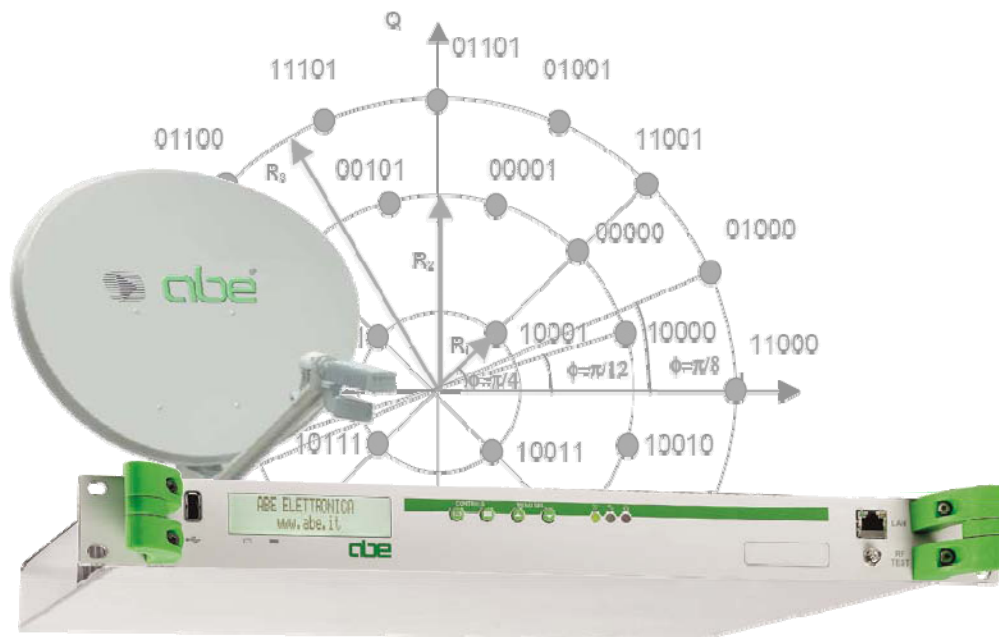


MPEG ENCODERS (SD/HD) + DVB-S/DSNG/S2 MODULATOR FOR SATELLITE UPLINK & MW LINK APPLICATIONS

The high quality, professional and cost-effective solution



The "DME" is a high quality, professional, flexible and truly cost-effective solution for digital satellite uplinks and terrestrial microwave links.

The unit consists of a high performance **DVB-S/DSNG/S2** Multistandard modulator with up to four MPEG-2 and/or MPEG-4 (H.264/AVC SD/HD) Encoders in a single 1U rack chassis.

The DVB-S2 modulation supported complies with **ETSI EN 302 307 (DVB-S2 standard)** for BROADCAST and DSNG applications: includes all modulation schemes (QPSK, 8PSK, 16APSK and 32APSK), all code rates (both mandatory and optional), CCM (Constant Coding and Modulation), normal FEC frame, Dummy frame Insertion, all roll-off factors and null packet deletion/insertion.

A key function of the modulator is the **digital non-linear pre-correction** with the possibility to store and recall of several setups. This function allows to correct the amplitude and phase vs. level distortions introduced by the high power amplifiers (HPAs), so increasing output power, MER and shoulders performances.

Features also include a 10MHz reference clock and the power supply for the BUC (Block Up Converter).

The DME series, combined with a BUC and a parabolic antenna for the chosen frequency range (usually Ku band - 14 to 14.5GHz - or C band 5.85 to 6.43GHz), makes a complete satellite uplink solution.

Another application of the DME is as encoder/s - digital modulator for agile terrestrial digital microwave links.

