

TX-4 Transmitter 4 W



SPECIFICATIONS	MODULATOR
INPUTS MPEG-2 Transport Stream GPS Inputs 10 MHz input 1pps input Synchronisation Master MFN Slave MFN SFN	Two DVB-ASI inputs, 75 Ω female BNC. One DVB-SPI input, LVDS DB-25. TS packets of length 188 or 204 bytes (automatic detection). Support for burst and continuous packet mode. High impedance / 50 Ω female BNC. Min. 50 mV, max. +3.3V. High impedance / 50 Ω female BNC. Selectable active edge (high or low). Minimum 2 V, max. 5 V. Internal 10 MHz TCXO or external 10 MHz GPS reference. Input TS bit rate strictly below the value given in the DVB-T/H specification. Packet stuffing for bit rate adaptation and PCR re-stamping are carried out automatically. Input TS bit rate constant and equal to the value given in the DVB-T/H document $\pm 0.1\%$ (no stuffing). External 10 MHz reference or input TS data rate. Automatic seamless switching between ASI inputs in the event of a sync loss.
IF OUTPUT Type Frequency range Spectrum polarity Power level (average) In-band amplitude ripple In-band group delay ripple Frequency stability Out-of-band spectral characteristics1 @ ± 3.805 MHz @ ± 4.25 MHz @ ± 5.25 MHz IQ amplitude imbalance IQ quadrature error Central carrier suppression Harmonics and spurious MER Muting in the presence of errors	50 Ω BNC female connector. Variable between 32 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 dBmV on 50 W), fixed < 0.2 dB < 10 ns Better than 2 ppm 0 dBc -46 dBc (2k), -56 dBc (4k), -56 dBc (8k) -56 dBc < 0.02% < 0.02° < -55 dBc < -60 dBc > 43 dB SFN only
RF OUTPUT Type Frequency range Spectrum polarity Power level (average) Level of harmonics and spurious Frequency stability MER Phase noise Muting in the presence of errors	50 Ω N-type female connector. Adjustable between 45 and 875 MHz in 1 Hz steps. Selectable via front panel controls. Approximately -27 dBm on 50 Ω with no attenuation. Variable attenuation of 0 to 60 dB in steps of 1 Db. < -50 dBc. Better than 5 ppm. > 38 dB typical. Better than -94 dBc/Hz @ 1 kHz. SFN only.

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DVB-T/H PARAMETERS Number of carriers Guard intervals Code rates (HP&LP) Symbol interleaver Constellations Hierarchical modes Network topology TPS signalling Channel bandwidth Parameter extraction	2k, 4k, 8k. 1/4, 1/8, 1/16, 1/32. 1/2, 2/3, 3/4, 5/6, 7/8. Native and in-depth (2k & 4k DVB-H only). QPSK, 16QAM, 64QAM. 16QAM and 64QAM constellations with constellation ratio $a = 1, 2$ or 4 . MFN and SFN. Cell ID, DVB-H's time-slicing and MPE-FEC. 5, 6, 7 and 8 MHz. MIP packet or local programming
PROCESSING DELAYS MFN SFN	The static delay may be adjusted between 0 and 1 second with a resolution given by the DVB-T/H elementary clock period. Dynamic delay automatically calculated from the 10 MHz GPS reference, the 1pps signal and the MIP packet embedded in the HP TS multiplex. The resolution is 100 ns. A positive or negative local delay offset may be added as long as the total delay is never greater than 1 s or lower than the inherent latency of the modulator. Synchronisation accuracy better than ± 200 ns. Rough estimate of the network delay from the SFN adapter output to the modulator TS inputs
TEST MODES Carrier blanking Pilot carriers Single carrier TS packet generation PRBS generation Bit error injection	Blank a number of carriers (start index to stop index) within the COFDM ensemble. Generate the pilot carriers only (continual and TPS) Generate a single carrier at the channel central frequency whose level equals the average COFDM output power or is set to the maximum available. This is intended for signal level alignment Internal generation of test TS using PRBS sequences of length 15 or 23 embedded within NULL packets as specified in document ETSI TR 101 290. Map a PRBS sequence into constellation points following the guidelines of document ETSI TR 101 290. Inject bit errors at the input to the constellation mapper (results in a non-zero CBBER before the Viterbi decoder) or at the input to the convolutional encoder (results in a non-zero VBBER after the Viterbi decoder).
CREST FACTOR REDUCTION Crest Factor range	8 to 11 dB in 0.1 dB steps.
NON-LINEAR PRE-DISTORTER Correction bandwidth Number of correction points AM-AM table AM-PM table	$> 3 \times$ the DVB-T/H complex sample rate 2 to 16 using linear interpolation -12 dB to +12 dB for the abscissae, -6 dB to +6 dB for the ordinates, both in 0.1 dB steps -12 dB to +12 dB for the abscissae in 0.1 dB steps, -30° to $+30^\circ$ in steps of 0.1° for the ordinates
ETHERNET INTERFACE Connector Standard	RJ45 with activity indicator LEDs. 10BASE-T or 100BASE-TX (auto-sensing).
POWER SUPPLY Voltage Frequency Consumption	100 – 130 VAC; 200 – 250 VAC 50 - 60 Hz. 20 W.
OPERATING ENVIRONMENTAL CONDITIONS Indoor use only Altitude Temperature range	Up to 2000 m From 0°C to 40°C Max. relative humidity 80 % (up to 31°C), decreasing linearly up to 50% at 40°C

¹ Frequencies are referred to the central frequency for an 8 MHz channel. Peak levels measured using a 3 kHz bandwidth are referred to the carriers located on either side of the spectrum. Values shown are the worst case and correspond to guard intervals of 1/32.

² For instance, for an 8 MHz channel the correction bandwidth is greater than $3 \times 64/7 = 27.4$ MHz.

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SPECIFICATIONS	TRANSMITTER
Output signal Frequency band Bandwidth Output impedance Output power Output connector Output coupling Amplitude flatness Shoulder level Harmonic & Spurious rejection Group delay Inband ripple Noise figure MER	470 ~ 862 MHz 8 MHz (with CCIR standard) 50 Ω 4 W (rms) 7/16 DIN connector ≥ 20 dB $\leq \pm 0.5$ dB ≤ 35 dB > 90 dB < 40 nS ≤ 2 dBpp ≤ 10 dB > 35 dB
Power supply Voltage Frequency Consumption	220 V $\pm 10\%$ 50 Hz $\pm 1\%$ 50 W
Mechanical features Dimensions	19" 2 U standard rack