



- **Compliant with China national standard**
- **Single Carrier and Multicarrier mode of operation**
- **High frequency resolution (in steps of 1 Hz)**
- **High MER**
- **Multi-path channel simulator**
- **CNR generator**

General description of the DTMB modulator MO-270

The **MO-270** is a general purpose **DTMB modulator** fully compliant with the standard **GB20600-2006** contained in a 19" 1U chassis. The unit has two serial **MPEG-2 TS-ASI** inputs. Either of these inputs can be used to modulate the DTMB signal.

An additional **test TS** can be generated internally in the modulator. This allows generating compliant **DTMB** signals even in the absence of a valid TS input.

Detailed description

The **MO-270** is able to work with any incoming bit rate as long as this is strictly lower than the value given in the **DTMB** specification for the modulation parameters in use. The input **TS** bit rate is adapted (bit rate adaptation) to the useful bit rate required by the **DTMB** signal by stuffing the **TS** with NULL packets (packet stuffing). This stuffing process alters the sequence of PCR values embedded in the **TS**. These values have to be re-stamped for the resultant PCR jitter to remain within the acceptable limits specified by the **DTMB**.

The modulator can be configured to generate any of the transmission modes listed in the **DTMB** specification. Several test modes are available in the **MO-270** (single tone output and test **TS** generation).

The **MO-270** has been designed to work in Multi Frequency Networks (MFN). Single Frequency Network (SFN) operation is not currently supported.

Control interface

- Pushable rotary control on the front panel with navigation key and LCD display.
- Two LEDs indicating the power and synchronisation status of the equipment.
- RS-232C DB-9 male connector for remote control.

The **MO-270** can add white Gaussian noise to the **DTMB** signal with a given Carrier-to-Noise Ratio (C/N). This random noise is generated digitally and is available on both IF and RF outputs. The noise bandwidth is more than twice the bandwidth of the DTMB signal.

The channel simulator implemented in the **MO-270** allows the user to simulate both dynamic and static multipath scenarios. Up to 6 echoes (including the main path) of variable amplitude, delay, phase and Doppler frequency can be selected.

The operation of the **MO-270** is done via the front panel LCD display and controls. The modulator can be easily configured by navigating through a rather intuitive set of menus.

SPECIFICATIONS	MO-270 DTMB MODULATOR
INPUTS MPEG-2 Transport Stream Operating modes	Two ASI inputs, 75 Ω female BNC TS packets of length 188 or 204 bytes. (automatic detection) Support for burst and continuous packet mode Input TS bit rate strictly below the value given in the DTMB specification Packet stuffing for bit rate adaptation and PCR re-stamping are carried out automatically
IF OUTPUT Type Frequency range Spectrum polarity Power level (average) In-band amplitude ripple In-band group delay ripple Frequency stability MER	50 Ω BNC female connector Variable between 31 and 36 MHz in steps of 1 Hz; fixed at 36 MHz when RF output is off Selectable via front panel controls 0 dBm (107 dB μ V) fixed < 0.5 dB < 10 ns 20 ppm > 43 dB
RF OUTPUT Type Frequency range Spectrum polarity Power level (average) Frequency stability MER SSB phase noise	50 Ω N-type female connector Adjustable between 45 and 875 MHz in 1 Hz steps Selectable via front panel controls Approximately 80 dB μ V with no attenuation. Variable attenuation of 0 to 60 dB in steps of 1 dB 20 ppm > 38 dB ≤ -87 dBc/Hz @ 2 kHz
DTMB PARAMETERS Carrier Mode Frame Header Length Frame Header Phase FEC rates Constellations Time Interleaving MFN operation	Single, Multicarrier 420, 595, 945 symbols Fixed, Rotating 0.4, 0.6, 0.8 4QAM-NR, 4QAM, 16QAM, 32QAM, 64QAM 240, 720 Available
NOISE GENERATOR	Fully digital complex baseband generation. Both signal and/or noise can be switched off.
CHANNEL SIMULATOR	Fully digital complex baseband generation
REMOTE CONTROL	RS-232C interface (DB-9 male connector)
TEST MODES Single carrier (R.M.S Tone) TS packet generation	Generate a single carrier at the channel central frequency whose level equals the average DTMB output power. This is intended for signal level alignment Internal generation of test TS using PRBS sequences of length 15 or 23 embedded within NULL packets
ECHOES GENERATOR Amplitude Phase Doppler	From 0 down to -40 dBc in 0.1 steps From 0° to 359.9° in 0.1 steps Static (0 Hz) / Dynamic (from +- 830 Hz). Delay Variable in 100 ns steps
POWER SUPPLY	90 - 250 VAC @ 50 - 60 Hz. Consumption 20W
MECHANICAL FEATURES Dimensions Weight	19" (W.) x 1.75" (H.) x 15" (D.) 6.3 kg