



CTE High Efficiency Broadband Doherty TV Transmitters



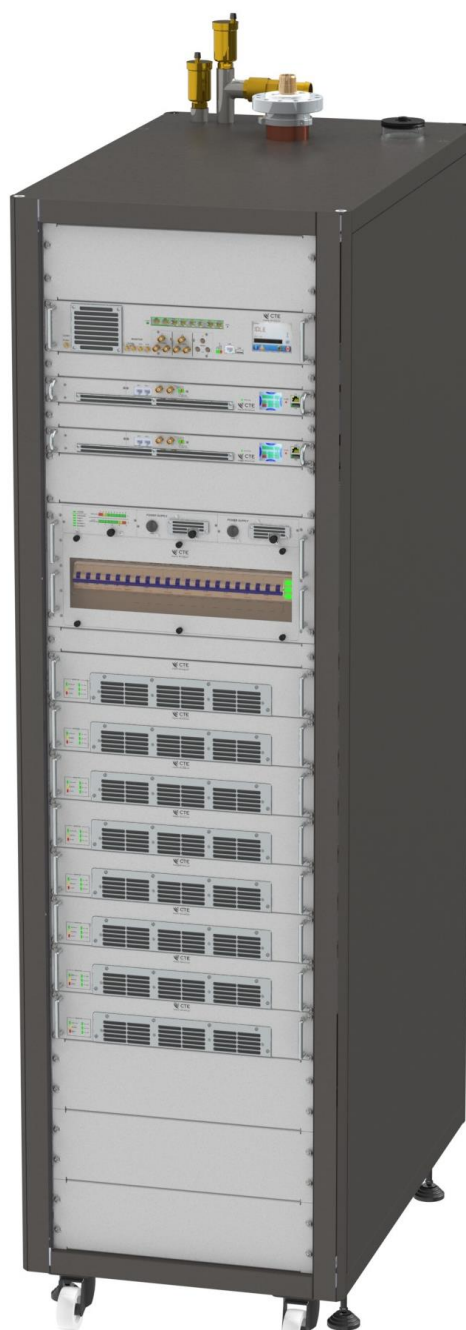
BLUETECH represents the new set of innovative ideas implemented by "CTE Digital Broadcast" both for TV and FM transmitters: energy saving, small footprint, compact design, low operating cost, long-life duration are the most important benefits granted for a more sustainable broadcasting.

CTE air and liquid cooled high power transmitter range is available in different versions with different output powers from 1500 to 12000 Wrms and from 2500 to 22500 W p.s. when operating in analogue standards.

CTE high power transmitters are composed of some main subparts:

- An exciter (dual driver as an option), with native adaptive pre-correction circuits, bringing multiple input interfaces (ASI, IP, Satellite) and on-board GPS/GLONASS receiver for accurate synchronization in SFN environments;
- Several amplifier stages (from 2 to 8 depending on the model and the output power level);
- A control and monitoring unit, with embedded change over system;
- An innovative and highly efficient Liquid cooling system (L series).
- transmitters support several digital modulation standards (DVB-T/H/T2, ISDB-T/Tb, DAB/DAB+/T-DMB, ATSC), as well as dual-cast analog operation (supporting PAL and NTSC).

CTE DB high power range obviously incorporates the innovative and distinctive engineering that has made the success of the low/medium power range of CTE DB transmitters, allowing unparalleled ease of use and maintenance.



