

RFE

MAKING
BROADCAST
SMARTER

DS2000 - DS3000

Medium Power FM Transmitter DSP Based





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PRODUCT DESCRIPTION

The DS2000 ~ DS3000 FM Transmitter features very compact dimensions associated with RFE most innovative technological characteristics. A reliable device, easy to be used and controlled, including the best performances in a small size.

The standard configuration includes various features, while others are available on request.

MAIN FEATURES

- Highest overall efficiency > 73% with Software Energy Saving
- Large LCD color display with touch panel
- Nominal Output Power 50W ~ 1000W
- UDAQ Ultimate Digital Audio Quality
- High stereo performance typ. 60 dB
- 6th LD-MOS generation VSWR 65:1
- CCIR & FCC Compliant
- DSP Based Audio Processor with:
 - AMC (Automatic Modulation Control)
 - SFP (4 band audio processor w/ Filter Profile)

OPTIONS

- DDS Direct Digital Synthesis
- RDS/RBDS coder
- SNMP v2 remote control
- OIRT and JPN version
- Audio Over IP
- GSM Telemetry
- SFN Reference
- Deep Tropicalization





GENERAL

Power Output	2000W, 3000W adjustable until to 110% of nominal power
RF Output Impedance	50 ohm
RF Output Connector	7/8"
Monitor RF	BNC connector.
VSWR	max 1.8:1 (8% of nominal power)
Frequency Range	87.5 ÷ 108.00 MHz, Programmable in 10 kHz steps. (Other frequencies on request)
Frequency Stability	≤±1 ppm from -5 to 45°C Frequency accuracy best than± 50 Hz in short period ± 150 Hz max after one month
Off Lock Attenuation	≤ -80 dBc
Modulation Capability	max ±150 kHz (nominal ±75 kHz±5%).
Power Good Detector	adjustable from 20÷90% of the power
Audio Presence Detector	adjustable level and time
Modulation Mode	Mono, Stereo, Multiplex, SCA, RDS
Preemphasis	Flat/50/75µs selectable from front panel
Residual AM Synchronous	≤ -50 dB
Asynchronous AM S/N Ratio	≤-70 dB @100% AM without Modulation
Synchronous AM S/N Ratio	≤-60 dB @100% AM with Modulation
RF Harmonics	≥ 80dBc - Exceeds EBU/CCIR/FCC requirements.
RF Spurious	≥ 85dBc - Exceeds EBU/CCIR/FCC requirements.

**MONO
OPERATION**

Audio Input Impedance	600 ohm balanced - ≥10 kOhm.
Audio Input Level	-6 to +12 dBm adjustable in 0.1 dB steps
Input Connector	XLR female
Audio Frequency Response	±0.1 dB, 30 Hz to 15 kHz
Total HarmonicDistortion	≤0.1% with or without pre-emphasis (range ±75KHz)
Total HarmonicDistortion + Noise	≤-0.15% with or without pre-emphasis (range ±75KHz)
Intermodulation Distortion	0.1%, 1 kHz/1.3 kHz, 1:1 ratio
Transient Intermodulation Distortion	0.1% 2.96kHz square wave and 14 kHz sine wave.
Distortion	0.1% 2.96kHz square wave and 14 kHz sine wave
FM S/N Ratio	≤-75 dB below ±75 kHz deviation (unweighted). ≤-70 dB below ±75 kHz deviation (weighted)





**STEREO
OPERATION**

Audio Input Impedance	600 ohm balanced -10 KOhm
Audio Input Level	-6 to +12 dBm adjustable in 0.1 dB steps
Input Connector	XLR female
Audio Frequency Response	±0.1 dB, 30 Hz to 15 kHz
Total HarmonicDistortion	≤0.1% with or without pre-emphasis [range ±75KHz]
Total HarmonicDistortion + Noise	≤-0.15% with or without pre-emphasis [range ±75KHz]
Intermodulation Distortion	0.1%, 1 kHz/1.3 kHz, 1:1 ratio
Transient Intermodulation Distortion	0,1% 2.96kHz square wave and 14 kHz sine wave.
FM S/N Ratio	≤-70 dB below ±75 kHz deviation (unweighted). ≤-70 dB below ±75 kHz deviation (weighted)
Stereo Separation	≥ 50dB from 30Hz to 15kHz (typ 60dB @ 1kHz)
Crosstalk attenuation	Main to Sub ≤-60 dB 30 Hz to 15 kHz
38 kHz Suppression	≤ -75 dBc
Pilot Frequency	19 kHz ± 2 Hz
Output Pilot	1 Vpp. [selectable], BNC female

