AXON Series
30/100/150/300/500/1000W FM TRANSMITTER

SERVICE AND OPERATION MANUAL

Revision 1.1

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AXON Series
500W/1000W FM TRANSMITTER

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1   GENERAL INFORMATION

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1.1   SAFETY SUGGESTIONS

Regardless of how well electrical equipment is designed, personnel can be exposed to **dangerous electrical shock** when protective covers are removed for maintenance or other activities. Therefore, the user is obliged to see that all safety regulations are consistently observed and that each individual assigned to the equipment has a clear understanding of the first aid related to electrical shocks. (see following pages)

In addition these safety practices must be followed:

*   Do not attempt to adjust unprotected circuit controls or to dress leads with power on.
*   Always avoid placing parts of the body in series between ground and circuit points.
*   To avoid burns, do not touch heavily loaded or overheated components without precautions.
*   Remember that some semiconductor cases and solid-state circuits carry high voltages.
*   Do not assume that all danger of electrical shock is removed when the power is off. Charged capacitors can retain dangerous voltages for a long time after power is turned off. These capacitors should be discharged through a suitable resistor before any circuit points are touched.
*   Don't take chances. Be fully trained. TEKO International equipment should be operated and maintained by fully qualified personnel.
*   Do not service alone and do not perform internal adjustments of this unit unless another person capable of rendering first aid and resuscitation is present.
*   Some components used in the construction of this equipment contain Beryllium Oxide (BeO). This substance is harmless as it is, but becomes highly dangerous if it is ground to powder. Special procedures of disposal must be observed in case of failure of these devices.

> Note: This section is not intended to contain a complete statement of all safety precautions which should be observed by personnel in using this electronic equipment or others.
>
> TEKO International shall not be responsible for injury or damage resulted from improper procedures or from using it by improperly trained or inexperienced personnel.

1.1.a   General safety recommendations

When connecting the equipment to the power, please follow these important recommendations:

*   This product is intended to operate from a power source that will not apply more than 10% of the voltage specified on the rear panel between the supply conductors or between either supply conductor and ground. A protective-ground connection by way of the grounding conductor in the power cord is essential for safe operation.
*   This equipment is grounded through the grounding conductor of the power cord. To avoid electrical shock, plug the power cord into a properly wired socket before connecting to the product input or output terminals.
*   Upon loss of the protective-ground connection, all accessible conductive parts (including parts that may appear to be insulating) can render an electric shock.
*   To avoid fire hazard, use only the fuse of correct type, voltage rating, and current rating. Refer fuse replacement to qualified service personnel.
*   To avoid explosion, do not operate this equipment in an explosive atmosphere.
*   To avoid personal injury, do not remove the product covers or panels. Do not operate the product without the covers and panels properly installed.

1.1.b   Good practices

In maintaining the equipment covered in this manual, please keep in mind the following, standard good practices:

*   When connecting any instrument (wattmeter, spectrum analyzer, etc.) to a high frequency output, use the appropriate attenuator or dummy load to protect the final amplifiers and the instrument input.
*   When inserting or removing printed circuit boards (PCBs), cable connectors, or fuses, always turn off power from the affected portion of the equipment. After power is removed, allow sufficient time for the power supplies to bleed down before reinserting PCBs.
*   When troubleshooting, remember that FETs and other metal-oxide semiconductor (MOS) devices may appear defective because of leakage between traces or component leads on the printed circuit board. Clean the printed circuit board and recheck the MOS device before assuming it is defective.
*   When replacing MOS devices, follow standard practices to avoid damage caused by static charges and soldering.
*   When removing components from PCBs (particularly ICs), use care to avoid damaging PCB traces.

1.1.c   First aid in case of electrical shock

If someone seems unable to free himself under electric shock contact, **turn the power off** before rendering aid. A muscular spasm or unconsciousness can make a victim unable to free himself from the electrical power.

If power cannot be turned off immediately, **very carefully** loop a length of dry non-conducting material (such as a rope, insulating material, or clothing) around the victim and pull him free of the power. Carefully avoid touching him or his clothing until free of power.

> **DO NOT TOUCH VICTIM OR HIS CLOTHING**
> **BEFORE POWER IS DISCONNECTED OR YOU**
> **CAN BECOME A SHOCK VICTIM YOURSELF**

1.1.d   Emergency resuscitation technique

	Step 1 Check the victim for responsiveness. If there is <u>no response</u>, **immediately call for medical assistance**, and then return to the person.
	Step 2 Position the person flat on their back. Kneel by their side and place one hand on the forehead and the other under the chin. Tilt the head back and lift the chin until teeth almost touch. Look and listen for breathing.
	Step 3 If not breathing normally, pinch the nose and cover the mouth with yours. Give two full breaths. The person's chest will rise if you are giving enough air.
	Step 4 Put the fingertips of your hand on the Adam's apple, slide them into the groove next to the windpipe. Feel for a pulse. If you can not feel a pulse or are unsure, move on to the next step.
	Step 5 Position your hands in the center of the chest between the nipples. Place one hand on top of the other.

	Step 6 Push down firmly two inches. Push on chest 15 times.

CONTINUE WITH TWO BREATHS AND 15 PUMPS UNTIL HELP ARRIVES.

1.1.e   Treatment for burns

- Continue treat victim for electrical shock.
- Check for points of entry and exit of current.
- Cover burned surface with a clean dressing.
- Remove all clothing from the injured area, but cut around any clothing that adheres to the skin and leave it in place. Keep the patient covered, except the injured part, since there is a tendency to chill.
- Splint all fractures. (Violent muscle contractions caused by the electricity may result in fractures.).
- Never permit burned surfaces to be in contact with each other, such as: areas between the fingers or toes, the ears and the side of the head, the undersurface of the arm and the chest wall, the folds of the groin, and similar places.
- Transport to a medical facility.

1.2   WARNING INSTRUCTION

1.2.a   Introduction

The transmitter or the equipment that this manual is referred to is developed, produced and tested following the relevant safety standards EN 602125.The following safety instruction advice the operator about the dangerous operation concerning the equipment. The user must be read the safety instruction contained in the manual and they must follow them. As mentioned on the safety rules qualified technical staff only can operate this equipment. TEKO declines any responsibility for damages caused by an improper use or improper setting up performed by inexperienced staff, not qualified or operating with instruments or tools not in compliance with safety set of rules.

The staff in charge, besides being technically qualified, must be trained in first aid in case of emergency or accident (reanimation, heart massage, mouth to mouth respiration, etc.).

Before going on with the operations to be performed, it is necessary to know the position of the general electric switch and the one of the extinguishers, which have to be used very quickly if necessary.

1.2.b   Checking of safety conditions

The following connection and verify must be observed to guarantee the safety for the personnel.
- Correct connection with the antenna cable
- Correct connection with a mains line cable
- Correct connection with a ground cable (EARTH CONNECTION)
- Verify that the ambient where the equipments is installed is in compliance with the specification declared by the manufacturer: altitude, humidity, temperature.

1.2.c   AC/DC Line warning

This equipment is working with dangerous high voltage and current. Any voltage present inside this equipment can be potentially dangerous for personnel. The technical staff designed for the service and repair operation must be qualified and they must take the appropriate safety measures stated on safety rules.

1.2.d   Service and operational warning

The technical staff in charge of the service operations inside the equipment with any cover removed must

check that the mains line is disconnected. After the service operation is completed the cover must be correctly mounted before the connection with the mains line. The high voltage is present on the mains stage of the equipments also when the mains switch is in OFF positions and the mains line cable is connected.

If it is really necessary, and after authorization of TEKO, very qualified technical staff only can work with on live parts. In this special case special safety precautions must be taken. TEKO declines any responsibility if any safety rule is not respected. The replacement of the accessible fuse must be made with the transmitters turned off and using a fuse with the identical characteristics only as specified by the manufacturer.

1.2.e   Warning symbols

The following symbols are used on this equipment to advise the user about the most important dangerous parts.

Symbol	Color	Explanation
	Red	High voltage terminal: a terminal with a voltage, with respect to other terminal or parts, which is or may be adjusted to 1000 V or more. (High voltage > 1000 V).
	Black/yellow	Live part shock risk of electric shock.
	Black/yellow	To preserve the instrument from damages the operator must refer to an explanation in the instruction manual.
	White/black	Protective earth (grounding) terminal.
	Black	Alternating current (placed on the identification plate).
	White/black	Off (supply - mains switch). On (supply - mains switch).

1.3   ABOUT THE MANUAL

1.3.a   Contents

We used the utmost care in making a complete manual with detailed, precise and updated information, yet the contents herein cannot be regarded as totally binding towards our company.

TEKO Broadcast, in their constant commitment to improve the quality of their products, reserve the right to vary the technical features of the same without prior notice. For a full update please contact our local dealer or agent.

The manufacturer will not be held responsible for any consequence caused by errors or improper handling on which he has no direct control.

According to the requirements of our customers, the described options may vary from model to model.

All rights reserved. No part of this document can be reproduced in any form or by any means, including recording or photocopy without the manufacturer's prior written authorization.

1.3.b   Symbols used

For quick reference, we can use symbols that attract immediate attention, and which simply and efficiently advise and inform the user.

🖐 **The symbol of the open hand stresses a description of the highest importance concerning technical assistance, dangerous situations, safety warnings, advice, and/or information of the highest importance. Where such symbol is not heeded, serious problems/consequences may arise.**

📓 *The written notebook represents practical, important advice that we recommend be followed in order to obtain the best possible performance from the device.*

The display messages (menu, options, etc.) are written `in this font` (Courier New).

Important sentences and words are underlined.

For ease of reference, cross references to sections, chapters, page numbers, diagrams, etc. may be indicated using the symbol ➔. For example: "➔3.1" means "refer to paragraph 3.1".

1.3.c   Software version

Menu descriptions, screenshots and MMI wordings are referred to the current software version. Should you note significant differences between the ones of your equipment, please contact TEKO Broadcast in order to get the proper updated manual.

1.4   GENERAL WARNINGS

✋ **Before connecting or using this device, carefully read all instructions contained in this manual, in the order in which they are written. Cross references to sections and chapters were created exclusively for ease of use. Keep this manual in a safe place for future reference.**

✋ **IMPORTANT: Improper use or installation of this device could cause serious damage to objects and people alike. Therefore, it is essential to rely on an installer who has been previously authorized or approved by TEKO Broadcast, or by our local representative, and that both the user and the installer read the entire manual before carrying out any operation.**

✋ **All warnings included in this manual must be strictly followed to avoid damages to both the device and the operator. Read and follow all instructions indicated on warning labels or affixed to the device and its accessories.**

✋ **The AXON Series family of transmitters has characteristics common to all its models. However, each version is equipped with a different transmission power, and characteristics specific to the series or options that make it unique. For this reason, it is important to verify the exact model of your device.**

✋ **Depending on the model used, the device may be of a weight such as does not permit it to be moved by a single person and without the proper equipment. In this case, the transmitter should only be moved exclusively with the proper equipment and having taken the proper precautions. The same is true for various internal parts. In case of doubt, contact TEKO Broadcast or our local representative.**

✋ **Do not turn on the device without having duly wired and connected it, as explained later.**

✋ **Always follow the laws and regulations stipulated regarding the use of broadcast transmitters, as in effect in the geographical area in which you are operating.**

📄 *This manual describes in detail the menus that appear on the LCD display: as the software is continually updated, some of the screens shown in the chapters below may be different than those that appear on your device. In case of doubt, contact TEKO Broadcast or our local representative.*

AXON Series
500W/1000W FM TRANSMITTER

SERVICE AND OPERATION MANUAL

2   FEATURES & OPERATIONS

CONTENTS

2.1   INTRODUCTION

AXON Series is a series of modern FM broadcasting transmitters which produce an output radio signal with high characteristics of quality and with high efficiency. It's currently composed by power module of 1000 watt, in the case of AXON, or 500W in the case of TX05-HE.

