ETG5200
ETG3500
ETG2500

(list of variations available in the manual)

SOLID STATE FM TRANSMITTER

ELENOS
World Broadcast Experience

USER MANUAL

Please remember to register the product purchased on http://www.elenos.com/product-registration/

Please contact technical support service for information and assistance:

Elenos
Ph : +39 0532 829965
Fax : +39 0532 829177
E-mail : info@elenos.com
Internet web site : www.elenos.com

Elenos USA
1315 nw 98th Ct. Suite 9, 33172 Miami (Florida), Ph 1-855-ELENOS-0 (1-855-353-6670)

Elenos APAC
53/64 Saracha Villa, Sansuk Muang Chonburi (Thailand), Ph +66 83 618-9333

Please complete the RMA form (ITA http://www.elenos.com/it/elenos-rma/ or ENG http://www.elenos.com/elenos-rma/) and provide the equipment serial number (indicated on the nameplate).

Elenos s.r.l. declares that the equipment described in this document is compliant with the 1999/05/EC Directive.

$$C\!E \ 0470 \ \textcircled{!}$$

For details please refer to the "EC Marking" section.

EC Declaration of Conformity
According to Directive 1999/5/EC (R&TTE)

$$C\hspace{-0.3em}\epsilon$$

We : **ELENOS s.r.l. - via G.Amendola, 9 – 44028 Poggio Renatico (FE) - Italy**

Declare under our sole responsibility that the product:
ETG5200, ETG5000, ETG4000/5, ETG3500/5, ETG3000/5, ETG2500/5, ETG2000/5, ETG1800/5, ETG1500/5, ETG1200/5, ETG1000/5, ETG800/5, ETG500/5
ETG3500, ETG3000/3.5, ETG2500/3.5, ETG2000/3.5, ETG1800/3.5, ETG1500/3.5, ETG1200/3.5, ETG1000/3.5, ETG800/3.5, ETG500/3.5
ETG2500, ETG2000/2.5, ETG1800/2.5, ETG1500/2.5, ETG1200/2.5, ETG1000/2.5, ETG800/2.5, ETG500/2.5

E5200, E5000, E4000/5, E3500/5, E3000/5, E2500/5, E2000/5, E1800/5, E1500/5, E1200/5, E1000/5, E800/5, E500/5
E3500, E3000/3.5, E2500/3.5, E2000/3.5, E1800/3.5, E1500/3.5, E1200/3.5, E1000/3.5, E800/3.5, E500/3.5
E2500, E2000/2.5, E1800/2.5, E1500/2.5, E1200/2.5, E1000/2.5, E800/2.5, E500/2.5

With intended purpose: VHF FM broadcast transmitters and amplifiers
And manufactured by: ELENOS s.r.l.

To which this declaration relates is in conformity with the essential requirements and other relevant requirements of the R&TTE Directive (1999/5/CE).
The product is in conformity with the following standards and/or other normative documents:

Health and safety requirements pursuant to Article 3.1.a
Standards applied: EN60215:1989+A1:1992+A2:1994
Protection requirements concerning electromagnetic compatibility pursuant to Article 3.1.b
Standards applied: EN 301 489-1 V1.9.2 ; EN 301 489-11 V1.3.1
Measures for the efficient use of the radio frequency spectrum pursuant to Article 3.2
Standards applied: EN 302 018-2 V1.2.1

Supplementary information :
Notified body involved: Nemko AS
Technical file held by : Elenos s.r.l and Nemko AS

Place and Date: Ferrara March 11, 2013

Responsible person : Leonardo Busi (Amministratore unico)
Tel. +39 0532 829965
e-mail: leonardobusi@elenos.com

Signature:

Revisions

No.	Date	Description
00	02/04/2012	Original version
01	27/08/2013	Validity for ETG3500-ETG2500 transmitters Warranty management reference User interface section update Alarm list update Add transmitter internal photos Power supply dip-switch setting procedure

Series models

Transmitter	Number of modules	Number of drivers	Maximum output power
ETG5200	7	1	5200W
ETG5000	7	1	5000W
ETG4000/5 ETG3500/5 ETG3000/5 ETG2500/5 ETG2000/5 ETG1800/5 ETG1500/5 ETG1200/5 ETG1000/5 ETG800/5 ETG500/5	7	1	Equal to the rated value
ETG3500	5	1	3500W
ETG3000/3.5 ETG2500/3.5 ETG2000/3.5 ETG1800/3.5 ETG1500/3.5 ETG1200/3.5 ETG1000/3.5 ETG800/3.5 ETG500/3.5	5	1	Equal to the rated value
ETG2500	4	1	2500W
ETG2000/2.5 ETG1800/2.5 ETG1500/2.5 ETG1200/2.5 ETG1000/2.5 ETG800/2.5 ETG500/2.5	4	1	Equal to the rated value

Contents

Contents

1 General information

1.1 Intended use

The equipment referred to in this manual is solid state transmitters with adjustable output power from 0W to a maximum rated value (see Section "Series models"), to be used in the whole FM band between 87.5 and 108 MHz, in 10 kHz steps.
With this product, Elenos has achieved its aim of obtaining high values of power in just 4 rack units.
The transmitter is also a starting point for developing a new concept of scalability.
The RF performance, obtained with 7, 5 or 4 amplifier modules, is close to the highest target physically possible by the devices and current technology, in terms of efficiency. This enables a drastic reduction in the electrical operating costs.
The distinctive characteristics of Elenos products remain constant: ECOSAVING, ICEFET, VSWR PEAK HOLD, monitoring possibility, protection against corrosion, etc.
The available options STEREO or AES/EBU (both with integrated MPX).
The LIFEXTENDER functionality can be added.

1.2 Transport

The equipment must only be transported in its original packaging. However, although it has been designed to prevent the machine being damaged,
even in the event of incorrect manoeuvres, it is recommended to respect the "HIGH/ LOW" direction and not to subject it to impact.
Ensure that the transport and lifting equipment are suitable for supporting the load.

1.3 Unpacking

The personnel in charge of handling the load must use protective gloves and accident-prevention footwear.
Before lifting or moving the equipment or any of its parts, check that the operating area has been cleared, also considering a safe area in order to prevent damage to people and/or properties that could be within the manoeuvring radius.

1.4 Storage

Should it be necessary to store the equipment for any reason, it is necessary that:
- in the storage area, the temperature is between -20° and +55°C, with humidity of no more than 90% at 55°C;
- the equipment is disconnected from energy sources;
- the equipment is clean and there are no dust deposits;
- the equipment is covered with a waterproof sheet.

1.5 Decommissioning and disposal

For all the aspects regarding the disposal of the product, please refer to the specific European Directives.

Please note that **the equipment DOES NOT CONTAIN POLLUTANT OILS.**

1.6 Checking the product purchased

Before installing the equipment, it is important to check that it was not damaged during transport or storage. Check that all standard components and accessories ordered have been delivered correctly, otherwise contact Elenos s.r.l .

In this case, the package must contain at least the following:
· n°1 piece of equipment from the ETG5200, ETG3500 or ETG2500 series;
· n°1 "Identification and Quick Start" manual, which we recommend keeping with the product;
It may also contain:
· n°1 "User" manual;
· n°1 CD containing all the documentation relative to Elenos s.r.l. manuals;
· n°1 PC connection cable.

Cables, spare parts and other accessories may be requested from Elenos S.r.l. or Elenos retailers.

General information

2 Product description

You can find a detailed description of section here flagged in the Quick Start manual.

You can find a detailed description of section here flagged in the Quick Start manual.

Product description

2.1 Description of external connectors

2.1.1 EIA485 connector/Telemetry

N. 6 Front panel (type DB9 - female)
This connector uses Com1, as the connector n. 13 (rear). The two connectors can't be used simultaneously.

Connector	Pin	Meaning	Notes
CN3 on board TG5K2A881	1	Com1 TX+	EIA485/422
	2	Com1 TX-	EIA485/422
	3	Com1 RX+	EIA485/422
	4	Com1 RX-	EIA485/422
	5	Common ground	Connected to the frame
	6	Common ground	Connected to the frame
	7	Common ground	Connected to the frame
	8	Common ground	Connected to the frame
	9	Common ground	Connected to the frame

2.1.2 LEFT/RIGHT connectors

N. 5 Rear panel (XLR type - female)
The input impedance is 10 kOhm (default), 600 ohm selectable with jumpers on the card.
 If you have an unbalanced signal, connect the signal at the positive, the common ground and the negative input to ground (optional if Zin = 10 kOhm, required if Zin = 600 ohms).

Connector	Pin	Meaning	Notes
J01 on board TG3K1A866 or J1 on board TG3K2A867	1	Common ground	
	2	Right channel audio signal "+"	Differential input
	3	Right channel audio signal "-"	
J02 on board TG3K1A866 or J2 on board TG3K2A867	1	Common ground	
	2	Left channel audio signal "+"	Differential input
	3	Left channel audio signal "-"	

2.1.3 AES/EBU connector

N. 6 Rear panel (XLR type - female)

Connector	Pin	Meaning	Notes
J3 on board TG3K2A867	1	Common ground	
	2	"Positive" differential AES-EBU input	
	3	"Negative" differential AES-EBU input	

2.1.4 AUX connectors

N. 7 Rear panel (BNC type - female)

Connector	Pin	Meaning	Notes
J2 on board TG3K0B866	1	RDS/SCA AUX1	Input
	2	Common ground	
J3 on board TG3K0B866	1	AUX2	Input
	2	Common ground	

2.1.5 MPX connector

N. 8 Rear panel (BNC type - female)
The input signal on the connector is in parallel, inside the card, to the signal L + right channel. For the correct operation (Zin = 10 kOhm) requires that the jumper on the board, to select the impedance of 600 ohms on the right channel is removed (the jumper is not present by default).

Connector	Pin	Meaning	Notes
J1 on board TG3K0B866	1	MPX	Input
	2	Common ground	

2.1.6 Monitor connector/19kHz

N. 9 Rear panel (BNC type - female)

Connector	Pin	Meaning	Notes
J4 on board TG3K0B866	1	Monitor MPX (19KHz)	Output
	2	Common ground	

2.1.7 TC/TS connector

N. 10 Rear panel (DB25 type - female)
Signals compatible with standard IEC 60864-1.

As reported here applies both to the signals TC/TS that for the signals PROFILES.
- Digital I/O
- Polarity N
- Maximum voltage range: 0 to +30 V
- Operating voltage: between +0.5 and +5 .. +24 V
- Input Current : 5mA (controlled in parallel)
- Output current : 50mA max. Of the open drain type, can be connected in parallel (or wired, with the exception of the fault signal that is reversed polarity). Can drive inductive loads, in which case it is recommended to clamp diode in parallel with the load (cathode power supply).
- The inputs are supplied on board (pull up = 1 kOhm, +5 V) with EMI filter series and diode. This allows the command in parallel. Are considered active when they are shorted to ground (active between 0 and +0.5 V). Are considered inactive if open or input voltage> = +4 V. Some are for command to state, for other command pulse, the pulse duration must be> = 0.5 seconds.
- The output signal is active (mos) with the circuit breaker closed. One exception is the default output, which is reversed polarity to ensure the signaling in the absence of power. The parallel connection of multiple fault lines does not cause electrical problems, but the primary message is meaningless.
- The analog outputs are between 0 and +4.5 V, Z = 470 ohms. Are protected against short circuit to ground or the voltage fed up to a maximum of +5 V.

Connector	Pin	Meaning	Notes
CN1 on board TG2U1A899			
	1	Enable (interlock)	Command to state Pin grounded = active command
	2	TX ON	Command pulse Pin grounded = active command
	3	TX OFF	Command pulse Pin grounded = active command
	4	Reflected power	Output in voltage See full scale values
	5	Common ground	Connected to the frame
	6	RX-	Com2 EIA485/422
	7	-	Not connected
	8	TX-	Com2 EIA485/422
	9	Common ground	Connected to the frame
	10	IPA (Current amplifier)	Output in voltage See full scale values
	11	Fault main	Power supply FAULT status The pin must be powered externally. "Open" Status → Fault active
	12	TX ON	Signaling output The pin must be powered externally. "Closed to ground" status → TX ON
	13	Warning/Bad audio	Signaling output The pin must be powered externally. "Closed to ground" status → Active Warning The operation is affected by settings of the machine
	14	Reset alarm	Command pulse Pin grounded = active command
	15	UPS target	Command to state
	16	-	Reserved for Elenos
	17	Forward power	Output in voltage See full scale values
	18	Common ground	Connected to the frame
	19	RX+	Com2 EIA485/422
	20	TX+	Com2 EIA485/422
	21	Common ground	Connected to the frame
	22	VPA (Voltage amplifier)	Output in voltage See full scale values

Product description

	23	Bad audio	Signaling output The pin must be powered externally. "Closed to ground" status → Active alarm
open collector	24	/FLT (reversed polarity)	Signaling output The pin must be powered externally. "Open" Status → Active alarm The operation can be affected by the settings of the machine
open collector	25	Remote	Signaling output The pin must be powered externally. "Closed to ground" status → Remote signal active

2.1.7.1 Full scale values

The nominal full scale corresponds to +4 V, with over stroke of up to more than +4.5 (max +5 V).

