

RFE

MAKING  
BROADCAST  
SMARTER

# HP DS20kW FM Transmitter

FM TRANSMITTERS - DS SERIES 2019





# HP DS20kW FM Transmitter



## PRODUCT DESCRIPTION

Available with RF nominal power of 22500W

The High Power 20 kW FM Transmitter combines a very compact size [38" RU] with RFE most innovative technologies in terms of efficiency, costs and maintenance. A reliable solution, performing ease of use, high reliability and simple control. The standard configuration includes various features, while many others are available on request.



Also available in a redundant hot plug and liquid cooled version

## MAIN FEATURES

- Highest overall efficiency  $\geq 73\%$
- Nominal RF power 22500W
- Front Panel Hot-Swap power supplies
- UAQ Ultimate Audio Quality
- High stereo performance typ. 60 dB
- Remote Control through mobile APP
- Web TCP/IP
- 6<sup>th</sup> LD-MOS generation VSWR 65:1
- Large LCD color display with touch panel
- CCIR & FCC compliant

## OPTIONS

- DDS Direct Digital Synthesis
- AES/EBU Audio Input
- RDS/RBDS coder
- SNMP V2-V3 remote control
- OIRT and JPN version
- Audio Over IP
- Liquid cooled
- Hot Plug RF Amplifier
- GPS Telemetry
- SFN Reference
- Deep Tropicalization





## PRODUCT INNOVATION

The High Power 20 kW FM Transmitter is provided with the best available technologies developed by RFE Laboratories. Our innovative solutions are carefully designed in order to always guarantee efficiency, reliability and ease of use.

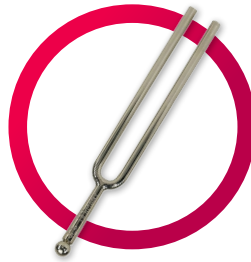
### Maximized Efficiency System

MES is an intelligent system of automatic regulation of the power devices working point: efficiencies RF/AC up to 85% and reduction of air and electricity consumption.



### Ultimate Audio Quality

UAQ is a sophisticated system that allows to obtain audio quality levels higher than industry standards and the current characteristics of digital modulations.



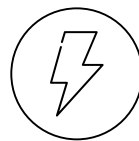
### Intelligent Air Cooling System

ICS is a smart innovation that regulates the amount of cooling air according to the environmental conditions and the needs of the transmitter, reducing energy waste.



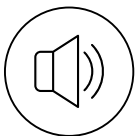
### Evolution Touch

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.



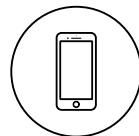
### Software Energy Saving

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



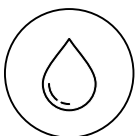
### Full Audio Interface

All the basic audio features included in RFE Transmitters: L+R board, MPX audio and Stereo coder in order to obtain almost digital audio quality.



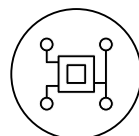
### Mobile Remote Control

Complete and remote control of the Transmitter via mobile, web or GSM, monitoring every function in total comfort.



### Liquid Cooling System AVAILABLE ON REQUEST

RFE innovative solution designed to improve the action of cooling the Transmitter by using liquids such as water, instead of the usual air system.



### Direct Digital Synthesis AVAILABLE ON REQUEST

The innovation of the digital audio modulator, a smart technology able to further improve audio quality by producing digital sound.





**GENERAL**

<b>Power Output</b>	20000W [typ. 22500W] adjustable from front panel
<b>RF Output Impedance</b>	50 ohm
<b>RF Output Connector</b>	3+1/8" type
<b>Monitor RF</b>	BNC connector
<b>VSWR</b>	1,5:1 WITH AUTOMATIC FOLDBACK
<b>Frequency Range</b>	87.5 ÷ 108.00 MHz, on request 66 ÷ 74 MHz ( OIRT) 76 ÷ 90 MHz (JPN) Programmable in 10kHz steps
<b>Frequency Stability</b>	±1 ppm from -5 to 45°C
<b>Type of Modulation</b>	Analog
<b>Off Lock Attenuation</b>	≥ -80 dBc
<b>Modulation Capability</b>	±150 KHz
<b>Limiter built in</b>	
<b>Power Good Detector</b>	adjustable from 20÷90% of the power
<b>Audio Presence Detector</b>	adjustable time from front panel
<b>External AGC</b>	Automatic, with fine ADJ back panel
<b>Modulation Mode</b>	Mono, Stereo, Multiplex, SCA, RDS, Aux
<b>Preemphasis</b>	Flat/50/75µs selectable from front panel
<b>Asynchronous AM S/N Ratio</b>	-60 dB
<b>Synchronous AM S/N Ratio</b>	-60 dB
<b>RF Harmonics</b>	Exceeds EBU/CCIR/FCC requirements
<b>RF Spurious</b>	Exceeds EBU/CCIR/FCC requirements

