Multichannel Series

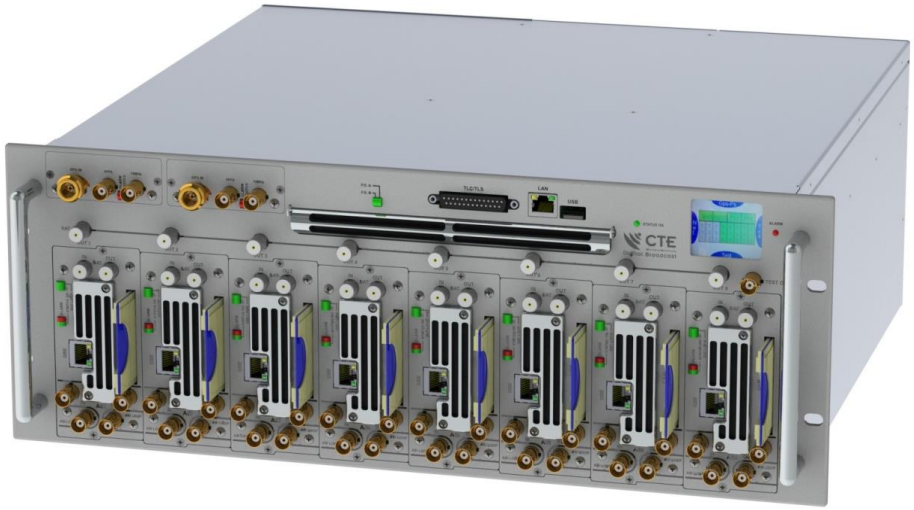
DTV, DAB/DAB+,T-DMB

CTE MTS Multi-channel TV Transmitter

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 MTS is an innovative multi-channel transmitter which introduces the “Castsharing” concept.

In today’s broadcast ecosystem and scenario, main broadcasters, network operators or even municipalities operate not only one but several DTV channels. But when it comes to investment in network infrastructure (CAPEX) or future operation of such network (OPEX), the bill can become quite expensive, and the investment almost impossible to overcome when high DTV penetration is required.



In a single 4U 19” Rack, MTS Multichannel combines up to 7+1 (or 6+2) low power separate transmitter modules (DVB-T/H/T2, ISDB-Tb, ATSC, DAB/DAB+/T-DMB), each of them equipped with various input interfaces (Satellite Receiver, ASI, Gigabit Ethernet or RF).

A clever system of internal matrix has been implemented, so a spare transmitter module automatically takes the lead in case one fails, ensuring a full redundancy management to the system. Embedded Satellite multi-switch, dual redundant hot swappable GPS / GLONASS receivers and power supplies secure the system operation in any situation.
Instead of investing into several separate transmitter units, as well as complex and costly redundancy management systems, broadcasters or network operators can now simply invest into a single 4U 19” rack MTS transmitter and operate up to 7 channels in one compact box.

Description	
MTS-C1	Base chassis, 4U, 8 slots to be fitted with plug-in transmitters for n+1 or N+2 systems, 1 power supply, 1 GPS receiver and RF output matrix
MTS-15U	15Wrms UHF Digital TV transmitter plug-in 1xASI + 1xGbE inputs, ASI matrix included
MTS-15R	15 W rms UHF Digital TV transposer/gap-filler plug-in with echo canceller

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Main Features

- Compact 4U 19” Rack chassis
- Up to 7+1 transmitter modules (output power: 15W per module)
- Several Input interfaces for each transmitter module:

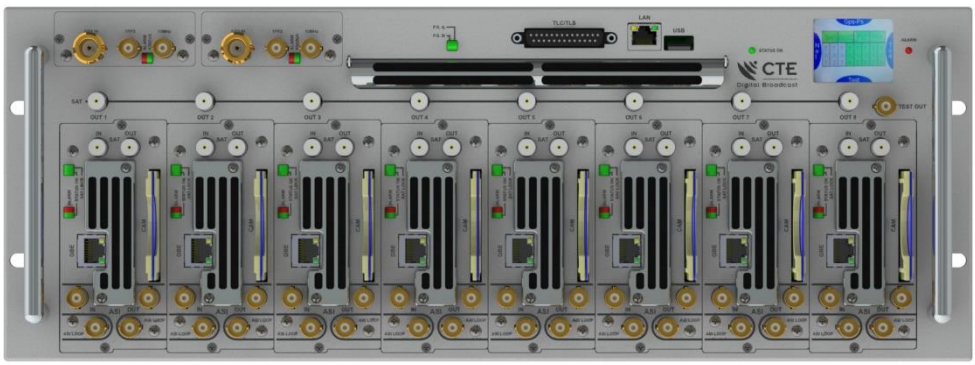
· 1 x ASI input (TS, BTS, T2MI, SMPTE-310M)

· 1 x GbE port (TS over IP)