**MULTIPLEX
OPERATION**

Composite Input Impedance:	2 kOhm unbalanced
Composite Input Level	-6 to +12 dBm
Input Connector	BNC Female
Composite Amplitude Response	±0.1dB, 30Hz to 100kHz.
Total Harmonic Distortion + Noise	0.1% @ 400 Hz
Intermodulation Distortion	0.1%, 1 kHz/1.3 kHz, 1:1 ratio.
Transient Intermodulation Distortion	0.1% 2.96kHz square wave and 14 kHz sine wave.
FM S/N Ratio	-75 dB below ±75 kHz deviation

**AES/EBU
OPERATION**

Input Connector	XLR female.
Input Impedance	110 ohm
Input Level	-20 to -3 dBfs
Data Format	24 bit [automatic]
Sampling Frequency	from 32 to 96 kHz [automatic]

**SCA, RDS
OPERATION**

Input Impedance	≥ 2 kOhm
Input Level	-6 to +12 dBm adjustable in 0.1 dB steps
Frequency Response	±0.1 dB, 50 kHz to 100 kHz
Input Connector	BNC female.

AUDIO PROCESSOR

DSP Technology	Equipped with DSP (Digital Signal Processor) that permits advanced digital audio treatments.
AMC Technology	Automatic Modulation Control, the average deviation value is kept constant within the preset limits, in order to avoid annoying "over-modulation" peaks
4BE Technology	through a drop-down menu you can select 6 preset audio equalization profiles (Bass Enhancer, Hi Lift, Speech, Pop, Rock and Club).





**INTERNAL RDS
CODER**

Type	Dynamic, Compliant to GENELEC Spec. (EN50067)
Frequency	57 kHz \pm 3 Hz
Synchronization	19kHz \pm 3 Hz Internal or External (Software selectable)
Interface	RS232 Asynchronous (1200 to 19600 baud) LAN/IP using the RDS-IP-100 Optional Interface
Services	PI, PS, TP, TA, PTY, M/S, DI, CT, RT, AF, IH.
Memories	6 memory programs.
Coding	Differential and Bi-phase
Amplitude Modulation	Double band with Carrier Suppression
Other Feature	In case of RDS coder fault the Transmitter keep broadcasting.

OTHER FEATURES

Power Reduction	permits the reduction of the output power. Time and power adjustable from the front panel.
Audio Changeover	permits the automatic switching of the main audio source to a backup audio source in case of the main audio absence.

**AUXILIARY
CONNECTIONS**

RS485	DB9 connector back panel.
Telemetry Interface	connector DB25 back panel (I/O and Relay Contact)
LAN	RJ45 connector back panel (Web Interface)
MPX OUT	connector BNC back panel.

OPTIONS

	SNMP v2c
	Audio Over IP
	DDS Direct Digital Synthesis

ELECTRICAL

AC Input Power	DS2000: 2 x 110 \div 260 VAC 50/60 Hz single phase DS3000: 3 x 110 \div 260 VAC 50/60 Hz single phase
AC Apparent Power Consumption	2700VA @2000W; 4000VA @3000W;
Cosϕ	> 0.95
Cooling	Forced air.
Acoustic noise	< 56 dBa @ 1 meter max.