**MONO  
OPERATION**

<b>Audio Input Impedance</b>	600 ohm - 10 Kohm balanced
<b>Audio Input Level</b>	-6 to +12 dBm
<b>Input Connector</b>	XLR female
<b>Audio Frequency Response</b>	±0.1 dB, 20 Hz to 15 KHz
<b>Total Harmonic Distortion + Noise</b>	0.1% @ 400 Hz
<b>Intermodulation Distortion</b>	0.1%, 1 KHz/1.3 KHz, 1:1 ratio
<b>Transient Intermodulation Distortion</b>	0.1% 2.96KHz square wave and 14 KHz sine wave
<b>Distortion</b>	0.1% 2.96KHz square wave and 14 KHz sine wave
<b>FM S/N Ratio</b>	-80 dB ±75 KHz dev.

**STEREO  
OPERATION**

<b>Audio Input Impedance</b>	600 ohm - 10 Kohm balanced
<b>Audio Input Level</b>	-6 to +12 dBm
<b>Input Connector</b>	XLR female
<b>Audio Frequency Response</b>	±0.1 dB, 20 Hz to 15 KHz
<b>Total Harmonic Distortion + Noise</b>	0.1% @ 400 Hz
<b>Intermodulation Distortion</b>	0.1%, 1 KHz/1.3 KHz, 1:1 ratio
<b>Transient Intermodulation Distortion</b>	0.1% 2.96KHz square wave and 14 KHz sine wave
<b>FM S/N Ratio</b>	-80 dB below ±75 KHz dev.
<b>Stereo Separation</b>	1kHz ≥ -60dB
<b>Crosstalk attenuation</b>	Main to Sub -70 dB 30 Hz to 15 KHz
<b>38 KHz Suppression</b>	≥ -85 dB
<b>Pilot Frequency</b>	19 KHz ± 1 Hz
<b>Output Pilot</b>	1 Vpp., BNC female





<b>MULTIPLEX OPERATION</b>	<b>Composite Input Impedance</b>	2 Kohm unbalanced
	<b>Composite Input Level</b>	-6 to +12 dBm
	<b>Input Connector</b>	BNC female
	<b>Composite Amplitude Response</b>	±0.1 dB, 30 Hz to 100 KHz
	<b>Total Harmonic Distortion + Noise</b>	0.1% @ 400 Hz
	<b>Intermodulation Distortion</b>	0.1%, 1 KHz/1.3 KHz, 1:1 ratio
	<b>Transient Intermodulation Distortion</b>	0.1% 2.96KHz square wave and 14 KHz sine wave
	<b>FM S/N Ratio</b>	-80 dB below ±75 KHz dev.
<b>AES/EBU OPERATION</b>	<b>Input Connector</b>	XLR female, optical TOS-LINK
	<b>Data Format</b>	S/PDF, AES/EBU, IEC958, EIAJCP340/1201
	<b>D/A Converter</b>	24 bit
	<b>Sampling Frequency</b>	from 32 to 96 KHz
<b>SCA, RDS, AUX OPERATION</b>	<b>Input Impedance</b>	≥ 2 Kohm
	<b>Input Level</b>	-6 to +12 dBm
	<b>Frequency Response</b>	±0.1 dB, 50 KHz to 100 KHz
	<b>Input Connector</b>	BNC female
<b>AUXILIARY CONNECTIONS</b>	<b>RS485</b>	DB9 connector back panel
	<b>Telemetry Interface</b>	connector DB25 back panel
	<b>LAN</b>	RJ45 connector back panel
	<b>MPX OUT</b>	connector BNC back panel
<b>OPTIONS</b>		AES/EBU -SPDIF
		RDS/RBDS Programmable Coder via PC
		OIRT or JPN version
		SNMP v2-v3
		Audio Over IP
		DDS Direct Digital Synthesis
	SFN Reference	
<b>ELECTRICAL</b>	<b>AC Input Power</b>	200-400 VAC 50/60 HZ 3phase+N
	<b>AC Apparent Power Consumption</b>	27500VA @ 20000W
	<b>Cos Ø</b>	> 0.98
	<b>Cooling</b>	Forced air or Liquid Cooling (optional)
	<b>Acoustic noise</b>	< -56 dBa @ 1 meter
<b>ENVIRONMENTAL</b>	<b>Operating temperature</b>	-10°C to +50°C
	<b>Max Operating Altitude</b>	4500 mt
	<b>Relative Humidity Range</b>	0 to 90%
<b>PHYSICAL DIMENSION</b>	<b>Mounting</b>	Standard 19" chassis 38U rack
	<b>Size</b>	W x 580mm D x 1050mm H x 1690mm
	<b>Weight</b>	~ 360 Kg

