



# FROM 2.5kW TO 5kW

FM TRANSMITTER

**ELENOS**<sup>®</sup>  
World Broadcast Experience



\*All images are proprietary from Elenos and are for indicative purposes only.  
Technical data can be subject to change without notice.



our technologies





Brochure

## FM TRANSMITTER MEDIUM POWER

### FM TRANSMITTER MEDIUM POWER

The Elenos medium power transmitter product line includes models from 2500W to 5000W. It can come with an amplifier and integrated modulator (exciter) in the same chassis (4U), or with a separate ETG 2U series low power modulator (exciter) and an E 4U series amplifier. These products represent the most advanced technology in terms of electrical efficiency, compactness, reduced weight, ease of use, and diagnostics. Additionally, the technology in these products offers the most complete access to transmitter operating data, protection operation, and the ability to operate under severe environmental conditions while maintaining undiminished RF and audio specifications.

This product line has been designed to guarantee the maximum performance and operation while lowering operational costs through energy saving technology. The ETG Indium 4U transmitters achieve levels of overall electrical efficiency unseen in the market today, while also providing an extremely high operational performance under extreme environmental conditions (high external temperatures, poorly adjusted antenna, fluctuations in the network). How is this possible? Mainly due to innovative techniques in RF design, intelligent power supplies, and through the use of powerful algorithms designed for optimal performance management.

The great efficiency of the RF amplifiers, modulator, and power supplies has also allowed a noticeable reduction of operating temperature, system weight and size. The resulting advantages are substantial: easier installation and lowered transportation, rack space and energy costs. Each of the transmitters in this product line provide accurate real-time operating data, thus allowing the user a precise status of the equipment operation in order to easily identify possible problems, either through a local user interface or via remote devices. The user can receive data and send instructions to the transmitter via several communication channels — SMS, GPRS, TCP/IP and SNMP.

### Features:

#### **Smart Design**

Ultra compact size, light weight, clean layout, ease of maintenance and repair.

#### **Low energy consumption**

Highly reduced energy consumption and significantly lowered operating costs due to state of the art nature of the design.

#### **Reliability**

Extremely high reliability and the ability to ensure continuity of the service even under extreme operating conditions due to intelligent safety protocols, Icefet technology, and Lifextender algorithms.

#### **Total control**

Accurate and detailed real time data on the operating status of the transmitter, available at the analytical level, (voltage, current, power, temperature, efficiency, safety,

settings, audio levels, communications).

Local and remote management and control via Serial Protocol, SMS, GPRS, SNMP, WEB. via Sereial Protocol, SMS, GPRS, SNMP, WEB.

#### **Scalability**

All products are designed to be scalable with the greatest advantage that any technological improvement affecting the base product is directly transferred to all equipment in the product family via upgrades.

#### **Lower Cost of Ownership**

The cost savings due to the compact size of the equipment, planar technology and other features make this series a most competitive value for both large and small networks and radio operators.



Datasheet

## FM TRANSMITTER MEDIUM POWER | ETG2500

ETG2500

FM TRANSMITTER MEDIUM POWER

### GENERAL DATA

Output Nominal Power	2500 W adjustable
Operating band	87.5 ÷ 108 MHz
RS232/RS485	Yes. Connector DB9 female
Points of measure	RF Sample - MPX Monitor
Displayed Parameters	More than 50 parameters displayed on a wide graphic OLED
Adjustments	From the frontal panel through OLED/from PC
Number of L-DMOS in amplifier stage	4
RF power stage technology	ICEFET & ECOSAVING
Dimensions: Rack units	4U
Dimensions: W - H - D	48.5 - 17.6 - 70 cm
Weight	38 Kg
Number of power supplies	3
Number of cooling fans	6

### CONNECTORS

RF Output	7/8
MPX	BNC Female
LEFT & RIGHT	XLR Female
AES/EBU	XLR Female
AUX	BNC Female
Ext.ref 10 MHz	SMA (option)
Monitor/19 kHz	BNC Female

### RF PERFORMANCE

Output impedance	50 Ω
Automatic power RF control	Stabilizes the output power value on the set value
Overall output power RF stability	+/- 0,1 dB
VSWR	2:1 at full power. Automatic power reduction beyond 1.7:1. Transmitter is protected for open and short circuit.
Harmonics	< -75 dBc
Out of band emission (spurious)	< -80 dBc

