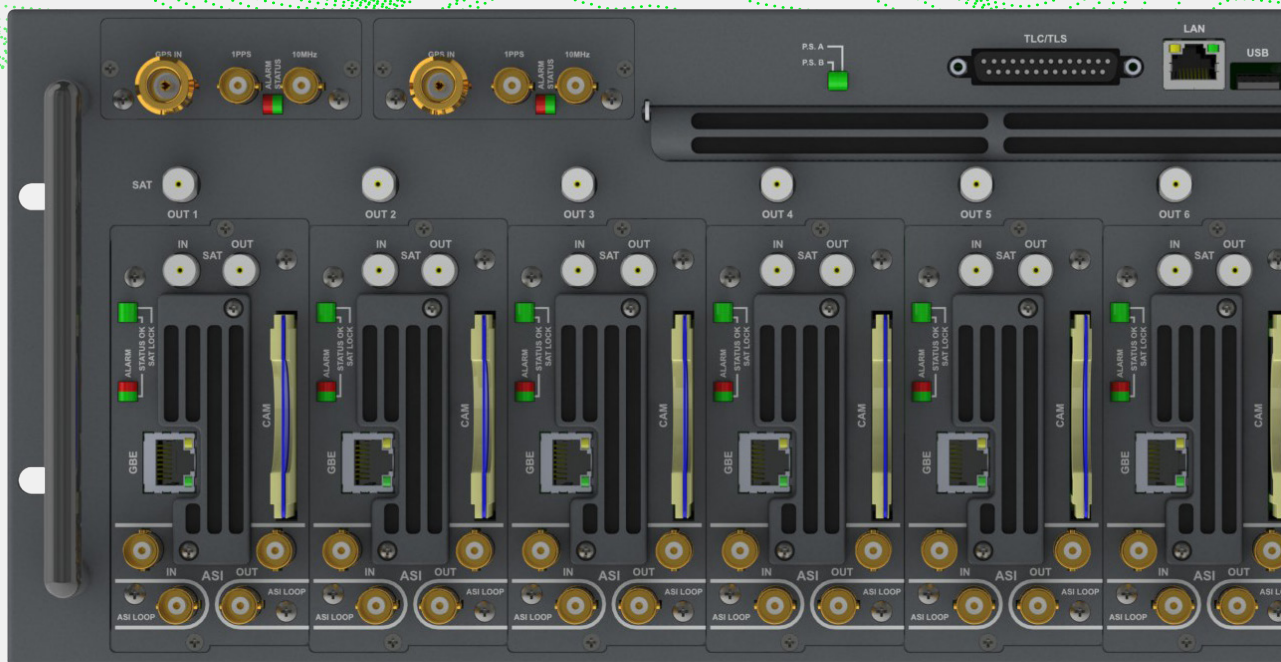


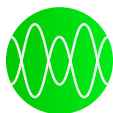
RFE

MAKING
BROADCAST
SMARTER

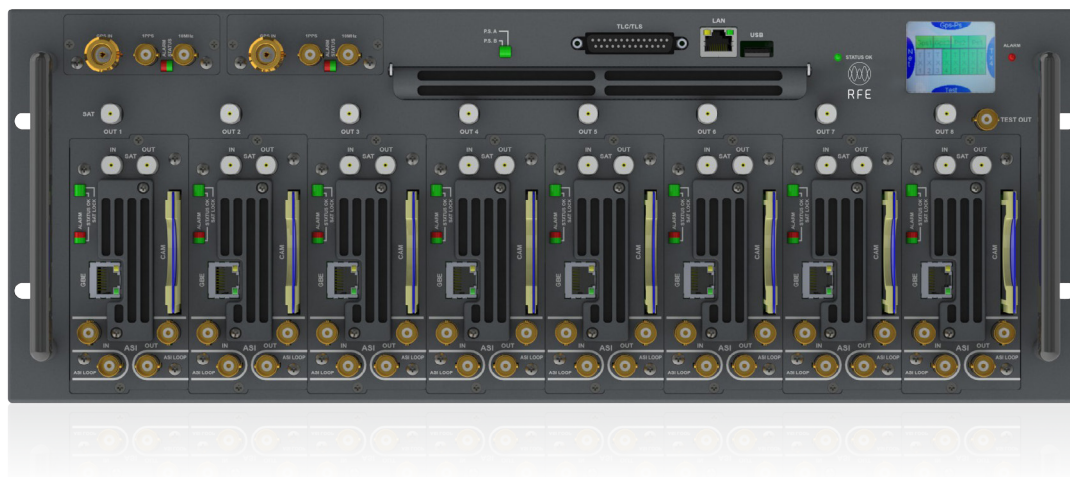
Tv Transmitter MT Series

MT SERIES





TV Transmitter MT Series



PRODUCT DESCRIPTION

MT is an innovative multi-channel transmitter which introduces the “Cast-sharing” 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, MultiTastic combines up to 7+1 (or 6+2) transmitter modules (DVB-T/H/T2, ISDB-Tb, ATSC, DAB/DAB+/T-DMB), each of them equipped with various input interfaces (Satellite Receiver, ASI, ETI, EDI, Gigabit Ethernet or RF).