Applications:

- Digital satellite Uplinks for Distribution, Contribution, DSNG / ENG Mobile news gathering;
- Digital Microwave Links (Mobile and STL);

Features:

- Up to 4 real time MPEG-2 (MP@ML - 4:2:0) and/or MPEG-4 (H.264/AVC SD/HD) video/dual audio Encoders;
- Second audio pair option;
- User configurable Encoders settings + easy to recall pre-defined factory settings;
- Teletext of Closed Captioning extraction from video input and reinsertion in the Transport Stream;
- Basic T.S. multiplexing functions embedded in MPEG-2 and MPEG-4 encoders;
- **DVB-S / DSNG / S2** Modulator having "L" band or 70MHz output for Broadcast and DSNG applications;
- Multistream option, with the possibility of transmitting up to 6 different Transport Stream simultaneously;
- ASI and Ethernet (T.S. over IP) input interface options;
- User-friendly local control with front panel LCD display and keypad;
- Ethernet 10/100 Base-T (RJ45 connector - SNMP, web server, e-mail client) remote control interface;
- Stand-Alone unit 1U high.



MPEG-4 (H.264/AVC) SD/HD Encoder Card

VIDEO INPUTS AND ENCODING

Video input format:	Digital SD/HD-SDI with embedded or separate AES - EBU audio; Analog (Standard Definition only) composite PAL / SECAM / NTSC
Digital video input:	SDI / HD-SDI - 75Ω / BNC socket
Analog Composite video input:	1Vp-p / 75Ω / BNC socket
Encoding standard:	ISO/IEC 14496-10 (H.264/AVC, 4:2:0) Main Profile Level 3.0 and High Profile Level 4.0
Bit rate:	From less than 2Mbit/s up to 24Mbit/s. Bit rate mode: CBR, VBR
Supported resolutions – downscaler:	1920 x 1080 x 60i/50i/24p, 1440 x 1080 x 60i/50i/24p, 1280 x 720 x 60p/50p/24p, 720 x 480 x 60i, 720 x 576 x 50i – Down scaler embedded
Picture encoding type:	I, P, B
Minimum latency:	Around 500mS - according to settings (GOP structure, bit rate etc.)

AUDIO INPUTS AND ENCODING

Audio input format:	Analog: Two channels (one stereo pair) - mono, stereo Digital SDI/HD-SDI with embedded audio or with AES/EBU audio input
Analog audio inputs:	0dBu (adjustable) / 600Ω balanced
Sampling frequency:	48KHz
Bit rate and encoding standard:	Up to 384Kb/s - ISO / IEC11172-3 (MPEG-1 audio) layer 2 – compliant
Second audio pair option:	Stereo - up to 256Kb/s

OTHERS SPECIFICATIONS

Output stream type and system multiplexing	Transport Stream - ISO / IEC 13818-1 (MPEG2 TS) - PAT, PMT, NIT, SDT (LCN support)
Pre-settings:	№8 Factory preset + №8 User configurable preset
Teletext / Closed Captioning data:	Extraction from analogue video input and insertion in the T.S.

MPEG-2 Encoder Card

VIDEO INPUTS AND ENCODING

Video input format:	Digital SD-SDI with embedded or separate AES - EBU audio; Analog (Standard Definition only) composite PAL / SECAM / NTSC
Composite video input and filter:	1Vp-p / 75 Ω / BNC socket
Pre-processing:	TBC (Time Base Corrector) - Noise Reduction Filter
Encoding standard:	ISO / IEC 13818-2 MP@ML (MPEG-2 4:2:0)
Bit rate and supported resolutions:	Up to 15Mb/s - Full D1, 3/4 D1, 2/3 D1, 1/2 D1, SIF, QSIF Slice Screen: up to 720 Horizontal pixel - up to 480/576 Vertical pixel (in steps of 32)
Picture encoding type / GOP Structure:	I, P, B / Flexible
Minimum latency:	Around 200mS - according to settings (GOP structure, bit rate etc.)

