

# DIG

Digital series

## MPEG ENCODERS - MULTIPLEXERS - DIGITAL MODULATORS FOR TV AND RADIO APPLICATIONS



The high quality, professional and cost-effective solution



High reliability  
and compact size



Designed for  
TV & Radio signals



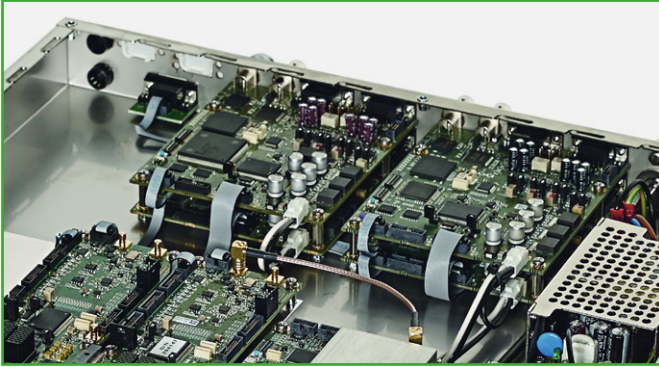
High quality



Low cost  
of ownership

# EMX

## MPEG Encoders



The **EMX series** is a high quality, flexible and cost-effective solution that combines, in a single unit, **one or more MPEG Encoders**.

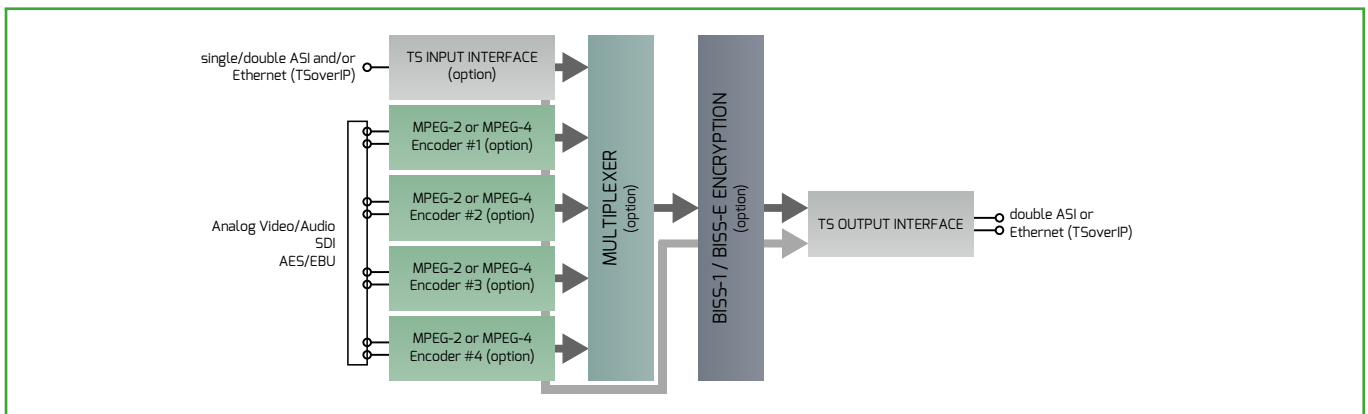
### APPLICATIONS

- Digital Terrestrial and Satellite TV Broadcasting Head-ends
- Satellite Uplinks for Distribution and Contribution
- DSNG Mobile news gathering
- Digital Microwave Links (STL and Mobile)
- Webcasting Encoding - IP Streaming

### PRODUCT SKILLS

- **1 to 4 real time MPEG video/audio Encoders** in a single 1U Rack drawer
- **MPEG-4 H.264/AVC Encoder (HD/SD)**
- **MPEG-2 MP@ML 4:2:0 Encoder** up to full D1 resolution
- Input: **SDI/HD-SDI** with embedded or separate **AES-EBU** audio, **analog Video and Audio**
- **Teletext or Closed Captioning** extraction from video and reinsertion in the Transport Stream
- **Re-multiplexing** option to combine more units
- Input/Output: **ASI, Ethernet (Transport Stream over IP)**
- User configurable Encoders settings + easy to recall pre-defined factory settings
- User friendly **local and remote control** includes on-board display, Web GUI, SNMP and e-mail client
- Available as OEM units