ENVIRONMENTAL

Operating temperature	-10°C to +50°C
Max Operating Altitude	4500 mt.
Relative Humidity Range	0 to 90%

**PHYSICAL
DIMENSION**

Mounting	Standard 19" chassis 2 U rack
Size	W x 483 mm. D x 600 mm. H x 132 mm
Weight	~ 20 Kg (2000W); 30 Kg (3000W)

**ORDERING
INFORMATIONS**

Description	Ordering Code
DS2000 - 2kW FM Transmitter DSP	ATF00850-R
DS3000 - 3kW FM Transmitter DSP	ATF00750-R
Internal Advanced RDS	ALV01210
Advanced Web Server & SNMPv2c	AT000440

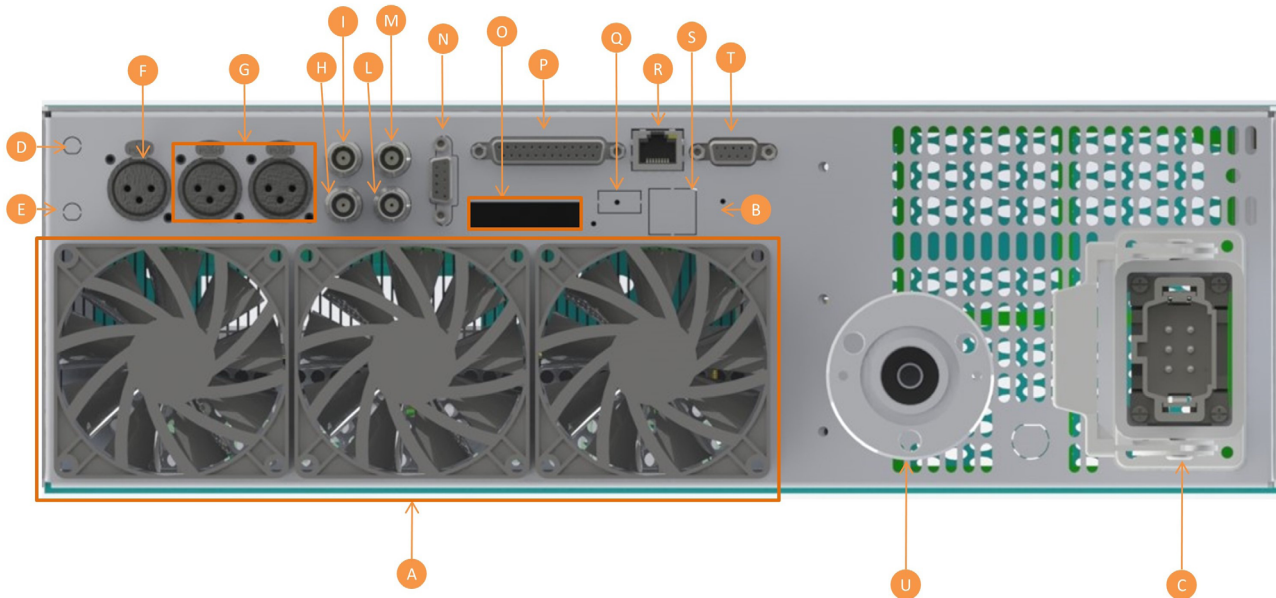
**SUGGESTED
SPARE PARTS**

DS2000 - DS3000	
Description	Ordering Code
1100W Pallet Amplifier	AMF00400
80x80x38 4 wire Fan	FAD80-24D
Main Power Supply	PSA2000-48-A
Aux Power Supply	PSA150-24-C





Rear Panel Connectors



On the rear panel connectors are located as follows:

A	Fans	
B	Reset	
C	AC Mains	6-poles AC connector
D	GSM Ant.	Optional
E	Optical	Optional
F	AES/EBU input	XLR connector
G	L/R audio input	XLR connectors
H	MPX audio output	BNC Connector
I	MPX audio input	BNC Connector
L	SCA/RDS input	BNC connector
M	19kHz in/out	BNC connector
N	RDS/RS232	DB9 connector (optional)
O	Fan connectors	
P	TLC/TLS	DB25 connector (refer to appendix A for the pin description)
Q	USB	USB connector
R	LAN POE	RJ45 connector
S	LAN	RJ45 connector
T	RS485	DB89 connector (refer to appendix A for the pin description)
U	RF Output	7/8 connector

