

# ETG3500 - ETG2000

3500 - 2000W ICEFET SOLID STATE FM TRANSMITTERS



**ELENOS**®  
broadcast @xperience

DATA SHEET

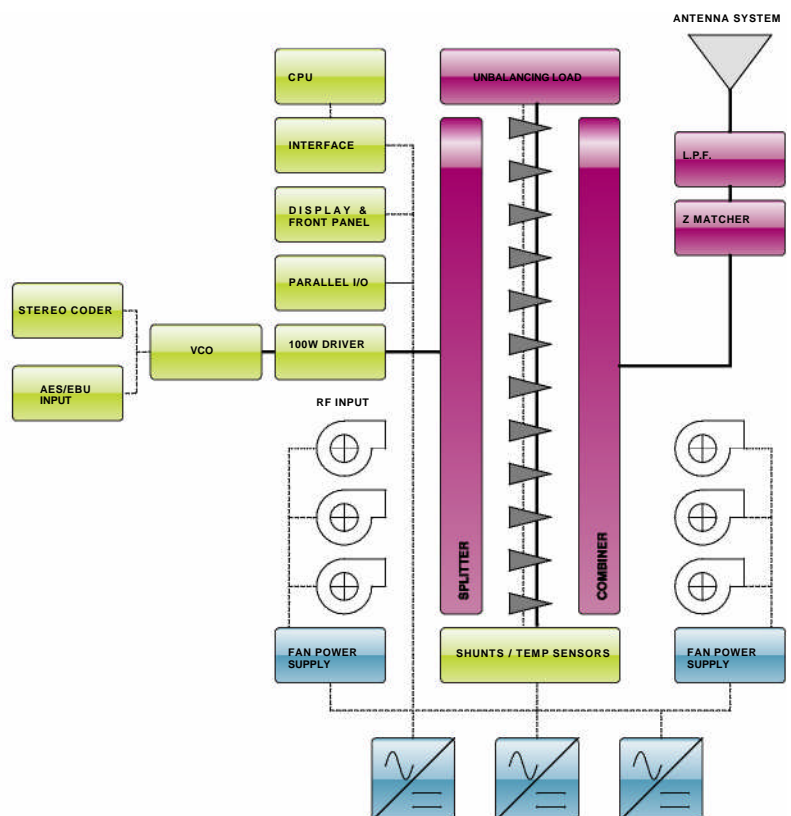
# ETG3500 - ETG2000

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### Highlights

- **ICEFET®:** This technology reduces Mosfet and heat-sink temperatures, improves efficiency and grants higher MTBF. The result is unmatched size, consumption and reliability.
- **ALWAYS ON AIR (Fully redundant):** The redundancy of this transmitter prevents "SINGLE-POINT-FAILURES" thanks to a "SOFT FAILURE DESIGN", and a protection system which keeps it "ON AIR" even in the most extreme working conditions.
- **IPC (Intelligent Power Control):** Another exclusive Elenos application. IPC maintains constant the output power within 2% of the setting value, regardless of fluctuations in incoming AC line voltage, RF drive or load conditions.
- **IPF (Intelligent Proportional Fold back):** IPF is an intelligent system that allows the transmitter to stay "ON AIR" into mismatched loads.
- **BROAD BAND:** The transmitter keeps optimum performances of power and efficiency over the all broadband operation without needing of tuning. Useful as main transmitter or as reserve in "N+1" applications.
- **CONSTANT EFFICIENCY:** The Voltage Power Amplifier and the Bias voltage are both controlled to obtain maximum efficiency at any frequency and at any output rated power.
- **NO IPA:** In Elenos transmitters, the IPA (Intermediate Power Amplifier) is avoided. This choice eliminates one of the bottlenecks in redundancy frequently present on transmitters of this category.
- **EASY MAINTENANCE:** All parts, RF modules, electronic control boards, blowers, power supplies etc. are easy to replace.
- **SMS ALARMS/REMOTE DEEP DIAGNOSTIC CAPABILITY:** All alarms and events can be sent by SMS through a GSM modem. The industrial standard Hostlink protocol allows to safety handle huge quantity of information to perform remote deep diagnosis.
- **WORLD-WIDE SALES & SERVICE SUPPORT:** ELENOS is the FM manufacturer with one of the biggest distribution network of the world. Each distributor is chosen mainly by the technical support capability.

