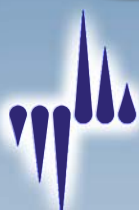


ALL UNDER ONE ROOF



TRANSRADIO – We have your Solution



TRANSRADIO
SenderSysteme Berlin



TRAM PREMIUM LINE – PURE EFFICIENCY IN ALL MODES



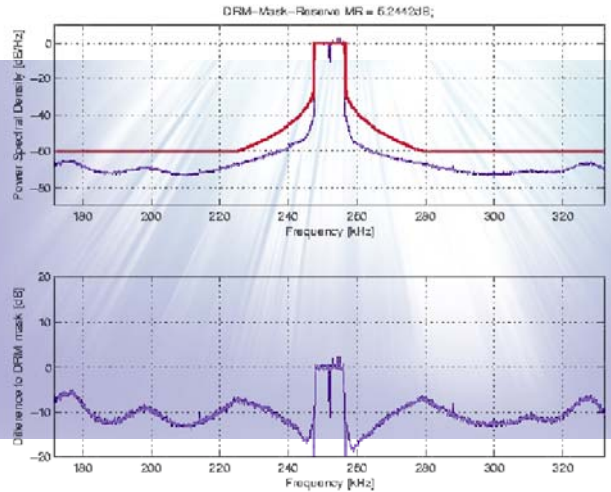
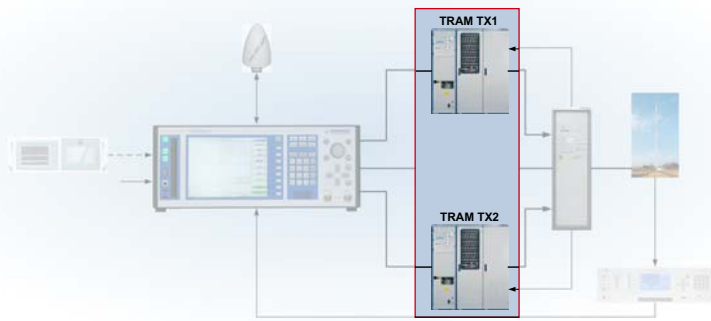
TRAM 10



TRAM 50



TRAM 100



The TRAM Premium Line – optimized for DRM Transmission

Many years of experience in the field of high power transmitters in conjunction with the latest state of the art transistor technology has paved the way for a future oriented and meanwhile well established solid state transmitter concept. As opposed to conventional transmitters the simple modular system of solid state medium wave transmitters from TRANSRADIO offers a maximum of flexibility and unsurpassed audio quality. The TRAM Premium line based on the new developed power modules secures optimized DRM parameter while achieving an outstanding overall efficiency in all operation modes.

All TRAM Premium line transmitters are optimized for digital transmission and exceed the DRM recommendations. The layout, in standard 19" racks, allows for easy and comfortable access to all components and modules and results in exceptionally low space requirement for the respective power classes. The power amplifier stage offers true modular redundancy through the use of standardized 1 kW amplifier modules. Each individual module is equipped with an on-board PDM modulator and no quantization problems occur. Designed with a high power reserve capability, each module provides full signal quality on its own.



TRAM 400



- | Outstanding efficiency and excellent performance data
- | $\geq 125\%$ positive peak programme capability
- | DAM operating mode for further energy saving (standard for all models, DCC by jumper setting)
- | Compact and service-friendly design, extremely low space requirement
- | Modular design of the power amplifiers: standard 1 kW plug-in power module, broadband over the whole MF range, no tuning of the modules is required. Integrated supervision and protection circuits are standard features.
- | All transmitters are exclusively air-cooled utilising a unique internal air-flow system. Recycled air cooling by means of air-water heat exchangers available.
- | Factory fitted and tuned to the desired operating frequency.
- | Rugged construction with emphasis placed on high mechanical strength and stability.
- | Combining stand alone transmitters by utilising an innovative paralleling unit (PU). No need for a high-power reject load.
- | TRAM Premium line transmitters are also available as long wave broadcast transmitters (150 to 300 kHz) and long wave communication transmitters (14 to 148 KHz)
- | All TRAM Premium line transmitters are optimized for digital modulation techniques such as DRM.