Thanks to the new solutions that our engineers have implemented in the circuitry and to the compact design, for these transmitters we have estimated a 20% longer MTBF with respect to the average similar models available in the market.

All printed circuits are produced with surface mounting technology component assembling. These transmitters, featuring simple and rugged construction, are able to satisfy the requests of all those end-users looking for top-quality equipment at reasonable prices.

The AXON are equipped with a microprocessor board that allows the programming from the local display or even remotely, through a standard RS232 or SNMP. Thanks to the ultimate electronic components that have been largely implemented in the design, also the R.F. spectrum specifications have been significantly improved.

2.2   PURPOSE

- Weights only 10 Kg, for easy moving and maintenance.
- Better operation temperature of the equipment, thanks to the air filter placed on the front panel and to the optional air convey to be placed in the rear part of unit.
- Impressive number of utilities, controls and data, with local or remote record facility.
- High quality/price ratio.
- Output Power adjustable from 10 W to 1000W (500W for the TX05 HE).
- User friendly for monitoring and control
- Fast and multiple protections
- Compact and modular design for quick and easy maintenance
- Flexible telemetry system and remote control
- N+1 Hardware and software control facility
- AGC audio control: active frequency deviation limiter up to +6 dB over input level with no distortion.
- WEB and SNMP control

2.3   TECHNICAL SPECIFICATIONS

2.3.a Basics/Equipment – Dependant

ITEM	AXON	TX05-HE
R.F. output power	From 10 to 1000 W	From 10 to 500 W
Output Connector	N Type Female	
Dimension (WxHXD) mm	(Package: 80x482x447)	
Weight	10 Kg	
Power consumption	1450 W	715 W
Number of power supplies	230 Vac±15%, single phase	
Number of fans	2 rotors 12 V_{DC} and 24 V_{DC}	
Power Factor	1	

2.3.b Frequency

Operating frequency range	FM 87.5 to 108 MHz
Internal Setting mode	10 KHz steps
External Setting mode	10 KHz steps by remote control RS232-RS485
Generation	PLL synthesizer
Control	Microprocessor
Output frequency stability	± 300 Hz / 3months
Reference	TCXO 12,8 MHz
Nominal deviation	± 75 KHz
Stability of Frequency Deviation	± 2,5 % over 6 months
Impedance R.F. Connector	50 Ohm

2.3.c R.F. Output

Harmonics suppression	< - 75 dBc
Spurious Emission	< - 90 dBc
Off Lock Attenuation	> 60 dBc
S/N RATIO (weighted)	> 83 dB (referred to ± 75 KHz)
THD	0,10%
VSWR	Less then 1,5:1
Monitor	BNC connector R.F. – 50 dB
	BNC connector LF

2.3.d Mono MXP Operation

Mono/MPX Impedance	600 Ohm or 10 KOhm
	XLR female Connector
Mono Level	From - 6 to + 12 dBm
MPX Level	- 6 dBm +12 dBm
Audio Filter Response	> 30 dB (from 19 KHz to 100 KHz)
THD	< 0,1% From 40 Hz to 15 KHz
Suppression of 19 KHz	> 46 dB
RDS and SCA Impedance	10 KOhm unbal., BNC Connector
	(with 30 Hz to100 KHz Filter)

2.3.e Stereo Operation

Left, and Right Impedance	600 Ohm bal. or 10 KOhm balanced
	XLR female Connector
Left, Right Level	From – 6 to + 12 dBm
Stereo separation	> 50 dB
THD on Encoded channels	< 0,03 % From 0,4 Hz to 15 KHz
Suppression of 38 KHz	> 50 dB
Spurious suppression outside band	According to ETSI 300-384
Sub Carrier Generation	Internal Cristal
Pilot Frequency	19 KHz ± 1 Hz

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2.3.f Design Data

Type	Solid state direct FM frequency
Pre –emphasis	Flat or 75 or 50 µs
Audio frequency response	± 0,2 dB (from 40 Hz to 15 KHz) (stereo)
	± 0,3 dB (from 40 Hz to 100 KHz) (MPX)
Unbalance rejection	> 40 dB
Modulation	Type: Direct VCO frequency modulation
	F3E/F8ECapability: Meets or exceeds all
	CE 99/ 05 R&TTE requirements

2.3.g Remote Control

Output Connector	RS 232 – PC connection (front panel) RS 232
	Amplifier connection (rear panel)
	RS 485 (rear panel)
	LAN (rear panel)
	GSM remote (front panel)

2.3.h Standard Compliance

Radio spectrum	ETSI 300-384; ETS 302-018
EMC	ETSI 447; ETS 301-489
Safety	EN 60950 - EN 60215

2.3.i Temperature

|	
Operating range	0° to 45°C
Storage range	- 10° to 55°C
Maximum relative Humidity	90% non condensing
Max Operating Altitude	2500 mt. a.s.l.

2.4 LOCATING THE MAIN PARTS AND CONNECTORS

2.4.a Front view
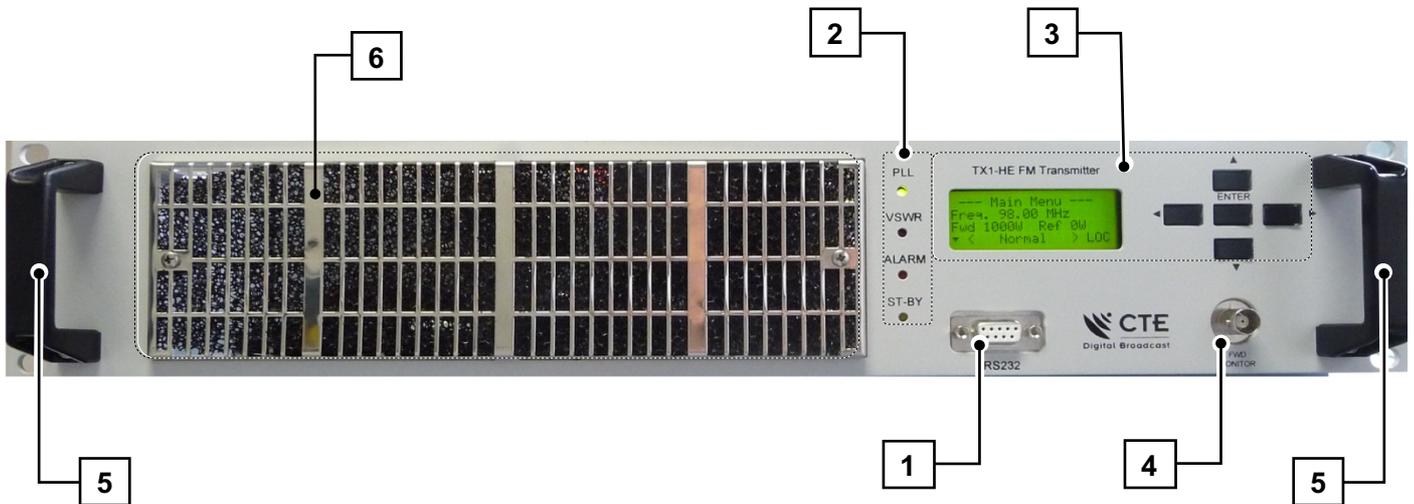
[1] RS232 PC CONNECTION - this RS232-type connector is an auxiliary RS232 front connection.

[2] STATUS LEDs - these indicators show the status of the equipment (➔2.4.b).

[3] CONTROL PANEL - allows to control the functions and set the parameters of the equipment (➔2.4.c).

[4]   FWD MONITOR - this connector is a -50 dB attenuated R.F. sample output coming from the R.F. filter unit. It's suitable for linear R.F. measurements in the 87,5 to 107.95 MHz frequency range(➔2.6.a).

[5] FRONT HANDLES - they allow the users to easily carry the device in conjunction with the rear handles

**[6]   FRONT VENTILATION AIR GRID** - allows the device to draw in the cooling air.

2.4.b   Status LEDs
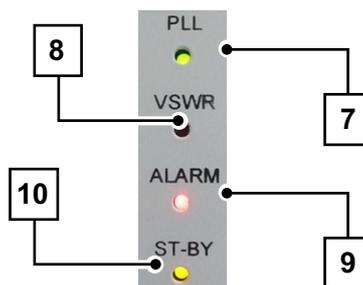
These LED-fitted indicators show the current status of the equipment with the following information:

[7]   PLL (green) – this LED is glowing when the PLL (frequency synthesizer) is regularly locked.

[8]   VSWR (red) – this LED is glowing when the VSWR exceeds 10% of the R.F. output power.

[9] ALARM (red) – this LED is glowing when an alarm is released (e.g. low modulation, high VSWR, interlock open, etc. - (➔3.7.e).

[10] ST-BY (yellow) – this LED lights up when the equipment is in stand-by mode (by means of the appropriate menu command ➔3.5.a).

2.4.c Control panel
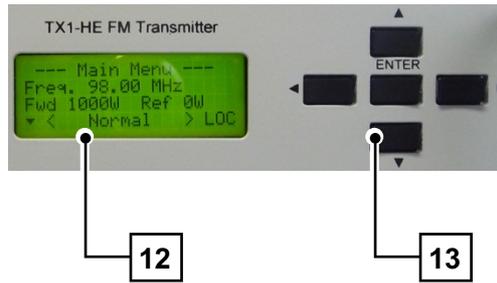
The control panel is composed by the following items:

[12] LCD display (Liquid Crystal Display) – this display, composed of 4 lines of 20 characters, shows the operation parameters and the selected modes through the navigation keys.

[13] Navigation keys – these keys allow the navigation in the command menu, read the equipment's parameters and set them. Their main functions are:

*   ▲ (up) – In the command menu, allows to scroll up one level toward the **Main menu**. In the **EventLog** list, allows to scroll toward the last event/alarm.
*   ▼ (down) - In the command menu, allows to scroll down and access the currently selected submenu/option. In the **EventLog** list, allows to scroll toward the first event/alarm.
*   ◄ (left) – In the command menu, allows to move to the previous menu by scrolling the screenshots left.
*   ► (right – In the command menu, allows to move to the next menu by scrolling the screenshots right
*   [**ENTER**] – confirms the setting currently shown on the display.