ETG5000

Parameters	Full scale	Scale factor	Resolution
Forward power	5000W	1250W * V	Full scale/204
Reflected power	500W	125W * V	
IPA (current amplifier)	200A	50A * V	
VPA (voltage amplifier)	50V	12.5V * V	

ETG3500

Parameters	Full scale	Scale factor	Resolution
Forward power	3500W	875W * V	Full scale/204
Reflected power	350W	87.5W * V	
IPA (current amplifier)	150A	37.5A * V	
VPA (voltage amplifier)	50V	12.5V * V	

ETG2500

Parameters	Full scale	Scale factor	Resolution
Forward power	2500W	625W * V	Full scale/204
Reflected power	250W	62.5W * V	
IPA (current amplifier)	150A	37.5A * V	
VPA (voltage amplifier)	50V	12.5V * V	

2.1.8 Profiles connector

N. 11 Rear panel (DB25 type - female)

Connector	Pin	Meaning	Notes
CN1 on boardT-G2U2A899	1	Channel 1	Command pulse
	2	Channel 3	Command pulse
	3	Channel 5	Command pulse
	4	Riserve	Command pulse
	5	Common ground	Connected to the frame
	6	Common ground	Connected to the frame
	7	-	Not connected
	8	Common ground	Connected to the frame
	9	Common ground	Connected to the frame
	10	Common ground	Connected to the frame
	11	Channel 5 status	Signaling output
	12	Channel 3 status	Signaling output
	13	Channel 1 status	Signaling output
	14	Channel 2	Command pulse
	15	Channel 4	Command pulse
	16	Channel 6	Command pulse
	17	-	Not connected
	18	Common ground	Connected to the frame
	19	Common ground	Connected to the frame
	20	Common ground	Connected to the frame
	21	Common ground	Connected to the frame
	22	Common ground	Connected to the frame
	23	Channel 6 status	Signaling output
	24	Channel 4 status	Signaling output
	25	Channel 2 status	Signaling output

Product description

2.1.9 TCP/IP connectors - Reserved

N. 12 Rear panel (RJ48 type)

Connector	Pin	Meaning	Notes
CN3 on board TG2U2A899	1	ETHERNET interface 10Base-T or 100Base-TX	
	2		
	3		
	4		
	5		
	6		
	7		
	8		
CN2 on board TG2U2A899	1	Reserved	
	2		
	3		
	4		
	5		
	6		
	7		
	8		

2.1.10 EIA485 connector

N. 13 Rear panel (DB9 type - female)
This connector uses Com1, as the connector n. 6 (front). The two connectors can't be used simultaneously.

Connector	Pin	Meaning	Notes
CN2 on board TG2U1A899	1	Com1 TX+	EIA485/422
	2	Com1 TX-	EIA485/422
	3	Com1 RX+	EIA485/422
	4	Com1 RX-	EIA485/422
	5	Common ground	Connected to the frame
	6	Common ground	Connected to the frame
	7	Common ground	Connected to the frame
	8	Common ground	Connected to the frame
	9	Common ground	Connected to the frame

2.2 Technical data sheet

FM TRANSMITTER MEDIUM POWER | ETG5000

ETG5000 | FM TRANSMITTER MEDIUM POWER

GENERAL DATA

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

CONNECTORS

RF Output	7/8
MPX	BNC Female
LEFT & RIGHT	XLR Female
AES/EBU	XLR Female
AUX	BNC Female
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 fro 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 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

Product description

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 reccomendation 450 (pilot tone)

EXCITER PERFORMANCE

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

INSTALLATION REQUIREMENTS

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

COOLING/NOISE/DATA

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

ENVIRONMENT

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

TELECONTROL & TELEMETRY

Remote control	Yes
Remote control, dry contacts	Yes
SNMP option	Yes (external)

Datasheet

FM TRANSMITTER MEDIUM POWER | ETG3500

GENERAL DATA

Output Nominal Power	3500 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	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

CONNECTORS

RF Output	7/8
MPX	BNC Female
LEFT & RIGHT	XLR Female
AES/EBU	XLR Female
AUX	BNC Female
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 fro 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 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

Product description

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 reccomendation 450 (pilot tone)

EXCITER PERFORMANCE

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

INSTALLATION REQUIREMENTS

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

COOLING/NOISE/DATA

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

ENVIRONMENT

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

TELECONTROL & TELEMETRY

Remote control	Yes
Remote control, dry contacts	Yes
SNMP option	Yes (external)

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

| **Product description**

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 reccomendation 450 (pilot tone)

EXCITER PERFORMANCE

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

INSTALLATION REQUIREMENTS

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

COOLING/NOISE/DATA

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

ENVIRONMENT

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

TELECONTROL & TELEMETRY

Remote control	Yes
Remote control, dry contacts	Yes
SNMP option	Yes (external)

2.3 Protections

The equipment has a protection system which is partially integrated and partially optional both for the hardware and the software.

2.3.1 Software protections

2.3.1.1 IPF (Intelligent Proportional Foldback)
The IPF is an intelligent system which reduces the equipment's output power in the event of strong load mismatch, thus preventing the machine from turning off.
The activation of this feature is shown on the display as alarm "026".

2.3.1.2 IPC (Intelligent Power Control)
When the equipment is working properly, the IPC keeps the output power constant within +/-1% of the target set, irrespective of mains voltage, temperature and load variations.
This contributes greatly to making the equipment insensitive to its working conditions.
The IPC also allows to optimize the RF section efficiency by making the MOSFETs constantly work at maximum efficiency, thus minimizing overall electrical consumption.

2.3.1.3 Safety Management ("Lifextender"option) ®
The Safety Management consists of algorithms which perform a real-time analysis of the transmitter's operating status and operates in order to maintain the output power set, according to the type and severity of any anomalies (internal or environmental) which may occur.
The Safety Management can command an output power reduction proportional to the severity of the anomaly that arises
The algorithms act at different levels and in various sections of the equipment: Thermal Management on the RF unit, Current Management on the power supply unit, Thermal Management on the power supply unit, Fault management on the RF unit, Fault Management on the power supply unit, Cooling Management on the fan unit.

Thermal Management on the RF unit (Lifextender) ®
Should the temperature measured in the vicinity of the MOSFETs exceed 72 °C, a first level of Derating intervenes slightly in order to reduce the temperature through an output power reduction. This power reduction is the minimum allowed in order to reach a thermal balance at a temperature lower than 72°C. The output power reduction never exceeds 48% with this first Derating. In other words, the output power always stays above 52% of that set by the user and the
"-3 dB" warning and relative alarm do not intervene.
This first Derating level is effective in virtually all cases.
The activation of this feature is shown on the display as alarm "010".
Should the first level Derating be insufficient (extremely rare), a second level intervenes, further reducing the power, thus obtaining a thermal balance status which is compatible with the safe operation of the equipment even if it is below
- 3dB (with subsequent alarm "005").
Should the second Derating be ineffective (in case of external conditions which are not compatible with the safe operation of the equipment) the equipment switches off.
In this case, if the temperature decreases, the power increases proportionally. If it decreases by 10°C (i.e. it reaches 62°C) the Derating mechanism stops
and full power is restored. After 3 failed attempts, the control logic blocks the equipment (alarm "011").

Product description

Current management on the power supply (Lifextender) ®

This is activated when the maximum current for continuous operation of the power supply is exceeded. This value is set below the deliverable current limit and constitutes the threshold which can be exceeded only for short periods (maximum 1 minute at a time). Should this situation arise, the "PSU current derating" function is activated (alarm "013" and if necessary alarm "014") and the ALC management algorithm, envisaged for normal operating conditions, is replaced by another one wherein the VDS control and Bias is determined by the power set and, with even higher priority, by the current delivered by the power supply.

The current derating condition is deactivated when the power delivered returns to the value set by the user and if the maximum current delivered by the power supply is less than or equal to the maximum value allowed for continuous operation.

Thermal management on the power supply (Lifextender) ®

The power supply management algorithm according to the temperature, is the same as that on the RF unit and is logically connected in "OR" to the latter.

The first Derating level (acting directly on the output power) is activated when the power supply temperature exceeds 75°C, while the second level is activated - if the first is ineffective - if the temperature does not stabilize below this value. In the latter case, the output power is brought below − 3 dB with the same procedure as that described for the RF section.

The activation of this feature is shown on the display as alarm "015" and possibly "016".

Fault Management on the RF modules (Lifextender) ®

This manages the maximum deliverable power according to the number of RF amplifier modules considered to be operating correctly.

If one or more MOSFETs are considered faulty (this happens when the absorbed current is 10% below the average value), the RF output power is reduced to the expected value when a fault occurs and the fans rotation speed is activated at the maximum value. The fault case study and corresponding maximum power is described through a complex table obtained through tests. It is designed to stop the fault spreading and to prevent
the MOSFETs that are still working from being put under excessive strain by the ALC mechanism (which would require them to provide all the missing output power).

In order to avoid a ridiculously high number of alarm SMSs, no messages are sent during this phase: the alarm SMS, if validated, is only sent after the adaptation procedure of the output power according to the table parameters and only if the -3dB condition occurs on the output power.

The activation of this feature is shown on the display as alarm "008" and "009".

Cooling Management on the fan unit (Lifextender) ®

According to the actual cooling requirements, the rotation speed of the fans is adjusted from a minimum of 60% to a maximum of 120% approx. (these values may vary according to the models of fan used). The cooling requirement is evaluated based on accurate measurements of the temperature in the vicinity of the RF MOSFETs and the power supply unit. The Cooling Management aims to extend the useful life of the fans, minimize the quantity of dust which can be transported by the air flow and allow the safe operation of the equipment also under extreme temperature conditions.

Without Lifextender, the fans always operate at 100%.

2.3.2 Hardware protections

The hardware protection system comprises:

· fast electronic and fuse protection of power supplies;

· fast electronic protection on the fan power supply;

· fast protection against excess reflected power (SWR/VSWR) following a strong load mismatch.

This protection is activated when the reflected power value exceeds 10% of the direct one.

2.4 Options

The models belonging to this series can be purchased with different options included:

Version with modulating signal input	Purchase information: please request the following codes
STEREO Inputs: · Left channel · Right channel · MPX · Aux1 · Aux Outputs: · MPX monitor/19 kHz	00E-JLA-10 (ETG5000) 00E-JLA-15 (ETG5000 with internal E.Box) 00E-ILA-30 (ETG3500) 00E-ILA-40 (ETG3500 with internal E.Box) 00E-ILA-35 (ETG2500) 00E-ILA-45 (ETG2500 with internal E.Box)
AES/EBU Inputs: · Left channel · Right channel · MPX · Aux 1 · Aux 2 · AES-EBU Outputs: · MPX monitor/19 kHz	00E-JLD-10 (ETG5000) 00E-JLD-15 (ETG5000 with internal E.Box) 00E-ILD-30 (ETG3500) 00E-ILD-40 (ETG3500 with internal E.Box) 00E-ILD-35 (ETG2500) 00E-ILD-45 (ETG2500 with internal E.Box)

The LifExtender can be requested as an option using the previous codes. To be specified in the order.

Product description

3 Instructions for use

3.1 User interface

The controls and display views are described below.

Please note that in order to have complete visibility of all the available interfaces, **the equipment must be set to LOCAL mode** and it must be accessed with the specific passwords.
Specifically in REMOTE mode you lose visibility of the menus PASSWORD SETTING, LIFEXTENDER, GSM/MODEM menu and DIAGNOSTIC menu.

Rotate the encoder to navigate through the menu items.
Press the encoder to access the desired item or to browse through submenus.
To exit an item go onto the "MENU" tab and press the encoder.
To return to the previous level go to the "Exit" item and press the encoder.

