

10kW VHF/FM Transmitter U3-10

The 10kW VHF/FM Transmitter U3-10 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.

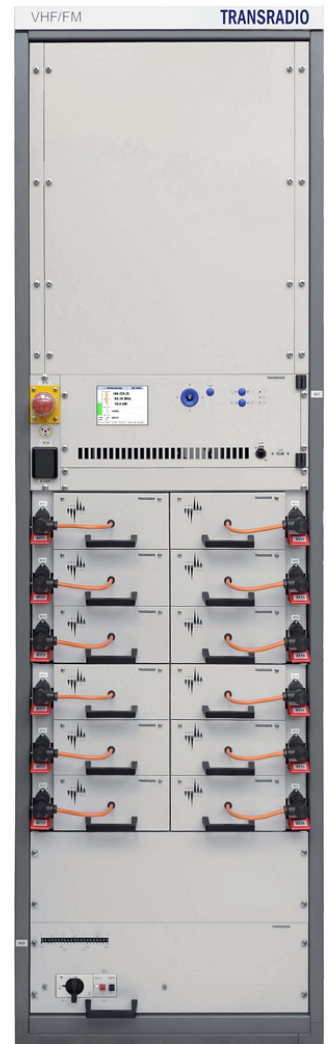
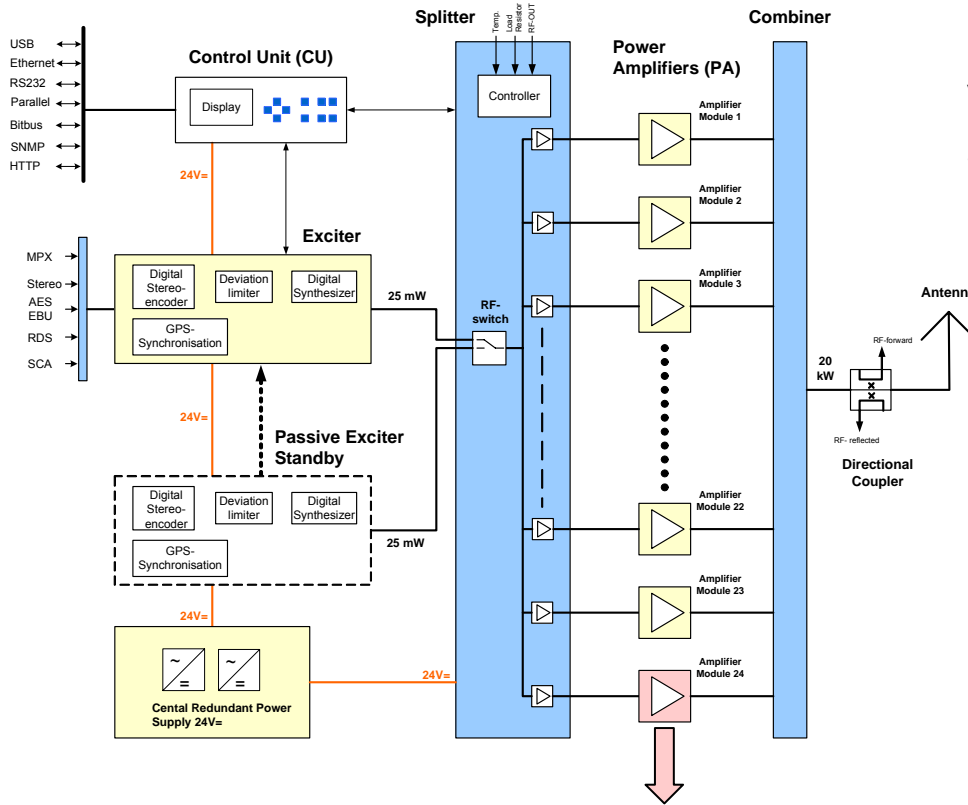


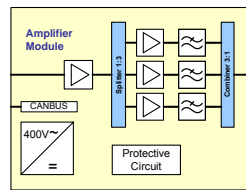
Image: 10kW VHF/FM transmitter U3-10

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 weighs 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



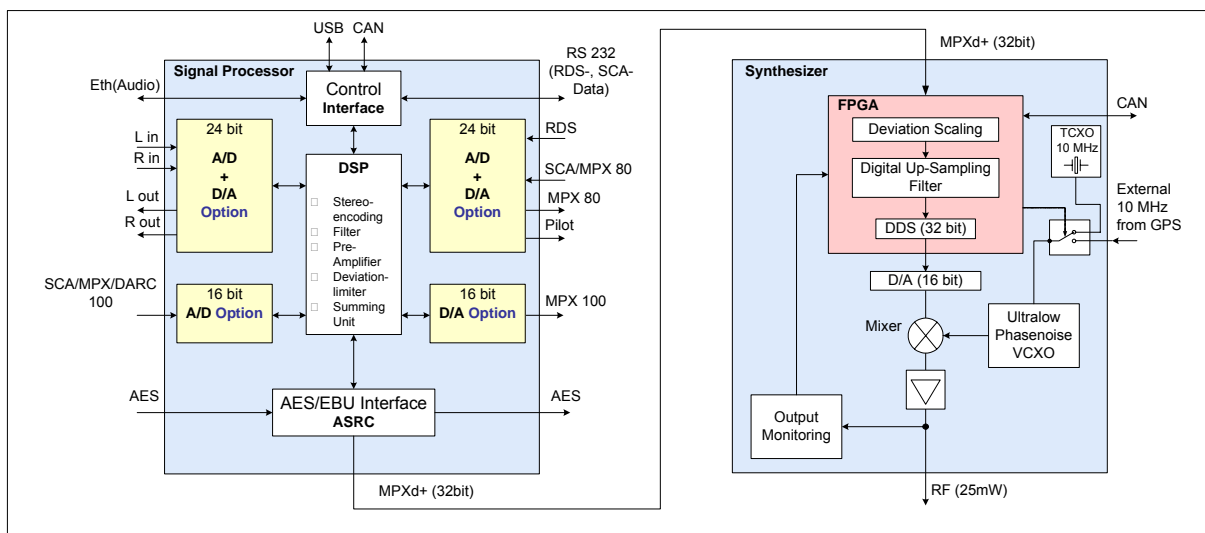
Block Diagramm of the VHF/FM Transmitter U3 with Dual Exciter in Passive Standby



Block Diagramm 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 T3403

Transmitter Power

| | |
|-----------------------------|---|
| Output power P_{RF} | 10 kW |
| Amplifiers | 12 * 900 W |
| Output power setting range | 2 kW ... 10 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 |
|---|--------------------|

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 |
| Mains frequency | | 47 Hz ... 63 Hz |
| Typical efficiency | | > 61% |
| cos φ | | > 0.9 |
| Recovery time following mains interruption | | < 2 sec |
| RF output connector | | 1 5/8" EIA, 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 |
| Cooling | | Air, 2000m ³ /h, 550PA, |
| 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 | | 650 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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