2.5   REAR VIEW
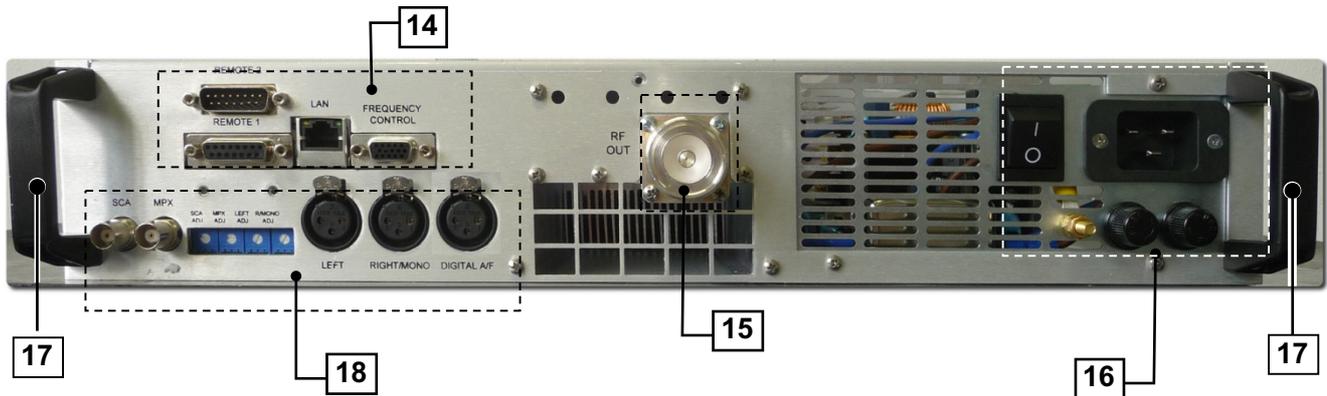
**[14] General connection area** – its details are available on par. 2.5.a.

[15] Antenna N female output connector (R.F. OUTPUT 500W/1000W) – an FM broadcasting suitable antenna able to bear the transmitter's nominal power must be connected to this N female connector.

[16] AC connection area + earth connection – its details are available on par. 0.

[17] Rear handles – they allows the user to easily carry the device in conjunction with front handles.

[18] Modulation connection area – its details are available on par. 2.5.a.

2.5.a General connection area
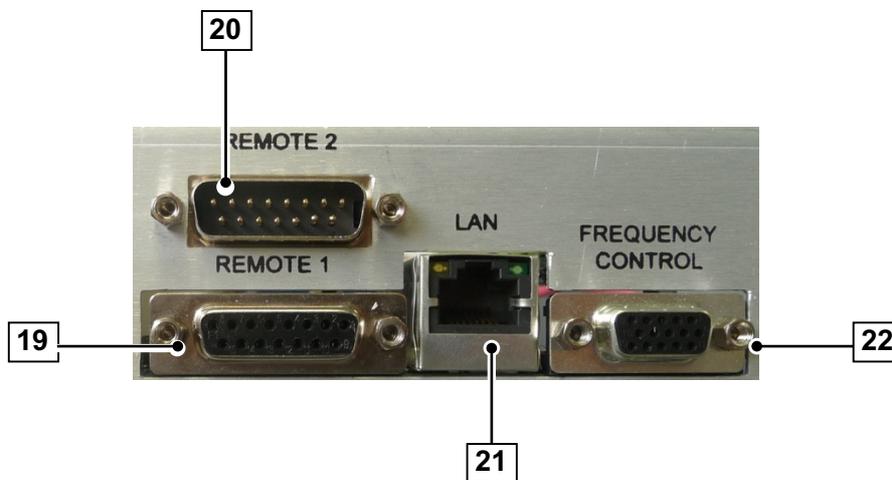
[19] REMOTE 1 – Remote control DB15 female. For its wiring see 2.6.c.

[20] REMOTE 2 – Remote control DB15 male connector. This port increases the number of tele signals and tele commands available on the **REMOTE 1** port, offering more flexibility when using the transmitter within broadcasting systems, for example N+1 or N+0 with transceiver systems, when the equipment is connected to an FM receiver. It is directly connected to the relay board, which mounts the jumpers used to set the behavior of the output/input signals of this port. For its wiring see 2.6.d.
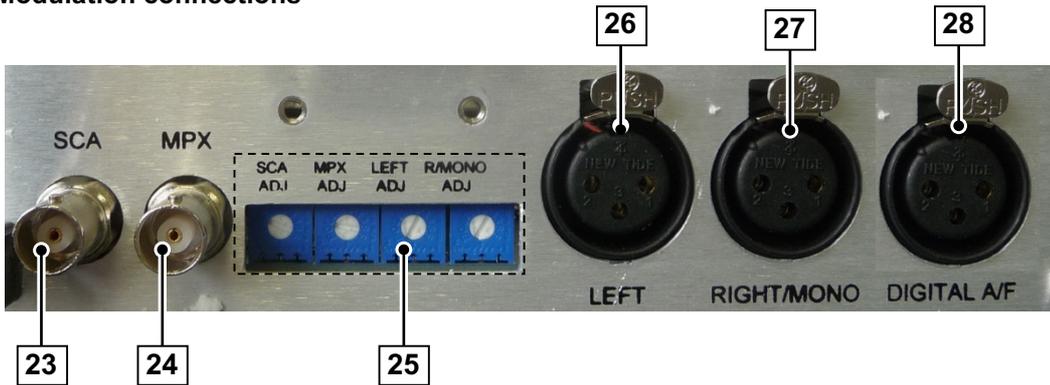
[21] LAN – input for LAN connection (Ethernet standard).

[22] FREQUENCY CONTROL.

🖐 **When using the transmitter in stand alone configuration, it is necessary to plug the DB15 male connector, supplied with the equipment, into the REMOTE 1 port (➔2.7.c).**

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2.5.b   Modulation connections

[23] SCA – input 1 for external RDS/SCA signal.

[24] MPX   – input 1 for external mpx signal.

[25]   Modulation adjustments (behind the panel) – the four trimmers behind this panel allows to regulate the modulation as follows:

- **L/ adj** – adjusts the input level of the connector [26]
- **R/MONO adj** – adjusts the input level of the connector [27]
- **SCA** – adjusts the input level of the connector [23]
- **MPX** – adjusts the input level of the connector [24]

*The trimmers **L/ adj** and **R/MONO adj** work only if the submenu `Setting – AF Level` has been previously set to the option `-6:+12dB` (➔3.5.f).*

[26] LEFT   – Left external input.

[27] RIGHT MONO - Right-Mono external input.

[28] DIGITAL AF - – input for AES-EBU digital standard.
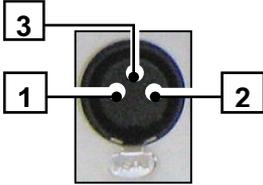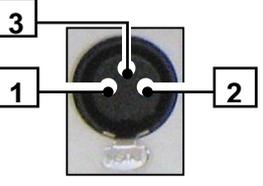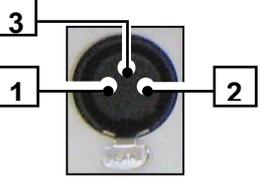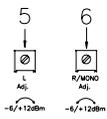
2.5.c AC POWER

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[28] **POWER LINE plug with FUSE** – IEC-type AC power input plug 185 to 265 V – 50/60 Hz, single phase.

Fuse: T 5x20   10A (AXON) and 5A (TX05-HE) 250Vac

[29] **POWER LINE SWITCH** – AC power switch. Allows the whole equipment to be switched on/off.

[30] **Earth connection** – it allows the connection of the equipment to ground for a safe functioning.

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2.6   DESCRIPTION OF CONNECTORS AND SETTINGS

A wide range of connectors is available in the FM transmitter. One is located in the front panel while the other ones are located in the rear panel

2.6.a Front panel connection

PICTURE	ITEM	DESCRIPTION
	RS232	This 9 pin DB9-type connector [1] is designed for several remote controls and services. For example for the software update (➔3.5.o).
	FWD MONITOR	RF Probe 70dB. Attenuated R.F. sample output (±3dB) coming from the R.F. LPF filter unit.

2.6.b Rear panel connection

| PICTURE	ITEM	DESCRIPTION

PICTURE	ITEM	DESCRIPTION
	LEFT	Pin 1: connected to Ground. Pin 2: connected to +input. Pin 3: connected to –input. Input balanced pins 3-2. Input unbalanced pins 3/1-2 to Ground.
	RIGHT/ MONO	Input for Right-Mono external input. Pin 1 and shield: connected to ground. Pin 2: connected to +input. Pin 3: connected to –input.
	DIGITAL AF	Input for AES-EBU digital modulation. Pin 1 and shield: connected to ground. Pin 2: B digital. Pin 3: A digital.
SCA MPX	SCA, MPX	Sub carrier inputs.
5 6	L/R Adj.	The two trimmers indicated in the picture allow to adjust the level of the input low frequency sensitivity. These trimmers are working only if the submenu **Setting – AF Level** has been previously set to the option -6:+12dB (➔3.5.f).
SCA MPX Min Max	SCA,MPX adjustment	By means these trimmers the two sub carriers can be adjusted from 10% up to 90% of the nominal value.
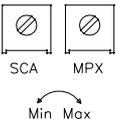
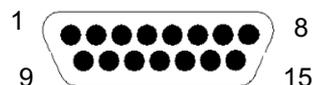| PICTURE	ITEM	DESCRIPTION

	REMOTE 1	This DB15 connector allows the remote control. Its wirings are stated on par.(➜2.6.c)
	REMOTE 2	This DB15 connector allows the remote control. Its wirings are stated on par.(➜2.6.c)
	LAN	This Ethernet-type connector allows the connection to a LAN with Ethernet standard.
	Frequency Control	This DB15 connector allows the remote control. Its wirings are stated on par.(➜2.6.e).

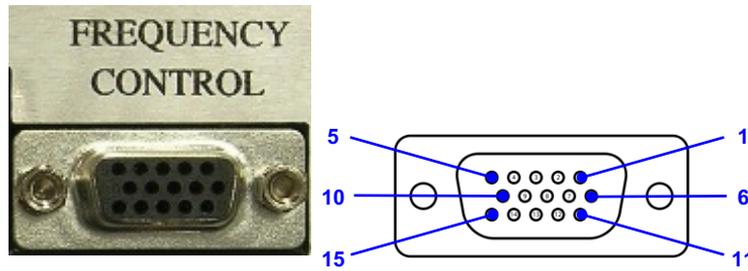### 2.6.c Wiring connections of the DB15-type REMOTE 1 connector
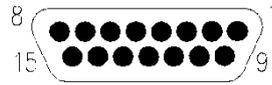
PIN	DESCRIPTION		
1	Ground		
2	Power Supply Voltage	Analogue output	DC voltage proportional to the P.S. output. Scale 1V = $10V_{DC}$
3	Forward Power	Analogue output	Proportional analogue output from 0 to 4.5V. Full scale 4.5V = 1,000W
4	$+15V_{DC}$ max 30 mA		Auxiliary voltage for test purposes $+15V_{DC}$ 30mA max
5	Ground		
6	EXT ALARM	TC Stationary	(ACTIVE IF close to ground) **This connection is used for RX connection.**
7	Interlock circuit	TC Stationary	**This pin must be connected to ground for the start-up of the equipment**
8	Reset alarm	Analogue output	Reset alarm due to equipment block (input $+5V_{DC}$). Select the jumper on the mother board. This output is preset as disabled.
9	Total Current R.F. Unit	Analogue output	DC voltage proportional to the electrical input. Scale 1A = 0.1V
10	Reflected Power	Analogue output	Proportional output DC voltage, from 0 to 5V. Full scale 5V = 100W
11	Not Connected		
12	Stand-by OUT	Stationary TS	Open to ground when the transmitter is in stand-by status.
13	Alarm Signal N. Closed	Stationary TS	open when the alarm is active
14	Alarm Signal N. Open	Stationary TS	closed when the alarm is active
15	Common (for pins 13 and 14)		

