

RFE

MAKING
BROADCAST
SMARTER

DAB Transmitter TS Compact

TS COMPACT SERIES



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PRODUCT DESCRIPTION

DAB Transmitter TS Compact



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TS Compact is an all-in-one transmitter, fully supporting DVB-T/H, DVB-T2, ISDB-T/Tb, DAB/DAB+/T-DMB, ATSC, PAL and NTSC modulations (dual-cast Analog and Digital is also supported), able to provide an output power up to 750W rms or up to 1200W p.s.

TS Compact comes as an ultra compact chassis available in 2U 19" rack or 3U 19" rack, with adaptive pre-correction circuits natively offered and built in GPS / GLONASS receiver for accurate synchronization and SFN operations.

Different input interfaces can be configured (Satellite Receiver, ASI, ETI, EDI, Gigabit Ethernet or RF), which makes TS Compact the perfect flexible platform to cover the different applications of any Digital network (terrestrial or satellite fed transmitter, re-generative repeater, on channel gap-filler, transposer, etc.).

For the South American ISDB-Tb market, OneCompact combines Satellite Receiver, Re-Multiplexer/Layer Combiner/TS to BTS (188 to 204 byte) converter and Transmitter in a single box.

MAIN FEATURES

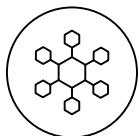
- Compact 2U 19" Rack chassis or 3U 19" Rack chassis
- Output Power up to 750W rms in digital or up to 1200 W p.s. in analogue
- High efficiency wideband or broadband amplifier technology both in UHF and VHF bands
- DVB-T/H/T2, ISDB-T/Tb, DAB/DAB+/T-DMB, ATSC, PAL, NTSC, NICAM modulations fully supported
- Embedded Re-Multiplexer/Layer Combiner/TS to BTS (188 to 204 byte) converter for ISDB-Tb
- Adaptive pre-correction circuits
- Powerful echo canceller when TS Compact is used as an on-channel repeater
- Optional internal demodulator with equalizer for regenerative transposers
- Equalized Digital On-Channel Repeater (Spectrum Restorer) configuration available
- On-board high stability GPS / GLONASS receiver with battery
- Flexible input interfaces:
 - 4 x ASI inputs (TS, BTS, T2MI, SMPTE-310M) + Analog input
 - 2 x ASI inputs and 2 x Gigabit Ethernet
 - 4 x ETI or 2 x ETI + 2 x EDI inputs
 - 1 x DVB-S/S2 Satellite Receiver input
 - 1 x RF input
- SNMP, Web Interface and Touch Screen display





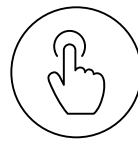
Software Energy Saving

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



Multiple Interface

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



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.



TS Compact H transmitter dual cast (ASI and analog inputs)



TS Compact R or P transmitter dual cast (ASI and analog inputs)



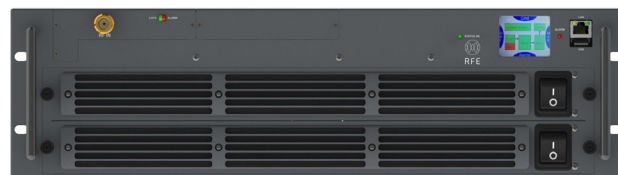
TS Compact H transmitter IP and ASI (or ETI) inputs



TS Compact R or P transmitter IP and ASI (or ETI) inputs



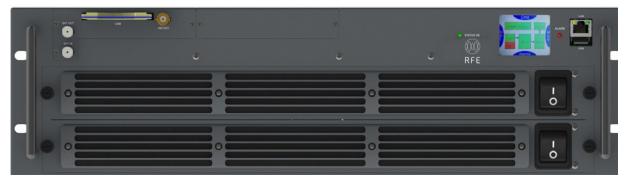
TS Compact H transposer or Spectrum Restorer (EDOCR)



TS Compact R or P repeater or Spectrum Restorer (EDOCR)