AUDIO INPUTS AND ENCODING

Audio input format:	Analog: mono, stereo, dual, joint stereo; Digital: SDI (Serial Digital Interface) embedded audio or AES/EBU
Analog audio inputs:	0dBu (adjustable) / 600 Ω balanced
Sampling frequency:	32KHz, 44.1KHz, 48KHz
Bit rate and Encoding standard:	Up to 448Kb/s - ISO / IEC11172-3 (MPEG-1 audio) layer 1/2 - compliant

OTHER SPECIFICATIONS

Output stream type and system multiplexing	Transport stream - ISO / IEC 13818-1 (MPEG-2) - PAT, PMT, NIT, SDT (LCN support)
Pre-settings:	№8 Factory preset + №8 User configurable preset
Teletext / Closed Captioning data:	Extraction from analogue video input and insertion in the T.S.

Multiplexer card (option)

Tables:	Add / modify (NIT, SDT, TDT, EIT)
Other functions:	PID filtering; MHP support

Ethernet input card (T.S. over IP)

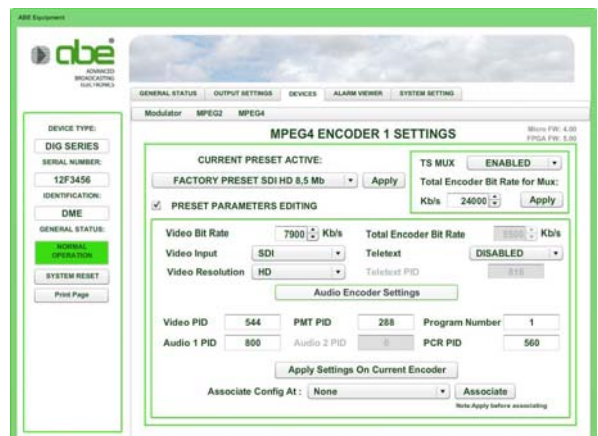
Standard, IP data rate, connector:	IEEE802.3a; 100/1000 Mbps with auto detect; RJ-45 with LEDs
IP to T.S. delay, T.S. data rate:	1 to 120ms, over 100 Mbps
T.S. over IP encapsulation, addressing mode:	UDP, SMPTE 2022-2 (RTP); Unicast and Multicast (IGMP v2)
FEC:	As per Pro-MPEG Code of Practice #3 release 2 (SMPTE 2022-1); max. matrix size 100
T.S. packets per IP packet	1 to 7 (packet size: 188 or 204)

Modulator card

Modulation scheme:	QPSK (EN300 421 DVB-S); QPSK, 8PSK, 16QAM (EN 301 210 DVB-DSNG); QPSK, 8PSK, 16APSK, 32APSK (EN 302 307 DVB-S2)
Output frequency:	“L” band: 950 to 1750MHz in 10KHz steps (option: 1KHz steps) Options: extended frequency range to 2700MHz; 70MHz (50 to 90 MHz)
L band local oscillator side band phase noise (typical values):	@10Hz offset: -65dBc/Hz @1KHz offset: -84dBc/Hz @100KHz offset: -95dBc/Hz @1MHz offset: -118dBc/Hz
Frequency reference clock:	Internal: 10MHz (stability +/- 5x10 ⁻⁷) available also for BUC reference Option: high stability oven (1x10 ⁻⁸), external reference, GPS locked reference
Output level:	0dBm (Typ. adj. range: -30 to +5dBm - option: different output levels)
Output impedance and connector:	50 Ω “N” socket (option: 75 Ω)
Input Transport Stream Bit Rate:	Up to around 100 Mb/s according to settings (Modulation Scheme, Symbol Rate, etc.)
Symbol Rate:	200KS/s to 30MS/s in 1KS/s steps - Transparent mode option (for SFN Streams)
Baseband Shaping (roll-off), forward error correction (FEC) encoding and data scrambling:	According to the standard (EN 300 421 DVB-S; EN 301 210 DVB-DSNG; EN 302 307 DVB-S2 for Broadcast and DSNG applications)
Encryption option:	BISS 1/E; PL (Physical Layer) scrambler with Gold Code insertion - DVB-S2 only
Multistream option (DVB-S2 only):	Supported up to 6 T.S. inputs