TRAM-transmitters, preferred models

Type

No. of 50kW- Power blocks	
No. of identical power modules	
No. of driver modules	
Output power (other power classes on request)*)	
Frequency range	LW MW

Operation modes

RF Output	Connector Load impedance VSWR
-----------	-------------------------------------

Modulation system

AF range

AF Frequency response

AF harmonic Distortion (THD)

Modulation capability

Carrier shift (amplitude drop)

RF harmonics and spurious emissions

Signal to noise ratio

Frequency stability

AF Input

Power supply

Voltage

Frequency

Voltage variations

Power factor

Power consumption

m = 0

m = 1

Overall efficiency**)

Control

Local

Remote

Environmental conditions

Temperature

Relative humidity

Installation altitude

Cooling system

Dimensions [mm]
(LW TXs require more filter racks)

Width

Depth

Height

TRAM – Essentials at a Glance

LW communication transmitters:	14 kHz to 148 kHz
LW broadcast transmitters:	150kHz to 300kHz
MW broadcast transmitters:	525 kHz to 1710 kHz
Output power range:	stand-alone version 5kW to 600 kW combined up to 2000 kW

AM TRANSMITTERS – A SECURE INVESTMENT INTO THE FUTURE

TRAM 5	TRAM 10	TRAM 25	TRAM 50	TRAM 100	TRAM 200	TRAM 300	TRAM 400	TRAM 500	TRAM 600	
			1	2	4	6	8	10	12	
5	10	24	48	96	192	288	384	480	576	
–	–	1	1	2	4	6	8	10	12	
5 kW	10 kW	25 kW	50 kW	100 kW	200 kW	300 kW	400 kW	500 kW	600 kW	
150 kHz to 300 kHz										
525 kHz to 1710 kHz										
Factory fitted and tuned to the determined operating frequency										
Components for change to other frequencies on request										
AM (A3E) – AM reduced power P/4 – DAM (X3E), i.e. dynamic carrier control – AM stereo capability, prepared for DRM										
7/8" EIA		1 5/8" EIA		3 1/8" EIA		4 1/2" EIA		6 1/8" EIA		9" EIA
50 Ω unbalanced										
VSWR < 1.3 tuneable, automatic power reduction as a result of increasing VSWR during operation										
Pulse Duration Modulation (PDM)										
30 Hz to 10 kHz										
Changeover between a maximum of 2 band limiting filters on request										
± 0.5 dB, 30 Hz to 10 kHz, with band limiting filters switched off										
≤ 1% at m = 0,8										
100% continuously, + 125% peak programme capability										
≤ 1% with voltage regulation										
Standard: according to ITU-R SM 329 or better (≤ 50mW), FCC requirements on request										
≥ 60 dB referred to 100% Modulation										
Deviation ≤ 5Hz, external synchronisation of synthesizer possible										
600 Ω balanced (can be changed inside the unit by jumper to > 2000 Ω)										
Adjustable from –10dBm to +10dBm referred to 100% modulation, switched coarse increments (5dB), fine adjustment by potentiometer										
Standard mains configuration: 3 N 400V; TN-S or TN-C, other voltages on request, TRAM 200 or higher MV supply preferred										
50Hz (60 Hz on request)										
≤ ± 5% with full performance; ≤ ± 10% with minor performance degradation										
≥ 0.9					≥ 0.95					
≤ 6.7 kW	≤ 12.2 kW	≤ 29,8 kW	≤ 57,5 kW	≤ 114,9 kW	≤ 229,9 kW	≤ 344,8 kW	≤ 459,8 kW	≤ 574,7 kW	≤ 689,7 kW	
≤ 10,0 kW	≤ 18.3 kW	≤ 44,6 kW	≤ 86,2 kW	≤ 172,4 kW	≤ 344,8 kW	≤ 517,2 kW	≤ 689,7 kW	≤ 862,1 kW	≤ 1034,5 kW	
> 75%	> 82%	> 84%	> 87%							
OFF/ON, full power/on, reduced power(P/n) – AM/DAM – selection local/remote										
Changeover between 2 AF band limiting filters – various status indications by LED										
Command input by floating contacts, same commands as for local control, indications by floating contacts										
RS 232 standard and BIT BUS, SNMP, HTML optional										
Standard: –10 °C to +50°C, other environmental temperatures on request										
maximum 95%, non-condensing										
Standard: maximum 2000 m, higher altitudes on request										
Air cooling (intake air from the room, exhaust air to the room, air duct system with blowers on request)										
600	600	1200	1800	3000	4800	6000	9600	10800	12000	
1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	
2000	2000	2000	2000	2000	2500	2500	2500	2500	2500	