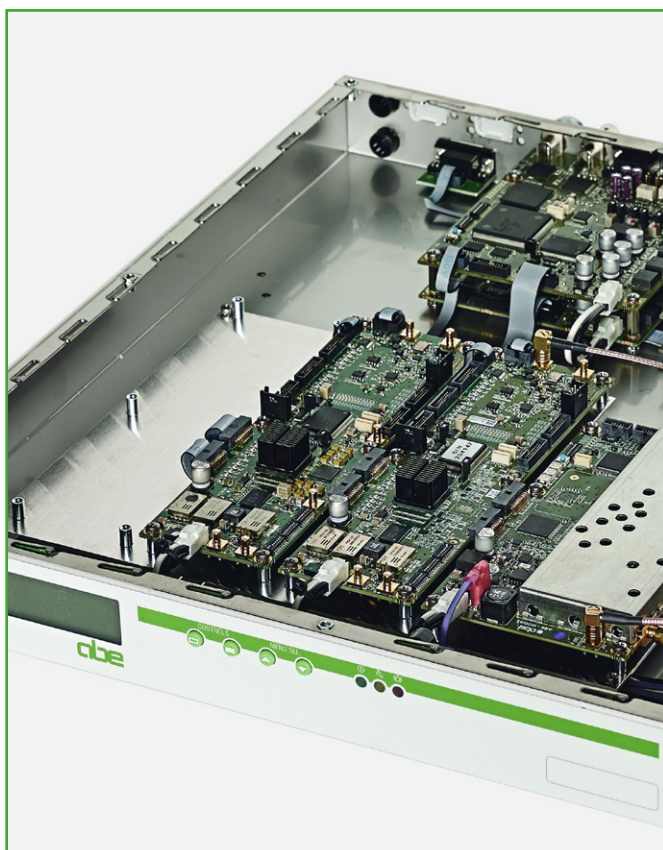
### BLOCK DIAGRAM



# MUX

## Transport Stream Multiplexer - Remultiplexer

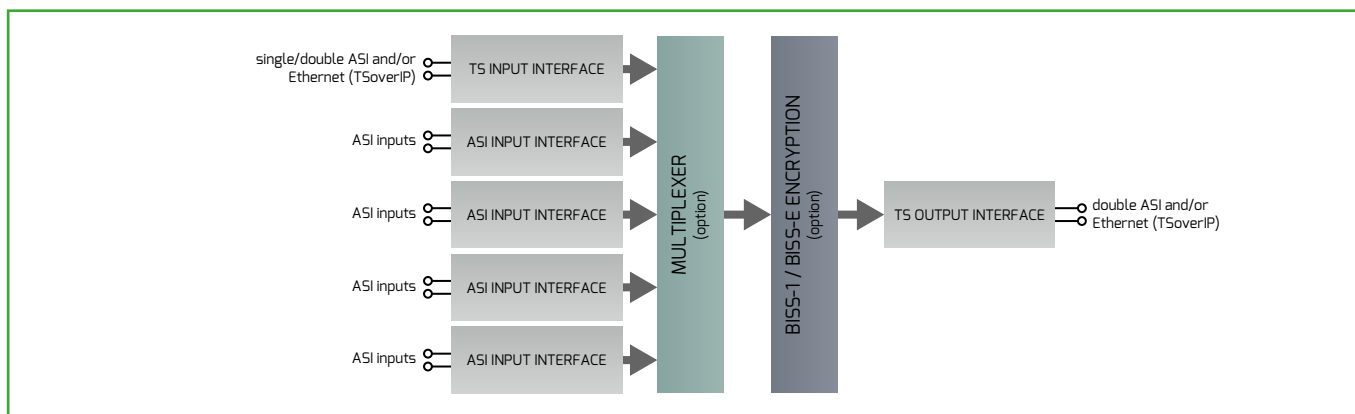
The **MUX series of DVB MPEG TS Multiplexers** combines the output of different Encoders, producing a **multi-program Transport Stream**; it can also “re-multiplex” existing Transport Streams, adding or deleting programs and including or modifying tables.