If you change the value of a parameter, to maintain it, before turn off the machine wait at least 60seconds.

Warning: the screen pictures shown below and the values attributed to the parameters are provided for illustrative purposes only. The parameters shown may vary slightly according to the equipment and setup type of the audio board.

TX CONTROL PANEL

PROFILE RF/BASEBAND MODE

PROFILE BASEBAND LEVELS

VIEW TX PARAMETERS 1

VIEW TX PARAMETERS 2

BASEBAND LEVELS

ALARMS LIST

EVENTS HISTORY

PASSWORD

PASSWORD SETTING

PASSWORD RECOVERY

MENU SYSTEM

MENU DIAGNOSTIC

EXIT

SYSTEM CONFIG

SYSTEM CONFIG 1

AUDIO TRIM & ALRM

COMMUNICATION PORT SET

SYSTEM INFO

SYSTEM TIME

CLOCK PWR TARGET 1 OF 2

CLOCK PWR TARGET 2 OF 2

ENABLE ALARMS SMS

DISPLAY ALARMS BIT

USER ALARMS DATA

USER ALARMS TIMERS

LIFEXTENDER

MENU GSM/MODEM

EXIT

GSM AND MODEM SERVICE

PHONE N.1 TO 4

PHONE N.5 TO 8

EXIT

UART 0 INFO

UART 1 INFO

UART 2 INFO

SMS DIAGNOSTIC

EXIT

3.1.1 TX control panel

Main screen which appears automatically when turning on in LOCAL mode. It is used to set and check the main operating parameters.

Warning light: when it is on it indicates the opening of the interlock contacts.

Warning light: when it is on it indicates a power drop below 3dB (<50% of target)

Warning light: when it is on it indicates the clipper engagement caused by overdrive

Warning light: when it is on it indicates an absence of signal beyond the limits set

Target frequency

Target audio level

Vu-meter: it must indicate approx. 0dB

Target power

Forward power effectively delivered

Reflected power: it must be null or very low

To access the list of menus

To switch on /put the system on stand-by

To reset the alarms

To set the pre-emphasis level

To set the audio signal

To set the profile

3.1.2 Profile RF/Baseband mode

Setting and display screen.
For every profile, the frequency, target power, type of audio signal and pre-emphasis are defined.
The active profile values are indicated by the letter "A". The deviation is displayed (in kHz).

3.1.3 Profile baseband levels

Setting and display screen.
For each profile, the audio signal level, auxiliary channel level (expressed as a percentage, 100% equals the maximum amplitude for 75kHz deviation), clipping value and reference voltage value are defined.
The active profile values are indicated by the letter "A". The deviation is displayed (in kHz).

3.1.4 View TX parameters 1

Display only screen.
The parameters which can be monitored are as follows: frequency, active profile number, deviation, efficiency, transmitter working hours, fan working hours, direct power target, effective direct power value, reflected power, current, voltage, maximum temperature (the following pictures show the probe position) and fan speed.

```
Freq(MHz)   98.00      Targ (W)    5000
Profile     PF 1       Fwd  (W)       0
Dev.(KHz)    0.0       Refl (W)       0
Eff. (%)     0.0
                       Itot (A)     0.0
WTime(h)       0       Vds  (V)     0.0
WFans(h)       0       Temp.(C)     0.0
MENU                   FanSp(%)       0
```


Environment temperature
probe

PSUs temperature probes

RF temperature probes

3.1.5 View TX parameters 2

Display only screen.
The parameters which can be monitored are as follows: current and temperature of the amplifier modules, current, voltage and temperature of the power supplies, voltages and auxiliary power supply polarization, sum of the power supply currents, sum of the module currents, voltage, ambient temperature and efficiency.

```
Device n.  1    2    3    4    5    6    7
AmpI(A)   0.0  0.0  0.0  0.0  0.0  0.0  0.0
AmpI(C)   0.0  0.0  0.0  0.0  0.0  0.0  0.0
PSU (A)   0.0  0.0  0.0  0.0  | I PSU(A)   0.0
PSU (V)   0.0  0.0  0.0  0.0  | Iampl(A)   0.0
PSU (C)   0.0  0.0  0.0  0.0  | Vds  (V)   0.0
Aux-> VCC   +V1   -V1   Bias | Tenv.(C)   0.0
MENU  5.0  12.0 -11.4   0.0  | Eff. (%)   0.0
```

3.1.6 Baseband levels

Setting and display screen.
There are levels of the audio signal.
The display changes depending on the audio mode selected.

3.1.7 Alarms list

Display only screen.
It is possible to monitor the list of most recent alarms. The alarms indicated by the letter "A" are still active.
In order to understand the meaning of the alarms, please refer to paragraph "Alarms/events list".

3.1.8 Events history

Display only screen.
The log of all the events/alarms occurred (up to 99) can be monitored. These are indicated by code, description, date and time.

3.1.9 Password

The equipment is delivered with the default password "0000" that can be customized by the user (for more details, please see paragraph "Password Setting").
In this screen the access password must be entered.

```
PASSWORD : 0000

MENU STBY REST Ø uS STER PF 1
```

3.1.10 Password setting

There are two levels of user privilege: USER and SYSTEM, which are both initially protected by the default password "0000".
In this screen it is possible to define customized passwords by the user with "SYSTEM" privileges.

Other parameters that can be set from this menu are the machine addresses (reference for communication with it).

```
FRONTID    0 TCTS ID    0
PASSWORD USER 0000
MENU STBY REST Ø uS STER PF 1
```

3.1.11 Password recovery

If you lose your password, please contact Elenos.
Elenos must be given the "Unlock code" in this screen.
Elenos will provide a password valid for 24 hours to be entered on the same screen under the "Password Recovery" item.
The user must later define new passwords through the "Password Setting" screen.

```
UNLOCK CODE        02A7
PASSWORD RECOVERY  0000
MENU STBY REST Ø uS STER PF 1
```

3.1.12 System config

Setting and display screen.
The following parameters can be set by the user: temperature measurement unit (Temp. U.), remote display operating mode (Show D.), audio board model (BB model, automatically detected, or STEREO view as default), equipment protection in case of oscillations (PwOscChk), power target when working with a UPS (UPS T), VCO synchronization (Time base, internal or external
at 10MHz), power reading calibration (FwdPwrCal), SWR foldback, polarization threshold (IPA Bias Tres.), reflected power nominal threshold (Refl.Pwr T.N., when active it is 10% of direct power), reflected power customized threshold (Refl.Pwr T.Lev., when the nominal threshold is inactive, it is possible to set values below10%), final polarization (PAbias), maximum settable power full scale (Max Target Pwr).

```
Temp.U.:CELSIUS  |Time base (10MHz):INTER.
Show D.:ALWAYS   |Fwd Pwr Cal.  (%):    100
BBmodel:       0 |SWR Foldback     :ENABLE
                 |IPA Bias Tres. (V):   8.00
PwOscChk: FALSE  |Refl.Pwr T.N.(10%): FOLD!
UPS T(W):   2600 |Refl.Pwr T.Lev.(W):    525
Min T Sen: 1     |PAbias         (V):   5.45
MENU  <==========|Max Target Pwr (W)    5000
```

3.1.12.1 Power oscillation algorithm
In Elenos devices, if there is a power variation of "n" W ("n" being defined in specific tables) at least 3 consecutive times within 15 seconds, the "035" alarm is activated and the three block out mechanism is triggered (if this mechanism fails, the "003" alarm is then activated).

3.1.12.2 Foldback algorithm
The Elenos devices feature two different and independent protections which are activated when there is an excess of reflected power.
The first is a hardware threshold which operates when the reflected power exceeds 10% of the maximum rated output power of the transmitter in a very short space of time.
In these conditions the transmitter switches off.
The second is a software protection, called "foldback algorithm".
It is activated when the reflected power increase is slower (for example, when there is snow or ice on the antenna).
In these conditions, the transmitter gradually reduces its output power until the reflected power threshold is exceeded, while the output power is gradually restored when the values go back to normal.
If normal operating conditions continue for more than 60 seconds, the algorithm is inactive.
The activation of this second protection is left to the user (from the System config screen).

Instructions for use

3.1.13 System config 1

Setting and display screen.
The alarm signal, caused by wrong output power, snaps by default at -3dB of target power and disappears when you reach the 2/3 of that.
The "Min Level Fwr Pwr Fault" additional parameter, set here, acts in an AND condition with the standard algorithm: so, the alarm will snap when there is the first between the two conditions "-3dB" and "Min Level Fwr Pwr Fault", while will disappear when the highest value between "2/3 Ptarget" and "Min Level Fwr Pwr Fault+typical step related to apparatus" occurs.
For stand-alone devices meant to set Min Level Fwr Pwr Fault to a value greater than-3dB, while using lower values may have meaning in N+1 systems.
By default Min Level Fwr Pwr Fault is set to the minimum value of power.

```
Min Level Fwr Pwr Fault (W):   100




MENU <=========
```

3.1.14 Audio trim & alrm

Setting and display screen.
The following parameters can be set by the user: pilot tone level, pilot tone phase,
clipping voltage.
It is possible to monitor the audio board model (BB board model, automatically
detected, or STEREO view as default) and the firmware version of the audio board (BB
Firmware).
The alarms connected to the audio section are set. The management uses the TC/TS
connector.
The alarm is activated when it is below the threshold set (Modulation), after the set
period of time (Dlay Alarm Timer).
The user can choose from five operating modes (Bad mod.) : DISABLE, NO AUDIO, SWAP,
FAULT, FLT/SWAP.

3.1.14.1 Audio "Disable" alarm
By setting the "Bad mod." field to "DISABLE", the alarm is completely deactivated wi-
thout needing to change the levels (Modulation, Dlay Alarm Timer).

3.1.14.2 "No audio" audio alarm
By setting the "Bad mod." field to "NO AUDIO", the default setting is kept, i.e. "No Au-
dio" on pin 23 of the TC/TS connector.
If the transmitter is inside an N+1 system, the "No Audio" signal is not available at the
exchange unit.

3.1.14.3 "Swap" audio alarm
By setting the "Bad mod." field to "SWAP", the "No Audio" line (pin 23) is exchanged
with the "Warning" line (pin 13) on the TC/TS connector.
If the transmitter is inside an N+1 system, the "No Audio" signal is available at the
exchange unit.

3.1.14.4 "Fault" audio alarm
By setting the "Bad mod." field to "FAULT", the "No Audio" line (pin 23) is in "or" condi-
tion with the "Fault" line (pin 24) on the TC/TS connector.
If the transmitter is inside an N+1 system, the exchange unit activates the switching in
the presence of No Audio.

3.1.14.5 "Flt/Swap" audio alarm
By setting the "Bad mod." field to "FLT/SWAP", there is a combination of the two
"Swap" and "Fault" modes.
In this way, if the transmitter is inside an N+1 system, the "No Audio" signal is available
at the exchange unit and the exchange unit actives the switching.

3.1.15 Communication port set

Setting and display screen.
The parameters which can be set by the user are the speed and the front and rear 485 door addresses.

```
Front 485 -c1--        TcTs 485 --c2--
  Speed  :  9.6K          Speed  : 57.6K
  Address:     0          Address:     0



MENU <=============================
```

3.1.16 System info

Setting and display screen.
The equipment software version, the protocol version, the equipment activity time and the fan operating time are indicated.
It is possible to reset the latter by clicking "R".

```
Ver.Sw 2.80     Ver.P.  1.10

On air time          0:00:00
Fan work time        0:00:00 R
MENU STBY REST 0 uS STER PF 1
```

3.1.17 System Time

Setting and display screen.
The following parameters can be set by the user: the day of the week, date and time.

```
       wd gg/mm/yy   hh:mm:ss
C:    01 13/02/14   12:10:56
SET >01 13/02/14   12:10:41
MENU STBY REST 0 uS STER PF 1
```

3.1.18 Clock Pwr Target

Setting and display screen.
As well as the standard power adjustment, it can also be set according to time slots in order to save energy. In order to be able to set the power according to individual time slots, the field "Target Power Mode" must be set to "CLOCKED".
Then, the various times of day can be matched with four different power percentage values (100%, 75%, 50% or 25% of the set power).
After defining the day of the week to be set (Target Power on day of) for each time of day, press the cursor to enter the setting bar, rotate it to define the percentage (nothing displayed corresponds to 25%, T1 corresponds to 50%, T2 corresponds to 75%, T3 corresponds to 100%) and press the cursor to confirm.
By setting the "Copy over next day" field to "T", the previous day setting is copied to the next day.
By setting the "Reset at default" field to "T", the settings are reset to default, where the power is low at night and full during the day.

