PROMAX
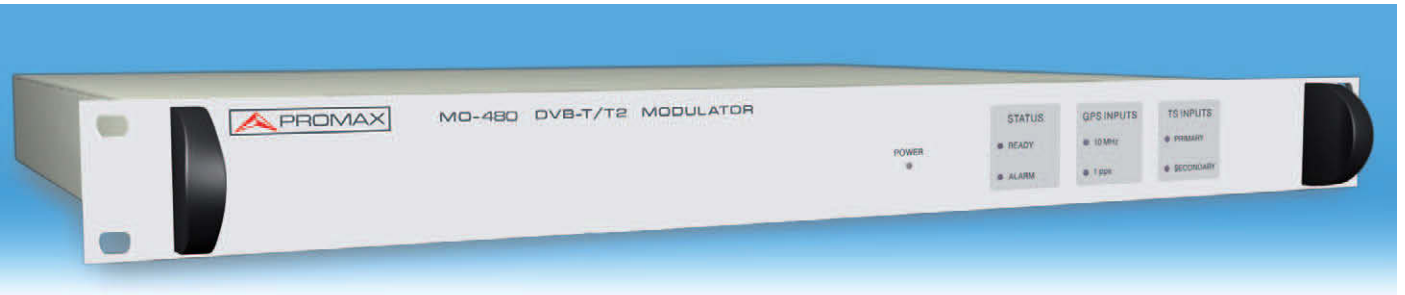
Broadcast grade DVB-T2 modulator

MO-480 / MO-481

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 / 1PPS internal and external references
- ✓ Installation and maintenance tests modes
- ✓ Configurable latence
- ✓ 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.
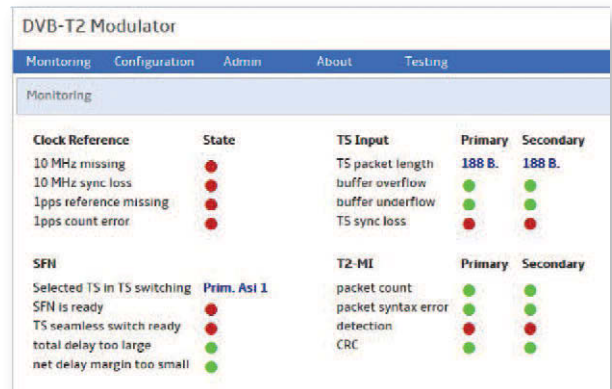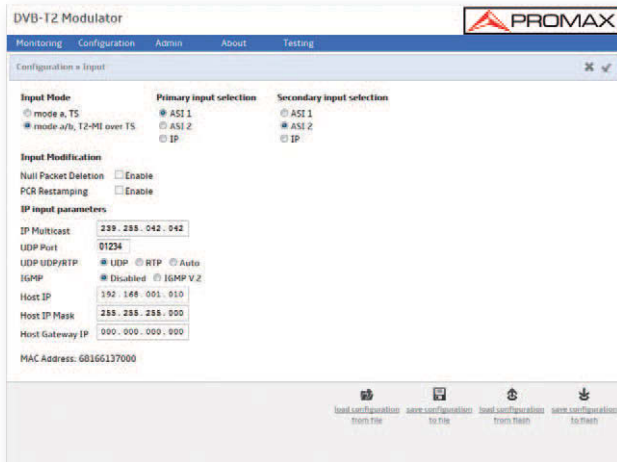
MO-481