### PRODUCT SKILLS

- **Up to 8 ASI Transport Stream inputs**
- **PID Filtering** and **automatic Transport Stream adaptation** (with PCR time re-stamping)
- **NIT** (Network Information Table) and **SDT** (Service Description Table) insertion and modification
- **EIT** (Event Information Table) and **TDT** (Time and Date Table) insertion
- **Dynamic EIT** option with specific management software
- **MHP** (Multimedia Home Platform) support (associate carousels and other MHP tables to programs)
- Configuration and management software
- **ASI and Ethernet (Transport Stream over IP) output and input** interface options
- User-friendly **local and remote controls** include on-board display, Web GUI, SNMP and e-mail client
- Available as OEM units

### BLOCK DIAGRAM



# DME

## Digital modulators series



The **DME series** is the best solution for **Digital Satellite Uplinks** (Broadcasting, Distribution, Contribution, DSNG/ENG Mobile news gathering) and **terrestrial Microwave Links**.

The units consist of a **Multistandard Modulator** (DVB-S2, DVB-S, DSNG, OFDM) with up to four **MPEG-2** or **MPEG-4 Encoders** in a single 1U rack chassis.

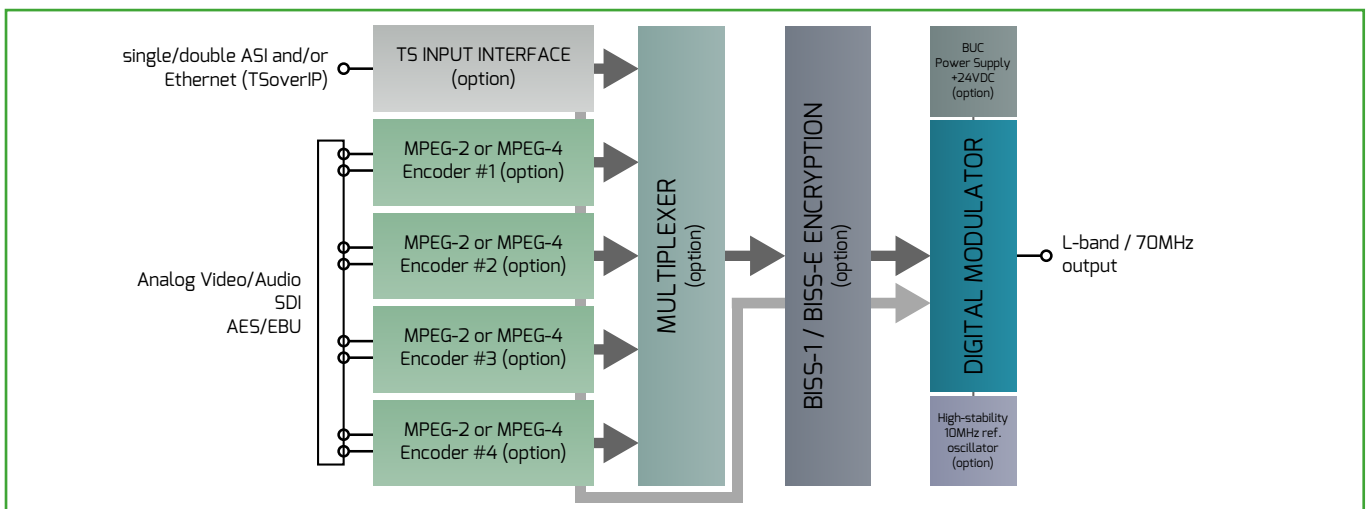
A DME unit, combined with a BUC and a parabolic antenna for the chosen frequency range (usually Ku or C band), makes a complete **satellite uplink solution**.

