: Hot-swappable, mounted on opposite side of input/output Modules : 360W each : 1 or optionally 2 (not possible to combine AC and DC)
DC Power supply rating 4 RU chassis Number of power supplies 4RU chassis Power supply rating 1RU chassis Number of power supplies 1RU Chassis Mounting 1RU chassis		: 200W, T250V 4A fuse : 1 : Internally mounted
Fans	Cooling 4RU chassis	: Hot-swappable fans (airflow front-to-back)
	Number of fans 4RU chassis Control 4RU chassis Cooling 1RU chassis Number of fans 1RU chassis	: 4 : Fans are monitored from GUI and via LEDs on chassis : Integrated fans (airflow right to left side) : 6
Physical	Dimensions 4RU chassis	: 19" 4RU (w*h*d mm) 440 (480 with ears) * 180 * 400
	Mounting options 4RU chassis	: Telco – cable in front, Broadcast style – cable in back
Dimensions 1RU chassis	: 19" 1RU (w*h*d mm) 440 (480 with ears) * 45 * 480	
Mounting options 1RU chassis	: Broadcast style – cable in back and front	
Modules including optical SFP		: Class 1 laser product

Specifications and product availability are subject to change without notice.

HD/SD SDI Encoder

Available in 3 variants:

- Quad SD Encoder
- Dual HD Encoder with AES option
- Quad SD upgradeable to Dual HD



REDUNDANCY

(AWARD WINNING)

INTELLIGENT SOFTWARE

Appear TV's intelligent redundancy software provides seamless integration between broadcast equipment and IP networks.

Appear TV's redundancy solution is unique in being the only software solution in the IP television market to take a holistic view of operation and network management. Redundancy configurations are simplified and automated, and operational routines are significantly reduced.

Appear TV's holistic approach is built upon a single software core capable of handling failures on both inputs and outputs. This redundancy solution offers operators using IP for video distribution significant quality of service benefits and improved network efficiency. The system provides automatic backup in case of service stream failure on an operator's network, without requiring complex control software.

IP Output Redundancy

With Appear TV, operators can now determine a redundancy, maintenance and repair strategy appropriate for their operations, their customer base and services offered.

The IP output redundancy system presents a network with multiple sources from which it is possible to obtain the same service. Should the service from one source be corrupted, the network can receive the service from another source.

For a full redundancy scenario, identical Appear TV chassis can be configured to receive, process and stream identical services. In a typical deployment, a service is broadcast from two locations using the same IP multicast source address. As long as all sources have the same IP source address, the network will route just a single copy of the multicast stream forward to the receiver. In the event of a service issue within, or prior to, the Appear TV chassis, the IP output module exploits standard IP protocols to trigger external routers to switch to secondary sources.

Where full redundancy is not required, partial redundancy strategies can be implemented. Systems can be configured to provide full redundancy of only selected premium or 'must-carry' services. Operators can then choose not to replicate the input and descrambling functions of lower priority services, but still equip the chassis with multiple IP output modules to provide limited fault tolerance.

FEATURES

- Provides unmatched service availability
- Rapid switching
- Utilizes general level 3 IP - routing protocols to perform the switching (or signal selection)
- Can switch an entire port or just one service (SPTS)
- Minimal network setup required
- Redundancy structure supports multiple site distribution