

All in one HD Encoder + DTV Modulator
(ATSC/OpenCable/DVB-T /DVB-C/ISDB-T/DTMB)

HD ENCODULATOR



HD Encodulator for Professional Head End

The HD Encodulator is professional HD encoder including digital modulator as like ATSC, OpenCable, DVB-T/C, ISDB-T, and DTMB. This product has variable interfaces with HDMI, HD-SDI, Y/Pb/Pr, ASI, Analog Stereo Audio(L/R), SPDIF (optical/coaxial), and AES/EBU. So it's variable interfaces make this product ideal for broadcasting systems as like MATV systems in company building and apartment, education broadcasting system at school and government building.

System Diagram



< 1 HD encoder >



< 1 HD encoder / Option >

Features

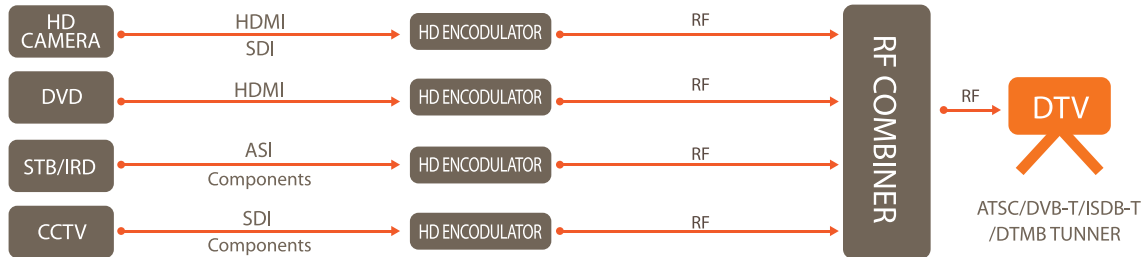
- Encoder plus DTV modulator in one rack unit case
- Video and audio CODEC selectable: MPEG2/H.264, MPEG1-L2/AC3/AAC
- Versatile input ports: HDMI, HD-SDI, Y/Pb/Pr, ASI, Analog Stereo Audio(L/R), SPDIF (optical/coaxial), and AES/EBU
- High power RF output (10dBm for 1ch)
- Variable DTV modulation options (ATSC, OpenCable, DVB-T/C, ISDB-T, DTMB)
- 4 adjacent RF channel output option for some modulations
- Internal PSI/PSIP generation or external input through ASI Input port
- Firmware update and control through web server
- HTTP and SNMP control with 100BaseT

Video Encoder

- Input : HD-SDI, HDMI, Y/Pb/Pr
- HD Resolutions and frame(progressive) or field(interlaced) rates:
 - 1920x1080 at 60p, 50p via internal interlacer (convert to 60i, 50i, respectively)
 - 1920x1080 at 60i, 59.94i, 50i, 30p, 29.97p, 25p, 24p, 23.97p
 - 1280x720 at 60p, 59.94p, 50p.
- SD Resolutions and frame/field rates:
 - 720x480: 59.94i
 - 720x576: 50i
- MPEG2 HD/SD Encoder
 - ISO/IEC 13818-2 (MPEG2 HP@HL, MP@HL, MP@ML)
 - HD video bit rate: 25~0.5 Mbps.
 - SD video bit rate: 25~0.5 Mbps.
 - Sub 1.5 seconds encoder latency, configurable.
- H.264 HD/SD Encoder
 - Baseline, Main and High Profiles support
 - HD video bit rate: 25~0.25 Mbps.
 - SD video bit rate: 25~0.25 Mbps.
 - Sub 0.8 seconds encoder latency, configurable.
- Maximum TS bit rate: 30 Mbps.
- Advanced Settings(option)
 - GOP structure: Automatic/IP/IPB/IPBB/IPBBB, open/closed, size 1 to 300.
 - Adaptive I-frame insertion: enable/disable.
 - Bit rate control: CBR, VBR and capped-VBR
 - MCTF strength: 0(off) to 7(maximum).
 - Inverse Telecine enable/disable.
 - Scene change detection and fade detection enable/disable.



HD ENCODULATOR Full Diagram



Audio Encoder

- Input : SDI embedded, HDMI embedded, SPIDIF(Optic/Coax), AES-EBU(BNC), Analog Stereo
- Sample rate converter
- Dolby Digital CE Stereo Encoder (for ATSC, DTMB)
 - Output bit rates: 128/192/256/384 Kbps
 - Encoding sample rates: 48 KHz
- MPEG-1 Layer II Stereo Encoder (for DVB-T, DTMB)
 - Output bit rate: 192/224/256/320/384 Kbps
 - Encoding sample rates: 32/44.1/48KHz
- AAC-LC, HE-AAC v1, HE-AAC v2 Stereo Encoder (for ISDB-T)
 - Output bit rate(LC):32/48/56/64/80/96/112/128/160/192/224/256/320/384 Kbps
 - Output bit rate(HE-AAC v1): 32/48/56/64/80/96/112/128/160/192 Kbps
 - Output bit rate(HE-AAC v1): 32/48/56/64/80/96 Kbps
 - Audio sample rate: 32/44.1/48KHz
- Pass-through of Dolby Digital Stereo/5.1ch, MPEG-1 Layer II and AAC-LC audio support.