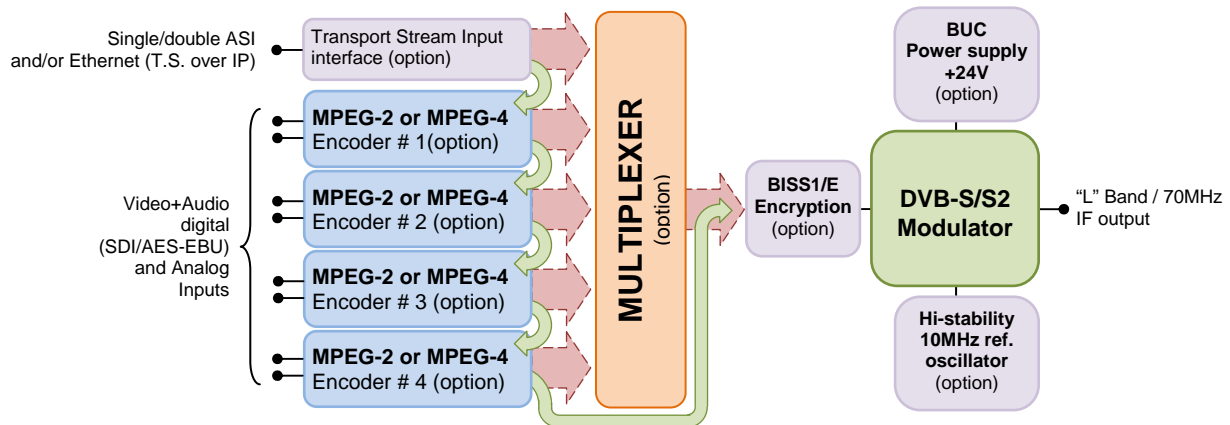
General specifications

Power supply:	85 to 264Vac 50/60 Hz (other on request)
Remote control interface options:	Ethernet 10/100 Base-T (SNMP, web server, e-mail client)
BUC power supply (option):	24V 1.9A
Housing and dimensions:	Rack drawer 19” 1U (depth 450mm - connectors and handles excluded)
Operating temperature range:	0 to 45° C.



Screenshot of MPEG-2 and MPEG-4 Encoder web page

DME series block diagram



NOTE:

Without the multiplexer card option, the T.S. is generated with NIT and SDT tables.
With the multiplexer card option, are also added the TDT and EIT tables and on the optional transport stream input is possible to have advanced remultiplexing functions such as PID filtering.

CREATE YOUR OWN EQUIPMENT CODE

Series suffix and number	multiplexer <i>card</i> (0=no; 1=yes)	number of MPEG-4 (H.264) Encoder <i>cards</i> (*)	number of MPEG-2 Encoder <i>cards</i> (*)
DME 5	0 or 1	0 to 4	0 to 4

Examples:

- “DME 5131” = DVB-S/S2 Modulator with multiplexer, №3 MPEG-4 and №1 MPEG-2 encoders
- “DME 5012” = DVB-S/S2 Modulator without multiplexer, №1 MPEG-4 and №2 MPEG-2 encoders
- “DME 5101” = DVB-S/S2 Modulator with multiplexer, no MPEG-4 and №1 MPEG-2 encoder
- “DME 5000” = DVB-S/S2 Modulator with T.S. input (ASI or, optionally, Ethernet for T.S. over IP)

(*) Maximum number of MPEG-4 + MPEG-2 encoders is 4

AVAILABLE MAIN OPTIONS:

- Up to №4 MPEG-2 or MPEG-4 (H.264 HD/SD) encoders
- BUC power supply (24V 1.9A)
- Hi stability 10MHz reference oscillator
- Single/double ASI T.S. input
- Multistream (up to 6 different T.S.)
- Multiplexer card for advanced functions
- 70MHz output (instead of “L” Band)
- Ethernet input (T.S. over IP)
- BISS 1/ E encryption – PL scrambler with “Gold Code”
- Second (stereo) audio channel (for MPEG4 encoder)

All specifications contained in this document may be changed without prior notice.