3.1.19 Enable Alarms Sms

Setting and display screen.
Besides the alarm management "by status", it is possible to have
alarm management "by event".
The alarms for which this management mode is enabled merge in a buffer.
If the value "0" is attributed to the relative alarm, it means that is deactivated, while the value
"1" means that is activated to be managed in "by event" mode.
This function is available only by means of connection on the Omron protocol.
In order to understand the meaning of the alarms, please refer to paragraph "Alarms/events list".

3.1.20 Display Alarms Bit

Setting and display screen.
Here is summarized the event configuration set in the menu "Enable Alarms SMS" (the "Enable") and those that are active are highlighted ("Status" field).
If the field "SMS / PSTN StatusReady" is "TRUE" means that an event is active, and has been sent alarm or phone call.
To return the field "FALSE" you need to reset alarms.

3.1.21 User Alarms Data

Setting and display screen.
Some alarms can be set according to activation conditions.
The current value of the alarm condition parameter (ambient temperature, RF temperature, RF current, power supply temperature, power supply current, direct power, reflected power) can be monitored.
By setting the "En." parameter to "T/F" the respective alarm is enabled/disabled.
The following parameters can be set by the user: the parameter minimum and maximum values, and the type of condition to be met (upper, lower, inside, outside).

MENU	Rdg.	En.	Max	Min	Type
Env.Temp(C):	0.0	F	50.0	45.0	UPPER
RF Temp(C):	0.0	F	90.0	98.0	UPPER
RF Curr(A):	0.00	F	1.20	1.00	UPPER
PSU Temp(C):	0.0	F	90.0	98.0	UPPER
PSU Curr(A):	0.0	F	198.0	178.2	UPPER
FWD Pwr(W):	0	F	2500	2000	LOWER
REFL Pwr(W):	0	F	500	450	UPPER

3.1.22 User Alarms Timers

Setting and display screen.
In some alarms, it is possible to set a time frame in which the condition must occur in order to make the alarm effective ("Dlay").
The trend of the meter for this time can be monitored as well as the possible enabling of the alarm by means of a status flag (Alrm).

MENU	Rdg.	En.	Max	Min	Type
Env.Temp(C):	0.0	F	50.0	45.0	UPPER
RF Temp(C):	0.0	F	90.0	98.0	UPPER
RF Curr(A):	0.00	F	1.20	1.00	UPPER
PSU Temp(C):	0.0	F	90.0	98.0	UPPER
PSU Curr(A):	0.0	F	198.0	178.2	UPPER
FWD Pwr(W):	0	F	2500	2000	LOWER
REFL Pwr(W):	0	F	500	450	UPPER

Instructions for use

3.1.23 Lifextender

Setting and display screen.
The parameters relative to the Lifextender option can be monitored: equipment serial number, equipment code (parameter to be notified to Elenos should the user require the activation/deactivation of this function), activation/deactivation code (parameter supplied by Elenos to be entered for the function activation/deactivation), function status, work days in good operating conditions, work days in critical operating conditions.
The algorithm considers the following parameters to define the critical days: RF temperature, power supply temperature, ambient temperature and reflected power with respect to maximum operating power.
These parameters must exceed the threshold values for a certain amount of time.
In this way, the duration and intensity of the event is assessed: intense short events are heavy; less intense but longer events are heavy too.

```
SerialNumber            :  00000000
Device Code             :  9A00
Deactivation Code       :  0000
LIFE EXTENDER Status    :  ACTIVE
Run Time(dd): Optimal   4 Heavy:       0
MENU STBY REST 0 uS STER PF 1
```

3.1.24 GSM and modem service

Setting and display screen.
The GSM signal field intensity can be monitored.
It is possible to enable the submission of an alarm by SMS and/or PSTN in case of no mains power (No Mains SMS) for the period of time set (Delay).
It is possible to enable the submission of an alarm by SMS and/or PSTN if the power delivered is at least 3dB less than the target set (SMS FWD over 2/3).
The codes to be displayed in the different message strings can be defined (PagerId, StatId, String Id).

3.1.25 Phone N.1 to N.8

Setting and display screen.
The equipment can "communicate" with up to 8 SIM cards.
The telephone numbers and authorizations can be defined in international format
The number can be globally enabled for SMS transmission and reception SMS (En.), be enabled to send commands (Cmd), be enabled to request and receive the machine status (Sts), be enabled to receive the echo any of commands sent by other numbers (Glb) and be enabled to receive SMSs in text or digital format (PC.).

3.1.26 Uart 0,1,2 info

Control menu for testing the serial ports.

3.1.27 SMS diagnostic

To see the number of SMS sent and received successfully.
For more detail see paragraph "SMS List".

3.2 Alarms/events list

There is an "Alarm management" module.
In order to check the alarm conditions, physical and logical digital inputs are used.
The status of each input is sampled and the condition is then logically processed by a combinational network so as to establish whether the alarm or signalling is active.
The minimum intervention time is 100ms.
This module is repeatedly performed with the same priority as ALC management, so as to constantly monitor the alarm cause onset and therefore to intervene within the required time frame.
A log stores the sequence of the last events generating alarms with the date and time of activation.
The alarms/event list which can be found is as follows:

Alarm/event	Description
"000 CORRECT WORKING"	This indicates correct equipment operation. The "On air" event has higher priority.
"001 SYSTEM RESET"	This indicates that the alarm reset is in progress. All stored and inactive alarms are removed from the list.
"002 EEPROM CHKSUM ERROR"	This indicates that the stored data is not reliable any longer and the machine is reconfigured according to the default parameters.
"003 BLOCKED"	This indicates that the machine is blocked after making 5 restore attempts. the user must reset in order to allow the equipment to restart.
"004 STOP"	This indicates that the equipment is in stand-by mode and is ready to start without alarms.
"005 -3dB CARRIER"	This indicates that the equipment has been delivering power at least 3dB less than the target set, for at least a minute in start-up and 5 seconds of normal operation.
"006 HIGH REF PWR"	This indicates that the level of reflected output power is too high, meaning that the equipment will turn off in three block out.
"007 MIN 12V"	This indicates that the negative voltage reference is altered and prevents correct operation of the protections. Stop in three block out.
"008 RF AMP. FAULT"	This indicates a fault on one or more RF .
"009 RF AMP. FAULT DERATING"	This indicates a fault on one or more RF modules, which implies a reduction in the overall maximum deliverable power.
"010 RF THERMAL DERATING"	This indicates an excessive temperature on the RF modules which implies a reduction in the maximum output power.
"011 RF OVER TEMPERATURE"	This indicates that the maximum operating temperature has been exceeded, thus causing machine turn off in three block out. This protection intervenes in extreme cases in which the Derating mechanism is not sufficient to make the temperature values go back to normal.
"012 PSU FAULT"	This indicates the malfunctioning of the power supply(ies).
"013 PSU CURRENT DERATING"	This indicates power supply overload which causes a decrease in the power delivered.
"014 PSU OVER CURRENT"	This indicates that the machine switches off if 1 minute after derating the current still does not decrease.
"015 PSU THERMAL DERATING"	This indicates power supply overheating which causes a decrease in the power delivered.

Instructions for use

"016 PSU OVER TEMPERATURE"	This indicates power supply overheating which causes the equipment to switch off.
"017 PSU COMM TIMEOUT"	This indicates malfunctioning of the IEEE485 internal bus for communication between CPU, PSU and SHUNT.
"018 EXTERNAL INTERLOCK"	This indicates the presence of the active interlock.
"019 ON AIR"	This indicates that the device is working properly and is transmitting.
"020 POWER UP"	This indicates that the equipment restart signalling is being added to the log.
"021 POWER DOWN"	This indicates that the equipment switch off signalling is being added to the log.
"022 PSU THERMAL FAULT"	This indicates power supply overheating with subsequent switching off of the machine. For ELENOS equipment with more than one power supply, the intervention of this protection aims to allow operation at reduced power, should a power supply be disconnected to protect the hardware from excessive temperature.
"023 PSU LOW POWER"	This indicates a power drop with subsequent switching off of the equipment. For ELENOS equipment with more than one power supply, the intervention of this protection aims to allow operation at reduced power, should a power supply be disconnected to protect the hardware from a power decrease.
"024 PSU RF OFF"	This indicates a problem on 50V with subsequent switching off of the machine. For ELENOS equipment with more than one power supply, the intervention of this protection aims to allow operation at reduced power, should a power supply be disconnected to protect the hardware from the absence of RF power.
"025 WORKING MODE COMBINED"	This indicates the operation of the machine in a combined system.
"026 SWR FOLDBACK"	This indicates that the machine is having a power reduction since the reflected power detected is too high.
"027 UNLOCK"	This indicates that the PLL is not engaged, therefore the machine is stopped.
"028 EXCITER COMM ERROR"	This indicates that the PLL and VCO are not programmable.
"029 NO AUDIO"	This indicates the absence of the audio signal.
"030 OVER 2/3 CARRIER"	This indicates that 2/3 of the power set has been exceeded.
"031 PREAMPLIFIER NOT CONNECTED"	This indicates 100% reflected power. Not implemented here.
"032 OVER MODULATION"	This indicates over modulation.
"033 FAST INHIBIT"	This indicates that there are problems on the hardware lines leading to RF delivery inhibition.
"034 TEMPERATURE SENSOR ERROR"	Where there are multiple RF temperature probes, this indicates that one is faulty if it measures a noticeably different value from the other probes.
"035 PWR FORWARD OSCILLATION"	This indicates oscillations in the output power.
"036 THREE BLOCK OUT"	This indicates that restore procedure.
"037 USER ENV TEMP OUT LIMIT"	This indicates a variation with respect to the conditions set by the user relating to the ambient temperature measured by the equipment.
"038 USER RF TEMP OUT LIMIT"	This indicates a variation with respect to the conditions set by the user relating to the RF module temperature.

"039 USER PSU TEMP OUT LIMIT"	This indicates a variation with respect to the conditions set by the user relating to the power supply temperature.
"040 USER RF CURRENT OUT LIMIT"	This indicates a variation with respect to the conditions set by the user relating to the RF module currents.
"041 USER PSU CURRENT OUT LIMIT"	This indicates a variation with respect to the conditions set by the user relating to the power supply current.
"042 USER FRW PWR OUT LIMIT"	This indicates a variation with respect to the conditions set by the user relating to the direct power.
"043 USER RFL PWR OUT LIMIT"	This indicates a variation with respect to the conditions set by the user relating to the reflected power.
"044 OUT PWR NOT VERIFIED"	This indicates that the output power cannot be detected properly.
"045 UPS ACTIVE"	This indicates that the UPS is active, therefore the equipment is using the target power set for operation in this mode.
"046 SHUNT COMM TIMEOUT"	This indicates the communication timeout on the polarizer. It stops the operation of the apparatus.
"047 WARNING TEMPERATURE SENSOR"	This indicates a fault in the temperature probes.
"048 AUDIO OK MASK"	This indicates that the No audio alarm is finished.
"049 DRAIN VOLTAGE FEEDBACK ERROR"	This indicates the lack of control of Vds for causes such as power failures, wrong feeding, etc..
"050 OVER FRW PWR ERROR"	This indicates the presence of overshoot in power.
"058 RTC FAULT"	This indicates that there were 3 consecutive mismatches between date/time hardware and firmware, or the date is incorrectly formatted.
"059 RTC USER UPDATED"	This indicates a date upgrade.
"060 RTC AUTOMATIC RECOVERY"	This indicates that there is a misalignment of more than 5 seconds between date/time hardware and firmware.