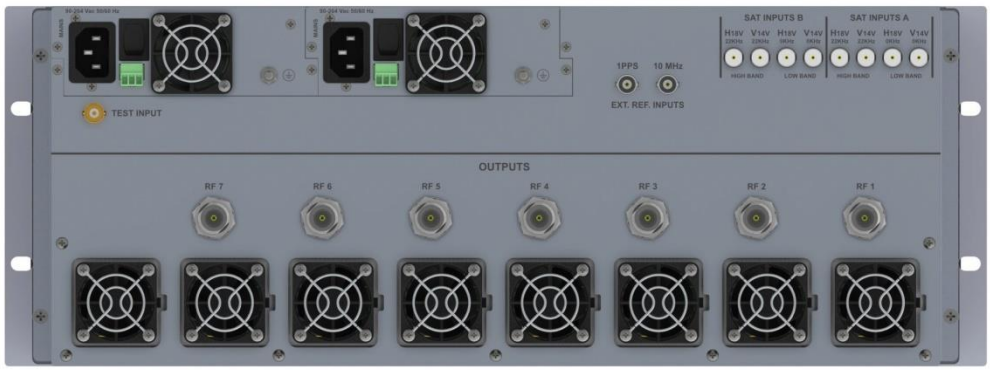
· Optional: 1 x DVB-S/S2 Satellite Receiver input (including CAM interface and multi-stream capabilities)

· Optional: 1 x RF receiver input for repeater/gap-filler configuration

- DVB-T/H/T2, ISDB-T/Tb, DAB/DAB+/T-DMB, ATSC modulations fully supported
- Embedded ASI and RF Matrix for redundancy management of each transmitter module
- Embedded Re-Multiplexer/Layer Combiner/TS to BTS (188 to 204 byte) converter for ISDB-Tb
- Adaptive pre-correction circuits
- 2 x hot swappable high stability GPS / GLONASS receivers with battery
- 2 x hot swappable power supplies
- SNMP, Web Interface and Touch Screen display



front view 7+1 or 6+2 configuration



rear view

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Technical Specification

CONFIGURATION

Number of TX slots: 8 hot-swappable
Protection: N+1, N+2, N+1+M+1

TRANSMITTERS

Output power: 15 W rms per channel (up to 7 channels) @ MER > 36 dB
Frequency agility: UHF Band IV and V or VHF Band III
Frequency resolution: 1 Hz
Pre-correction: Adaptive
RF connector: N (f), 50 Ohm

MODULATOR

DVB-T/-H/-T2

Standard: EN300744, EN302304, EN302755 V1.3.1 (DVB-T2-Lite), TS101191, TS102773 (T2-MI), TS102034
Inputs: ASI BNC (f), 75 Ohm and RJ45 TS oIP 10/100/1000. Hierarchical and not hierarchical (DVB-T, using TS oIP input)
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 (T2)
MISO processing: Supported

ISDB-Tb

Standard: ABNT NBR 15601, ABNT NBR 15603
Inputs: ASI TS/BTS BNC (f), 75 Ohm and 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: 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: ASI / SMPTE-310M BNC (f), 75 Ohm and 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

SATELLITE RECEIVER (Option)

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)

REPEATER / GAP FILLER

RF Input

Signal type: One DTV channel (DVB-T/H/T2, ISDB-T/Tb, ATSC)
Frequency range: 170 ÷ 862 MHz (agile tuning)
Sensitivity: -75 ÷ -15 dBm (-75 ÷ 0 dBm if regenerative transp.)
Selectivity : > 60 dB ± 4.2 MHz
NF (Pi=-50 dBm): < 6 dB
Conversion type: Direct Base Band Conversion (Zero IF)
Return losses: > 15 dB
Connector: N (f), 50 Ohm

Echo Canceller

Cancellation level: 40 dB, typical
Cancellation window: 20 µs
cancellation window: 2.4 µs (time shift from 10 to 500 µs)
Doppler cancellation: yes
Max. echo/signal ratio: +15 dB (over the main signal), typical
Total delay: < 10 µs

MECHANICALS

Chassis: 4U rack 19"
Width: 482 mm
Height: 177 mm
Depth: 420 mm without fans
Weight: 25 Kg

CONTROLS

TFT touchscreen
Web GUI
SNMP
GPIO

ENVIRONMENTAL

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

ELECTRICAL

Power supply: Single Phase 100÷240 V~ 50/60 Hz, IEC320 C14 Plug
Double redundant power sup.: Hot-swappable (optional)
Maximum consumption: 750 W with 8 slots at maximum power

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.

Options

Options	
A	Redundant power supply, hot-swappable unit
G2	Redundant 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
MS	DVB-S/S2 integrated input matrix for N+1 or N+2 configurations
MR	RF integrated input matrix for N+1 or N+2 configurations
RM	RF integrated receiver board for transposer/gap-filler operations
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