2.6.d Wiring connections of the DB15-Male REMOTE 2

PIN	DESCRIPTION		
1	TC ST-BY ON	TC Impulsive Command	• Active if TC>100ms • Available only in Remote setting • Close to GND for TC activation • NC or NA set by jumper(see Remote 2 setting) • Referred to GND
2	TC ST-BY OFF	TC Impulsive Command	• Active if TC>100ms • Available only in Remote setting • Close to GND for TC activation • NC or NA set by jumper(see Remote 2 setting) • Referred to GND
3	EXT.Squelch	TC Stationary	• Active if TC close to GND • Available only in Remote setting • Close to GND for TC activation • NC or NA set by jumper(see Remote 2 setting) • Referred to GND Used for RX connection, Power Squelch in case of Missing Field
4	Local/Remote	TS Stationary Signal	• Closed to GND in Remote operation • Open to GND in Local operation • NC or NA set by jumper(see Remote 2 setting)
5	NO 230Vac	TS Stationary Signal	• NOT available on standard version Module option on request
6	Power output -7dB	TS Stationary Signal	RF NOMINAL (open to GND pout >-7dBc; closed to GND pout<-7dBc)
7	Power output -3dB	TS Stationary Signal	RF NOMINAL (open to GND pout >-7dBc; closed to GND pout<-7dBc)
8	NO Modulation	TS Stationary Signal	• Closed to GND if Alarm modulation active • Not working for F0-P0 • NC or NA set by jumper(see Remote 2 setting)
9	SWR Alarm	TS Stationary Signal	• Closed to GND if Alarm modulation active • NC or NA set by jumper(see Remote 2 setting)
10	GND		
11	Reset	TC Impulsive Command	Alarm Reset, Restart the unit if allowed by Microprocessor.
12-13-14	nc		
15	+15V 10mA	for QC test	

2.6.e Wiring connections of the DB-15-type FREQUENCY CONTROL connector

Input PIN	On-air Frequency/Power output
No contact	F0 / P0
12	F1 / P1
11	F2 / P2
10	F3 / P3
9	F4 / P4
8	F5 / P5
7	F6 / P6
6	F7 / P7
5	F8 / P8
4	F9 / P9
1-2-3	ground
13-14-15	N.C.
Connected to ground.	

When the transmitter is in remote mode, the wanted on-air Frequency/Power output couple is selected connecting to ground the relevant pin. Changing to local mode, the transmitter keeps the last selected frequency/power couple, even if the relevant pin is disconnected from ground. When in local mode, the FREQUENCY CONTROL port does not work.

If in remote mode the pins of the FREQUENCY CONTROL port are not connected to ground, the system refers to the values set for the F0/P0 couple.

2.7 OPERATIONS

2.7.a Unpacking

After unpacking the FM transmitter and choosing a suitable place to put it, check that all the necessary parts are available to continue:

1) Spare fuses.
2) AC power plug (inside its package).
3) Interlock connector (a male DB15 type with pin 7 connected to pin 5).
4) Documentation.

2.7.b Connections

1) Make sure that the AC power line switch 0 is in **O** (Off) position.
2) Connect all the earth wires coming from the other devices fitted in the rack to the earth terminal 0 provided in the rear of the equipment and marked with the appropriate symbol.
3) Connect the AC power cable to the AC power plug 0 following the instructions printed on its package, taking particular care with the earth connection.
4) Insert the AC power input plug in the AC connector 0 located in the rear of the FM transmitter.
5) Check the connection of the **REMOTE 1** port to the Interlock circuit (see the following paragraph).
6) Ensure that the AC mains supply voltage is 230V$_{AC}$ (±15%) and connect the other end of the cable to the power line.
7) Ensure that the antenna or amplifier is suitable for the FM broadcasting frequency range (from 87.5 to 108 MHz) and connect it to the 7/16 R.F. output connector 0 available in the rear of the transmitter.
8) Now the equipment is ready to work at the minimum configuration.

🖑 **Attention! If the Interlock circuit is not properly connected, the transmitter does not correctly work. See the following paragraph.**

2.7.c Interlock connection

When the transmitter works in stand alone configuration it is necessary connecting to ground the Interlock circuit to enable the R.F. signal to be put on-air. It can be done plugging into the **REMOTE 1** port the male DB15 connector supplied with the transmitter. In fact, this connector has the pin 7 (Interlock pin) connected to pin 5, which will be grounded through the relevant pin 5 of the **REMOTE 1** port.
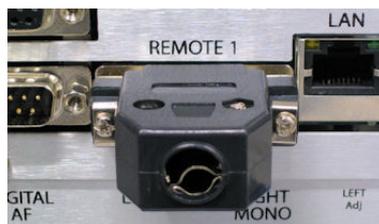
If the transmitter works within a system (not in a stand alone mode), it is however important checking that the connection of the Interlock pin of the **REMOTE 1** port has been correctly carried out.

In any case, if the pin 7 is not connected to ground the equipment acknowledges an active Interlock command, and accordingly stops the transmitter operation. At the same time the display shows the following warning screenshot (see the `Interlck` message on the 4th row):

To remove this error status it is sufficient plugging the connector into **REMOTE 1**.

The equipment returns to the status it was before the last switch off (`Normal` in the following screenshot):

2.7.d Switching the system on

9) Switch the FM transmitter on by pressing the AC power line switch 0 in I (on) position. The startup messages will appear on the LCD (3.1).

10) Set the frequency (➔3.5.b) and wait the **PLL** LED 0 switching ON.

11) Set the required output power (➔3.5.c).

12) Now the system is operating. If all is properly working, the LED **PLL** will glow (meaning that the PLL is locked).

13) Moreover the upper line of the LCD display should show the output power and the lower should show **Normal** (normal working condition ➔3.1). The LCD display should stay back lighted for 20 minutes after the last button pressed.

14) Check the forward and reflected R.F. power (➔3.4.b).

2.7.e Cares and maintenance

As many other electronic equipment, this transmitter need some care which is mandatory to guarantee years of perfect operation. On the other side, if maintenance operation is not regularly carried out, faults can occur, particularly in harsh environments.

Air cooling fans must be regularly inspected and replaced every 10,000 hours. Vent air filter must be regularly replaced or cleaned according to the environment conditions.

2.8   AUDIO SETTING

2.8.a   Mother board.

It is possible to carry out fine adjustments using the trimmers shown in the following figures and referring to the modulation values shown on the equipment's display.
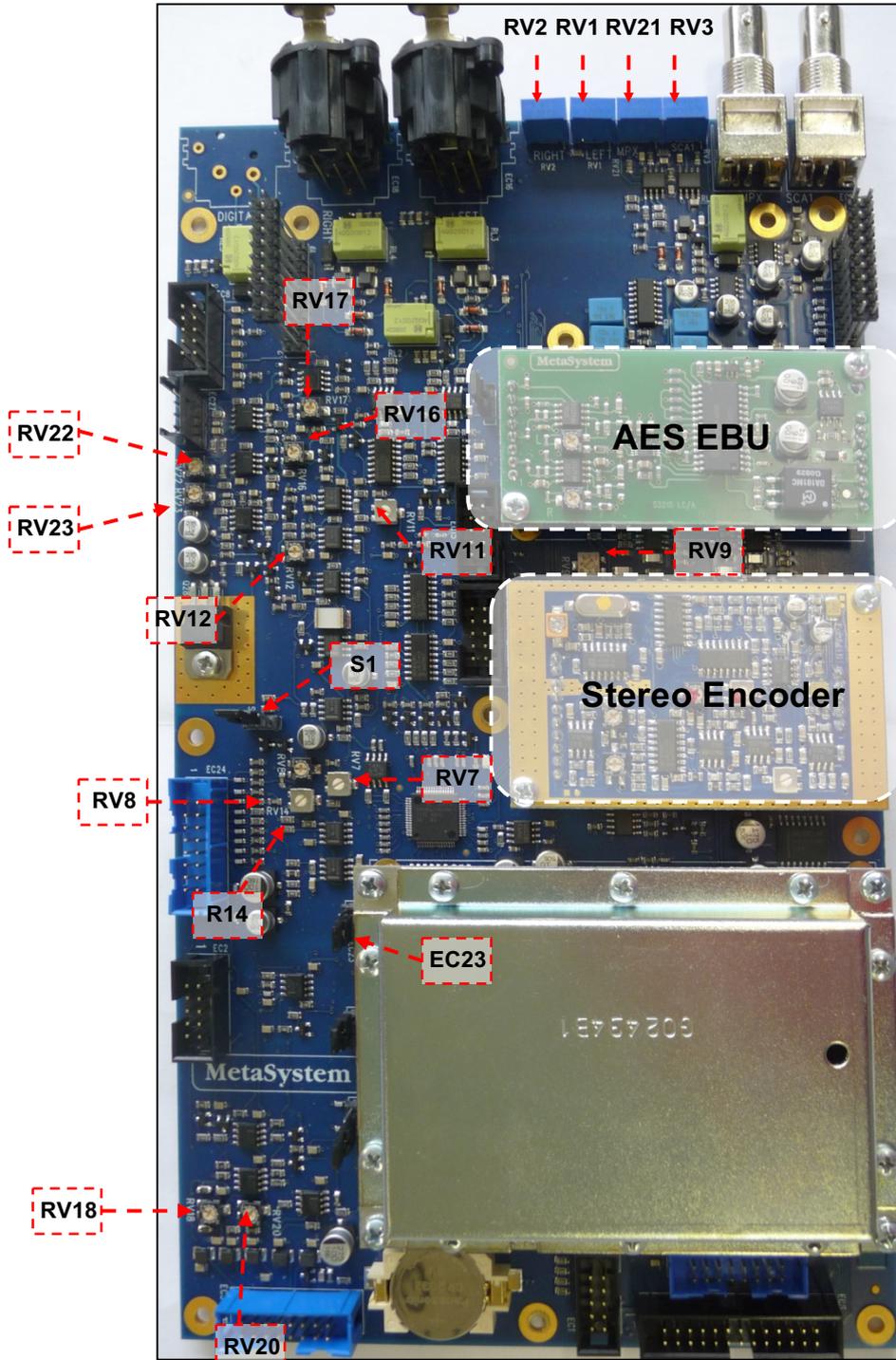

Adjustments on the motherboard

Trimmer	Setting Description	Factory Setting	NOTE

RV7	Right channel FM Dev(Input XLR)	75kHz (40kHz optional, on demand)	Audio Menù setting +6 & +0dBu
RV9	Left channel FM Dev (Input XLR)	75kHz (40kHz optional, on demand)	Audio Menù setting +6 & +0dBu
RV14	Mono FM Dev (Input XLR)	75kHz (40kHz optional, on demand)	Audio Menù setting +6 & +0dBu
RV11	Deviazione Display	Factory use only	
RV12	AGC Audio limit	100kHz (80kHz optional, on demand)	
RV8	Audio Clipper limit	110kHz (90kHz optional, on demand)	
S1	AGC OFF	ON	
EC23	CLIPPER OFF	ON	
RV1	Left channel FM Dev (Input XLR)	75kHz (40kHz optional, on demand)	Audio Menù setting -6 & +12dBu (ext.Tuning)
RV2	Right channel FM Dev (Input XLR)	75kHz (40kHz optional, on demand)	Audio Menù setting -6 & +12dBu (ext.Tuning)
RV21	MPX channel FM Dev (Input BNC)	75kHz (40kHz optional, on demand)	
RV3	SCA FM Dev (RDS)		
RV18	Voltage measurement adjustment		
RV20	Current measurement adjustment		
RV16	Reflected Power measurement adjustment		
RV17	Forward Power measurement adjustment		
RV22	ALC level adjustment		
RV23	Reflected Power adjustment		

