

2.5kW VHF/FM Transmitter U3-2.5

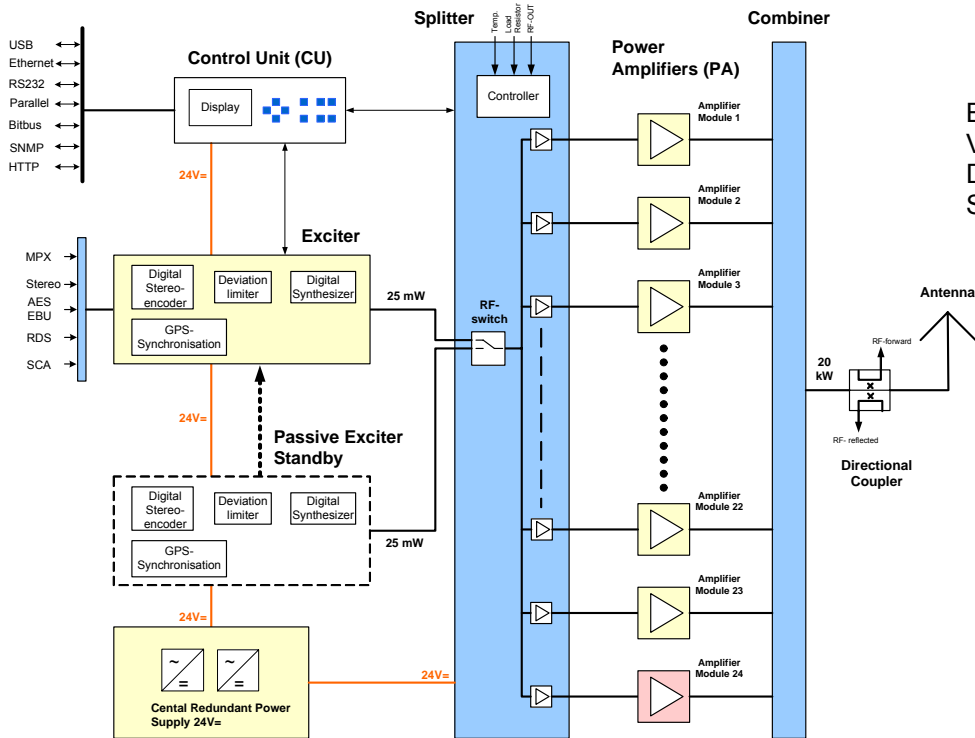
The 2.5kW VHF/FM Transmitter U3-2.5 is designed for frequency modulated broadcast, mono or stereo, in the frequency range of 87.5 to 108 MHz. The integrated digital exciter offers fully digital design and digital inputs via AES/EBU. The high-power VHF/FM transmitter family includes the power classes of 2.5kW, 5kW, 10kW and 20kW.



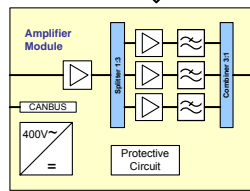
Image: 2.5kW VHF/FM transmitter U3-2.5

Features:

- Up to 20kW transmitter output power per 19" standard rack
- Fully digital exciter with digital input via AES/EBU or optional analog inputs
- Direct Digital Synthesis (DDS)
- Integrated stereo encoder with deviation limiter
- High internal redundancy; even in 2.5kW version; dual redundant 24V power supply
- Amplifier modules are hot-pluggable, only 25mW input power per module
- Each amplifier module includes its own primary power supply unit
- Low output transistor junction temperatures for a high MTBF
- Easy handling for comfortable replacement, each amplifier module weights about 15kg
- Multi-Transmitter-Option offers n+1 solutions in one 19" rack
- Integrated air-cooling up to 10kW per 19" rack
- Support of future proof function for SFN (Single Frequency Network) and Audio Network



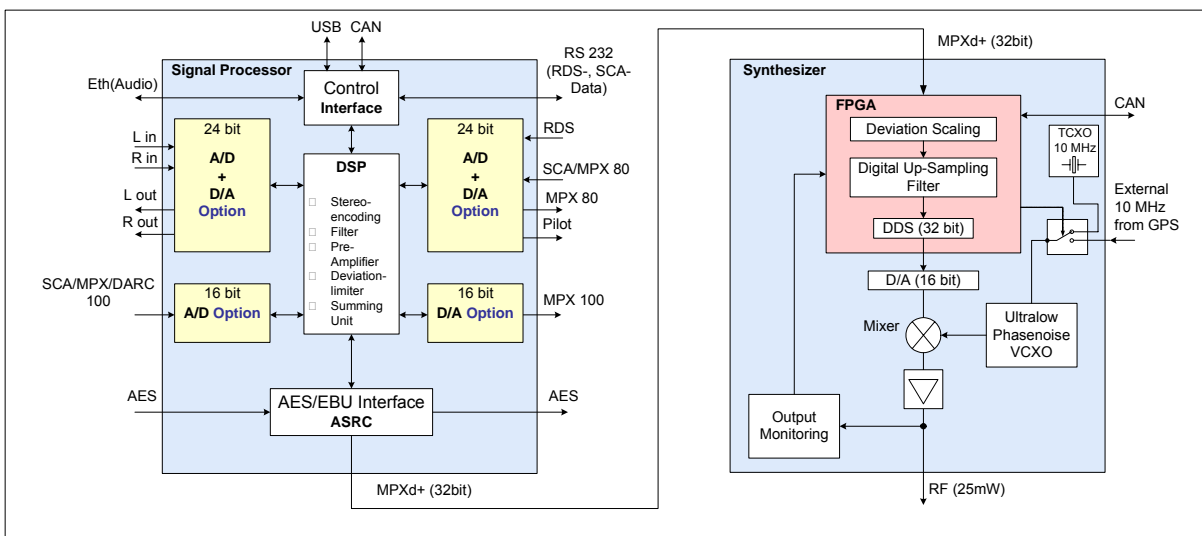
Blockdiagramm of the VHF/FM Transmitter U3 with Dual Exciter in Passive Standby