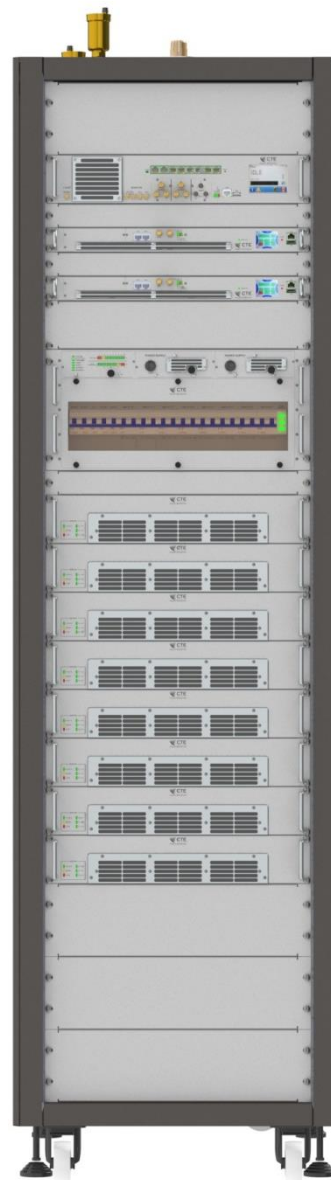


Main Features

- Compact dimensions (single 19" Rack, including output filter)
 - Output Power up to 12000 Wrms (COFDM), up to 15000W rms (ATSC) or up to 22500W p.s. (analogue)
 - High efficiency broadband or 120MHz Band amplifier technology
 - Single or Dual driver
 - PSU enhanced redundancy in Liquid series
 - DVB-T/H/T2, ISDB-T/Tb, DAB/DAB+/T-DMB, ATSC, PAL, NTSC modulations fully supported
 - Embedded Re-Multiplexer/Layer Combiner/TS to BTS (188 to 204 byte) converter for ISDB-Tb
 - Adaptive pre-correction circuits
 - On-board high stability GPS / GLONASS receiver with battery
 - Flexible input interfaces (ASI/BTS/SMPTE-310M, IP, Satellite)
 - Logic control and monitoring unit with embedded change over and switching system
- interfaces:
- 4 x ASI inputs (TS, BTS, T2MI, SMPTE-310M) + Analog input
 - 2 x ASI inputs and 2 x Gigabit Ethernet
 - 1 x DVB-S/S2 Satellite Receiver input with integrated CAM
 - 1 x RF input
- Easy connection to 1 or 2 exciters



air cooled 2600 W rms



liquid cooled 12000 W rms



ECO-Series

DTV, DAB/DAB+, T-DMB

Technical Specifications

SYSTEM

UHF digital output power:	from 1500 W to 12000 W rms @ MER 38 dB typ. (DVB, ISDB) from 2400 W to 15000 W rms (ATSC)
UHF analogue output power:	from 5000 W to 22500 W p.s.
VHF digital output power:	from 1800 W to 5000 W rms @ MER 37 dB typ. (DVB, ISDB) from 2000 W to 5500 W rms @ MER 34 dB typ. (DAB/DAB+/T-DMB) from 2500 W to 6000 W (ATSC)
VHF analogue output power:	from 4600 W to 10000 W p.s.
Configurations:	Single or dual driver
RF output connector:	7/8" (f) or 1-5/8" (f) or 3-1/8" (f) or 4-1/8" (f), EIA, 50 Ohm (according to output power and frequency band)
Frequency agility:	UHF Band IV and V or VHF Band III
Frequency resolution:	1 Hz
Pre-correction:	Adaptive
Integrated matrix circuits:	ASI/BTS/Video (dual), audio and RF BTS/ASI/Video matrix connectors: BNC (f), 75 Ohm
Audio matrix connectors:	Tini-QG "Mini XLR", 6 Pin (m), 600 Ohm

MODULATOR

DVB-T/-H/-T2

Standard:	EN300744, EN302304, EN302755 V1.3.1 (DVB-T2-Lite), TS101191, TS102773 (T2-MI), TS102034
Inputs:	4x ASI BNC (f), 75 Ohm or 2x ASI BNC (f), 75 Ohm and 2x RJ45 TSolP 10/100/1000 Switch seamless between ASI inputs. Hierarchical and not hierarchical (DVB-T)
FFT:	1K (DVB-T2), 2K, 4K, 8K, 8K ext. (DVB-T2), 16K & 16K ext. (DVB-T2), 32K & 32K ext. (DVB-T2)
Code rate:	All modes available according to the standard Block Short or Normal (DVB-T2) DVB-T: Reed-Solomon (204, 188) DVB-T2: BCH, LDPC
Guard Interval:	1/32, 1/16, 1/8, 1/4, 19/256 (DVB-T2), 19/128 (DVB-T2), 1/128 (DVB-T2)
Constellation:	QPSK, 16QAM, 64QAM, 256QAM (DVB-T2). Rotated and non-rotated (DVB-T2)
MISO processing:	Supported