### ETG3500 Block diagram



# ETG3500 - ETG2000

## GENERAL DATA

Output Nominal Power	2000W adjustable(ETG2000) 3500W adjustable(ETG3500)
Maximum peak power	2350W (ETG2000) 3550W (ETG3500)
Operating band	87.5 - 108 MHz
Output Low-pass Filter	W.B. 87.5 MHz - 108 MHz
RS232/RS485	Yes
Points of measure	RF Sample-MPX Monitor
Displayed Parameters	More than 50 parameters displayed on a wide graphic OLED
Adjustments	From the frontal panel trough OLED /from PC
Microprocessor controlled	Yes
Power supply redundancy	Yes
Number of MOSFETs	8 (ETG2000) 12 (ETG3500)
RF power stage technology	ICEFET & ECOSAVING
MOSFET type	BLF278 Philips
Number of power supplies	2 (ETG2000) 3 (ETG3500)
Dimensions: Rack units	4 U
Dimensions: W - H - D	48,5 - 17,6 - 70 cm
Weight	40kg (ETG2000) 43kg (ETG3500)
Number of cooling fans in the amplifiers	5 (ETG2000) 6 (ETG3500)

## CONNECTORS

RF Output connector	7/8
RF Input connector (in power amplifier mode)	BNC
Input connectors LEFT & RIGHT	XLR female
Input connectors AES/EBU	XLR female
MPX Input connector	BNC female
SCA Connector	BNC female
Remote control connector	DB25 female
RS485/232 Connector	DB9 female

## RF

Automatic gain control	Stabilizes the output power value on the set value
Overall output power stability	+/-0,1 dB
Output impedance	50Ω
Harmonic suppression	> 70 dB
Spurious signal suppression	> 80 dB
Driving power amplifier stage	65W (ETG2000) 85W (ETG3500)
Input impedance power amplifier stage	50 Ω
Gain power amplifier stage	16dB
V.S.W.R. protection	10% of forward power
Asynchronous residual AM (typical values)	60 dB
Synchronous residual AM (typical values)	50 dB
RF Efficiency	78%Typ

## A

AES/EBU Input Resolution	24bits
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SCA/RDS Input Impedance	100 K Ω
PILOT level adjustment	Soft adjust 0,1 dBm steps from front panel
PILOT Phase adjustment	Soft adjust 0,1 dBm steps from front panel
19KHz Output	Yes
AES/EBU-Analog input automatic changeover	

## Y

Performance Exciter	
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## PERFORMANCE EXCITER

PLL lock time	<20sec
Time for starting up	30 sec. from OFF/ON
Time for starting up	1 sec. From interlock closure
Intermodulation distortion	<0.05% Measured with two of tones 1KHz & 1.3KHz, ratio 1:1 at 100% modulation
Frequency deviation	+/- 75 KHz 0.1dB steps adjustable
Frequency steps	10 KHz
Frequency stability	1 ppm from 0 to +40°C
THD+N	< 0.03% @ 1 KHz
Pre-emphasis	50/75 microseconds +/-0,1dB
FM S/N MPX FCC	82 dB 20Hz - 23KHz - 50uS - ref @ 53KHz - RMS
FM S/N STEREO CCIR Weighted	72 dB Weight-ref@53KHz-Qpk
FM S/N STEREO CCIR Unweighted	72 dB Unweight-ref@53KHz-Qpk
Mono frequency response	+/-0.15 dB 30Hz - 15KHz
MPX frequency response	+/-0,1 dB 30Hz - 100KHz
Stereo frequency response	+/- 0.15 dB 30Hz - 15KHz
SCA frequency response	+/- 1 dB 20 KHz - 100 KHz
Type of modulation	F3 direct modulation FM on RF oscillator
Stereo Crosstalk	- 72 dB @ 1 KHz
Pilot tone frequency	19 KHz
Pilot tone deviation	7,5 KHz Adjustable
Pilot tone frequency stability	+/-1 Hz