2.8.b Stereo Encoder
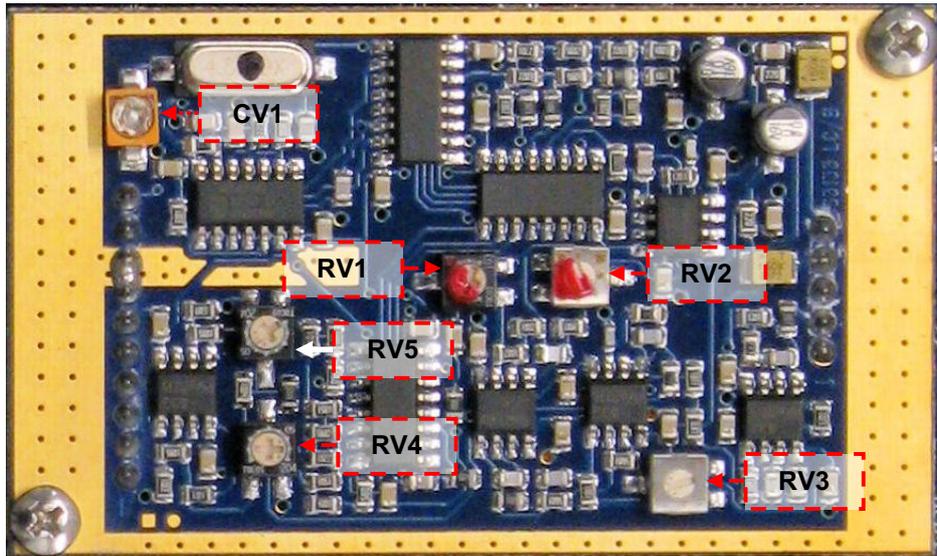
Trimmer	Setting description	Factory setting	Customer fine adjustment
CV1	Setting of the 19kHz frequency	19kHz	Not requested
RV1	Setting of the 19kHz FM deviation	7.5kHz (6.7kHz optional, on demand)	Allowed
RV2	Setting of the 19kHz phase	Set for the best stereo separation	Not requested
RV3	Setting of the 15kHz attenuation	Set for the max attenuation	Not requested
RV4	Setting of the left channel attenuation	Set for the best stereo separation	Not requested
RV5	Setting of the right channel attenuation	Set for the best stereo separation	Not requested

2.8.c   AES/EUB
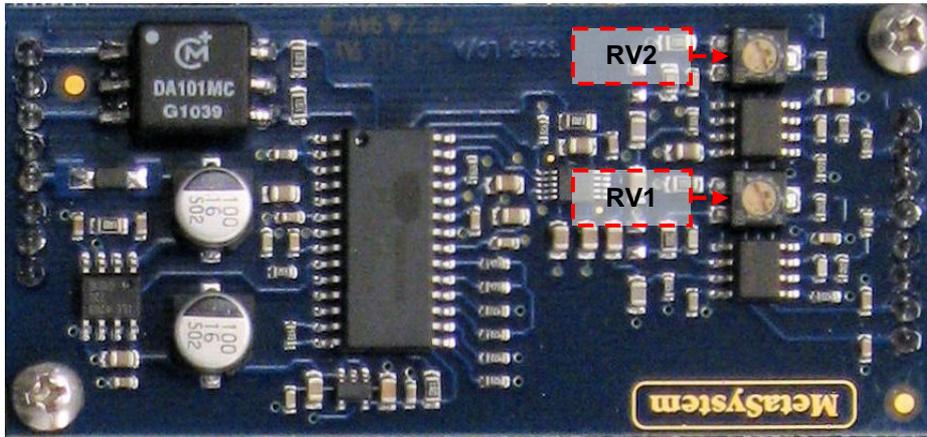
Trimmer	Setting description	Factory setting
RV2	Right channel level FM deviation (XLR input)	75kHz (40kHz optional, on demand)
RV1	Left channel level FM deviation (XLR input)	75kHz (40kHz optional, on demand)

TEKO Broadcast

AXON Series
500W/1000W FM TRANSMITTER

SERVICE AND OPERATION MANUAL

3   STARTUP & MENU DESCRIPTION

CONTENTS

3.1   INITIAL STARTUP

At the startup time, the fans will be activated and all the LEDs will light up steadily for some seconds in order to automatically test them. During this time the following screenshots will appear in sequence.

1) This first one shows the manufacturer's brand and the model name/kind of the equipment .

2) The second one shows the following information of the equipment:

- **SN**: the serial number (in the example **080008**)
- **CN**: the customer name which is set by default to **None**.
- **FW**: the firmware release (in the example the release 1.0)

📄 *The customer name can be further set with the menu* **Setting – Client Name** *(➔3.5.n)*

3) The third one is called "Main screen" (of the main menu) and shows:
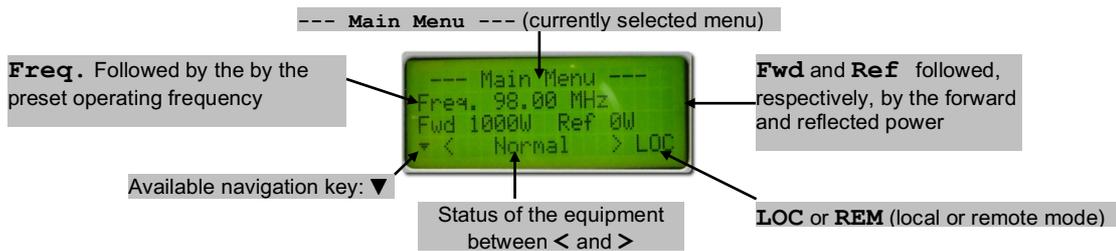
- 1st line: **--- Main Menu ---** shows that the main menu is currently accessed
- 2nd line: **Freq.** – followed by the preset operating frequency (in the example **98.00 MHz**)
- 3rd line: **Fwd** followed by the forward power (in the example **1000W**) and **Ref** followed by the reflected power (in the example 0W)
- 4th line:
  - On the left shows the currently available navigation key (▼)
  - In the center the status of the equipment between the symbols **<** and **>** (usually **Normal**)
  - On the right **LOC** or **REM**, showing if the equipment is set, respectively, in local or remote mode (in the example is set in local mode)

📄 *As better explained later, when an error/problem occurs, the related error/warning message replaces* **Normal** *and stays there as long as the reason of the alarm is present (➔3.8).*

4) Press the navigation key ▼. The **Set LOC/REM SYSTEM** screenshot will appear showing if the equipment is currently in remote or local mode by showing, respectively, **REM** or **LOC** inside square brackets:
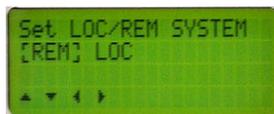
5) Should you need to change the current mode (in the example **REM** =remote mode), see par. 3.3, otherwise go to the next step.

📄 *In the remote mode, all the settings can be performer by remote commands only.*

6) Press ▼. This screen will allow you to access the first submenu of the Main Menu (**Measures**). For further information see 3.2.a.

```
Main menu
atus [Measures] Sett

▲ ▼ ◄ ►
```
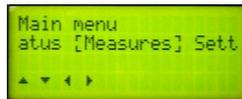
3.2   MENU STRUCTURE AND NAVIGATION

As briefly explained, the options and settings of the equipment are organized in menu and submenus. Due to the complete information of the LCD and the navigation keys, browsing and accessing the menu is very simple. Just note the following issues:

3.2.a   Main Menu

If the equipment is in local mode, the main menu is divided in four submenus. Their name is stated in the 2nd line inside square brackets: **Measures**, **Setting**, **EventLog** and **Status**.
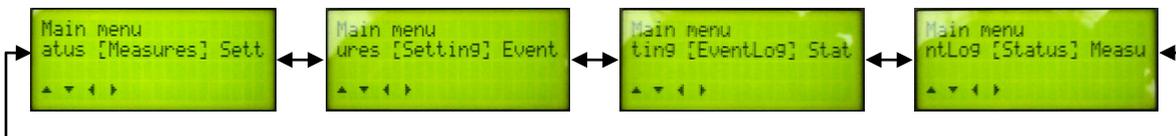

- **Measures** – allows to check the transmitter's operating parameters, for example, modulation, direct/reflected power, PA voltage, frequency, etc. (➔3.4).
- **Setting** (available only in local mode and password protected) - allows to set the transmitter's operating parameters, for example, modulation, direct/reflected power, PA voltage, frequency, etc. (➔3.5).
- **EventLog** – allows to see the list of alarms/events that have occurred during operation (➔0).
- **Status** - allows to see the status of the equipment, for example preemphasis, LAN address, FW revision, etc. (➔3.7).

📖   *If the equipment is in remote mode, the* **Setting** *menu is not shown in the display. To access it, set the equipment in local mode (➔3.3).*

3.2.b   Main navigation

When the submenus of the **Main menu** have been displayed:
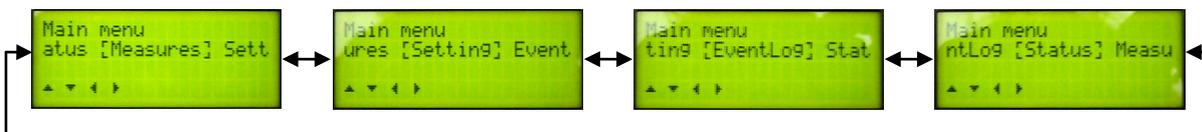
- To move from one submenu to the next one (e.g. from **Measures** to **Setting**), simply press the navigation key ►.
- To move from one submenu to the previous one (e.g. from **Setting** to **Measures**), simply press the navigation key ◄.

When the proper submenu has been selected, to see the list of its available options just press the navigation key ▼.

| **Measures** option list | **Setting** option list | **EventLog** option list | **Status** option list |
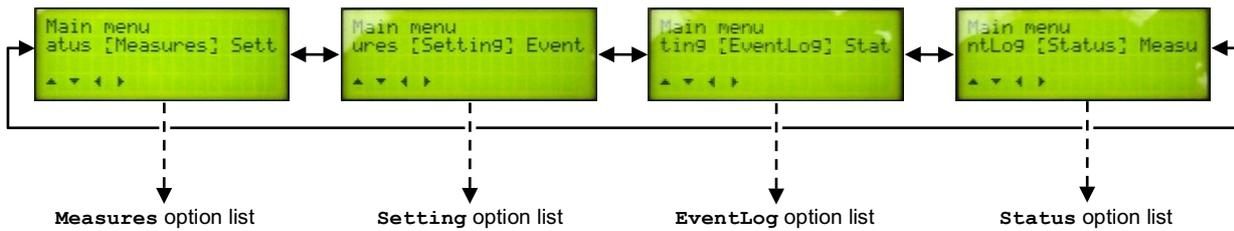
For example, if the submenu **Measures** has been currently displayed, pressing the key ▼ will lead to the first option (**Modulation**) of the **Measures** option list:
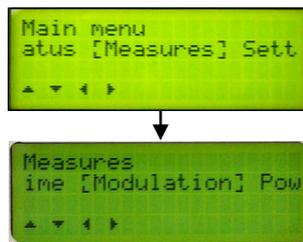
To select another option in the list, the same operation used to scroll from one submenu to another one are available, i.e.:

- To move from one option to the next one, simply press the navigation key ▶.
- To move from one option to the previous one, simply press the navigation key ◀.

