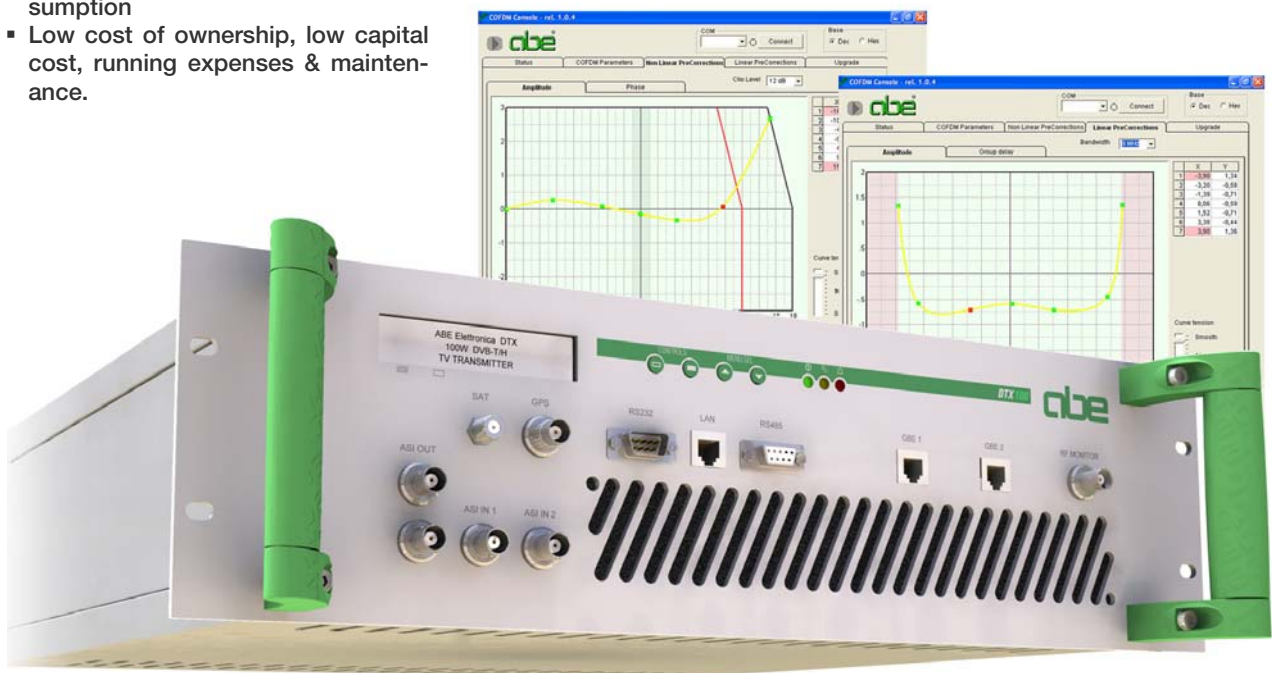


50 (80) – 100 (160)W UHF DIGITAL DVB-H & DVB-T TV TRANSMITTER

The high quality, professional and cost-effective solution

FEATURES:

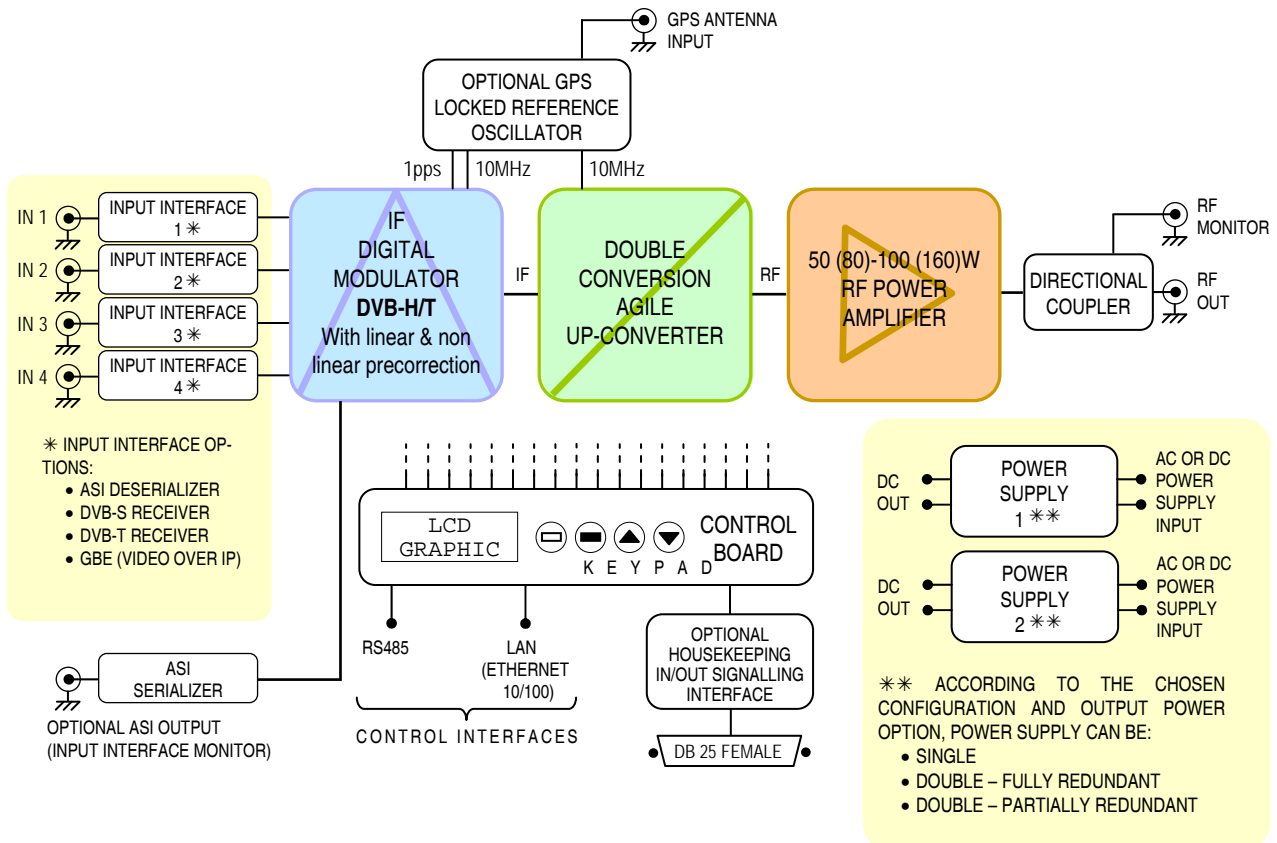
- A high performance digital COFDM TV Transmitter - Regenerative Transposer - Transmodulator - Gap-filler featuring high MER.
- Ultra compact solution integrating a choice of input interfaces, a GPS locked reference oscillator, an agile upconverter and a broad-band power amplifier
- High reliability and low power consumption
- Low cost of ownership, low capital cost, running expenses & maintenance.



ABE Elettronica is proud to present the “DTX” Series of Transmitters for DVB-H and DVB-T Digital Terrestrial Television Broadcasting. Building on the “State-of-the-art” image established by ABE’s digital and analog TV Transmitter range in over 30 years, the “DTX” series is designed to bring together the excellence of the COFDM Digital Mod-

ulation scheme with the highly efficient and reliable LD-MOS broadband Power Amplifiers designed and produced by ABE.

DTX transmitter - Regenerative transposer - Gap-filler Block diagram



The DTX transmitter, composed of the digital modulator, an agile upconverter, broadband power amplifier, along with the power supply and the fan system, is fully contained in a single 19" 3U rack drawer.

The transmitter can be equipped with a choice of input interfaces (including a satellite receiver) and a reference oscillator locked to a GPS receiver.

Featuring modular construction - with easily removable modules having high internal RF isolation - the DTX series exploits the advantages of SMD technology to achieve high reliability and comprehensive system flexibility - all at reduced size.

Maintenance as well as channel changing operations are simple and easy to perform.

The OFDM modulator, the key component of the transmitter, is based on a single FPGA and is fully compliant with the ETSI standard EN 300 744 for DVB-T & DVB-H.

A key function of the modulator is the digital linear and non-linear pre-correction with the possibility to

store and recall of several setups.

Linear pre-correction prevents the distortions introduced by the RF output filter. The result is a significant improvement in deploying SFN networks as well as cost optimisation thanks to the lower performing requirements of the output filters.

Several input interfaces are available in order to feed the modulator:

- #2 ASI interfaces, capable of near seamless switching and supporting hierarchical modulation
- GbE interfaces with up to 2 inputs for Mpeg TS over IP (ProMpeg COP#3 rel.2 – available soon)
- QPSK (and optionally also 8PSK) receiver for microwave or satellite (DVB-S/S2) link
- DVB-T receiver to employ the unit as a regenerative transposer

The up-converter is equipped with low phase noise local oscillators and is frequency agile over the UHF band with a 1Hz resolution.

The optional GPS receiver, specifically developed for the timing function, provides the 1pps (one pulse per second) and lock a 10 MHz reference oscillator necessary for the synchronization in SFN network mode operation. The unit has been specifically designed to minimize problems in SFN networks (i.e. cumulated error and wander). The transmitter can be equipped with a high-stability “oven” reference oscillator in order to maintain the synchronization in case of GPS signal unavailability.

The equipment employ high performance, highly efficient power amplifiers (low power consumption in comparison with the output power), using highly linear latest generation LD-MOS semiconductors, AB class polarized; linearity is further enhanced by the digital non-linear precorrector of the modulator.

The output RF Amplifier operates in redundant configuration.

Efficiency is further enhanced by the use of switch-mode power supplies, provided with PFC Power Factor (cos.φ) Corrector in order to minimize reactive power consumption.

The transmitter can be equipped with a dual power supply in order to significantly increase the equipment’s protection level.