*) All other power ranges on request **) with standard cooling



TRANSRADIO – RF and Power are our Strength



PARALLELING UNIT

C24

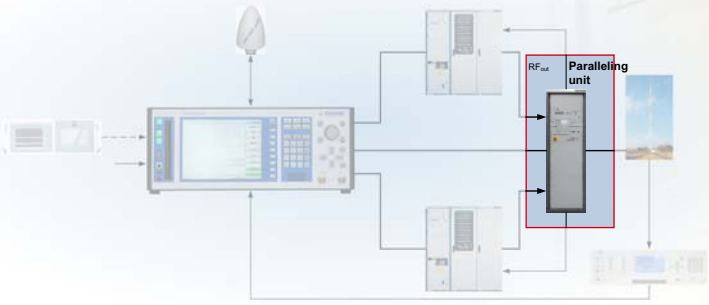


The paralleling unit (PU) serves to combine two single transmitters to double the output power. Furthermore, it provides an active redundancy system to avoid a loss of transmission during maintenance schedules.

The PU equipment contains a central control unit, a combining network and a compact balancing resistor.

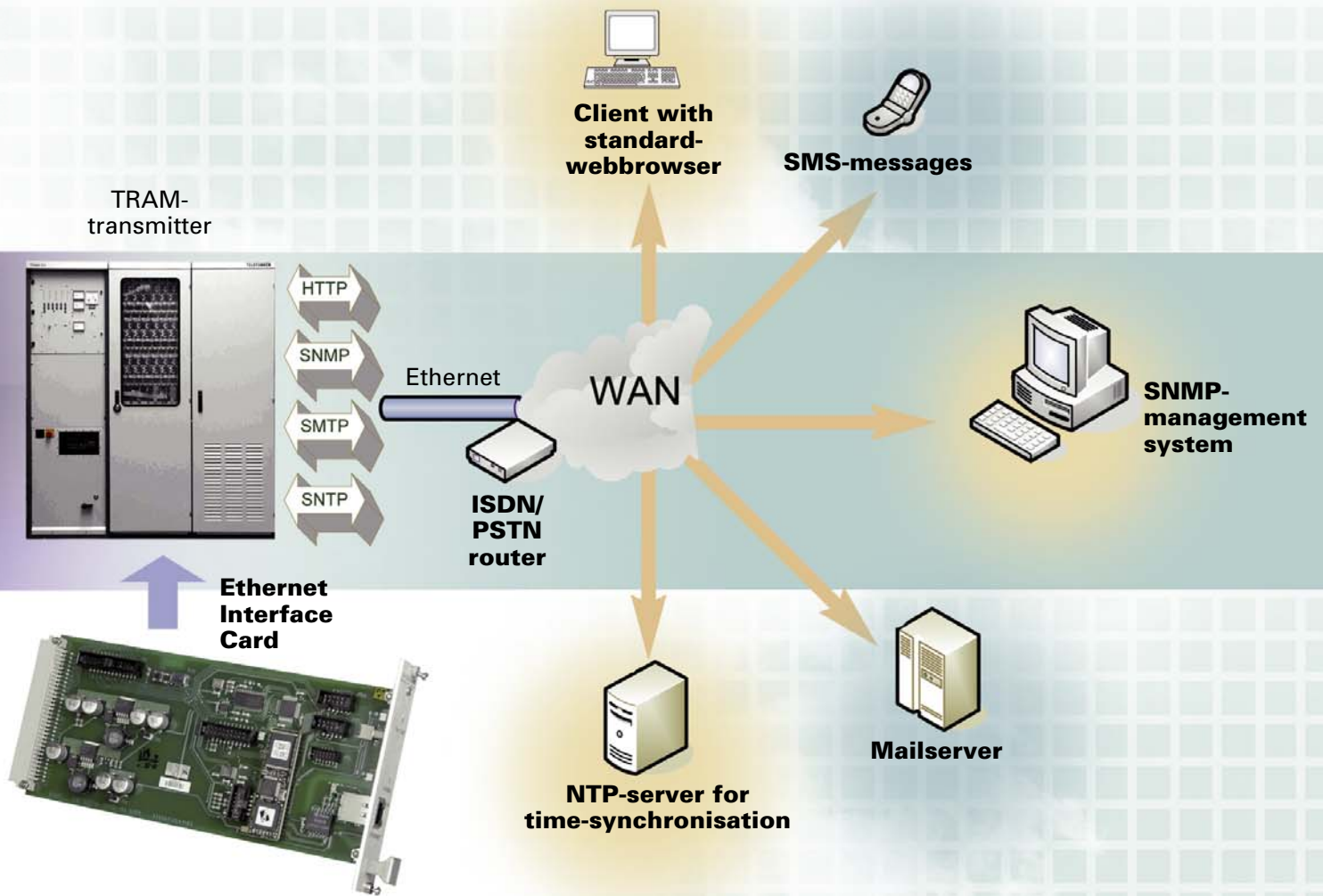
The load regulation of the central control unit ensures that both transmitters are levelled automatically to equal RF output powers and a minimum of power is lost on the balancing resistor. In the unlikely event of failure of one of the transmitters, a motorised RF switch will automatically switch the unaffected transmitter directly to the antenna and the faulty transmitter to a dummy load. The transmission continues and the faulty transmitter can be repaired whilst connected to the dummy load.