To access the currently displayed option in the list, just press the navigation key ▼. For example, if the option **Modulation** of the **Measures** submenu is currently displayed, pressing the ▼ will lead to the **Modulation** measure screenshot allowing to check the modulation:
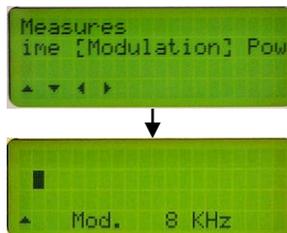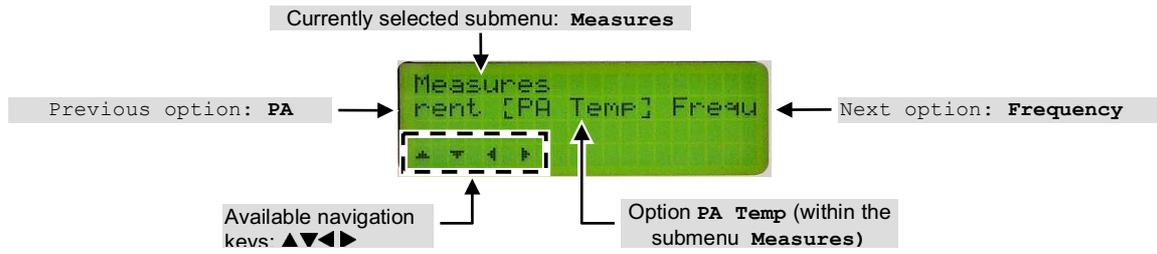

At this point, to go back to the option list, simply press the key ▲.

3.2.c   On screen instructions

Navigating the menu and locating each screenshot is easy thanks to the on-screen guidance information which are continuously shown on each screenshot and dynamically updated:

- The 1st line works as a navigation map, always showing the menu or submenu name in which you are currently navigating (in the below stated example, the submenu **Measures**).
- The 2nd line shows:
  - In the center the currently selected option in the list which is stated inside square brackets (in the below stated example [**PA Temp**])
  - On the left the previous available option (before the currently selected one) with its ending letters (in the below stated example **rent** means **PA Current**, which is the previous option)
  - On the right the next available option (after the currently selected one) with its initial letters (in the below stated example **Freq** means **Frequency**, which is the next option)
- The last line always shows in the bottom-left part the keys you can press to navigate the menu (in the below stated example, the navigation keys ▲▼◀▶ are available, but not the **ENTER** one – see bottom note).

Currently selected submenu: **Measures**

Previous option: **PA**   Next option: **Frequency**

Available navigation
keys: ▲▼◄ ►

Option **PA Temp** (within the
submenu **Measures**)

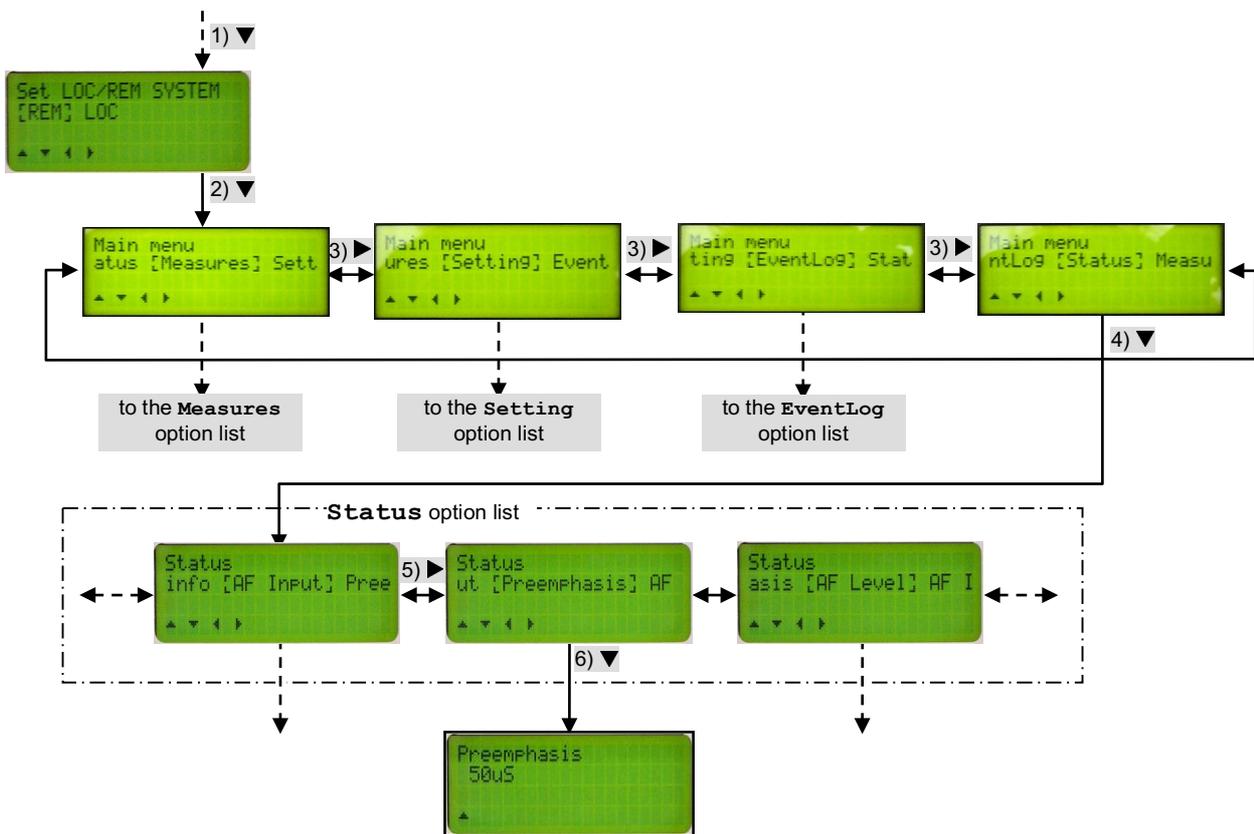📄 *When the [**ENTER**] key is available, it's represented as a filled-in circle ●.*

3.2.d   Timings

When an option is accessed, if no keys are pressed for a certain time (variable according to the version, e.g. 1 minute), the display returns to the related submenu.

Moreover, if no keys are pressed for a certain time (also variable according to the version, e.g. 3 minutes) in every menu/submenu, the display is automatically reverted to the main screen (➔ 3.1 – step 3).

3.2.e   Navigation example

This example better explain the navigation. See the below stated partial diagram (the full map is available on par. 3.9).

1) ▼

Set LOC/REM SYSTEM
[REM] LOC

2) ▼

Main menu   Main menu   Main menu   Main menu
atus [Measures] Sett   3) ►   ures [Setting] Event   3) ►   ting [EventLog] Stat   3) ►   ntLog [Status] Measu

4) ▼

to the **Measures**
option list

to the **Setting**
option list

to the **EventLog**
option list

Status option list

Status   Status   Status
info [AF Input] Pree   5) ►   ut [Preemphasis] AF   asis [AF Level] AF I

6) ▼

Preemphasis
50uS

If the main screen is selected and there is the needs to check the currently selected preemphasis (submenu **Status** – **Preemphasis**), these are the proper operations to do:

1) Press once the ▼ key to move one step down in the **Set LOC/REM SYSTEM**.
2) Press once the ▼ key to move one step down in the submenus.
3) Press three times the ► key (or the key ◄ once) to reach the **Status** submenu.
4) Press once the ▼ key to access the option list of the **Status** menu (the first one is **AF Input**).

5) Press the ▶ key to reach the **Preemphasis** option in the option list.

6) Press ▼ to check the **Preemphasis** (in the example **50 uS**).

📄 *In this last screenshot only the ▲ sign is shown in the last line. This means that the only available operation is to return to the **Status** option by pressing the ▲ key.*

3.3   SETTING THE LOCAL OR REMOTE MODE

When the **Set LOC/REM SYSTEM** screenshot is selected (➔3.1 step 5), it shows if the equipment is currently in remote or local mode by showing, respectively, **REM** or **LOC** inside square brackets:

1) Press ◄ or ▶ in order to select the needed mode, then press the [**ENTER**] key. The display will show:
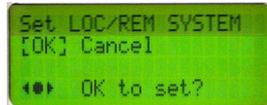
2) Press [**ENTER**] to confirm the previously selected mode (or, to escape, use ◄ or ▶ to select **Cancel** then press [**ENTER**].

📄 *In the remote mode, all the settings can be performer by remote commands only, so the **Setting** menu (explained later) won't be available.*

📄 *In the last step you can also exit without changing the mode by following the escape procedure (➔0).*

3.4   MEASURES SUBMENU

This submenu allows to provide some measurements and see the following transmitter's operating parameters available in these screenshots:

- **Modulation** – checks the modulation of the equipment (➔3.4.a)
- **Power** – checks the forward and reflected R.F. power (➔3.4.b)
- **PA Voltage** – checks the voltage supplying the R.F. power amplifier (➔3.4.b)
- **PA current** – checks the current drain of the R.F. power amplifier (➔3.4.d)
- **PA Temp** – checks the working temperature of the R.F. power amplifier (➔3.4.e)
- **Frequency** – shows the operating frequency (➔3.4.f)
- **Time** – shows time and date set in the equipment (➔3.4.g)

Each of the above submenus can be accessed simply by using the ▼ key from each item in the menu list and is used just to view parameters (to change them, use the **Setting** submenu - ➔3.5). For this reason only the ▲ key to step back to the **Measure** option list is available.

3.4.a   Modulation

This option checks the current level of modulation.
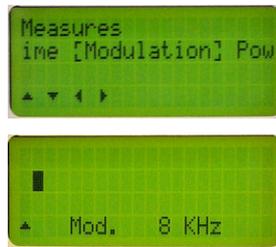
- The 2nd line of the display is a modulation bar meter graphically showing the current level of the modulating signal (in the example only one bar is shown).
- The last line digitally shows the current modulation level in KHz

📄 *Should you need to change the attenuation of the modulation input (i.e. the modulation level), see par 3.5.f.*

3.4.b   Power

This option checks the R.F. power currently handled by the equipment:
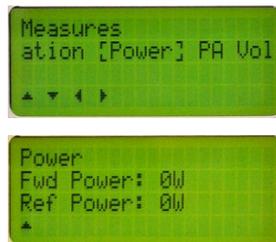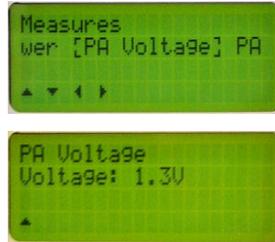

- **Fwd Power:** shows the forward power
- **Ref Power:** shows the reflected power

📄 *Should you need to change the R.F. output power, see par 3.5.c.*

3.4.c   PA Voltage

This option checks the voltage supplying the R.F. power amplifier:

📄 *The value of this voltage changes according to the current operation. For example the over stated example shows the typical voltage in standby mode.*

3.4.d   PA current

This option checks the current drained by the R.F. power amplifier:

📄 *The value of this voltage changes according to the current operation. For example the over stated example shows the current drain in standby mode.*
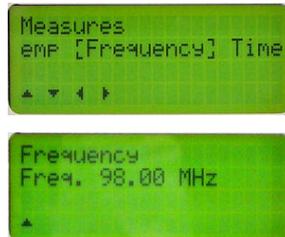
3.4.e   MOSFET Temp

This option checks the operating temperature of the R.F. power amplifier:

3.4.f   Frequency

This option shows the operating frequency currently set:

📄 *Should you need to change the operating frequency, see par 3.5.b.*

3.4.g Time

This option shows the system time and date currently set in the equipment:
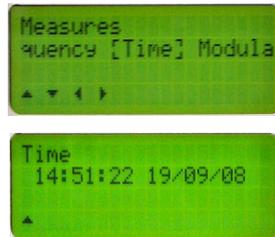
The time is shown in **hh:mm:ss** (hours, minutes and seconds) format and the date in **dd:mm:yy** (day, month and year) format.