The DTX family can operate in active/stand by configuration by means of an external (changeover unit). The innovative interface, management and control board of the equipment is built on a 32 bit micro controller.

Key characteristics are:

- 10/100 Base T Ethernet control interface in addition to RS485
- User friendly Web browser for local and remote management and diagnostics (TCP/IP protocol)
- SNMP support
- Remote firmware upgrade

A graphic display on the front panel allows onsite control and adjustment of the most important operating parameters.

Additional features of the DTX series include:

- Comprehensive indication, control and protection circuits, including a Power Amplifier foldback function to reduce output power before tripping off, in case of high VSWR, heatsink overtemperature or overdrive.
- AGC features IF muting and RF output Power Amplifier switch off in absence of IF signal or absence of local oscillator locking.
- “Soft start” on appearance of IF input, to avoid output power surges.
- Automatic RF Level Control (ALC) to stabilise the Power Amplifier’s RF output level over a limited range.

Technical specification

TRANSMITTER SECTION

Output power	DTX 4/9	50Wavg (tol.+0/-1dB) nominal power 80Wavg (tol.+0/-1dB) maximum power with reduced MER and shoulders performance 100Wavg (tol.+0/-1dB) nominal power
	DTX 100:	160Wavg (tol.+0/-1dB) maximum power with reduced MER and shoulders performance
Output frequency range:		UHF 470 to 770MHz in 1Hz steps (option: up to 860MHz)
TV Standard:		DVB-H/T (EN 300 744)
Output impedance and connector:		50Ω “7/16” Female (option: “N” Female)
Output frequency stability: (with high stability reference oscillator)		±500Hz (aging: ≤100Hz/month – after 6 months operation) Option: higher stabilities, including GPS locked reference oscillator
GPS Locked reference oscillator option:		GPS Receiver: 12 channels; Input TNC female 50Ω; Sensitivity: -154dBm; 1pps rms accuracy: 30nS; Power supply (for amplified antenna): +5V (excludible); 10MHz oven oscillator option aging: 1•10-9/day
MER (Modulation Error Ratio):		≥ 36dB @ nominal power (≥32dB @ maximum power)
Shoulders @ F0 ±4.2MHz (without output filter)		≤ 38dB @ nominal power (≤36dB @ maximum power)
Spurious and harmonic emissions: (with RF output filter option)		≤ -60dBc

COFDM MODULATOR SPECIFICATIONS

IFFT:	2K, 4K and 8K selectable (with normal or inverted spectrum - selectable)
Bandwidth:	5, 6, 7 and 8MHz selectable
Guard intervals:	1/4, 1/8, 1/16 and 1/32, selectable
Code rates:	1/2, 2/3, 3/4, 5/6 and 7/8 selectable
Interleaver:	Native or in-depth selectable
Data scrambling:	Per ETSI EN 300 744
Modulation schemes (constellations):	QPSK, 16QAM and 64QAM selectable (16QAM and 64QAM hierarchical or non hierarchical modes supported - $\alpha = 1, 2$ or 4 selectable)
Bit rate:	Up to 31.67Mb/s (according to bandwidth, constellation, guard interval and code rate settings)
Network mode:	MFN or SFN selectable (SFN mode needs GPS receiver option)
Modulator settings in SFN mode:	Manual or automatic from MIP data + adjustable additional delay in 0.1 μ S steps
Digital precorrection:	Linear (amplitude and group-delay versus frequency) and Non Linear (amplitude and phase versus level). Up to 8 stored presettings
Output level clipping:	Adjustable
Inputs:	Up to N \geq 4 MPEG/DVB Transport Streams with manual or automatic near seamless switching
Transport stream output option:	Input transport stream monitoring ASI output selectable among inputs
Output frequency:	IF 36MHz \pm 1MHz in 1Hz steps

MODULATOR INPUT INTERFACE OPTIONS (maximum #4)

ASI:	MPEG/DVB Transport Stream - 75 Ω BNC Female - 270MBit/s \pm 100ppm
DVB-S receiver:	Input: -25 to -65dBm - 75 Ω "F" Female - 950 to 2150MHz with LNB power supply; Symbol rate: 2 to 45MS/s; Code rate: 1/2 to 7/8 - automatic or manual; Roll-off: 35%
DVB-T receiver:	Input: -35 to -74/92dBm - 75 Ω "F" Female - 45 to 860MHz;
GBE (video over IP):	MPEG Transport Stream over IP reception (encapsulation as per Pro-MPEG Code of Practice #3 release 2)

GENERAL SPECIFICATIONS

Power supply:	185 to 275 Vac 50 to 60Hz or 42.5 to 60Vdc Different power supplies and tolerances available on request
Remote control interface options:	RS485; Ethernet 10/100 Base-T (SNMP support – web browser TCP/IP protocol). Please see also Network Manager documentation Remote firmware upgrade: supported
Housing:	Rack drawer 19" 3U
Operating temperature range:	0 to 45° C.
Maximum operative humidity:	90% non condensing



All specifications contained in this document may be changed without prior notice.