### AUDIO PERFORMANCE

MPX input level	+15/-10 dBu for 75 KHz standard deviation
MPX level adjustment	Soft adjust 0.1 dB steps from front panel
MPX input impedance	5 KΩ selectable
L/R input level	+15/-10 dBu for 75 KHz standard deviation
L/R level adjustment	Soft adjust 0.1 dBu steps from front panel
L/R Input Impedance	Selectable 10 K - 600 Ω, balanced
AES/EBU input resolution	24 bits
AES/EBU input sample rate	32,44,1,48,96 KHz Automatically selected
AES/EBU input level	-20 dBFS - 0 dBFS
AES/EBU input impedance	110 Ω balanced
AES/EBU-Analog input automatic changeover	Yes
PILOT Amplitude adjustment	Soft adjust 0.05% steps from front panel
PILOT Phase adjustment	Soft adjust 0.01 degree steps from front panel
PILOT tone frequency	19 KHz
PILOT tone deviation	Soft adjust +/- 7.5 KHz
PILOT tone frequency stability	+/- 1 Hz
THD+N (stereo/mono operation)	< 0.05% with 75 KHz frequency deviation < 0.05% with 100 KHz frequency deviation 30 Hz to 15 KHz
Pre-emphasis	0/25/50/75 microseconds, selectable
Pre-emphasis tolerance	+/- 0.1 dB
FM S/N (MPX operation)	82 dB 20 Hz to 23 KHz @ 53 KHz - detector RMS
FM S/N CCIR (stereo/mono operation)	> = 72 dB weighted > = 72 dB unweighted 400 Hz, 75 KHz frequency deviation, quasi-peak detector, 50 us de-emphasis

## FM TRANSMITTER MEDIUM POWER | ETG2500

Asynchronous AM S/N unweighted	> = 55 dB a 400 Hz, 75 us de-emphasis
Synchronous AM S/N	> = 50 dB a 400 Hz, 75 us de-emphasis
Amplitude-frequency characteristic (stereo/mono operation)	+/- 0.1 dB (without pre-emphasis) +/- 0.1 dB (with pre-emphasis) 20 Hz to 15 KHz, @ 400 Hz
Stereo Crosstalk (typical)	60 dB @ 400 Hz to 10 KHz
Linear crosstalk	>60 db 20 Hz to 15 KHz
Intermodulation distortion	<0.05% Measured with two of tones 1 KHz & 1.3 KHz, ratio 1:1 at 100% modulation
Class of emission	F3
Stereo emission	According to ITU-R recommendation 450 (pilot tone)
<b>EXCITER PERFORMANCE</b>	
PLL lock time	<10 sec
Frequency deviation	+/- 75 KHz 0.1 dB steps adjustable
Maximum frequency deviation	+/- 150 KHz
Frequency stability	1 ppm
RF Frequency steps	10 KHz
Phase Response	+/- 0.1 degree from linear phase; 20 KHz to 100 KHz
<b>INSTALLATION REQUIREMENTS</b>	
Power supply	230/400 Threephase-Singlephase Version 50-60 Hz VAC
Power consumption (typical)	3.5 KW
Overall efficiency (typical from -3 dB to Pnom)	> = 70%
Power factor	> 0.95
Current Consumption @ 230VAC/single phase	15 Amp
Magneto-thermic capacity @ 230VAC/single phase	32 Amp
Conductor size @ 230VAC/single phase	6 sqrt.mm
Conductor size @ 230VAC/single phase	9 AWG
Current Consumption @ 230VAC/three phase	9 Amp
Magneto-thermic capacity @ 230VAC/three phase	20 Amp
Conductor size @ 230VAC/three phase	4 sqrt.mm
Conductor size @ 230VAC/three phase	11 AWG
Current Consumption @ 400VAC/three phase	5 Amp
Magneto-thermic capacity @ 400VAC/three phase	10 Amp
Conductor size @ 400VAC/three phase	2.5 sqrt.mm
Conductor size @ 400VAC/three phase	13 AWG
<b>COOLING/NOISE/DATA</b>	
Cooling system	Forced air-cooling . From 600 to 1200 m3/h
Air temperature increase	17 °C
Acoustic noise	< 65 phon @ transmitter room, 2 m distance of the front of transmitter
<b>ENVIRONMENT</b>	
Temperature range (operating)	-5 ÷ +45 °C, 23 ÷ 113 °F
Temperature range (non operating)	-20 ÷ +55 °C, -4 ÷ 131 °F
Humidity range (operating)	95% @ 40 °C, 104 °F
Humidity range (non operating)	90% @ 55 °C, 131 °F
Altitude range (operating)	<3000 meters / <9840 Feet
Altitude range (non operating)	<15000 meters / < 49200 Feet
<b>TELECONTROL &amp; TELEMETRY</b>	
Remote control	Yes
Remote control, dry contacts	Yes
SNMP option	Yes (external)