<b>PERFORMANCE EXCITER</b>	
Phase Response	0.1 degree from linear phase; 53kHz to 100kHz
Modulation Capability	+/-250 KHz
<b>INSTALLATION REQUIREMENTS</b>	
Power supply	220 Singlephase Version, 220/380 Threephase Version 50-60Hz VAC (ETG2000) 110, 220, 380 Threephase-Singlephase 50-60Hz VAC (ETG3500)
Power consumption	3KW (ETG2000) 5 . 2 K W ( E T G 3 5 0 0 )
Overall Efficiency	6 7 % T y p e
<b>Magneto-thermic curve</b>	
Current Consumption @220VAC/single phase	D 15 Amp (ETG2000) 23 Amp (ETG3500)
Magneto-thermic capacity @220VAC/single phase	25 Amp (ETG2000) 32 Amp (ETG3500)
Conductor size @220VAC/single phase	6 sqrt.mm (ETG2000) 10 sqrt.mm (ETG3500)
Conductor size @220VAC/single phase	9 AWG (ETG2000) 7 AWG (ETG3500)
Current Consumption @220VAC/three phase	9 Amp (ETG2000) 13 Amp (ETG3500)
Magneto-thermic capacity @220VAC/three phase	16 Amp (ETG2000) 20 Amp (ETG3500)
Conductor size @220VAC/three phase	4 sqrt.mm (ETG2000) 6 sqrt.mm (ETG3500)
Conductor size @220VAC/three phase	11 AWG (ETG2000) 9 AWG (ETG3500)
Current Consumption @380VAC/three phase	5 Amp (ETG2000) 8 Amp (ETG3500)
Magneto-thermic capacity @380VAC/three phase	10 Amp (ETG2000) 16 Amp (ETG3500)
Conductor size @380VAC/three phase	2.5 sqrt.mm (ETG2000) 4 sqrt.mm (ETG3500)
Conductor size @380VAC/three phase	13 AWG (ETG2000) 11 AWG (ETG3500)
<b>C O O L I N G S Y S T E M</b>	
Cooling flow (m <sup>3</sup> /h)	From 200 to 600 m <sup>3</sup> /h (ETG2000) From 300 to 800 m <sup>3</sup> /h (ETG3500)
Air temperature increase between output/input	1 7 ° C
Cooling system	Foced air-cooling
<b>ENVIRONMENT</b>	
Temperature range (operating)	0 - +45 °C
Temperature range (non operating)	-20 - +70 °C
Humidity range (operating)	95% a 40 °C
Humidity range (non operating)	90% a 65 °C
Altitude range (operating)	<4600 meters
Altitude range (non operating)	<15000 meters
<b>TELECONTROL &amp; TELEMETRY</b>	
Remote control	Yes
Remote Control at clean contacts	Yes
SNMP option	Yes (external)
<b>REGULATIONS CONFORMITY</b>	
High frequency radiations from the enclosure	Below limit imposed by technical regulations.
Functioning type	h24 uninterrupted
Electromagnetic fields immunity	Higher than specified by laws on electromagnetic fields compat- i b i l i t y
CE Mark	Conform to 1999/5/CE European Directive.
<b>MANUFACTURING DATA</b>	
Spares availability guaranteed for	10 years from the date of purchase
<b>PRE- &amp; POST- MAINTENANCE</b>	
MTBF	10 Years
Programmed Maintenance	4 Years
Blower Replacement recurrence	4 - 6 Years (function of temperature)
Electrolitics Replacement Recurrence	8 Years
Lithium batteris replacement recurrence	10 Years
Batteries	Yes, only for alarm list storage
Time to realize the preventive maintenance every 4 years	1 H o u r
Time to realize the preventive maintenance every 8 years	2 H o u r s
Level and number of technician for maintenance	1 technician
Electrical safety	EN60215
Average repair time (change of an RF module or power supply)	1 Hour
<b>SET</b>	
Installation manual Quick Start	Y e s
User manual	Yes (On electronic format)
Maintenance manual	Yes (On electronic format)
Tests report	Yes
Troubleshooting manual	Yes (On electronic format)

Elenos Broadcast Experience

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