Instructions for use

3.3 SMS list

3.3.1 SMS commands (submit)

It is possible to submit SMSs in order to perform the following commands:

Command	SMS text
Setting power to xxxxx	PWR xxxxx
Setting the equipment to stand-by mode	STBY
Setting the equipment to stand-by mode	OFF
Setting the equipment to On Air mode	ON
Status request	STS
Reset request	RES
Setting data request	STS1
Setting the equipment to mute mode for xx minutes (no in MPX version)	MUTE xx
Restoring the audio by excluding the command MUTE AUDIO	AUDIO
Activating power in CLOCKED mode	CLKP
Activating power in FIXED MODE	FIXP
The number that sends this SMS will be disabled upon receipt alarm/status	SMSNO
The "n" number will be disabled upon receipt alarm/status	SMSNO n
The "n" number will be enabled upon receipt alarm/status	SMSYES n

3.3.2 Status/alarm SMS (reception)

It is possible to receive status or alarm SMSs, for example composed in this way:

**Exxxx ID xx
SMS String
+39xxxxxxxxxx
STBY
No mains xx m
NoAudio
AudioOK
xxx Messaggio di segnalazione
FWD yyyyy W
REFL yyyyy W
FRQ xxx.xxMHz
VDS xxx.xV
IDS xxx.xxA
TEMPMAX xxx.xC
TEMPENV xxx.xC**

**Exxxx ID xx
SMS String
+39xxxxxxxxxx
-3dB Alarm
No mains xx m
NoAudio
AudioOK
xxx Messaggio di segnalazione
FWD yyyyy W
REFL yyyyy W
FRQ xxx.xxMHz
VDS xxx.xV
IDS xxx.xxA
TEMPMAX xxx.xC
TEMPENV xxx.xC**

Exxxx ID xx
SMS String
+39xxxxxxxxxx
Status
No mains xx m
NoAudio
AudioOK
xxx Messaggio di segnalazione
FWD yyyyy W
REFL yyyyy W
FRQ xxx.xxMHz
VDS xxx.xV
IDS xxx.xxA
TEMPMAX xxx.xC
TEMPENV xxx.xC

Exxxx ID xx
SMS String
+39xxxxxxxxxx
Command
No mains xx m
NoAudio
AudioOK
xxx Messaggio di segnalazione
FWD yyyyy W
REFL yyyyy W
FRQ xxx.xxMHz
VDS xxx.xV
IDS xxx.xxA
TEMPMAX xxx.xC
TEMPENV xxx.xC

Exxxx ID xx
SMS String
+39xxxxxxxxxx
Set
STBY
FRQ xxx.xxMHz
[TRG]/[24hTRG]xxxxxW
SmsOver-3dB OFF
PwrAdj xxx%
Ver x.xx-x.xx
MaxPwr xxxxxW

Exxxx ID xx
SMS String
+39xxxxxxxxxx
Set
STBY
FRQ xxx.xxMHz
[TRG]/[24hTRG]xxxxxW
SmsOver-3dB ON
PwrAdj xxx%
Ver x.xx-x.xx
MaxPwr xxxxxW

Exxxx ID xx
SMS String
+39xxxxxxxxxx
Set
ON AIR
FRQ xxx.xxMHz
[TRG]/[24hTRG]xxxxxW
SmsOver-3dB OFF
PwrAdj xxx%
Ver x.xx-x.xx
MaxPwr xxxxxW

Exxxx ID xx
SMS String
+39xxxxxxxxxx
Set
ON AIR
FRQ xxx.xxMHz
[TRG]/[24hTRG]xxxxxW
SmsOver-3dB ON
PwrAdj xxx%
Ver x.xx-x.xx
MaxPwr xxxxxW

Where :

Exxxx ID xx is the description of the apparatus with indication of the ID number
SMS String is a customizable string of 10 characters
+39xxxxxxxxxx is the telephone number of origin of the last command
STBY/ON AIR indicates (command) that the machine is in Standby (Off)/On Air
-3dB Alarm indicates that the machine is working below the-3dB
Status is the response to an SMS status command
Command is the confirmation to a command
No mains xx m indicates that the machine has been off for the indicated time (in minutes)
NoAudio indicates that the machine is in no audio alarm
AudioOK indicates that the audio was restored to the level required
xxx Messaggio di segnalazione indicates a cause of arrest or a major signaling
FWD yyyyy W indicates the forward power
REFL yyyyy W indicates the reflected power
FRQ xxx.xxMHz indicates the frequency
VDS xxx.xV indicates the voltage
IDS xxx.xxA indicates the current
TEMPMAX xxx.xC indicates the max temperature
TEMPENV xxx.xC indicates the environmental temperature
Set are settings information
[TRG]/[24hTRG]xxxxxW indicates the target power
SmsOver-3dB ON/OFF indicates that the SMS to restore power is ON/OFF
PwrAdj xxx% indicates the correction of the display of forward power
Ver x.xx-x.xx indicates the firmware/datamap release
MaxPwr xxxxxW indicates the power omologation

Please note: The functionality of the SMS reception is interrupted for an hour, if they are sent by the system more than 5 messages over 5 min.

3.4 Externally connectable optional equipment

The equipment can be connected externally to the following units:
- PC
- Telemetry
- Exchange and/or Audio matrix
- Elenos E.BOX. module

3.4.1 Connection to PC

This connection is useful to analyse the equipment operating parameters in detail, for example during the performance assessment stage or during repairs.

To connect the equipment to a PC, insert an interface cable into the "Interface" connector, DB9, located on the front panel of the machine.
This may be supplied with the product (Elenos code CAB0068-0).
The connection can also be made when the machine is operating.

The Windows Hyperterminal programme can be used to display, or another equivalent available programme.
For the detailed procedure for using an ASCII terminal, please request technical bulletin No. 127 from the manufacturer.

CAB0068-0

3.4.1.1 Hyperterminal interface

The Hyperterminal pages have a very similar structure to the display view, hence they will not be further described herein.

Since there is more available space, there could be additional parameters.

```
+--------------------------------------------------------------------+
| ELENOS ETG5000_7F  S/N.00000000  ELENOS <id 0000> life eXtender  [menu=Q] |
|--------------------------------------------------------------------|
| Status : 004 STOP                          17:15 12/02 | Reset alarms :F |
|--------------------------------------------------------------------|
| Forward    (W):    0 [ 5000] Frequency (MHz):  98.00    RF    :    STBY |
| Reflected  (W):    0         LOCK  ----   ----  ----    VDS  (V):   0.0  |
| Eff. (%):   0.0  Prof.#:  1  ----   ----  ----  MPX     IDS  (A):  0.00  |
|--------------------------------------------------------------------|
| MAIN MENU (level 1) ===>                17:15:22   12/02/2014█      |
|--------------------------------------------------------------------|
| M = Main RF data                                                   |
| O = Profiles                                                       |
| E = Exciter monitor              +--------------------------------+|
| S = Status/Alarms                | E L E N O S  Srl               ||
| H = Events History               | Via G.Amendola, 9              ||
| K = Password...                  | 44028 Poggio Renatico (FE)     ||
| Y = System...                    | ITALY                          ||
| D = Debug...                     | Tel.+39 0532 829965            ||
|                                  | Fax.+39 0532 829177            ||
|                                  | www.elenos.com                 ||
|                                  +--------------------------------+|
|                                  Ver. 2.80 /1.10 (c)2011 Elenos|  |
+--------------------------------------------------------------------+
```

Main Menù

```
+--------------------------------------------------------------------+
| ELENOS ETG5000_7F  S/N.00000000  ELENOS <id 0000> life eXtender  [menu=Q] |
|--------------------------------------------------------------------|
| Status : 004 STOP                          17:15 12/02 | Reset alarms :F |
|--------------------------------------------------------------------|
| RF CURRENTS (A)                                                    |
| Ampl. n:       1     2     3     4     5     6     7                |
| I drain:      0.0   0.0   0.0   0.0   0.0   0.0   0.0      Sum:  0.0 |
|--------------------------------------------------------------------|
| PSU1   (V):  0.0  Vcc   (5V):   5.0 | STAND-BY    :          TRUE   |
| PSU2   (V):  0.0  V+   (12V):  12.0 | FREQUENCY(MHz):  98.00(ft)  98.00 |
| PSU3   (V):  0.0  V-   (12V): -11.4 | TARGET PWR (W):            5000   |
| PSU1   (A):  0.0  VBias  (V):   0.0 |------------------------------- |
| PSU2   (A):  0.0  Vds    (V):   0.0 | TEMPERATURES(C)          (C)   |
| PSU3   (A):  0.0  Ids(PSU, A):  0.0 | Int.Env:   0.0   Rf 1 :   0.0  |
|-------------------------------------| Max RF :   0.0   Rf 2 :   0.0  |
| Fwd    (W):  0                      |                  Rf 3 :   0.0  |
| Ref    (W):  0  Profile (n):    1   | Max PSU:   0.0   Rf 4 :   0.0  |
| Eff    (%): 0.0  Dev.  (KHz):  0.0  | PSU1       0.0   Rf 5 :   0.0  |
|                                     | PSU2       0.0   Rf 6 :   0.0  |
|-------------------------------------| PSU3       0.0   Rf 7 :   0.0  |
| WORKING TIME  :    0:00:00          |                                |
| FAN WORKING T.:    0:00:00  Reset: F█| Fan s.%:      0               |
+--------------------------------------------------------------------+
```

Main Menù
Main RF data (M)

```
+------------------------------------------------------------------------+
| ELENOS ETG5000_7F  S/N.00000000  ELENOS <id 0000> life eXtender   [menu=Q] |
|------------------------------------------------------------------------|
| Status : 004 STOP                        17:17 12/02 | Reset alarms :F |
|------------------------------------------------------------------------|
| Forward    (W):     0 [ 5000] Frequency (MHz):  98.00    RF      :    STBY |
| Reflected  (W):     0         LOCK ----  ----  ----      VDS  (V):   0.0 |
| Eff. (%):  0.0  Prof.#:  1    ----  ----  ----  MPX      IDS  (A):   0.0 |
|------------------------------------------------------------------------|
|                          ==== L e v e l s ====         Clipping |
| #   Freq.   Target    Mode    Input Right  Left  Aux1  Aux2 Pree Enab. Lev.|
|     MHz      W                       dB    dB    %     %    uS        KHz |
|Cur. 98.00   5000   Ext.MPX   AUTO   0.0   0.0  100.0 100.0   0  OFF 150.0 |
|                                                                        |
| 1   ------   ----  -------  -----  -----  -----  ----- -----  --  --- ---- |
| 2   98.00   5000   Ext.MPX   AUTO   0.0   0.0  100.0 100.0   0  OFF 150.0 |
| 3   98.00   5000   Ext.MPX   AUTO   0.0   0.0  100.0 100.0   0  OFF 150.0 |
| 4   98.00   5000   Ext.MPX   AUTO   0.0   0.0  100.0 100.0   0  OFF 150.0 |
| 5   98.00   5000   Ext.MPX   AUTO   0.0   0.0  100.0 100.0   0  OFF 150.0 |
| 6   98.00   5000   Ext.MPX   AUTO   0.0   0.0  100.0 100.0   0  OFF 150.0 |
|                                                                        |
| Current Profile # :     1                                              |
|   Delta F (+/- KHz):   0.0                     BB board model:    0 |
+------------------------------------------------------------------------+
```

```
+------------------------------------------------------------------------+
| ELENOS ETG5000_7F  S/N.00000000  ELENOS <id 0000> life eXtender   [menu=Q] |
|------------------------------------------------------------------------|
| Status : 004 STOP                        17:17 12/02 | Reset alarms :F |
|------------------------------------------------------------------------|
|0(kHz)  15       30       45       60       75       90      105 |
|Mpx---[   0.0]----------+--------+--------+--------+--------+--------|
|>                                                                       |
|                                                                        |
|                                                                        |
|                                                                        |
|                                                                        |
|                                                                        |
| 0(kHz)    5.0     10.0     15.0     20.0     25.0     30.0 |
|Aux----[   0.0]----------+--------+--------+--------+--------+--------|
|>                                                                       |
|------------------------------------------------------------------------|
| Tx Frequency(MHz): 98.00                                               |
|------------------------------------------------------------------------|
| Inp. level  (dB):         0.0  | Mode          :Ext.MPX | SW Ver:  0.00 |
|                                |                        | BB brd mod.: 0 |
|                                |                        |              |
| Aux1(%):100.0   Aux2(%):100.0  |                        | Pll   : LOCK |
+------------------------------------------------------------------------+
```

```
+----------------------------------------------------------------+
| ELENOS ETG5000_7F  S/N.00000000  ELENOS <id 0000> life eXtender   [menu=Q] |
|----------------------------------------------------------------|
| Status : 004 STOP                        17:18 12/02 | Reset alarms :F |
|----------------------------------------------------------------|
| STATUS/ALARMS (1 - 17)  -->                                    |
| ACTIVE 004 STOP                                                |
|                                                                |
|                                                                |
|                                                                |
|                                                                |
|                                                                |
|                                                                |
|                                                                |
|                                                                |
|                                                                |
|                            █                                   |
|                                                                |
+----------------------------------------------------------------+
```

```
+----------------------------------------------------------------+
| ELENOS ETG5000_7F  S/N.00000000  ELENOS <id 0000> life eXtender   [menu=Q] |
|----------------------------------------------------------------|
| ALARMS HISTORY --> ([-] prev.pag. [+] next pag. [arrow up/down] next/prev.)|
|    44) 046 SHUNT COMM TIMEOUT                     12/02 16:58:55  >> |
|    43) 017 PSU COMM TIMEOUT                       12/02 16:58:55     |
|    42) 020 POWER UP                               12/02 16:58:51     |
|    41) 021 POWER DOWN                             12/02 16:58:15     |
|    40) 001 SYSTEM RESET                           12/02 16:41:41     |
|    39) 047 WARNING TEMPERATURE SENSOR             12/02 16:24:58     |
|    38) 028 EXCITER COMM ERROR                     12/02 16:24:58     |
|    37) 046 SHUNT COMM TIMEOUT                     12/02 16:24:57     |
|    36) 017 PSU COMM TIMEOUT                       12/02 16:24:57     |
|    35) 020 POWER UP                               12/02 16:24:53     |
|    34) 021 POWER DOWN                             12/02 16:24:06     |
|    33) 001 SYSTEM RESET                           12/02 16:23:59     |
|    32) 047 WARNING TEMPERATURE SENSOR             12/02 16:23:43     |
|    31) 028 EXCITER COMM ERROR                     12/02 16:23:43     |
|    30) 046 SHUNT COMM TIMEOUT                     12/02 16:23:43     |
|    29) 017 PSU COMM TIMEOUT                       12/02 16:23:42     |
|    28) 020 POWER UP                               12/02 16:23:38     |
|    27) 021 POWER DOWN                             12/02 16:06:21     |
|    26) 017 PSU COMM TIMEOUT                       12/02 16:06:14█ >> |
+----------------------------------------------------------------+
```

