

## 5kW VHF/FM Transmitter U3-5

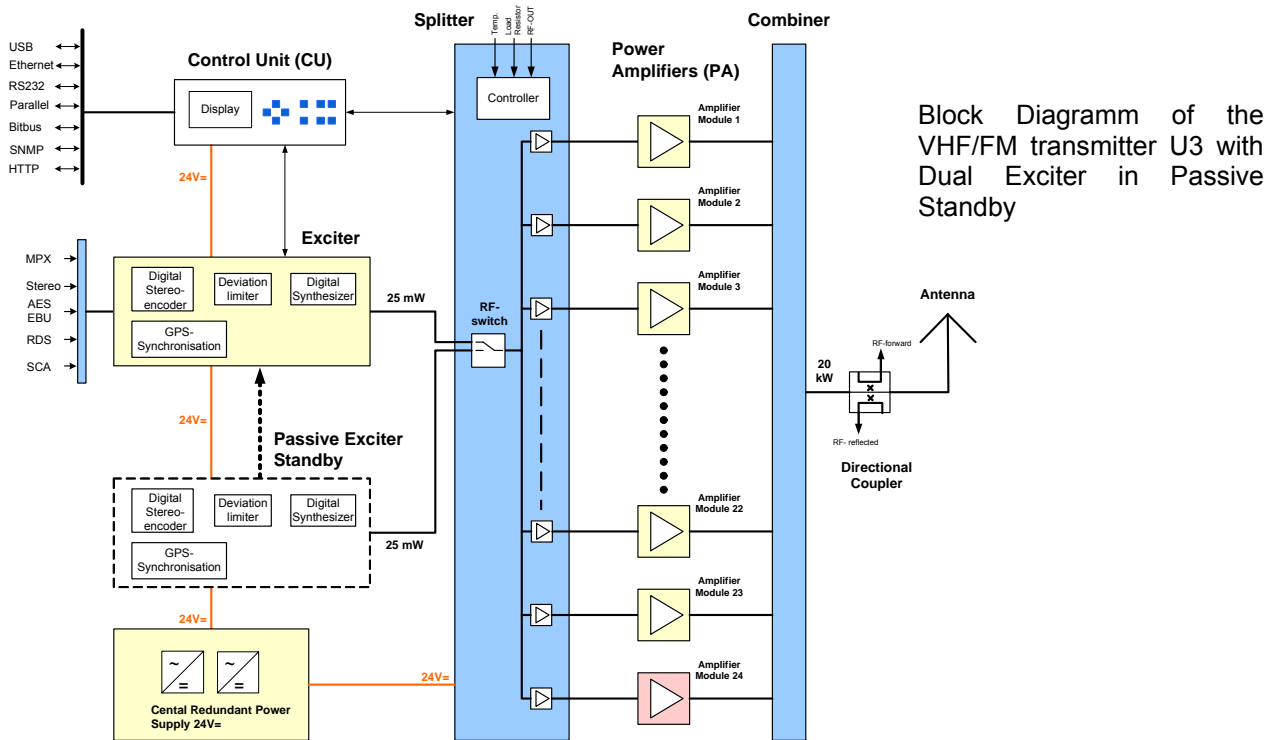
The 5kW VHF/FM Transmitter U3-5 is designed for frequency modulated broadcast, mono or stereo, in the frequency range of 87.5 to 108 MHz. The integrated digital exciter offers fully digital design and digital inputs via AES/EBU. The high-power VHF/FM transmitter family includes the power classes of 2.5kW,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



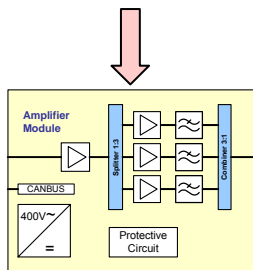
Image: 5kW VHF/FM transmitter U3-5

### 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 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



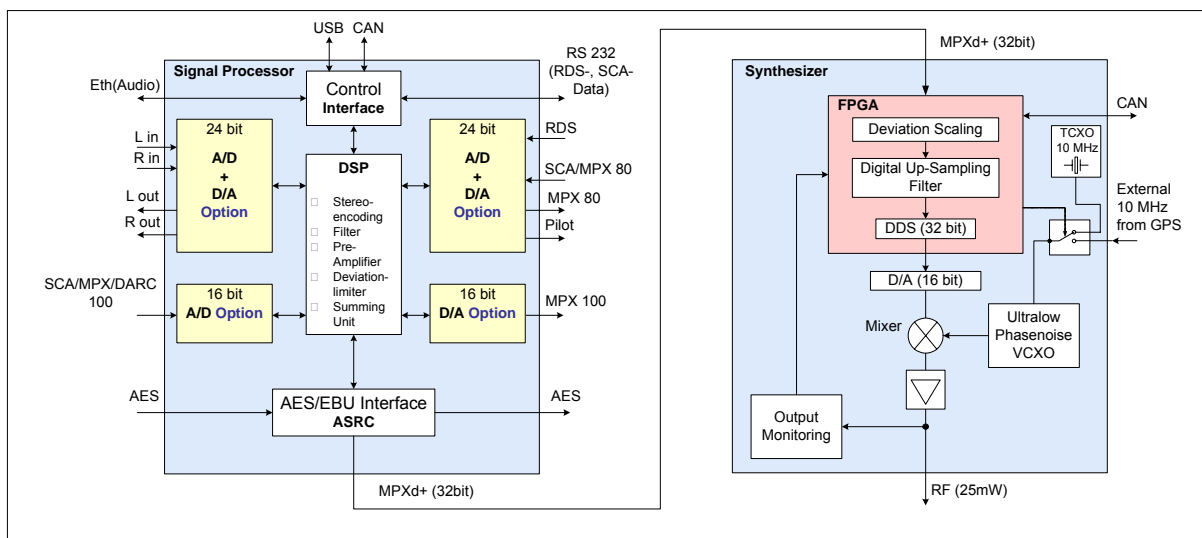
Block Diagram of the VHF/FM transmitter U3 with Dual Exciter in Passive Standby



Block Diagram of the 900W Amplifier Module



Amplifier Module



Block Diagram 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** T3402

#### **Transmitter Power**

Output power $P_{RF}$	5 kW
Amplifiers	6 * 900 W
Output power setting range	1 kW ... 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  $\Omega$  or 600  $\Omega$

**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
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, 1000m <sup>3</sup> /h, 500PA,
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		500 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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