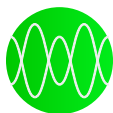
A clever system of internal matrix has been implemented, so a spare transmitter module automatically takes the lead in case one fails, ensuring a full redundancy management to the system. RF amplification system can be independent per each transmitter or also common, with redundant final amplifier (MT C2) in case of adjacent channels.

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 MT transmitter and operate up to 7 channels in one compact box.

MAIN FEATURES

- Compact 4U 19” Rack chassis
- Up to 7+1 transmitter modules
- Output power: 15W per module or 100W total (MT C2 - adjacent channels)
- Common amplification version (for adjacent channels) does not require external combiner
- Redundant and hot-pluggable RF amplifier in C2 versions
- Several Input interfaces for each transmitter module:
 - 1 x ASI input (TS, BTS, T2MI, SMPTE-310M, ETI)
 - 1 x GbE port (TS over IP or EDI)
 - 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





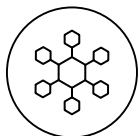
Software Energy Saving

Energy and time saving through RFE smart software, directly installed on the Transmitter: the innovative firmware ensuring easy control and high performance.



Evolution Touch

Quick and intuitive control of the Transmitter thanks to the full colour touch screen, an easy-to-use LCD display installed on the device front panel.



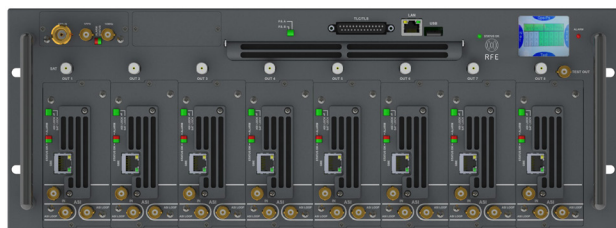
Multiple Interface

Different television standards, being either analogue or digital, implemented on the same TV Transmitter, extending broadcasting operation.

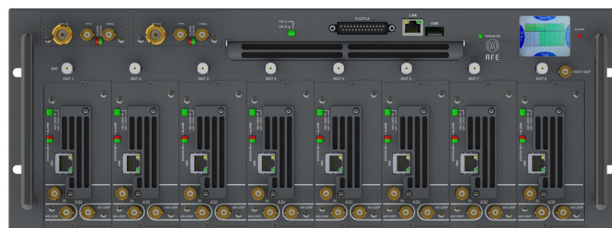


Cast Sharing

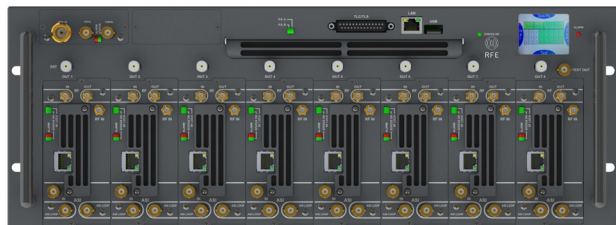
Many possibilities in just one device: combining two digital television standards, or an analogue standard with a digital one, through a dedicated software.



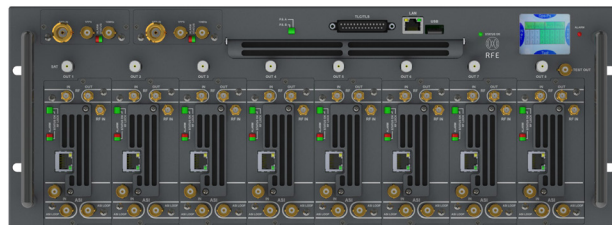
MT transmitter + 1 GPS / GLONASS receiver



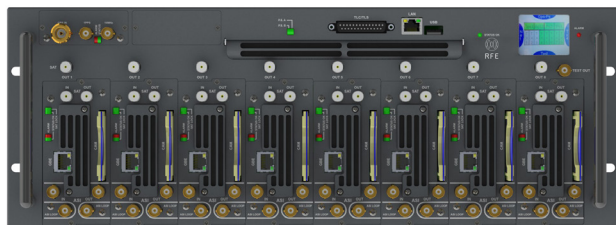
MT transmitter + 2 GPS / GLONASS receivers