The DME can be used as encoder - digital modulator for agile terrestrial **digital microwave links**.

### PRODUCT SKILLS

- **DVB-S2 / DVB-S / DSNG Modulator** with **L-band** or **70MHz** output for Broadcast and DSNG applications
- **OFDM version** available
- **All modulation schemes supported** (QPSK, 8PSK, 16APSK and 32APSK)
- **Multistream option**, with the possibility of transmitting **up to 6 different Transport Streams** simultaneously
- **Digital non-linear pre-correction** to linearize Power Amplifiers (HPA)
- Up to 4 real time **MPEG-2** (MP@ML - 4:2:0) or **MPEG-4** (H.264/AVC SD/HD) **video/audio Encoders**
- User-friendly **local and remote control** includes on-board display, Web GUI, SNMP and e-mail client
- Available as OEM unit

### BLOCK DIAGRAM



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

### VIDEO INPUTS AND ENCODING

<b>Video input format and connector</b>	Digital: SD/HD-SDI with embedded or separate AES/EBU audio - 75Ω - BNC socket Analog: composite PAL, SECAM, NTSC - 1Vpp - 75Ω - BNC socket
<b>Encoding standard</b>	ISO/IEC 14496-10 (H.264/AVC 4:2:0) Main Profile Level 3.0 and High profile Level 4.0
<b>Bit rate</b>	From 2 to 24 Mbit/s, CBR and VBR
<b>Supported resolutions</b>	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
<b>Picture encoding type</b>	I, B, P
<b>Minimum latency</b>	Around 500ms - according to the settings (GOP structure, bit rate, etc.)

### AUDIO INPUTS AND ENCODING

<b>Audio input format</b>	Digital: AES/EBU (embedded in SDI or separate) Analog: two channels (one stereo pair) - option for second stereo pair
<b>Analog audio nominal level</b>	0dBu adjustable / 600Ω balanced
<b>Sampling frequency</b>	48kHz
<b>Bit rate and encoding standard</b>	Up to 384kbit/s - ISO/IEC 11172-3 (MPEG-1 audio) layer 2 - option for AAC
<b>Second audio pair option</b>	Stereo - up to 256kbit/s

### OTHER SPECIFICATIONS

<b>Output stream type and system multiplexing</b>	Transport Stream - ISO/IEC 13818-1 (MPEG2 TS) - PAT, PMT, NIT, SDT (LCN support)
<b>Pre settings</b>	n.8 factory preset + n.8 user configurable preset
<b>Teletext / Closed captioning data</b>	Extraction from analog video input and insertion in the Transport Stream

## WEB GUI FOR REMOTE CONTROL

# MPEG-2 Encoder Card - TECHNICAL SPECIFICATIONS

## VIDEO INPUTS AND ENCODING

<b>Video input format and connector</b>	Digital: SD-SDI with embedded or separate AES/EBU audio - 75Ω - BNC socket Analog: composite PAL, SECAM, NTSC - 1Vpp - 75Ω - BNC socket
<b>Pre-processing</b>	TBC (Time Base Corrector) - Noise Reduction Filter
<b>Encoding standard</b>	ISO/IEC 13818-2 MP@ML (MPEG-2 4:2:0)
<b>Bit rate</b>	Up to 15 Mbit/s
<b>Supported resolutions</b>	Full D1, 3/4 D1, 2/3 D1, 1/2 D1, SIF, QSIF Slice screen: up to 720 horizontal pixels - up to 480/576 vertical pixels
<b>Picture encoding type / GOP structure</b>	I, P, B - Flexible
<b>Minimum latency</b>	Around 200ms - according to the settings (GOP structure, bit rate, etc.)