ISDB-Tb

Standard:	ABNT NBR 15601, ABNT NBR 15603
Inputs:	4x ASI TS/BTS BNC (f), 75 Ohm or 2x ASI TS/BTS BNC (f), 75 Ohm and 2x RJ45 TS/BTS oIP 10/100/1000
FFT:	Mode 1 (2K), Mode 2 (4K), Mode 3 (8K)
Code rate:	1/2, 2/3, 3/4, 5/6, 7/8
Guard interval:	1/4, 1/8, 1/16, 1/32
Hierarchical modulation:	Up to 3 layers
Constellation:	QPSK, 16QAM, 64QAM
Time interleaver:	Fully supported
Partial reception:	Supported

DAB/DAB+/T-DMB

Standard:	EN 300401, ETS 300 799
Inputs:	4x ETI (NI[G703], NA5376[G704] or NA5592[G704]) BNC (f), 75 Ohm
Transmission modes:	Mode I, II, III, IV (Automatically detected from the ETI stream, or user selectable)
Operation:	MFN or SFN operations

ATSC

Standard:	A/53, A/110
Inputs:	4x ASI / SMPTE-310M BNC (f), 75 Ohm or 2x ASI / SMPTE-310M BNC (f), 75 Ohm and 2x RJ45 TS oIP 10/100/1000
Modulation:	8-VSB
Input bit rate:	19.39 Mbit/s
Bandwidth:	6 MHz
Max processing delay:	Up to 1 second (programmable)

Analogue

Standard:	B, G, D, K, M, N, I
Inputs:	Video BNC (f), 75 Ohm, audio Tini-QG "Mini XLR", 6 Pin (m), 600 Ohm
Color system:	PAL, NTSC

GPS / GLONASS

Input connector:	N (f), 50 Ohm
Input/ output 10 MHz:	BNC (f), 75 Ohm
Input/ output 1 PPS:	BNC (f), 75 Ohm
Phase noise:	-140 dBc/Hz @ 10 kHz -150 dBc/Hz @ 100 kHz
Stability:	1e-12 / 24 H with disciplined OCXO
Hold-over stability:	5 µs after 5 hours (optional 1 µs after 24 hours)

SATELLITE RECEIVER

Standard:	ETSI EN 300 421 (QPSK) (DVB-S) ETSI EN 302 307 (QPSK, 8PSK, 16APSK) (DVB-S2) ETSI EN 50083-9 (ASI) ETSI EN 50221 (Common Interface)
DVB-S2:	VCM, CCM, Multi Stream and Single Stream, Normal & Short FEC frames
Symbol rate:	1 - 45 Msym/s (DVB-S) 2 - 45 Msym/s (DVB-S2)
Constellation:	QPSK, 8PSK, 16APSK
FEC:	Automatic, all modalities available according to the standard Block Short or Normal DVB-S: Reed-Solomon (204,188) DVB-S2: BCH, LDPC
Roll-Off:	0.2, 0.25, 0.35
Input connector:	F (f), 75 Ohm
Frequency:	L-band 930÷2250 MHz
LNB control voltage:	Off, +13/18 Vdc, 22 kHz, 0.25 A (overload protection)
RF input level:	40 ÷ 100 db/µV (with attenuator)
Output connector:	BNC (f), 75 Ohm
Modality:	188 bytes
Max input bit rate:	80 Mbps (CAM limit: 72 Mbps)
CAM interface:	PCMCIA DVB-CI Common Interface
Conditional Access:	Multicrypt, Simulcrypt
CAS support:	Mediaguard, Viaccess, Irdeto, Conax, BISS with Professional multiprogram CAM (descrambling of up to 24 Elementary Streams) Betacrypt, Cryptoworks, Nagravision with standard consumer CAM (descrambling of up to 4 services)

MECHANICALS

Rack:	See table on next page (other configurations are available on request)
Width:	600 mm
Rack height:	1530 mm (30U) 1800 mm (36U) 2000 mm (40U) 2070 mm (42U)
Depth:	800 mm (see table on next page) 1000 mm (see table on next page)