PSI/SI/PSIP

- PSI/SI: PAT, PMT generation enable/disable
- PSIP: MGT, TVCT/ CVCT generation enable/disable,
 - Short name, major and minor channel number setting
- External PSI/PSIP generator input via "ASI IN" port

Physical

- Dimension: 44(H) X 483(W) X 402(D, excluding connectors)
- Temperature: 0~45 °C
- Weight: 4 Kg
- Power Consumption: 45W max.

Management

- Front panel: 4-line text LCD, 6 buttons
- RS-232 local console
- Web GUI / • SNMP (Option)

Physical

- Dimension: 44(H) X 483(W) X 402(D, excluding connectors)
- Temperature: 0~45 °C
- Weight: 4 Kg
- Power Consumption: 45W max.



ATSC(8VSB) Modulator

- Modulation Mode: 8VSB
- Symbol Rate 10.762 MSps
- SNR(MER): >35 dB

DVB-T Modulator

- Modulation Mode: QPSK, 16QAM, 64QAM
- Transmission Mode: 2K, 4K, 8K
- Channel Bandwidth: 5, 6, 7, 8 MHz
- Code Rate: 1/2, 2/3, 3/4, 5/6, 7/8
- Guard Interval: 1/4, 1/8, 1/16, 1/32
- SNR(MER): >40dB

ATSC(8VSB) Modulator

- 1~4 adjacent RF channel configurable
- 1 channel from internal encoder.
- Other 3 channels are from extra DVB-ASI inputs
- Reduces total cost of ownership via superior RF performance, installed density and power consumption.

DTMB Modulator

- Single Carrier & TDS-OFDM modulation support
- Modulation Mode: QPSK, 16QAM, 32QAM, 64QAM
- Standards
 - GB20600-2006, ISO/IEC 13838-1, EN 50083-9.
 - OGY/T 229.1-2008 (SIP)
- SNR(MER): >40 dB

Open Cable Modulator

- Standard: ITU-T J.83 Annex B
- Constellation types & Symbol Rates:
 - 64QAM: 5.057MSps
 - 256QAM: 5.361MSps
- Channel Bandwidth: 6MHz
- SNR(MER): >40dB

ISDB-T/Tb Modulator

- Modulation Mode: ISDB-T Layered OFDM
- Standard: ARIB STD-B31
- TMCC Encoding: Fully supported
- SNR(MER): >40dB



RF Output

- Main Output: F-Type 75Ω 1ea @ rear
- -20dB Output: F-Type 75Ω 1ea @ front
- Maximum Output Level for 1ch: +10dBm
- Maximum Output Level for 2ch: +5dBm
- Maximum Output Level for 3ch: +2.5dBm
- Maximum Output Level for 4ch: +1dBm
- Level Adjustment: 0~-27dB in 0.5dB steps
- Center Frequency Range: 30~999 MHz
- Spurious: <-60dBc relative to output level
- Harmonics: <-45dBc
- Return Loss: > 15dB
- Phase Noise: <-98dBc/Hz @20kHz offset

ISDB-T/Tb Modulator

- Modulation Mode: ISDB-T Layered OFDM
- Standard: ARIB STD-B31
- TMCC Encoding: Fully supported
- SNR(MER): >40dB

TS over IP Output

- Ethernet 10/100Base-T
- UDP/IP, RTP/UDP/IP
- Connector: RJ-45
- Unicast, Multicast

Model Numbers

Model No.	Encoder Channel	Modulator
HEN-2100	1 HD(MPEG2, H.264)	None
HAT-2110/2140	1 HD(MPEG2, H.264)	1/4 ch. ATSC
HOC-2110/2140	1 HD(MPEG2, H.264)	1/4 ch. OpenCable
HDT-2110	1 HD(MPEG2, H.264)	1 ch. DVB-T
HDC-2110/2140	1 HD(MPEG2, H.264)	1/4 ch. DVB-C
HDM-2110	1 HD(MPEG2, H.264)	1 ch. DTMB
HIT-2110	1 HD(MPEG2, H.264)	1 ch. ISDB-T