Datasheet

# FM TRANSMITTER MEDIUM POWER | ETG3500

ETG3500

FM TRANSMITTER MEDIUM POWER

<b>GENERAL DATA</b>	
Output Nominal Power	3500 W adjustable
Operating band	87.5 ÷ 108 MHz
RS232/RS485	Yes. Connector DB9 femate
Points of measure	RF Sample - MPX Monitor
Displayed Parameters	More than 50 parameters displayed on a wide graphic OLED
Adjustments	From the frontal panel through OLED/from PC
Number of L-DMOS in amplifier stage	5
RF power stage technology	ICEFET & ECOSAVING
Dimensions: Rack units	4U
Dimensions: W - H - D	48.5 - 17.6 - 70 cm
Weight	38 Kg
Number of power supplies	3
Number of cooling fans	6
<b>CONNECTORS</b>	
RF Output	7/8
MPX	BNC Female
LEFT & RIGHT	XLR Female
AES/EBU	XLR Female
AUX	BNC Female
Monitor/19 kHz	BNC Female
<b>RF PERFORMANCE</b>	
Output impedance	50 Ω
Automatic power RF control	Stabilizes the output power value on the set value
Overall output power RF stability	+/- 0,1 dB
VSWR	2:1 at full power. Automatic power reduction beyond 1.7:1. Transmitter is protected fro open and short circuit.
Harmonics	< -75 dBc
Out of band emission (spurious)	< -80 dBc
<b>AUDIO PERFORMANCE</b>	
MPX input level	+15/-10 dBu for 75 KHz standard deviation
MPX level adjustment	Soft adjust 0.1 dB steps from front panel
MPX input impedance	5 KΩ selectable
L/R input level	+15/-10 dBu for 75 KHz standard deviation
L/R level adjustment	Soft adjust 0.1 dBu steps from front panel
L/R Input Impedance	Selectable 10 K - 600 Ω, balanced
AES/EBU input resolution	24 bits
AES/EBU input sample rate	32,44.1,48,96 KHz Automatically selected
AES/EBU input level	-20 dBFS - 0 dBFS
AES/EBU input impedance	110 Ω balanced
AES/EBU-Analog input automatic changeover	Yes
PILOT Amplitude adjustment	Soft adjust 0.05% steps from front panel
PILOT Phase adjustment	Soft adjust 0.01 degree steps from front panel
PILOT tone frequency	19 KHz
PILOT tone deviation	Soft adjust +/- 7.5 KHz
PILOT tone frequency stability	+/- 1 Hz
THD+N (stereo/mono operation)	< 0.05% with 75 KHz frequency deviation < 0.05% with 100 KHz frequency deviation 30 Hz to 15 KHz
Pre-emphasis	0/25/50/75 microseconds, selectable
Pre-emphasis tolerance	+/- 0.1 dB
FM S/N (MPX operation)	82 dB 20 Hz to 23KHz @ 53 KHz - detector RMS
FM S/N CCIR (stereo/mono operation)	> = 72 dB weighted > = 72 dB unweighted 400 Hz, 75 kHz frequency deviation, quasi-peak detector, 50 us de-emphasis



