

# DVB-T/T2

### ● MO-480

MFN / SFN Broadcast grade DVB-T and DVB-T2 Modulator (19" rack format)

- ✓ DVB-T and DVB-T2 modulation
- ✓ MFN and SFN
- ✓ Single output 30 to 900 MHz
- ✓ Affordable yet broadcast grade design
- ✓ High output quality
- ✓ Low power consumption
- ✓ Easy OEM integration
- ✓ Multi-PLP
- ✓ SISO/MISO
- ✓ Digital Pre-correction
- ✓ Webserver for programming and control
- ✓ 10 MHz / 1 PPS internal and external references
- ✓ Installation and maintenance tests modes
- ✓ Configurable latency
- ✓ IP FEC correction
- ✓ IP UDP, RTP & IGMP compatibility

The **MO-480/481** is a broadcast grade DVB-T2 modulator available in a standard 1U high 19" rack case (**MO-480**) and also in an open frame chassis (**MO-481**) that can be used for MFN as well as SFN applications.

The modulator has several Transport Stream and T2-MI inputs in ASI and IP formats so that it can be easily interfaced with other existing transmission equipments such as gateways. The modulator can be configured to generate any of the transmission modes listed in the corresponding **DVB-T2** standard including single and multiple PLP, MISO or SISO. It can also be used for DVB-T applications.

The interest in **DVB-T2** is now increasing with the growing demand for bandwidth mostly to deliver high definition television programmes. Several countries already have T2 commercial services, some others are running test trials and many more are on the planning stage.

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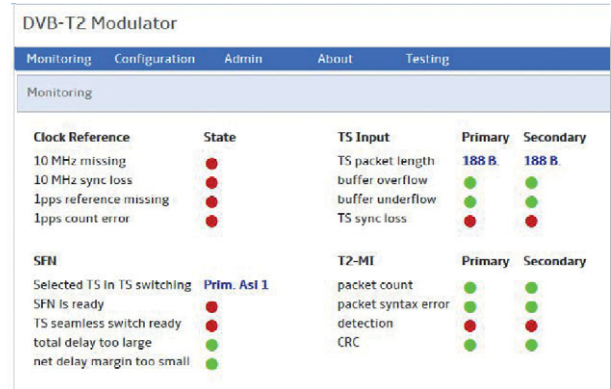
MFN / SFN Broadcast grade DVB-T and DVB-T2 modulator (OEM version)



SPECIFICATIONS	MO-480	MO-481
<b>INPUT STREAMS</b> Interface  System A input mode Systems A and B input mode T2-MI encapsulation Switching	2 x ASI (EN 102 773) 1 x IP (SMPTE-2022 – UDP, RTP and FEC) TS input (one PLP, HEM mode, no NULL packet deletion, no ISSY, no in-band signalling) T2-MI over TS input with automatic search for the T2-MI data piping PID MPEG-2 TS (ASI) and MPEG-2 TS over IP (IP) Automatic and seamless between any two T2-MI inputs in SFN mode. Automatic in MFN mode In both modes, the switchover may be permanent or temporary	
<b>REFERENCE INPUTS</b> 1pps Reference Input Active Edge Level Pulse width 10 MHz Reference Input Input Level	High impedance / 50 Ω (Configurable) Rising / Falling (Configurable) Min. 2 V, max. 5 V 100 μs minimum High impedance / 50 Ω (Configurable) Min. 50 mV, max. +3.3 V	
<b>IF OUTPUT</b> Return loss Output Frequency Spectrum polarity Power level (average) Ripple Group delay ripple Spectrum outside the band @ ± 3.805 MHz @ ± 4.25 MHz @ ± 5.25 MHz IQ amplitude imbalance IQ quadrature error Carrier Suppression Harmonics and spurious MER	> 26dB 36 MHz (variable between 31 and 37 MHz with 1 Hz resolution) Inverted/Normal -13 dBm ± 1dB fixed < ± 0.2 dB (without linear predistortion) < ± 10 ns (without linear predistortion)  0 dBc -52 dBc -55 dBc < 0.02% < 0.02° > 40 dBc < 60 dB relative to the total output power > 44 dB	
<b>RF OUTPUT</b> Output level Frequency Range	-10 dBm to -40 dBm 30 to 900 MHz	
<b>SYNCHRONISATION</b> MFN SFN	External: 10 MHz with T2-MI input. Internal: 10 MHz TCXO with TS input 10 MHz external reference	
<b>TRANSMISSION MODES</b> Standard IFFT lengths Guard interval Code Rate Constellation L1 constellation Rotated constellation Pilot pattern PAPR Network type Bandwidth Diversity Time interleaving Number of PLP Configuration parameters Local parameter insertion Others	DVB-T2 version 1.1.1 1K, 2K, 4K, 8K, 8K ext, 16K, 16K ext, 32K, 32K ext 1/4, 19/128, 1/8, 19/256, 1/16, 1/32, 1/128 1/2, 3/5, 2/3, 3/4, 4/5, 5/6, 7/8 for short and normal LDPCs QPSK, 16QAM, 64QAM, 256QAM (Normal or Rotated) BPSK, QPSK, 16QAM and 64QAM 29°, 16.8°, 8.6°, Atan (1/16) PP1 – PP8 Tone Reservation MFN or SFN 5, 6, 7, 8 MHz SISO, MISO groups 1 and 2 Bypass, options 1 and 3 (no multi-frame interleaving) 1 (System A). From 1 to 8 (System B) with optional sub-slicing From the L1 and Individual Addressing T2-MI packets or local programming via register map Cell ID, Network ID, T2 system ID, RF frequency TS and BBFRAME input bit rate measurement Estimates of the primary and secondary TS network delay margins Modulator latency available for any T2 configuration	
<b>SFN DELAY INSERTION</b> Dynamic Delay Local delay	Automatically calculated from the 1pps signal and the T2-MI timestamp Adjustable between -500,000.0 μs and +500,000.0 μs with 100-ns resolution	



### • Web server control



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<b>TEST MODES</b> PRBS Blank Carrier Null P1 preamble Single RMS tone	Modulates 23-bit PRBS-filled BBFRAMES Carriers are blanked between two configurable values First P1 preamble of every superframe is zeroed Tone at central frequency with the same RMS power as the T2 signal	
<b>SIGNAL PREDISTORTION</b> Crest Factor Reduction Range Resolution Non linear predistortion Number of points Table AM-AM Table AM-PM AM Resolution PM Resolution Linear predistortion Number of points Amplitude Correction Group Delay Correction Amplitude Resolution Group Delay Resolution	Enable/Disable 8 to 11 dB 0.1 dB Enable/Disable From 2 to 16. Linear interpolation Input Amplitude: -12 dB to +12 dB / Output Amplitude: -6 dB to +6 dB Input Amplitude: -12 dB to +12 dB / Output Phase: -30° to +30° 0.1 dB 0.1° Enable/Disable 72. Linear interpolation From -6 dB to +6 dB From -1500 to +1500 ns 0.01 dB 1 ns	
<b>OPERATING ENVIRONMENTAL CONDITIONS</b> Indoor use Altitude Temperature range Max. relative humidity	Up to 2000 m From 5°C to 40°C 80 % (up to 31°C), decreasing lineally up to 50% at 40 °C	
<b>POWER SUPPLY</b>	90 - 250 V AC @ 50 - 60 Hz Consumption 15 W	12 V DC 1.8 A
<b>MECHANICAL FEATURES</b> Dimensions Weight	482.6 (W.) x 44.4 (H.) x 381 (D.) mm 5.1 kg	116 (W.) x 61 (H.) x 258 (D.) mm 1.57 kg