Main Menù
Password (K)

```
+-----------------------------------------------------------------+
| ELENOS ETG5000_7F  S/N.00000000  ELENOS <id 0000> life eXtender  [menu=Q] |
|-----------------------------------------------------------------|
| Status : 004 STOP                         17:21 12/02 | Reset alarms :F |
|-----------------------------------------------------------------|
| Forward    (W):    0 [ 5000] Frequency (MHz):  98.00    RF    :    STBY |
| Reflected  (W):    0        LOCK  ----   ----  ----    VDS (V):    0.0 |
| Eff. (%):   0.0  Prof.#:  1  ----  ----  ----   MPX    IDS (A):    0.0 |
|-----------------------------------------------------------------|
| ACCESS MENU (level 1) ====>           17:21:10    12/02/2014█     |
|-----------------------------------------------------------------|
| K = Password                                                     |
| R = Password reset                   +--------------------------|
| P = Password settings                | E L E N O S  Srl          |
| Q = Exit                             | Via G.Amendola, 9         |
|                                      | 44028 Poggio Renatico (FE) |
|                                      | ITALY                     |
|                                      | Tel.+39 0532 829965       |
|                                      | Fax.+39 0532 829177       |
|                                      | www.elenos.com            |
|                                      +--------------------------|
|                                      Ver. 2.80 /1.10 (c)2011 Elenos|
|                                                                  |
+-----------------------------------------------------------------+
```

Main Menù
Password (K)
Password (K)

```
+-----------------------------------------------------------------+
| ELENOS ETG5000_7F  S/N.00000000  ELENOS <id 0000> life eXtender  [menu=Q] |
|-----------------------------------------------------------------|
| Status : 004 STOP                         17:21 12/02 | Reset alarms :F |
|-----------------------------------------------------------------|
| Forward    (W):    0 [ 5000] Frequency (MHz):  98.00    RF    :    STBY |
| Reflected  (W):    0        LOCK  ----   ----  ----    VDS (V):    0.0 |
| Eff. (%):   0.0  Prof.#:  1  ----  ----  ----   MPX    IDS (A):    0.0 |
|-----------------------------------------------------------------|
|  PASSWORD ===>                                                   |
|-----------------------------------------------------------------|
|                                                                  |
|   Password :            ███                                      |
|                                                                  |
|                                                                  |
|                                                                  |
|                                                                  |
|                                                                  |
|                                                                  |
|                                                                  |
|                                                                  |
+-----------------------------------------------------------------+
```

```
+----------------------------------------------------------------------+
| ELENOS ETG5000_7F  S/N.00000000  ELENOS <id 0000> life eXtender  [menu=Q] |
|----------------------------------------------------------------------|
| Status : 004 STOP                          17:22 12/02 | Reset alarms :F |
|----------------------------------------------------------------------|
| Forward    (W):     0 [ 5000] Frequency (MHz):  98.00     RF    :   STBY |
| Reflected  (W):     0          LOCK  ----  ----  ----     VDS (V):    0.0 |
| Eff. (%):   0.0  Prof.#:  1    ----  ----  ----    MPX    IDS (A):    0.0 |
|----------------------------------------------------------------------|
| PASSWORD RESET ===>                                                   |
|----------------------------------------------------------------------|
|                                                                       |
| Unlock Code        : 02A6                                             |
| Password Recovery : 0000█                                             |
|                                                                       |
|                                                                       |
|                                                                       |
|                                                                       |
|                                                                       |
|                                                                       |
|                                                                       |
|                                                                       |
+----------------------------------------------------------------------+
```

Main Menù
Password (K)
Password reset (R)

```
+----------------------------------------------------------------------+
| ELENOS ETG5000_7F  S/N.00000000  ELENOS <id 0000> life eXtender  [menu=Q] |
|----------------------------------------------------------------------|
| Status : 004 STOP                          17:23 12/02 | Reset alarms :F |
|----------------------------------------------------------------------|
| Forward    (W):     0 [ 5000] Frequency (MHz):  98.00     RF    :   STBY |
| Reflected  (W):     0          LOCK  ----  ----  ----     VDS (V):    0.0 |
| Eff. (%):   0.0  Prof.#:  1    ----  ----  ----    MPX    IDS (A):    0.0 |
|----------------------------------------------------------------------|
| PASSWORD SETTINGS ===>                                                |
|----------------------------------------------------------------------|
|                                                                       |
|                                                                       |
| User    password        (n.): 0000                                    |
| System password         (n.): 0000█                                   |
|                                                                       |
|                                                                       |
|                                                                       |
|                                                                       |
|                                                                       |
|                                                                       |
+----------------------------------------------------------------------+
```

Main Menù
Password (K)
Password settings (P)

Main Menù
System (Y)

```
+---------------------------------------------------------------------+
| ELENOS ETG5000_7F  S/N.00000000  ELENOS <id 0000> life eXtender     [menu=Q] |
|---------------------------------------------------------------------|
| Status : 004 STOP                         17:24 12/02 | Reset alarms :F |
|---------------------------------------------------------------------|
| Forward    (W):    0 [ 5000] Frequency (MHz): 98.00      RF     :   STBY |
| Reflected  (W):    0          LOCK  ----   ----  ----    VDS  (V):   0.0 |
| Eff. (%):  0.0   Prof.#: 1    ----   ----  ----   MPX    IDS  (A):   0.0 |
|---------------------------------------------------------------------|
| SYSTEM MENU (level 2) ====>            17:24:03   12/02/2014         |
|---------------------------------------------------------------------|
| X = System settings                                                 |
| U = Comm. settings                                                  |
| J = Audio trim & alrm                    +-------------------------+ |
| C = Clock power set                      | E L E N O S  Srl         |
| P = SMS Phone set.                       | Via G.Amendola, 9        |
| F = User Warning                         | 44028 Poggio Renatico (FE)|
| V = En. 0-31 Alrm SMS                     | ITALY                    |
| B = En.32-63 Alrm SMS                     | Tel.+39 0532 829965      |
| L = Life eXtender                         | Fax.+39 0532 829177      |
|                                           | www.elenos.com           |
|                                           +-------------------------+ |
|                                           Ver. 2.80 /1.10 (c)2011 Elenos|
|                                                                     |
|                                                                     |
+---------------------------------------------------------------------+
```

Main Menù
System (Y)
System settings (X)

```
+---------------------------------------------------------------------+
| ELENOS ETG5000_7F  S/N.00000000  ELENOS <id 0000> life eXtender     [menu=Q] |
|---------------------------------------------------------------------|
| Status : 004 STOP                         17:24 12/02 | Reset alarms :F |
|---------------------------------------------------------------------|
| Forward    (W):    0 [ 5000] Frequency (MHz): 98.00      RF     :   STBY |
| Reflected  (W):    0          LOCK  ----   ----  ----    VDS  (V):   0.0 |
| Eff. (%):  0.0   Prof.#: 1    ----   ----  ----   MPX    IDS  (A):   0.0 |
|---------------------------------------------------------------------|
| SYSTEM SETTINGS ====>                                               |
|---------------------------------------------------------------------|
| Temperature Unit         : CELSIUS   Min Temp Sensor Number    :    1 |
| Show Display             : ALWAYS    PLL reference (10MHz)      : INT. |
| Min Level Pwr Pwr Fault (W):   100   PwrOscillationCheck        : FALSE |
|                                      Fwd Pwr Cal.         (%):   100 |
|                                      SWR Foldback Enable     : TRUE |
| Base band board code     :     0     IPA Bias Treshold      (V): 8.00 |
| Target PWR UPS (W)       :  2600     Refl. Pwr Tresh. nom.  (10%): FOLD! |
|                                      Refl. Pwr Tresh. Level (W):  525 |
|                                      PAbias               (V): 5.45 |
|---------------------------------------------------------------------|
| Actual date        : 12/02/2014 07 17:24:39                         |
| New date           : 12/02/2014 07 17:24:26 UPDATE                  |
+---------------------------------------------------------------------+
```

```
+------------------------------------------------------------------+
| ELENOS ETG5000_7F  S/N.00000000   ELENOS <id 0000> life eXtender    [menu=Q] |
|------------------------------------------------------------------|
| Status : 004 STOP                         17:25 12/02 | Reset alarms :F |
|------------------------------------------------------------------|
| Forward    (W):    0 [ 5000] Frequency (MHz):   98.00     RF      :     STBY |
| Reflected  (W):    0         LOCK   ----    ----   ----    VDS  (V):      0.0 |
| Eff. (%):   0.0  Prof.#:  1  ----   ----   ----    MPX    IDS  (A):      0.0 |
|------------------------------------------------------------------|
| COMM. SETTINGS ===>                                              |
|------------------------------------------------------------------|
| Front 485 Id          (n.):     0      Front 485 Speed      :   9600|
| TcTs  485 Id          (n.):     0      TcTs  485 Speed      :  57600|
|                                        PSU   485 Speed      :   9600|
| Station Id              :     0                                  |
| Pager Id               :     0                                  |
|                                                                  |
|                                                                  |
|                                                                  |
|                                                                  |
|                                                                  |
|                                                                  |
+------------------------------------------------------------------+
```

```
+------------------------------------------------------------------+
| ELENOS ETG5000_7F  S/N.00000000   ELENOS <id 0000> life eXtender    [menu=Q] |
|------------------------------------------------------------------|
| Status : 004 STOP                         17:26 12/02 | Reset alarms :F |
|------------------------------------------------------------------|
| Forward    (W):    0 [ 5000] Frequency (MHz):   98.00     RF      :     STBY |
| Reflected  (W):    0         LOCK   ----    ----   ----    VDS  (V):      0.0 |
| Eff. (%):   0.0  Prof.#:  1  ----   ----   ----    MPX    IDS  (A):      0.0 |
|------------------------------------------------------------------|
|                                                                  |
|                                                                  |
|                                                                  |
| 19KHz Level:            10.00 %                                  |
| 19KHz Phase:             0.0 deg.                                |
| Limiter(Clipper):      150.0 KHz                                 |
|------------------------------------------------------------------|
| MODULATION ALARM SET ===>           | Base Band mod:      0       |
| Modulation Alarm         DISABLE    | Firmware     :    2.80     |
|         (TC/TS slave connector)     +---------------------------|
|                                                                  |
|                                                                  |
| No   mod. level (dB):  -25.0   Time    (s):    600              |
| Over mod. level (dB):    7.1   Time    (s):    600              |
+------------------------------------------------------------------+
```