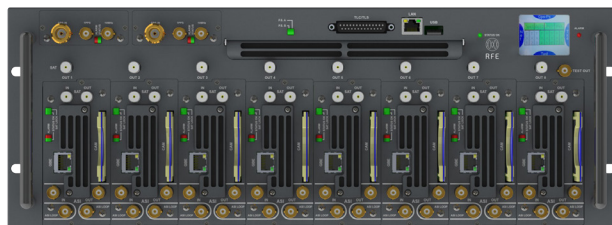
MT repeater + 1 GPS / GLONASS receiver



MT repeater + 2 GPS / GLONASS receivers

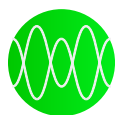


MT with satellite receiver + 1 GPS / GLONASS receiver



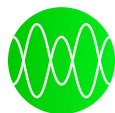
MT repeater + 2 GPS / GLONASS receivers





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 (C1 version) 100 W rms total in common amplification mode (C2 version)
	Frequency agility	UHF Band IV and V or VHF Band III
	Frequency resolution	1 Hz
	Pre-correction	Adaptive
	RF connector	N (f), 50 Ohm
	RF amplifier	Redundant and hot-pluggable in C2 versions
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 (DVB-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 EDI (ETSI TS 102 693) RJ45 10/100/1000
	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

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 CA mode (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.)

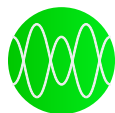
REPEATER
RF Input

Signal type	One DTV channel [DVB-T/H/T2, ISDB-T/Tb, ATSC]
Frequency range	170 ÷ 862 MHz (continuous tuning)
Sensitivity	-75 ÷ 15 dBm
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

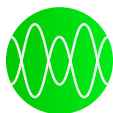
Cancellation level	40 dB, typical
Cancellation window	20 μs
Selective cancellation window	1.6 μs (time shift from 2 to 820 μs)
Doppler cancellation	yes
Maximum echo/signal ratio	+15 dB (over the main signal), typical
Total delay	< 10 μs





GPS / GLONASS	Input connector	N [f], 50 Ohm
	Input/Monitor output 10 MHz	BNC [f], 75 Ohm
	Input/Monitor 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)
MECHANICAL	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 range	-5°C ÷ 40°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 supply	Hot-swappable (optional)
	Maximum consumption	750 W with 8 slots at maximum power
NOTES	<p>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.</p> <p>Specifications are subject to change without notice.</p>	





DESCRIPTION

Base chassis, 4RU, 8 slots, to be fitted with Multitastic plug-in transmitters for N+1 or N+2 configurations, including 1 power supply, 1 GPS / GLONASS receiver and RF output matrix.

15 W rms UHF Digital TV transmitter plug-in, 1x ASI + 1x GbE inputs, including ASI matrix

15 W rms UHF Digital TV transposer/gap-filler plug-in with echo canceller

Base chassis, 4RU, 8 slots, to be fitted with Multitastic plug-in modulators for N+1 or N+2 configurations, including 1 power supply, 1 GPS / GLONASS receiver, 1 RF wideband amplifier and RF output matrix.

Digital TV modulator plug-in, 1x ASI + 1x GbE inputs, including ASI matrix

Digital TV transposer/gap-filler plug-in with echo canceller

OPTION

Redundant power supply, hot-swappable unit

Redundant RF wideband hot-swappable amplifier and combining module (C2 versions only)

Redundant GPS / GLONASS receiver plug-in board

26 dB LNA GPS / GLONASS antenna including mounting kit and 25 mt. coaxial cable

DVB-S/S2 integrated receiver board, single and multistream, with CAM slot

RF integrated receiver board for transposer/gap-filler operations

DVB-S/S2 integrated input matrix for N+1 or N+2 configurations

RF integrated input matrix for N+1 or N+2 configurations

Software option for ISDB-Tb Remux/Layer combiner/ TS to BTS (188 to 204 byte) converter

Dual-cast software option, adds DVB-T modulation

Dual-cast software option, adds DVB-T2 modulation

Dual-cast software option, adds ISDB-T modulation

Dual-cast software option, adds ATSC modulation

MODEL

MT C1

MT 15U

MT 15R

MT C2

MT T

MT R

Opt. A

Opt. R2

Opt. G2

Opt. KA

Opt. S

Opt. RM

Opt. MS

Opt. MR

Opt. L

Opt. T

Opt. T2

Opt. I

Opt. AT



MT C1 back panel with double redundant power supply