OVERVIEW



PU Control Unit

REMOTE CONTROL AND ERROR TRACKING VIA SNMP AND HTML



This function gives broadcast operators the freedom to control their equipment from any place in the world. Each individual transmitter or paralleling unit (PU) is optionally accessible via SNMP and HTML. The network access can be via dial-in (PSTN, ISDN) or Ethernet connection (TCP/IP). The web server and the SNMP MIBs (management

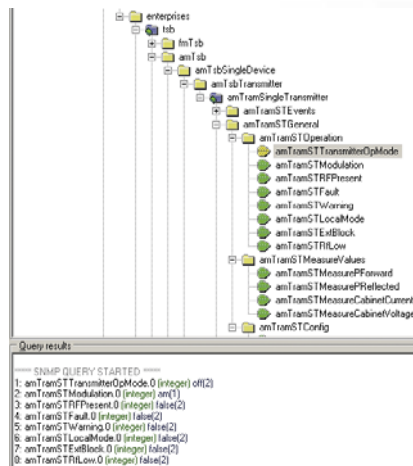
information base) offer all necessary functions to remotely control the transmitter and display failure messages.

SNMP

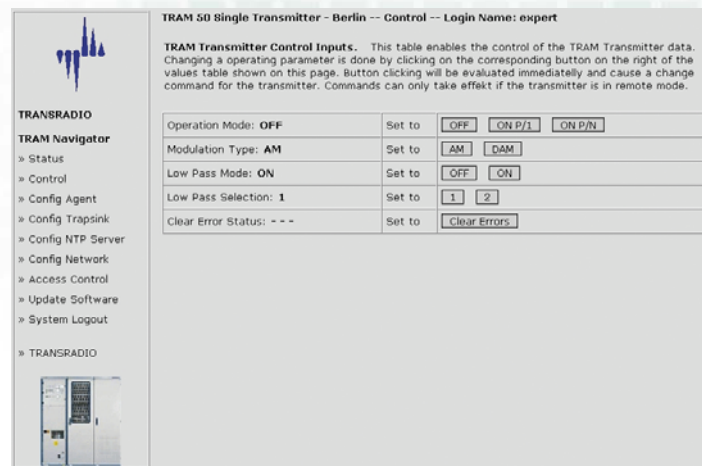
As a result of standardized SNMP-MIB implementation, the SNMP functions can be seamlessly integrated in a SNMP

management system. If a failure occurs, traps are sent by the SNMP agent. SNMP traps can be collected and presented by a central management system.

Also transmitter parameters can be modified via set commands. In addition, SMS messages and emails can be sent to the operator and the clock can be synchronized by an NTP-server.



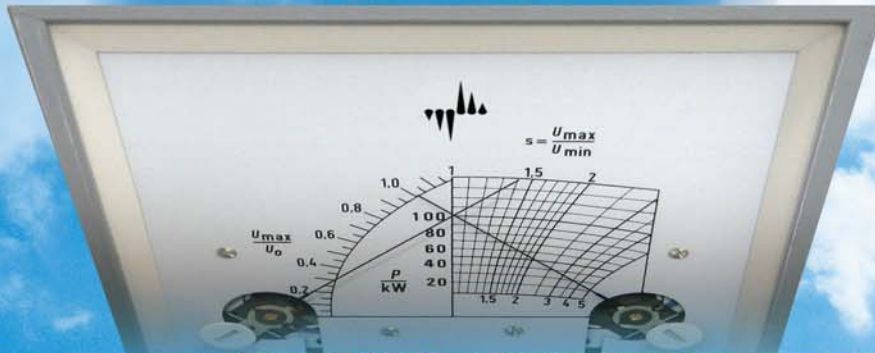
Standardized SNMP-MIB of a TRAM Transmitter



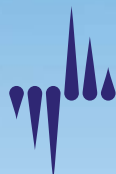
Webinterface of a TRAM Transmitter

Web Access via HTML

Based on a web server, all necessary functions of a transmitter system can be monitored and controlled by a standard browser – no proprietary software is required.



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