Block Diagram of the 900W Amplifier Module



Amplifier Module



Block Diagramm of the Digital Exciter

Technical Data Exciter

Typ E3420

Exciter key features

- Digital Signal Processing Blackfin® DSP / Xilinx FPGA
- PLL controlled VCXO for minimum phase noise (GPS lockable)
- Digital MPX link (MPXd+) between digital stereo encoder and digital synthesizer
- The base- version offers pure digital connectivity via AES/EBU: this may be upgraded using Feature Expansion Packs (FEP's) for additional analogue inputs (SCA,MPX, RDS)
- Preemphasis switchable off, 25, 50, or 75 us

Generic specification

24 bit Audio Converter (192kHz)

4 times oversampling 16 Bit converters
for SCA input / MPX output

Inputs

AF Inputs	- MPX (up to 100 kHz): -10 or +11.5 dBu - AES/EBU, -9 dBFS* -10 ... +8 dB (all sample rates with SRC) - Analog: + 6 dBu* -10 ... +8 dB balanced (*40kHz deviation)
RDS Input	-23...-9.5 dBu, Deviation 2...4 kHz
2 SCA Inputs	-23...-9.5 dBu, Deviation 2...4 kHz (up to 100 kHz)

Streaming Protocols (optional on request)

Deviation Limiter DGC (Digital Gain Control) with variable threshold and configurable fade-in time. Final clipper, ITU BS 412 compliance

Technical Data Transmitter

Typ T3401

Transmitter Power

Output power P_{RF}	2.5 kW
Amplifiers	3 * 900 W
Output power setting range	500 W ... 2,5 kW, continuous
Full power up to VSWR = 1.5	Thereafter down regulation of output power

Frequency

Frequency range	87.5 MHz ... 108 MHz, in 10 kHz steps
Frequency change	< 1 sec
Output frequency stability over 3 months period	< 300 Hz
Setting accuracy	< 50 Hz
Middle frequency shift during modulation	0 Hz
Warm-up time	None

Spurious Emission

Suppression of RF harmonics	< - 87 dBc
Noise power relative to carrier (2MHz offset)	< - 150 dBc/Hz

Reverse Intermodulation Products

> 15 dB

Input Impedance

> 2000 Ω or 600 Ω

Linear Distortion

Stereo cross-talk attenuation	
40 Hz ... 15 kHz	> 60 dB
Amplitude deviation	
40 Hz ... 65 kHz	± 0.05 dB
> 65 kHz ... 76 kHz	± 0.05 dB
100 kHz	± 0.05 dB
Damping of the 15 kHz low-pass	
40 Hz ... 15 kHz	< 0.1 dB
at 19 kHz	> 54 dB

Non-Linear Distortion

Distortion factor 40 Hz ... 15 kHz, at 75 kHz deviation	< 0.05 % = - 66 dB
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Selective S/N Ratio

Mono	> 80 dB
Stereo	> 78 dB

Unweighted S/N Ratio (effective peak value)

Mono	> 80 dB
Stereo	> 77 dB
AM unweighted S/N ratio, asynchronous	> 65 dB
AM unweighted S/N ratio, synchronous	> 65 dB

Weighted S/N Ratio (effective peak value)

Mono	> 75 dB
Stereo	> 72 dB
AM weighted S/N ratio, asynchronous	> 72 dB

Power Supply

Voltage range	3/N/PE 400 V -15/+10%	340 V ... 440 V
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Mains frequency	47 Hz ... 63 Hz
Typical efficiency	> 62%
cos φ	> 0.9
Recovery time following mains interruption	< 2 sec

RF output connector	7/16, 50 Ω
Number of presets	8 (program name, set power, AF- level, modulation type, deviation limiter, frequencies)

Remote interfaces	RS232, Ethernet, HTTP optional, BITBUS, SNMP or parallel
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Cooling	Air, 500m ³ /h, 350PA,
Operational in the temperature range	- 10° C ... + 45° C
Humidity	to 95 %, without dew
Dimensions W x H x D in mm	600 x 2000 x 1000
Weight	400 kg

The VHF/FM transmitter fulfils the national standards as well as the technical specifications of the ARD (5.1.0), ARD (5/ 3.1), ARD (5/3.2), the Deutschen Telekom (TS0162), (TS 0216), (TS0218), ETS 300 484, ETSI EN 302 018-2, ETSI EN 301 489-1, ETSI EN 301 489-11, ETSI EN 55011.

Quality Management System DIN EN ISO 9001
EC-R&TTE APPROVAL CERTIFICATED

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