Date and time are particularly important for the proper operation of the ***EventLog*** *list (➔0). Should you need to adjust time and date, see par 3.5.h.*

3.5   SETTING SUBMENU

This menu is available only in local mode (➔3.3). It allows to set the transmitter's operating parameters as below stated, for this reason it's password protected.
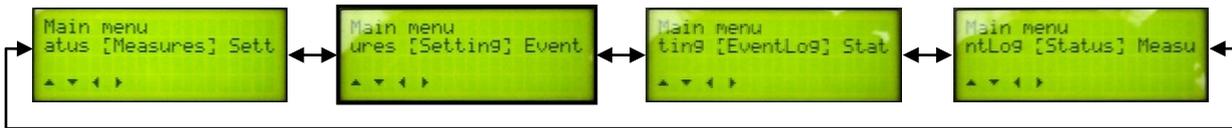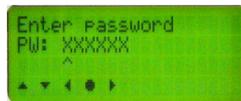
To access the **Setting** menu:

1) Check that the equipment is set in local mode. If not, set it this way using the **Set LOC/REM SYSTEM** screenshot (➔3.3).

2) Inside the main menu, use the ◄ and ► keys to select the **Setting** submenu.

3) Press the ▼ key. The **Enter password** screen will appear. Note that the first digit of the password is pointed with the ∧ symbol underneath.

4) Use the ▼ and ▲ keys to set the 1st digit of the password (which is preset by default to **000000**), then press the ► key. The ∧ symbol will move to the next digit.
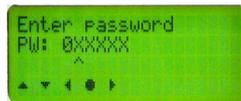
5) Repeat the previous step until you have set all the six digits.

6) As soon as you set the sixth digit, press [**ENTER**] to enter the password. If the password is correct, the option list of the **Setting** submenu will be available with this screenshot:
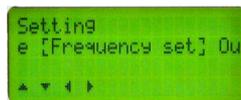
📄 *If necessary, the password can be changed by using the **Password** setting option as below stated (➔3.5.m).*

Setting list:

- **StandBy** – sets the system in standby mode (➔3.5.a)
- **Freq Table** – sets the operating frequency (➔3.5.b)
- **Pwr Out Table** – sets the R.F. output power (➔3.5.c)
- **AF Input** – sets the audio frequency input mode (Mono, Stereo, etc. -➔0)
- **Preemphasis** – sets the preemphasis value (➔3.5.e)
- **AF Level** – sets the audio frequency level (A.F. input attenuation - ➔3.5.f)
- **AF Impedance** – sets the audio input impedance (➔3.5.g)
- **Time Set** – sets the system time and date (➔3.5.h)
- **Factory reset** – restores the system to the factory settings (➔3.5.i)
- **Event Clear** – clears the event log (➔3.5.j)
- **Language** – sets the on-screen language (➔3.5.k)
- **Device Addr.** – sets the address of the RS485 interface (➔3.5.l)
- **Password** – sets the password to access the setting menu (➔3.5.m)
- **Client Name** – sets the client name which appears on the startup screen (➔3.5.n)
- **SW Update** – allows to update the system software (➔3.5.o)

- **LAN Restart-** allows TCP/IP restart in case of network fail (➔3.5.p)

- **SMS Alarm** (➔3.5.q)

- **Failure Counter** (➔3.5.r)

- **Reset Mode** (➔3.5.s)

- **Warning** (➔3.5.t)

- **-3dB Mode** (➔3.5.u)

- **GSM N.1; N.2; N.3** (➔3.5.v)

- **SWR Block** (➔3.5.z)

- **IP Address** – to check/set the IP address (➔3.5.x)

- **Subnet Mask** – to check/set the Subnet Mask address (➔3.5.y)

- **Gateway** – to check/set the Gateway address (➔3.5.z)

Each of the above submenus can be accessed simply by using the ▼ key from each item in the menu list. The specific instructions of each setting are stated in the following paragraphs.

3.5.a   StandBy

This option allows setting the equipment in standby mode or, from this last condition, restore the normal operating condition.

1) When this option is accessed, the display shows inside square brackets whether or not the standby mode is active. In this case is **OFF**, i.e. the equipment is not in standby mode, so it's normally operating.

2) Use the ◄ and ► keys to select the other available setting (in this case **ON** = standby).
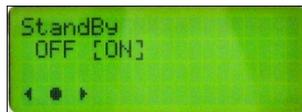
3) Press the [**ENTER**] key to enter the setting. The display prompts to confirm it with **OK** inside square brackets.

4) Press the [**ENTER**] key to confirm (or, to escape without changing the setting, follow the escape procedure - ➔3.5.b.1). The equipment will be set in standby mode.

When the equipment is in standby mode, the **ST-BY** yellow LED 0 will be steadily glowing.

3.5.b   Frequency table set

This submenu allows to set (up to 10) preset R.F. frequency values (F0 to F9). The operating frequency will be selected according the **Frequency Control** pins status (➔2.6.e). This operation mode works only when in remote mode.

📄 *If the **Frequency Control** port has no pins connected to ground, the on-air frequency is **F0**.*

7) In the following screens the ∧ symbol points to the digit which will be changed.

8) Use the ▼ and ▲ keys to set this digit, then press the◄ key. The ∧ symbol will move one digit left (100kHz resolution).

9) Repeat the previous step until you have set all the digits you need to change (in the example we changed all the digits till the 100MHz resolution).

10) Press the **[ENTER]** key to enter the setting. The display prompts to confirm it with **OK** inside square brackets.
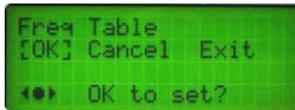
11) Press the **[ENTER]** key to confirm the frequency. The new frequency will be stored and the display will go back to option list.

12) To exit the `Frequency Table` menu press the **[ENTER]** key, then select **[Exit]**.

📄 *The equipment rejects eventual frequency settings which are outside the FM broadcast range.*

3.5.b.1   Escape procedure

This procedure applies to the major part of the `Setting` submenus and allows to escape without storing the new setting (i.e. leave the previous one) in case of mistakes. It might slightly change according to the currently selected submenu, but it basically works this way:

1) After changing the setting of the selected option, the equipment prompts to confirm the change showing in the 2nd line **OK** inside square brackets (e.g. step 4 of the par. 3.5.b).
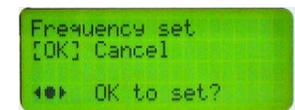
2) At this stage, if you need to escape without changing the setting, just use the ◄ and ► keys to move the square brackets on **Cancel** (in some settings the message could be different, e.g. **NO**).
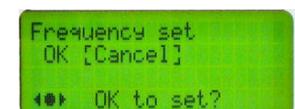
3) Press [**ENTER**]. The 2nd line of the display will show a message informing that you activated the escape procedure (e.g. **[X]   Set canceled**):

```
Frequency set
[X]  Set canceled

 *    OK to set?
```
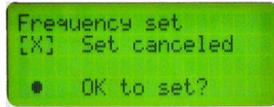
4) Press [**ENTER**] to confirm you want to escape. The new setting won't be stored and you come back to the option list without changing the settings of the previously selected submenu.

Obviously, when you will use the escape procedure with other **Setting** submenus, the 1st line of the screen will show the name of the submenu you are currently working on as per the following examples:

```
Language
[X]  Set canceled

 *    OK to set?
```
```
Event Clear
[i]  Clear executed

 *    Do Clear ?
```
```
Time Set
[X]  Set canceled

 *    OK to set?
```

However the escape operation is the same.

This is the diagram of the escape procedure applied to the **Time Set** submenu (➔3.5.h):

```
Setting
ance [Time Set] Fact

 ▲ ▼ ◄ ►
```

(time/date setting)

```
Time Set
[OK] Cancel

 ◄ * ►   OK to set?
```
1) ►
```
Time Set
 OK [Cancel]

 ◄ * ►   OK to set?
```
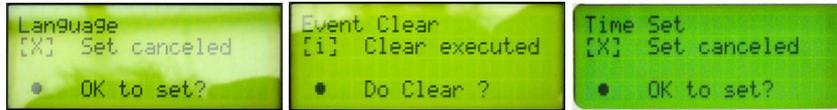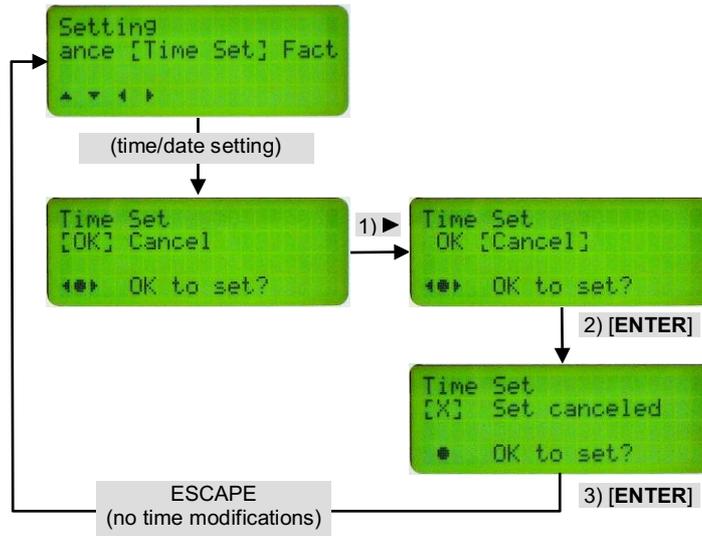
2) [**ENTER**]

```
Time Set
[X]  Set canceled

 *    OK to set?
```

ESCAPE
(no time modifications)

3) [**ENTER**]

3.5.c   Output Power

This option allows to set (up to 10) preset R.F. output power levels (from P0 to P9). The on-air output power is the one selected using the pins of the **Frequency Control** port (➔2.6.e). This operation mode works only when in remote mode.

```
Setting
le [PwrOut Table] AF

 ▲ ▼ ◄ ►
```
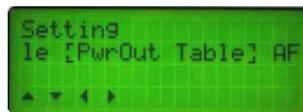
1) Select the location to be set (in this example the 0 position).

```
PwrOut Table
Pw 0: 00100 [W]
        ^
 ▲ ▼ ◄ * ►
```

2) Use the ▼ and ▲ keys to set the first digit on the right, then press the ◄ key. The ∧ symbol will move one digit left. Repeat this step until you have set all the digits you need to change (in the example we changed all the digits till the 100 W resolution in order to set the output power to 400W.

```
PwrOut Table
Pw 0: 00400 [W]
        ^
 ▲ ▼ ◄ * ►
```

3) Press the [**ENTER**] key to enter the setting. The display prompts to confirm it with [**OK**].