CONTROLS

TFT touchscreen
Web GUI
SNMP
GPIO

ENVIRONMENTAL

Operating temperature range:	-5°C ÷ 45°C
Max. relative humidity:	90% non condensing
Max. operating altitude:	2500 m. a.s.l. (>2500 m. optional)

ELECTRICAL

Power supply:	Energy distribution system with different options: <ul style="list-style-type: none"> Line 380-400 V3N~, 50/60Hz Line 220 V3N~, 50/60Hz Line 220-240 V~, 50/60 Hz Efficiency: Up to 40% efficiency in digital (UHF models)
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NOTES

To comply with the applicable standards and limit values for the suppression of out-of-band emissions (and in the case of digital standards, also for maintaining the required shoulder distance), the transmitter may only be operated with suitable filters at the RF output.

Specifications are subject to change without notice.



ECO-Series

DTV, DAB/DAB+, T-DMB

Ordering Info

UHF Models	OUTPUT POWER				Number of amplifiers	19" Rack cabinet height	19" Rack cabinet depth
	COFDM (rms)		ATSC (rms)	ATV (p.s.)			
	UHF Broadband	15 channels Band					
AIR COOLING							
<i>ECO-1500</i>	1500 W	1500 W	2400 W	5000 W	2	30U	800mm
<i>ECO-2300</i>	2300 W	2500 W	3500 W	7500 W	3	36U	800mm
<i>ECO-2600</i>	2600 W	3000 W	4000 W	5000 W	2	30U	1000mm
<i>ECO-3200</i>	3200 W	3500 W	4800 W	10000 W	4	40U	800mm
<i>ECO-4000</i>	3900 W	4500 W	6000 W	7500 W	3	36U	1000mm
<i>ECO-5000</i>	5000 W	6000 W	8000 W	10000 W	4	40U	1000mm
LIQUID COOLING							
<i>ECO-3000L</i>	3000W	3000 W	4000 W	7500 W	2	36U	1000mm
<i>ECO-4500L</i>	4500W	4500 W	6000 W	11500 W	3	36U	1000mm
<i>ECO-6000L</i>	6000W	6000 W	8000 W	15000 W	4	36U	1000mm
<i>ECO-9000L</i>	9000W	9000 W	11500 W	22500 W	6	42U	1000mm
<i>ECO-12000L</i>	12000W	12000 W	15000 W	-	8	42U	1000mm

VHF Models	OUTPUT POWER				Number of amplifiers	cabinet height	cabinet depth
	COFDM (rms)		ATSC (rms)	ATV (p.s.)			
	DVB/ISDB	DAB/DAB+					
AIR COOLING							
<i>ECO-1800V</i>	1500 W	2000 W	2500 W	4600 W	2	30U	800mm
<i>ECO-2500V</i>	2500 W	3000 W	3000 W	5000 W	2	30U	800mm
<i>ECO-2700V</i>	2700 W	3000 W	3800 W	6500 W	3	36U	800mm
<i>ECO-3600V</i>	3600 W	4000 W	5000 W	9000 W	4	40U	800mm
<i>ECO-3800V</i>	3800 W	4500 W	4500 W	7500 W	3	36U	800mm
<i>ECO-5000V</i>	5000 W	5500 W	6000 W	10000 W	4	40U	800mm

Options

Options	
2	Dual redundant exciter
G	GPS / GLONASS integrated receiver
KA	26 dB LNA GPS / GLONASS antenna including mounting kit and 25 mt. coaxial cable
S	DVB-S/S2 integrated receiver board, single and multistream, with CAM slot
IA	Additional input board, 4x ASI
IG	Additional input board, 2x ASI + 2x GbE
R	Additional input board, RF in
L	Software option for ISDB-Tb Remux/Layer Combiner/TS to BTS (188 to 204 byte) converter
T	Dual-cast software option, adds DVB-T modulation
T2	Dual-cast software option, adds DVB-T2 modulation
I	Dual-cast software option, adds ISDB-T modulation
AT	Dual-cast software option, adds ATSC modulation
P	Dual-cast software option, adds PAL modulation
N	Dual-cast software option, adds NTSC or PAL-M modulation