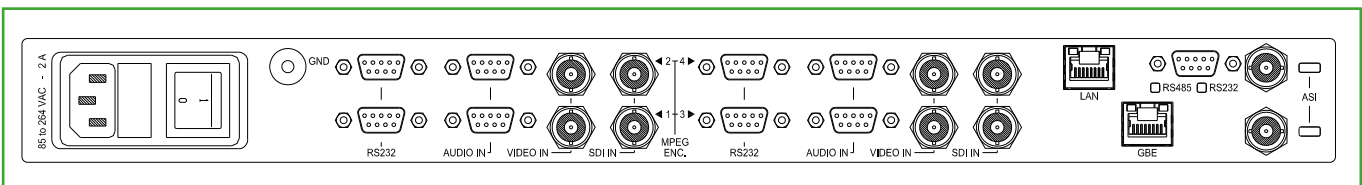
## AUDIO INPUTS AND ENCODING

<b>Audio input format</b>	Digital: AES/EBU (embedded in SDI or separate) Analog: two channels (one stereo pair)
<b>Analog audio nominal level</b>	0dBu adjustable / 600Ω balanced
<b>Sampling frequency</b>	32kHz, 44.1kHz, 48kHz
<b>Bit rate and encoding standard</b>	Up to 448kbit/s - ISO/IEC 11172-3 (MPEG-1 audio) layer 2

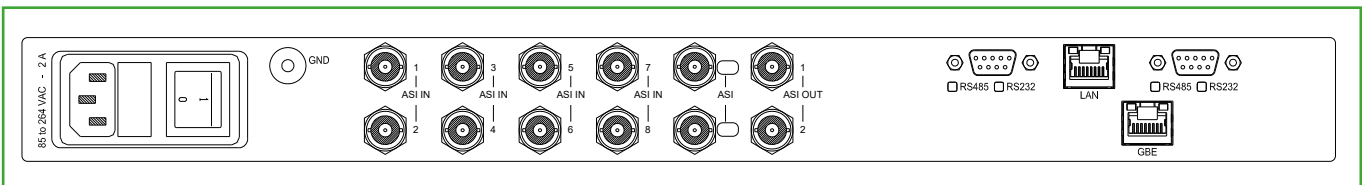
## OTHER SPECIFICATIONS

<b>Output stream type and system multiplexing</b>	Transport Stream - ISO/IEC 13818-1 (MPEG2 TS) - PAT, PMT, NIT, SDT (LCN support)
<b>Pre settings</b>	n.8 factory preset + n.8 user configurable preset
<b>Teletext / Closed captioning data</b>	Extraction from analog video input and insertion in the Transport Stream

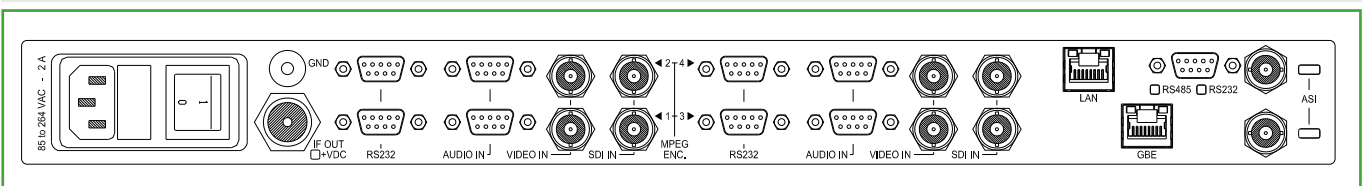
## EMX SERIES: REAR PANEL



## MUX SERIES: REAR PANEL



## DME SERIES: REAR PANEL





## Multiplexer Card - TECHNICAL SPECIFICATIONS

### MULTIPLEXING

Reference standard	EN 300 468
Input	Up to 8 Transport Streams
Output	Double ASI - Ethernet (T.S. over IP) as option
Time restamping (PCR update)	Available
Output bit rate clock frequency stability	$\geq 2$ ppm
Tables	Insertion / modification of NIT, SDT, TDT , EIT
PID filtering	Up to 128 PIDs per each Transport Stream
MHP support	Association to programs
Setting	Full control via RS232 port with specific management software or via web GUI