TS Compact H with satellite receiver



TS Compact R or P with satellite receiver

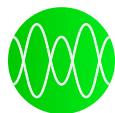


TS Compact H with satellite receiver, IP and ASI (or ETI) inputs



TS Compact R or P with satellite receiver, IP and ASI (or ETI) inputs





TRANSMITTERS

UHF digital output power	up to 650 W rms @ MER 38 dB typ. [DVB, ISDB] up to 750 W rms [ATSC]
UHF analogue output power	up to 1200 W p.s.
VHF Digital output power	up to 700 W rms @ MER 37 dB typ. [DVB, ISDB] up to 700 W rms @ MER 34 dB typ. [DAB/DAB+/T-DMB] up to 900 W rms [ATSC]
VHF analogue output power	up to 1500 W p.s.
Frequency agility	UHF Band IV and V or VHF Band III
Frequency resolution	1 Hz
Pre-correction	Adaptive
RF connector	7/16 (f), 50 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 TS oIP 10/100/1000 Seamless switch between any input 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 Seamless switch between any input
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 or 2x ETI BNC (f), 75 Ohm + 2x EDI [ETSI TS 102 693] J45 10/100/1000. Seamless switch between any input
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 Seamless switch between any input
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
Integrated NICAM encoder	Available

**SATELLITE
RECEIVER
(OPTION)**

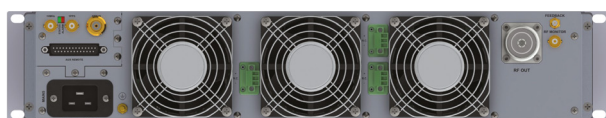
Standard	ETSI EN 300 421 (QPSK) [DVB-S] ETSI EN 302 307 (QPSK, 8PSK, 16APSK) [DVB-S2] ETSI EN 50083-9 (ASI) ETSI EN 50221 [Common Interface]
DVB-S2	VCM, CCM, Multi Stream and Single Stream, Normal & Short FEC frames
Symbol rate	1 - 45 Msym/s [DVB-S] 2 - 45 Msym/s [DVB-S2]
Constellation	QPSK, 8PSK, 16APSK
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 μ V (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**

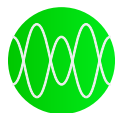
Signal type	One DTV channel [DVB-T/H/T2, ISDB-T/Tb, ATSC]
Frequency range	170 ÷ 862 MHz [agile tuning]
Sensitivity	-75 ÷ -15 dBm [-75 ÷ 0 dBm on regenerative transposers]
Selectivity	> 60 dB $\pm$ 4.2 MHz
NF [Pi=-50 dBm]	< 6 dB
Conversion type	Direct Base Band Conversion (Zero IF)
Return losses	> 15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



GPS / GLONASS (OPTION)	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:	2U rack 19" [TS Compact H] 3U rack 19" [TS Compact R and P]
	Width:	482 mm
	Height:	871 mm [TS Compact H] 132.5 mm [TS Compact R and P]
	Depth:	460.5 mm without fans [TS Compact H] 530 mm [TS Compact R and P]
	Weight:	14 Kg [TS Compact H] 21 Kg [TS Compact R and P]
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 C20 Plug
	Efficiency:	Up to 40% efficiency in digital
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.	


TS Compact H rear panel

TS Compact R or P rear panel



UHF BAND IV & V	OUTPUT POWER ¹				Rack chassis dimensions
	COFDM [rms]		ATSC [rms]	ATV [p.s.]	
	Broadband	Wideband			
MODEL					
TS Compact hul	200 W	200 W	300 W	600 W	2 HU 19"
TS Compact HU	350 W	400 W	400 W	600 W	2 HU 19"
TS Compact RU	350 W	400 W	600 W	1200 W	3 HU 19"
TS Compact pU	600 W	650 W	750 W	1200 W	3 HU 19"
¹ Before bandpass filter					

¹ Before bandpass filter

VHF BAND III	OUTPUT POWER ¹				Rack chassis dimensions
	COFDM [rms]		ATSC [rms]	ATV [p.s.]	
	DVB/ISDB	DAB/DAB+			
MODEL					
TS Compact HVL	250 W	250 W	300 W	600 W	2 HU 19"
TS Compact HV	500 W	500 W	500 W	600 W	2 HU 19"
TS Compact RV	500 W	500 W	700 W	1200 W	3 HU 19"
TS Compact PV	700 W	700 W	900 W	1500 W	3 HU 19"
¹ Before bandpass filter					

¹ Before bandpass filter

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