## FM TRANSMITTER MEDIUM POWER | ETG3500

Asynchronous AM S/N unweighted	> = 55 dB a 400 Hz, 75 us de-emphasis
Synchronous AM S/N	> = 50 dB a 400 Hz, 75 us de-emphasis
Amplitude-frequency characteristic (stereo/mono operation)	+/- 0.1 dB (without pre-emphasis) +/- 0.1 dB (with pre-emphasis) 20 Hz to 15 KHz, @ 400 Hz
Stereo Crosstalk (typical)	60 dB @ 400 Hz to 10 KHz
Linear crosstalk	>60 db 20 Hz to 15 KHz
Intermodulation distortion	<0.05% Measured with two of tones 1 KHz & 1.3 KHz, ratio 1:1 at 100% modulation
Class of emission	F3
Stereo emission	According to ITU-R recommendation 450 (pilot tone)
<b>EXCITER PERFORMANCE</b>	
PLL lock time	<10 sec
Frequency deviation	+/- 75 KHz 0.1 dB steps adjustable
Maximum frequency deviation	+/- 150 KHz
Frequency stability	1 ppm
RF Frequency steps	10 KHz
Phase Response	+/- 0.1 degree from linear phase; 20 KHz to 100 KHz
<b>INSTALLATION REQUIREMENTS</b>	
Power supply	230/400 Threephase-Singlephase Version 50-60 Hz VAC
Power consumption (typical)	4.9 KW
Overall efficiency (typical from -3 dB to Pnom)	> = 70%
Power factor	> 0.95
Current Consumption @ 230VAC/single phase	21.3 Amp
Magneto-thermic capacity @ 230VAC/single phase	32 Amp
Conductor size @ 230VAC/single phase	10 sqrt.mm
Conductor size @ 230VAC/single phase	7 AWG
Current Consumption @ 230VAC/three phase	12.5 Amp
Magneto-thermic capacity @ 230VAC/three phase	20 Amp
Conductor size @ 230VAC/three phase	6 sqrt.mm
Conductor size @ 230VAC/three phase	9 AWG
Current Consumption @ 400VAC/three phase	7.1 Amp
Magneto-thermic capacity @ 400VAC/three phase	16 Amp
Conductor size @ 400VAC/three phase	4 sqrt.mm
Conductor size @ 400VAC/three phase	11 AWG
<b>COOLING/NOISE/DATA</b>	
Cooling system	Forced air-cooling . From 600 to 1200 m3/h
Air temperature increase	17 °C
Acoustic noise	< 65 phon @ transmitter room, 2 m distance of the front of transmitter
<b>ENVIRONMENT</b>	
Temperature range (operating)	-5 ÷ +45 °C, 23 ÷ 113 °F
Temperature range (non operating)	-20 ÷ +55 °C, -4 ÷ 131 °F
Humidity range (operating)	95% @ 40 °C, 104 °F
Humidity range (non operating)	90% @ 55 °C, 131 °F
Altitude range (operating)	<3000 meters / <9840 Feet
Altitude range (non operating)	<15000 meters / < 49200 Feet
<b>TELECONTROL &amp; TELEMETRY</b>	
Remote control	Yes
Remote control, dry contacts	Yes
SNMP option	Yes (external)



Datasheet

## FM TRANSMITTER MEDIUM POWER | ETG5000

ETG5000

FM TRANSMITTER MEDIUM POWER

<b>GENERAL DATA</b>	
Output Nominal Power	5000 W adjustable
Operating band	87.5 ÷ 108 MHz
RS232/RS485	Yes. Connector DB9 female
Points of measure	RF Sample - MPX Monitor
Displayed Parameters	More than 50 parameters displayed on a wide graphic 0-LED screen
Adjustments	From the frontal panel through OLED/from PC
Number of L-DMOS in amplifier stage	7
RF power stage technology	ICEFET & ECOSAVING
Dimensions: Rack units	4U
Dimensions: W - H - D	48.5 - 17.6 - 70 cm
Weight	45 Kg
Number of power supplies	3
Number of cooling fans	6
<b>CONNECTORS</b>	
RF Output	7/8
MPX	BNC Female
LEFT & RIGHT	XLR Female
AES/EBU	XLR Female
AUX	BNC Female
Monitor/19 kHz	BNC Female
<b>RF PERFORMANCE</b>	
Output impedance	50 Ω
Automatic power RF control	Stabilizes the output power value on the set value
Overall output power RF stability	+/- 0,1 dB
VSWR	2:1 at full power. Automatic power reduction beyond 1.7:1. Transmitter is protected fro open and short circuit.
Harmonics	< -75 dBc
Out of band emission (spurious)	< -80 dBc
<b>AUDIO PERFORMANCE</b>	
MPX input level	+15/-10 dBu for 75 KHz standard deviation
MPX level adjustment	Soft adjust 0.1 dB steps from front panel
MPX input impedance	5 KΩ selectable
L/R input level	+15/-10 dBu for 75 KHz standard deviation
L/R level adjustment	Soft adjust 0.1 dBu steps from front panel
L/R Input Impedance	Selectable 10K - 600 Ω, balanced
AES/EBU input resolution	24 bits
AES/EBU input sample rate	32,44.1,48,96 KHz Automatically selected
AES/EBU input level	-20 dBFS - 0 dBFS
AES/EBU input impedance	110 Ω balanced
AES/EBU-Analog input automatic changeover	Yes
PILOT Amplitude adjustment	Soft adjust 0.05% steps from front panel
PILOT Phase adjustment	Soft adjust 0.01 degree steps from front panel
PILOT tone frequency	19 KHz
PILOT tone deviation	Soft adjust +/- 7.5 KHz
PILOT tone frequency stability	+/- 1 Hz
THD+N (stereo/mono operation)	< 0.05% with 75 KHz frequency deviation < 0.05% with 100 KHz frequency deviation 30 Hz to 15 KHz
Pre-emphasis	0/25/50/75 microseconds, selectable
Pre-emphasis tolerance	+/- 0.1 dB
FM S/N (MPX operation)	82 dB 20 Hz to 23KHz @ 53 KHz - detector RMS
FM S/N CCIR (stereo/mono operation)	> = 72 dB weighted > = 72 dB unweighted 400 Hz, 75 kHz frequency deviation, quasi-peak detector, 50 us de-emphasis