Main Menù
System (Y)
Clock power set (C)

```
+----------------------------------------------------------------+
| ELENOS ETG5000_7F  S/N.00000000   ELENOS <id 0000> life eXtender   [menu=Q] |
|----------------------------------------------------------------|
| Status : 004 STOP                        17:30 12/02▮| Reset alarms :F |
|----------------------------------------------------------------|
|  CLOCK POWER SET ===>                                          |
|----------------------------------------------------------------|
|  Target power mode fixed for all the 24 hours:   TRUE          |
|  Fixed target power                         (W):  5000         |
|----------------------------------------------------------------|
|  copy over next day           : FALSE                          |
|  reset all at factory default : FALSE                          |
|                                                                |
|  Target power on the 24 hours of Sunday    (7 of 7)            |
|T3  #  #  #  #  #  #  #  #  #  #  #  #  #  #  #  #  #  #  #  #  #  #  #  # |
|T2  #  #  #  #  #  #  #  #  #  #  #  #  #  #  #  #  #  #  #  #  #  #  #  # |
|T1  #  #  #  #  #  #  #  #  #  #  #  #  #  #  #  #  #  #  #  #  #  #  #  # |
|T0  00 01 02 03 04 05 06 07 08 09 10 11 12 13 14 15 16 17 18 19 20 21 22 23 |
|                                   Hours                        |
|  Target 3:  5000  = 100% of fixed target power                |
|  Target 2:  3750  =  75% of fixed target power                |
|  Target 1:  2500  =  50% of fixed target power                |
|  Target 0:  1250  =  25% of fixed target power                |
+----------------------------------------------------------------+
```

Main Menù
System (Y)
SMS phone set (P)

```
+----------------------------------------------------------------+
| ELENOS ETG5000_7F  S/N.00000000   ELENOS <id 0000> life eXtender   [menu=Q] |
|----------------------------------------------------------------|
| Status : 004 STOP                        17:30 12/02 | Reset alarms :F |
|----------------------------------------------------------------|
|  SMS PHONE SET ===>                                            |
|----------------------------------------------------------------|
|   Field Strength dBm: - 113         |En.this|command|status |global | dig. |
| >                                   |account|execute|request|echo rx| SMS  |
| Example   :      +393371234567890123 |-------+-------+-------+-------+------|
| Phone N.1:                          | FALSE | FALSE | FALSE | FALSE | T_SMS |
| Phone N.2:                          | FALSE | FALSE | FALSE | FALSE | T_SMS |
| Phone N.3:                          | FALSE | FALSE | FALSE | FALSE | T_SMS |
| Phone N.4:                          | FALSE | FALSE | FALSE | FALSE | T_SMS |
| Phone N.5:                          | FALSE | FALSE | FALSE | FALSE | T_SMS |
| Phone N.6:                          | FALSE | FALSE | FALSE | FALSE | T_SMS |
| Phone N.7:                          | FALSE | FALSE | FALSE | FALSE | T_SMS |
| Phone N.8:                          | FALSE | FALSE | FALSE | FALSE | T_SMS |
|-------------------------------------+--------------------------------|
| Id string :    ELENOS               | Enable SMS : FALSE      PSTN : FALSE |
| Pager  Id :        0 |SMS: Ok  Bad  | Mains alarm Enable          :  TRUE |
| Station Id:        0 |s.   0    0   | Mains alarm delay      (m):     30 |
|                      |r.   0    0▮  | FWD over 2/3 TARGET (-1,76DB): FALSE |
+----------------------------------------------------------------+
```

```
+---------------------------------------------------------------------------+
| ELENOS ETG5000_7F  S/N.00000000   ELENOS <id 0000> life eXtender  [menu=Q] |
+---------------------------------------------------------------------------+
| Status : 004 STOP                          17:31 12/02 | Reset alarms :F   |
+---------------------------------------------------------------------------+
| Forward     (W):     0 [ 5000] Frequency (MHz):  98.00      RF     :  STBY |
| Reflected   (W):     0          LOCK   ----   ----   ----   VDS  (V):  0.0 |
| Eff. (%):  0.0   Prof.#:  1     ----   ----   ----   MPX    IDS  (A):  0.0 |
+---------------------------------------------------------------------------+
|  USER LIMIT WARNING SETTING ===>                                          |
+---------------------------------------------------------------------------+
|            Act.Value Enable   Max      Min     Type   Delay   Timer Alarm  |
|Internal Temp (C):  0.0   F    50.0     45.0    UPPER   120    1200   F      |
|RF      Temp (C):  0.0    F    90.0     98.0    UPPER   120    1200   F      |
|PSU     Temp (C):  0.0    F    90.0     98.0    UPPER   120    1200   F      |
|PSU Current  (A):  0.0    F    198.0    178.2   UPPER   120    1200   F      |
|RF  Current  (A): 0.00    F    1.20     1.00    UPPER   120    1200   F      |
|Forward  PWR (%):    0    F    2500     2000    LOWER   120    1200   F      |
|Reflected PWR (W):   0█   F    500      450     UPPER   120    1200   F      |
+---------------------------------------------------------------------------+
|                                                                           |
|                                                                           |
|                                                                           |
+---------------------------------------------------------------------------+
```

Main Menù
System (Y)
User warning (F)

```
+---------------------------------------------------------------------------+
| ELENOS ETG5000_7F  S/N.00000000   ELENOS <id 0000> life eXtender  [menu=Q] |
+---------------------------------------------------------------------------+
| Status : 004 STOP                          17:32 12/02 | Reset alarms :F   |
+---------------------------------------------------------------------------+
|Bit  Status                         Bit  Status                            |
| |  / Enable                         |  / Enable                           |
| 0   F F   000 CORRECT WORKING      16   F F   016 PSU OVER TEMPERATURE     |
| 1   F F   001 SYSTEM RESET         17   F F   017 PSU COMM TIMEOUT         |
| 2   F F   002 EEPROM CHKSUM ERROR  18   F F   018 EXTERNAL INTERLOCK       |
| 3   F F   003 BLOCKED              19   F F   019 ON AIR                   |
| 4   T F   004 STOP                 20   F F   020 POWER UP                 |
| 5   F T   005 -3dB CARRIER         21   F F   021 POWER DOWN               |
| 6   F F   006 HIGH REF PWR         22   F F   022 PSU THERMAL FAULT        |
| 7   F F   007 MIN 12V              23   F F   023 PSU LOW POWER            |
| 8   F F   008 RF AMP. FAULT        24   F F   024 PSU RF OFF               |
| 9   F F   009 RF AMP. FAULT DERATING 25 F F   025 WORKING MODE COMBINED    |
|10   F F   010 RF THERMAL DERATING  26   F F   026 SWR FOLDBACK             |
|11   F F   011 RF OVER TEMPERATURE  27   F F   027 UNLOCK                   |
|12   F F   012 PSU FAULT            28   F F   028 EXCITER COMM ERROR       |
|13   F F   013 PSU CURRENT DERATING 29   F T   029 NO AUDIO                 |
|14   F F   014 PSU OVER CURRENT     30   F F   030 OVER 2/3 CARRIER         |
|15   F F   015 PSU THERMAL DERATING 31   F F█                              |
+---------------------------------------------------------------------------+
```

Main Menù
System (Y)
En. 0-31 alrm SMS (V)

Main Menù
System (Y)
En. 32-63 alrm SMS (B)

```
+----------------------------------------------------------------+
| ELENOS ETG5000_7F  S/N.00000000  ELENOS <id 0000> life eXtender   [menu=Q] |
|----------------------------------------------------------------|
| Status : 004 STOP                        17:33 12/02 | Reset alarms :F |
|----------------------------------------------------------------|
|Bit  Status                              Bit  Status            |
| |  / Enable                            |  / Enable            |
|32  F F    032 OVER MODULATION          48  F T    048 AUDIO OK        |
|33  F F                                 49  F F    049 DRAIN VOLTAGE FEEDBACK |
|34  F F    034 TEMPERATURE SENSOR ERRO  50  F F    050 OVER FRW PWR ERROR    |
|35  F F    035 PWR FORWARD OSCILATION   51  F F    051 PSU VOLTAGE DERATING  |
|36  F F    036 THREE BLOCK OUT          52  F F                            |
|37  F F    037 USER ENV TEMP OUT LIMIT  53  F F                            |
|38  F F    038 USER RF TEMP OUT LIMIT   54  F F                            |
|39  F F    039 USER PSU TEMP OUT LIMIT                                      |
|40  F F    040 USER RF CURRENT OUT LIM                                      |
|41  F F    041 USER PSU CURRENT OUT LI                                      |
|42  F F    042 USER FRW PWR OUT LIMIT                                       |
|43  F F    043 USER RFL PWR OUT LIMIT                                       |
|44  F F    044 OUT PWR NOT VERIFIED                                         |
|45  F F    045 UPS ACTIVE                                                   |
|46  F F    046 SHUNT COMM TIMEOUT                                           |
|47  F F    047 WARNING TEMPERATURE SEN                                      |
+----------------------------------------------------------------+
```

Main Menù
System (Y)
Life eXtender (L)

```
+----------------------------------------------------------------+
| ELENOS ETG5000_7F  S/N.00000000  ELENOS <id 0000> life eXtender   [menu=Q] |
|----------------------------------------------------------------|
| Status : 004 STOP                        17:34 12/02 | Reset alarms :F |
|----------------------------------------------------------------|
| Forward     (W):    0 [ 5000] Frequency (MHz):  98.00    RF    :    STBY |
| Reflected   (W):    0         LOCK  ----   ----  ----    VDS  (V):   0.0 |
| Eff. (%):  0.0   Prof.#:  1   ----  ----  ----   MPX     IDS  (A):   0.0 |
|----------------------------------------------------------------|
| LIFE EXTENDER ACTIVATION / DEACTIVATION ===>                   |
|----------------------------------------------------------------|
| SerialNumber                    : 000000000                   |
| Unlock Code                     : 9A00                         |
| Deactivation Code               :                             |
|                                                                |
| LIFE EXTENDER Status            : ACTIVE                       |
| Examinated (Days)      1              Run Time (Hours     0    |
| Examinated (Days)in Optimal Conditions     0                  |
| Examinated (Days)in Heavy Cnditions        0                  |
|                                                                |
|                                                                |
|                                                                |
|                                                                |
+----------------------------------------------------------------+
```

```
+----------------------------------------------------------------+
| ELENOS ETG5000_7F  S/N.00000000  ELENOS <id 0000> life eXtender  [menu=Q] |
|----------------------------------------------------------------|
| Status : 004 STOP                            17:35 12/02 | Reset alarms :F |
|----------------------------------------------------------------|
| Forward    (W):    0 [ 5000] Frequency (MHz):  98.00     RF      :    STBY |
| Reflected  (W):    0          LOCK  ====  ====  ====     VDS (V):     0.0  |
| Eff. (%):   0.0  Prof.#:  1    ====  ====  ====    MPX   IDS (A):     0.0  |
|----------------------------------------------------------------|
| DEBUG MENU (level 3) ====>              17:35:09    12/02/2014 |
|----------------------------------------------------------------|
| G = GSM debug                                                  |
| F = Uarts...                                                   |
| Q = Exit                          +----------------------------|
|                                   | E L E N O S  Srl           |
|                                   | Via G.Amendola, 9          |
|                                   | 44028 Poggio Renatico (FE) |
|                                   | ITALY                      |
|                                   | Tel.+39 0532 829965        |
|                                   | Fax.+39 0532 829177        |
|                                   | www.elenos.com             |
|                                   +----------------------------|
|                                   Ver. 2.80 /1.10 (c)2011 Elenos|
|                                                                |
+----------------------------------------------------------------+
```

Main Menù
Debug (D)

```
+----------------------------------------------------------------+
| ELENOS ETG5000_7F  S/N.00000000  ELENOS <id 0000> life eXtender  [menu=Q] |
|----------------------------------------------------------------|
| Status : 004 STOP                            17:36 12/02 | Reset alarms :F |
|----------------------------------------------------------------|
| Forward    (W):    0 [ 5000] Frequency (MHz):  98.00     RF      :    STBY |
| Reflected  (W):    0          LOCK  ====  ====  ====     VDS (V):     0.0  |
| Eff. (%):   0.0  Prof.#:  1    ====  ====  ====    MPX   IDS (A):     0.0  |
|----------------------------------------------------------------|
|                      1     2    3    4    5    6    7    8      |
|SmsStatusReqest    [] :  F     F    F    F    F    F    F    F   |
|SmsEchoCmdReqest      :  F                                       |
|dataMemoryReq         : 000000                                  |
|SmsDataMemoryReqest [] :  F     F    F    F    F    F    F    F   |
|SmsStatusExReqest   [] :  F     F    F    F    F    F    F    F   |
|                                                                |
|SMS diagnostic          ok          bad                         |
|Sended                   0           0                          |
|Received                 0           0                          |
|                                                                |
|                                                                |
|                                                                |
|                                                                |
+----------------------------------------------------------------+
```