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

HIGH-DEFINITION TELEVISION

SPECIFICATIONS	MO-480	MO-481
INPUT STREAMS		
Interface	2 x ASI (EN 102 773)	
	1 x IP (SMPTE 2022-1/2 – UDP, RTP and FEC)	
System A input mode	TS input (one PLP, HEM mode, no NULL packet deletion, no ISSY, no in-band signalling)	
Systems A and B input mode	T2-MI over TS input with automatic search for the T2-MI data piping PID	
T2-MI encapsulation	MPEG-2 TS (ASI) and MPEG-2 TS over IP (IP)	
Switching	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	
REFERENCE INPUTS		
1pps Reference Input	High impedance / 50 Ω (Configurable)	
Active Edge	Rising / Falling (Configurable)	
Level	Min. 2 V, max. 5 V	
Pulse width	100 µs minimum	
10 MHz Reference Input	High impedance / 50 Ω (Configurable)	
Input Level	Min. 50 mV, max. +3.3 V	
RF OUTPUT		
Output Frequency	30 to 900 MHz	
Power level	- 10 dBm to - 40 dBm	
Return loss	> 20 dB	
Spectrum polarity	Inverted/Normal	
Ripple	< ± 0.2 dB (without linear predistortion)	
Group delay ripple	< ± 10 ns (without linear predistortion)	
Harmonics and spurious	< 60 dB relative to the total output power	
MER	> 42 dB	
SYNCHRONISATION		
MFN	External:10 MHz. Internal:10 MHz TCXO in mode system A with TS input mode only	
SFN	10 MHz external reference	
TRANSMISSION MODES		
Standard	DVB-T2 version 1.1.1	
IFFT lengths	1K, 2K, 4K, 8K, 8K ext, 16K, 16K ext, 32K, 32K ext	
Guard interval	1/4, 19/128, 1/8, 19/256, 1/16, 1/32, 1/128	
Code Rate	1/2, 3/5, 2/3, 3/4, 4/5, 5/6, 7/8 for short and normal LDPCs	
Constellation	QPSK, 16QAM, 64QAM, 256QAM (Normal or Rotated)	
L1 constellation	BPSK, QPSK, 16QAM and 64QAM	
Rotated constellation	29º, 16.8º, 8.6º, Atan (1/16)	
Pilot pattern	PP1 – PP8	
PAPR	Tone Reservation	
Network type	MFN or SFN	
Bandwidth	5, 6, 7, 8 MHz	
Diversity	SISO, MISO groups 1 and 2	
Time interleaving	Bypass, options 1 and 3 (no multi-frame interleaving)	
Number of PLP	1 (System A). From 1 to 8 (System B) with optional sub-slicing	
Configuration parameters	From the L1 and Individual Addressing T2-MI packets or local programming via register map	
Local parameter insertion	Cell ID, Network ID, T2 system ID, RF frequency	
Others	TS and BBFRAME input bit rate measurement	
	Estimates of the primary and secondary TS network delay margins	
	Modulator latency available for any T2 configuration	
SFN DELAY INSERTION		
Dynamic Delay	Automatically calculated from the 1pps signal and the T2-MI timestamp	
Local delay	Adjustable between -500,000.0 µs and +500,000.0 µs with 100-ns resolution	
TEST MODES		
PRBS	Modulates 23-bit PRBS-filled BBFRAMEs	
Blank Carrier	Carriers are blanked between two configurable values	
Null P1 preamble	First P1 preamble of every superframe is zeroed	
Single RMS tone	Tone at central frequency with the same RMS power as the T2 signal	

● **Web server control**

SPECIFICATIONS	MO-480	MO-481
SIGNAL PREDISTORTION		
Crest Factor Reduction	Enable/Disable	
Range	8 to 11 dB	
Resolution	0.1 dB	
Non linear predistortion	Enable/Disable	
Number of points	From 2 to 16. Linear interpolation	
Table AM-AM	Input Amplitude: -12 dB to +12 dB / Output Amplitude: -6 dB to +6 dB	
Table AM-PM	Input Amplitude: -12 dB to +12 dB / Output Phase: -30° to +30°	
AM Resolution	0.1 dB	
PM Resolution	0.1°	
Linear predistortion	Enable/Disable	
Number of points	72. Linear interpolation	
Amplitude Correction	From -6 dB to +6 dB	
Group Delay Correction	From -1500 to +1500 ns	
Amplitude Resolution	0.01 dB	
Group Delay Resolution	1 ns	
POWER SUPPLY	90 - 250 V AC @ 50 - 60 Hz Consumption 15 W	12 V DC 1.8 A
MECHANICAL FEATURES		
Dimensions	482.6 (W.) x 44.4 (H.) x 381 (D.) mm	116 (W.) x 61 (H..) x 258 (D.) mm
Weight	5.1 kg	1. 57 kg
OPTIONS		
OP-480-E	White noise generator for C/N testing. Fixed and portable channel simulation in SFN/MFN networks	
OP-480-P	10 dBm amplifier	