## FM TRANSMITTER MEDIUM POWER | ETG5000

Asynchronous AM S/N unweighted	> = 55 dB a 400 Hz, 75 us de-emphasis
Synchronous AM S/N	> = 50 dB a 400 Hz, 75 us de-emphasis
Amplitude-frequency characteristic (stereo/mono operation)	+/- 0.1 dB (without pre-emphasis) +/- 0.1 dB (with pre-emphasis) 20 Hz to 15 KHz, @ 400hz
Stereo Crosstalk (typical)	60 dB @ 400 Hz to 10 KHz
Linear crosstalk	>60 db 20 Hz to 15 KHz
Intermodulation distortion	<0.05% Measured with two of tones 1 KHz & 1.3 KHz, ratio 1:1 at 100% modulation
Class of emission	F3
Stereo emission	According to ITU-R recommendation 450 (pilot tone)
<b>EXCITER PERFORMANCE</b>	
PLL lock time	<10 sec
Frequency deviation	+/- 75 KHz 0.1 dB steps adjustable
Maximum frequency deviation	+/- 150 KHz
Frequency stability	1 ppm
RF Frequency steps	10 KHz
Phase Response	+/- 0.1 degree from linear phase; 20 KHz to 100 KHz
<b>INSTALLATION REQUIREMENTS</b>	
Power supply	230/400 Threephase-Singlephase Version 50-60 Hz VAC
Power consumption (typical)	7.1 KW
Overall efficiency (typical from -3dB to Pnom)	> = 70%
Power factor	> 0.95
Current Consumption @ 230VAC/single phase	31 Amp
Magneto-thermic capacity @ 230VAC/single phase	45 Amp
Conductor size @ 230VAC/single phase	10 sqrt.mm
Conductor size @ 230VAC/single phase	7 AWG
Current Consumption @ 230VAC/three phase	18.5 Amp
Magneto-thermic capacity @ 230VAC/three phase	32 Amp
Conductor size @ 230VAC/three phase	6 sqrt.mm
Conductor size @ 230VAC/three phase	9 AWG
Current Consumption @ 400VAC/three phase	10.5 Amp
Magneto-thermic capacity @ 400VAC/three phase	20 Amp
Conductor size @ 400VAC/three phase	4 sqrt.mm
Conductor size @ 400VAC/three phase	11 AWG
<b>COOLING/NOISE/DATA</b>	
Cooling system	Forced air-cooling . From 600 to 1200 m3/h
Air temperature increase	17 °C
Acoustic noise	< 65 phon @ transmitter room, 2 m distance of the front of transmitter
<b>ENVIRONMENT</b>	
Temperature range (operating)	-5 ÷ +45 °C, 23 ÷ 113 °F
Temperature range (non operating)	-20 ÷ +55 °C, -4 ÷ 131 °F
Humidity range (operating)	95% @ 40 °C, 104 °F
Humidity range (non operating)	90% @ 55 °C, 131 °F
Altitude range (operating)	<3000 meters / <9840 Feet
Altitude range (non operating)	<15000 meters / < 49200 Feet
<b>TELECONTROL &amp; TELEMETRY</b>	
Remote control	Yes
Remote control, dry contacts	Yes
SNMP option	Yes (external)