Main Menù
Debug (D)
GSM debug (G)

Main Menù
Debug (D)
Uarts (F)

```
+-------------------------------------------------------------------+
| ELENOS ETG5000_7F  S/N.00000000  ELENOS <id 0000> life eXtender   [menu=Q] |
|-------------------------------------------------------------------|
| Status : 004 STOP                          17:37 12/02 | Reset alarms :F |
|-------------------------------------------------------------------|
| Forward    (W):    0 [ 5000] Frequency (MHz):  98.00    RF      :   STBY |
| Reflected  (W):    0         LOCK  ----   ----  ----    VDS  (V):    0.0 |
| Eff. (%):   0.0  Prof.#:  1  ----  ----  ----   MPX     IDS  (A):    0.0 |
|-------------------------------------------------------------------|
| UARTS MENU (level 4) ===>               17:37:49    12/02/2014         |
|                                                                   |
| Uart 0                                                            |
| Uart 1                                +-------------------------+ |
| Uart 2                                | E L E N O S  Srl        | |
| Q = Exit                              | Via G.Amendola, 9       | |
|                                       | 44028 Poggio Renatico (FE) | |
|                                       | ITALY                   | |
|                                       | Tel.+39 0532 829965     | |
|                                       | Fax.+39 0532 829177     | |
|                                       | www.elenos.com          | |
|                                       +-------------------------+ |
|                                       Ver. 2.80 /1.10 (c)2011 Elenos|
|                                                                   |
+-------------------------------------------------------------------+
```

Main Menù
Debug (D)
Uarts (F)
Uart 0,1,2

```
+-------------------------------------------------------------------+
| ELENOS ETG5000_7F  S/N.00000000  ELENOS <id 0000> life eXtender   [menu=Q] |
|-------------------------------------------------------------------|
|  ON BOARD UART 0 ===>                                             |
|-------------------------------------------------------------------|
|                                                                   |
| HostLink Slave                                                    |
|                                                                   |
| Rx_Errors                        A0                               |
| Errors_Counter                   1                                |
| txd_in_ptr                       0                                |
| txd_out_ptr                      0                                |
| rxd_in_ptr                       2                                |
| rxd_out_ptr                      2                                |
|                                                                   |
|                                                                   |
|                                                                   |
|                                                                   |
|                                                                   |
|                                                                   |
|                                                                   |
|                                                                   |
+-------------------------------------------------------------------+
```

Instructions for use

3.4.2 Connection to telemetry

This connection allows remote control through a device especially designed for that purpose.
The telemetry unit performs the energy backup for the continuous operation of the modem and is equipped with all the utilities for the general control of the parameters of other equipment and the work station.

To connect to an external telemetry unit, insert a standard extension cable into the "EIA485" connector, DB9, located on the rear panel of the machine.
This cable is supplied with the telemetry unit (Elenos code ETGSAL33).

The connection can also be made when the machine is operating.
For further information please refer to the telemetry unit manual.

ETGSAL33

3.4.3 Connection to exchange unit and/or audio matrix

This connection allows the transmitter to be used in a system which provides for the exchange of a faulty transmitter with a spare one.

In order to connect to an N+1 exchange unit, if the equipment is not a spare, insert a standard extension cable into a "TC/TS" connector, DB25, located on the rear panel of the machine.

If the equipment is used as a spare, also provide an additional standard extension cable to be inserted into the "PROFILES" connector, DB25, located on the rear panel of the machine.

If the system has an audio matrix, this latter cable must be connected the matrix itself and not to the exchange unit.

These cables are supplied with the exchange unit (Elenos code CAB0324-0).

The signal cables can also be connected when the equipment is working, excluding all RF cables.
For more information, please refer to the exchange unit manual.

CAB0324-0

CAB0324-0

CAB0324-0

Instructions for use

CAB0324-0

CAB0324-0

CAB0324-0

3.4.4 Connection to Elenos E.BOX module

This connection allows to have a "bridge" between the EIA485 bus of the equipment and the
Ethernet network.

To connect to the E.BOX module, insert a standard extension cable into the "EIA485" connector, DB9, located on the front or rear panel of the machine.
This cable is supplied with the module (Elenos code ETGSAL33).

The connection can also be made when the machine is operating.
For further information, please refer to the E.BOX module manual.

ETGSAL33

Instructions for use

4 Maintenance

4.1 Device overview

We report here the images of how, less than specific customizations, the apparatus out by the manufacturer.
If necessary, refer to these to restore the configuration of the transmitter.
The figures are related to ETG5000. For ETG3500 and ETG2500 the only significant differences to mention are that:

- in ETG3500 are absent the RF modules n.1 and n.7, and the connections between modules and concentrator board are to be carried out so
  module n.2 to CN1 on concentrator board
  module n.3 to CN2 on concentrator board
  module n.4 to CN3 on concentrator board
  module n.5 to CN4 on concentrator board
  module n.6 to CN5 on concentrator board

- ETG2500 are absent the RF modules n.1, n.4, and n.7, and the connections between modules and concentrator board are to be carried out so
  module n.2 to CN1 on concentrator board
  module n.3 to CN2 on concentrator board
  module n.5 to CN3 on concentrator board
  module n.6 to CN4 on concentrator board

For more details, to carry out repairs, if you are an authorized technician or bodies, you can request at the Manufacturer the Service Manual, including wiring diagrams.

CONCENTRATOR
BOARD

CN1 CN2 CN3 CN4 CN5 CN6 CN7

Maintenance

RF MODULES

Maintenance

4.2 Settings

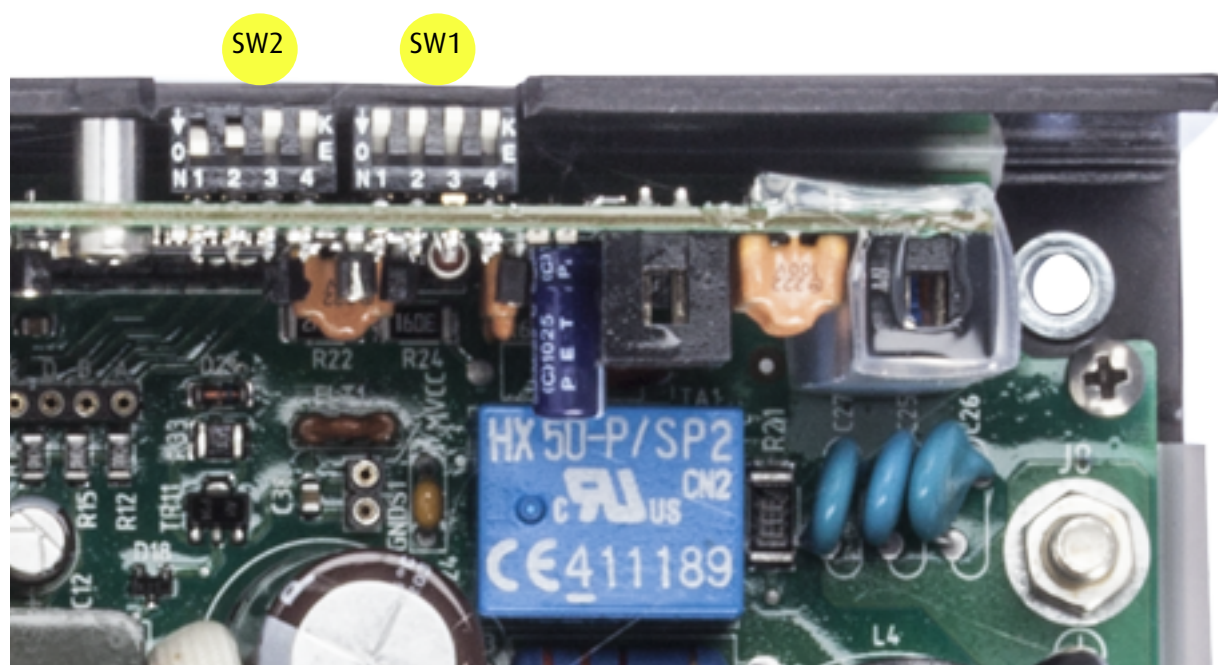## 4.2.1 Power supply Dip-switch

In this series there are three power supplies (2.5KW or 3KW).
On the power supplies must set the operating mode (analog, digital), using the dip-switch SW1, and the address, using the dip-switch SW2.

	SW1				SW2			
	Switch1	Switch2	Switch3	Switch4	Switch1	Switch2	Switch3	Switch4
Power supply N.1	OFF	OFF	OFF	OFF	**ON**	OFF	OFF	OFF
Power supply N.2	OFF	OFF	OFF	OFF	OFF	**ON**	OFF	OFF
Power supply N.3	OFF	OFF	OFF	OFF	**ON**	**ON**	OFF	OFF

Dip-switch setting parameters

POWER SUPPLIES

SW2   SW1

Maintenance

4.3 Spare parts and mounting

Refer to the Spare Parts manuals, technical bulletins, e-learning videos and training courses provided by the Manufacturer.

4.4 Routine maintenance (cleaning, replacements, checks)

During normal operation, we recommend performing routine checks in order to verify that there are no critical operating conditions.
We recommend following the following schedule:

Frequency	Intervention
15 days	Filter cleaning (very dusty environment).
30 days	Filter cleaning (not very dusty environment).
	Check the direct and reflected output power.
	Check telemetry operates properly, if applicable.
	Check the RF modules operate properly.
	Check the power supplies operate properly
6 months	Check the fans work properly.
	Check the operating temperatures of the equipment.
	Check the electric consumption.
12 months	Check the output RF connector closes properly.
	Check the condition of the electric connections.
	Check that the fan blades and the air grille are clean (dusty environment). To be performed when the equipment is in Stand-by mode.
	Filter washing (dusty environment).
24 months	Filter washing (not very dusty environment).
	Filter replacement (dusty environment).

4.5 Operating faults (symptoms, causes and remedies)

Fault	Cause	Remedy
The equipment does not start.	• Faulty or missing power supply cable	• Replace the power supply cable and connect it to the equipment
	• Auxiliary power supply incorrect (Led MAINS on the front panel off)	• Contact the manufacturer
	• Fault on the power supply stage	• Contact the manufacturer
The equipment does not reach the required power	• Equipment in Stand By mode	• Put the equipment in RF ON
	• No jumper for interlock	• Insert the jumper for the interlock
	• PLL not engaged (ON AIR warning light on the front panel off)	• Contact the manufacturer
	• Power supply fault	• Contact the manufacturer
	• RF module fault	• Contact the manufacturer
	• Fault on the power measurement system	• Contact the manufacturer
The equipment transmits on a different frequency from the one set	• PLL board failure	• Contact the manufacturer
	• VCO board failure	• Contact the manufacturer
Absence of modulation in output and on display	• Audio cable interruption or missing	• Audio cable connection or replacement
	• MPX board failure	• Contact the manufacturer
	• Stereo Coder board failure	• Contact the manufacturer
	• Modulation is off	• Reactivate modulation using the relative menu
Output modulation absent, but shown on the display	• MPX board failure	• Contact the manufacturer
	• Stereo Coder board failure	• Contact the manufacturer
Output modulation does not reach the desired value	• Input audio level low	• Increase the source audio level
	• MPX board failure	• Increase the sensitivity of the ETG input and/or contact the manufacturer
Stereophonic modulation absence	• Stereophonic carrier off	• Turn the stereophonic carrier on from the relative menu
	• Audio cables interrupted or missing	• Audio cable connection or replacement
	• Stereo Coder board failure	• Contact the manufacturer
	• Stereo Coder board missing	• The equipment does not feature the "Stereo Coder" option, therefore it cannot be used for stereophonic transmission
One or more fans stopped	• Fan failure	• Contact the manufacturer
	• Fan power supply failure	• Contact the manufacturer

Maintenance

Lack of communication with telemetry/PC	• Incorrect equipment address	• Check the equipment address from the menu and set the correct address
	• Connection cable unsuitable	• Check that the cable used is that supplied by ELENOS or equivalent
	• Incorrect parameter setting	• Check the correct parameters and set them in the section "Instructions for use", at paragraph "Optional equipment connected externally" (User manual)
	• Connection cable faulty or interrupted	• Cable connection or replacement
	• CPU board failure	• Contact the manufacturer

Maintenance