### OPTIONAL FEATURES

Encryption	BISS-1/E
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## Ethernet (T.S. over IP) Card - TECHNICAL SPECIFICATIONS

Standard, IP data rate, connector	IEEE802.3a - 100/1000 Mbit/s with auto detect - RJ45
IP to T.S. delay, T.S. data rate	1 to 120ms - over 100 Mbit/s
T.S. over IP encapsulation, addressing mode	UDP, SMPTE 20,22-2 (RTP) - Unicast and Multicast (IGMP v2)
FEC	As per Pro-MPEG Code of Practice #3 rel. 2 (SMPTE 2022-1) - Max matrix size 100
T.S. packets per IP packet	1 to 7 (packet size 188 or 204)
Setting	Full control via RS232 port with specific management software or via web GUI

MPEG-4 Encoder board



Ethernet (T.S. over IP) interface board



## Modulator Card - TECHNICAL SPECIFICATIONS

<b>Modulation scheme</b>	QPSK (EN 300 421 DVB-S) QPSK, 8PSK, 16QAM (EN 301 210 DVB-DSNG) QPSK, 8PSK, 16APSK, 32APSK (EN 302 307 DVB-S2)
<b>Output frequency</b>	L-band version: 950 to 1750MHz in 1kHz steps - option: up to 2400MHz 70MHz: 50 to 90MHz in 1kHz steps
<b>L-band Local Oscillator side band phase noise</b>	@10Hz: -65dBc/Hz @1kHz: -84dBc/Hz @100kHz: -95dBc/Hz @1MHz: -118dBc/Hz
<b>Frequency reference clock</b>	Internal: 10MHz (stability $\pm 5 \times 10^{-7}$ ) available also for BUC reference Options: high stability oven (stability $\pm 1 \times 10^{-8}$ ), external reference, GNSS locked ref.
<b>Output level</b>	0dBm (typ. adj. range -15 to +15dBm) - different output levels on request
<b>Output impedance and connector</b>	L-band version: 50 $\Omega$ - N female connector 70MHz version: 75 $\Omega$ - BNC female connector
<b>Input Transport Stream bit rate</b>	Up to around 100Mbit/s according to the settings (modulation scheme, Symbol Rate, etc.)
<b>Symbol Rate</b>	150kS/s to 30MS/s in 1kS/s steps - option: Transparent mode for SFN streams
<b>Roll-off, FEC and data scrambling</b>	According to the employed standard (EN 300 421 DVB-S, EN 301 210 DVB-DSNG, EN 302 307 DVB-S2 for broadcast and DSNG applications)
<b>Encryption option</b>	BISS-1/E PL (Physical Layer) scrambler with Gold Code insertion - DVB-S2 only
<b>Multistream option</b>	Supported up to 6 T.S.

## DIG SERIES - GENERAL SPECIFICATIONS

<b>Power supply</b>	85 to 264Vac 50/60Hz - other on request
<b>Remote control interface</b>	Ethernet 10/100 Base-T (web server, SNMP, email client)
<b>BUC power supply (option)</b>	24Vdc, 1.9A
<b>Housing</b>	Rack drawer 19" 1U (depth 450mm - connectors and handles excluded)
<b>Operating temperature range</b>	0 to +45°C
<b>Maximum operative humidity</b>	90% non condensing



### SUSTAINABILITY

We design and build high performance and environmentally friendly equipment



### MADE IN ITALY

Design and manpower are 100% Italian to guarantee quality and assistance



### SOLIDITY

Being in the broadcast industry for nearly forty years is the most obvious proof of our seriousness



### TECHNOLOGY

We believe it is essential to increase our technological know-how every day to provide excellent products

### ABE ELETTRONICA

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