4) Press the [**ENTER**] key to confirm (or, to escape without changing the setting, follow the escape procedure (➔3.5.b.1). The new setting of the R.F. output power will be stored and the display will go back to the option list.

📄 *Step 2 – the setting of each digit is performed in an intelligent way. This means, for example, that if you are currently setting the 1W resolution digit which currently reads **9** and you press ▲, you will obtain 10W (not **0**). Moreover, output powers higher than 600W cannot be stored.*

3.5.d   AF Input

This submenu allows to set the A.F. input mode (mono, MPX, stereo, digital).
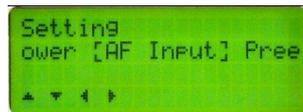
1) Use the ◄ and ► keys to set one of the following settings (in the example **Stereo**):

- **Mono** – monophonic modulation (input from the connector Right) filter 15KHz
- **MPX**- for ext Stereo signal , filter 100khz.
- **Stereo** – stereophonic modulation (input from connectors L and R) set ON the internal Stereo Coder.
- **Digital AF** – digital modulation (input from connector AES-EBU) set ON the internal Stereo Coder.

📄 *One or more settings couldn't be available according to the installed option or firmware version.*

2) Press the [**ENTER**] key to enter the setting. The display prompts to confirm it with **OK** inside square brackets.
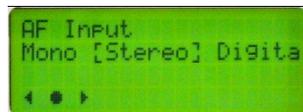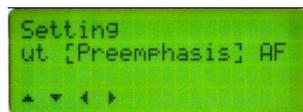
3) Press the [**ENTER**] key to confirm (or, to escape without changing the setting, follow the escape procedure - ➔3.5.b.1). The new setting of the A.F. input mode will be stored and the display will go back to the option list.

3.5.e   Preemphasis

This submenu allows to set the preemphasis of the modulation.

1) Use the ◄ and ► keys to set one of the following settings (in the example **50uS**):

- **75uS** – pre-emphasis of 75 microseconds
- **50uS** – pre-emphasis of 50 microseconds
- **OFF** – no pre-emphasis (flat)

2) Press the [**ENTER**] key to enter the setting. The display prompts to confirm it with **OK** inside square brackets.

3) Press the [**ENTER**] key to confirm (or, to escape without changing the setting, follow the escape procedure - ➔3.5.b.1). The new setting of the preemphasis will be stored and the display will go back to the option list.

3.5.f   AF Level

This submenu allows to set the attenuation of the modulation input, i.e. set the audio frequency level according to the A.F. source currently used.

4) Use the ◄ and ► keys to set one of the following settings (in the example **-6:+12dB**):
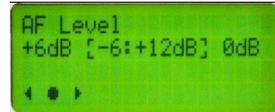
- **0dB** – no attenuation
- **+6dB** – amplification of +6dB
- **-6:+12dB** – variable adjustment from –6dB to +12dB by means of the external trimmers 0
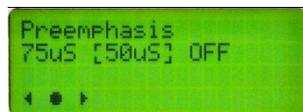
5) Press the [**ENTER**] key to enter the setting. The display prompts to confirm it with **OK** inside square brackets.

6) Press the [**ENTER**] key to confirm (or, to escape without changing the setting, follow the escape procedure - ➔0). The new setting of the A.F. level will be stored and the display will go back to the option list.

📄 *Obviously, as soon as the setting* **-6:+12dB** *has been set, the trimmers 0 must be regulated according to the A.F. source currently used.*

3.5.g   AF Impedance

This submenu allows to set the A.F. input impedance according to the A.F. source currently used.
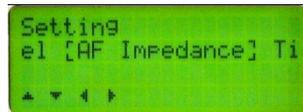
1) Use the ◄ and ► keys to set one of the following settings (in the example **10K**):

- **600** – input impedance of 600 ohm
- **10K** – input impedance of 10 Kohm

2) Press the [**ENTER**] key to enter the setting. The display prompts to confirm it with **OK** inside square brackets.

3) Press the [**ENTER**] key to confirm (or, to escape without changing the setting, follow the escape procedure - ➔3.5.b.1). The new setting of the A.F. impedance will be stored and the display will go back to the option list.

3.5.h   Time Set

This submenu allows to adjust the system time (hours, minutes, day, month and year in this order). Adjusting the system time is particularly important for the **EventLog** list (➔0).
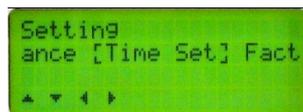
1) As can be seen, the 2nd digit of the time is pointed with the ∧ symbol underneath.

2) Use the ▼ and ▲ keys to set the hour, then press the ► key. The ∧ symbol will move to the minutes.

3) Repeat the previous step to set minutes, day, month and year.
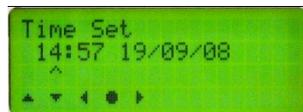

4) Press the [**ENTER**] key to enter the setting. The display prompts to confirm it with **OK** inside square brackets.

5) Press the [**ENTER**] key to confirm (or, to escape without changing the setting, follow the escape procedure - ➔3.5.b.1). The new setting of the time will be stored and the display will go back to the option list.

3.5.i   Factory reset

This submenu restores all the settings (frequency, output power, etc.) to the factory default (e.g. frequency set to 98.00 MHz).

1) Ensure that **YES** is set (or use the ◄ and ► keys to set it). The display asks to confirm the operation with the message **Do Reset?**

2) Press the [**ENTER**] key to confirm. The equipment will restart showing the startup screens and all the settings will be reverted to the factory default as it was switched on for the first time.

📄 *On step 1, you can also set* **No** *in order to escape without resetting the equipment (this submenu isn't fitted with the standard escape procedure).*

📄 *Obviously, since all the settings are restored to the factory default, frequency, power and all the main settings will need to be accessed and modified.*

3.5.j   Event Clear

This submenu allows to clear the event log, i.e. the list which records the events (e.g. power on) and alarms of the equipment (➔0).
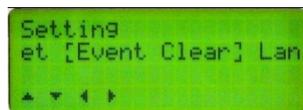
1) Ensure that **YES** is set (or use the ◄ and ► keys to set it). The display asks to confirm the operation with the message **Do Clear?**
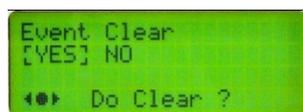
2) Press the [**ENTER**] key to confirm (or, to escape without changing the setting, follow the escape procedure described on par. 0). All the events in the event log will be cleared.

3.5.k   Language

This submenu allows to set the language used for the messages shown in the display.
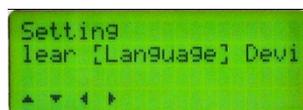
1) Use the ◄ and ► keys to set the needed language from the ones available (in the example **English**).

Language
 iano [English]

◄ ● ►

2) Press the [**ENTER**] key to confirm (or, to escape without changing the setting, follow the escape procedure - ➔3.5.b.1). The selected language will be set.

3.5.l Device Addr.

This submenu allows to set the address of the RS485 serial port (➔2.5.a):

Setting
ge [Device Addr.] Pa

▲ ▼ ◄ ►
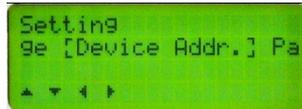
1) As can be seen, the least significant digit of the address is pointed with the ∧ symbol underneath.

Device Addr.
RS485 Addr.00001
                ^

▲ ▼ ◄ ● ►
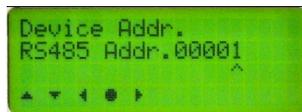
2) Use the ▼ and ▲ keys to set this digit (see note at the bottom), then press the ◄ key. The ∧ symbol will move one digit left.

Device Addr.
RS485 Addr.00001
               ^

▲ ▼ ◄ ● ►

3) Repeat the previous step until you have set all the digits of the address.
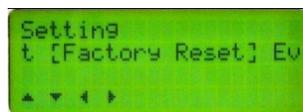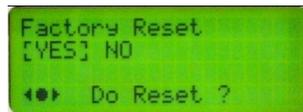4) Press the [**ENTER**] key to enter the setting. The display prompts to confirm it with **OK** inside square brackets.
5) Press the [**ENTER**] key to confirm (or, to escape without changing the setting, follow the escape procedure - ➔3.5.b.1). The new address of the RS485 will be stored and the display will go back to the option list.

📄 *At step 2, when you set each digit, you will note that it happens in an intelligent way. This means for example that if you are currently reading* **9** *in the least significant digit and press* ▲*, you will obtain* **10***.*

3.5.m Password

This submenu allows to change the password used to access the **Setting** submenu (➔3.5).
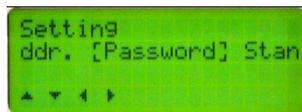
Setting
ddr. [Password] Stan

▲ ▼ ◄ ►

1) Press the ▼ key. The **Enter password** screen will appear. Note that the first digit of the password is pointed with the ∧ symbol underneath.

Enter password
PW: XXXXXX
    ^

▲ ▼ ◄ ● ►

2) Use the ▼ and ▲ keys to set the 1st digit of the password (which is preset by default to **000000**), then press the ► key. The ∧ symbol will move to the next digit.

Enter password
PW: 0XXXXX
     ^

▲ ▼ ◄ ● ►

3) Repeat the previous step until you have set all the six digits.

Enter password
PW: 012345
         ^

▲ ▼ ◄ ● ►
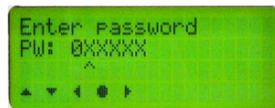
4) Note down the new password (see bottom note).

5) Press [**ENTER**] to enter the password. The display prompts to confirm the setting with **OK** inside square brackets.

6) Press the [**ENTER**] key to confirm (or, to escape without changing the setting, follow the escape procedure - ➔3.5.b.1). The new password will be stored and the display will go back to the option list.

✋ **Don't forget to note down the new password, otherwise you won't be able to access the `Setting` menu the next time you will try to access it.**

3.5.n   Client Name

This submenu allows to set the customer name appearing on the display at the initial startup (➔3.1). It's normally set by default to **None**, but it can be changed according to your needs (8 characters max) as follows:

```
Setting
By [Client Name] SW
▲ ▼ ◄ ►
```
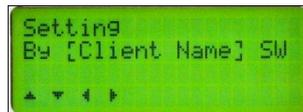
1) Press the ▼ key. The **Client Name** screen will appear. Note that the first character (in the example **N**) of the client name is pointed with the ⌃ symbol underneath.

```
Client Name
CN: None
    ⌃
▲ ▼ ◄ ● ►
```

2) Use the ▼ and ▲ keys to set the 1st character of the client name. The available characters are:
   * letters from A to Z (capital letters)
   * letters from a to z (small letters)
   * numbers (0 to 9)
   * the symbols **.** (dot) **_** (underscore) **–** (hyphen) and blank (empty space).

3) Press the ► key. The ⌃ symbol will move to the next digit.

```
Client Name
CN: Rone
     ⌃
▲ ▼ ◄ ● ►
```

4) Repeat the steps 2 and 3 until you have set the customer name you need (in the example **Radio9**).

```
Client Name
CN: Radio9
        ⌃
▲ ▼ ◄ ● ►
```

5) Press [**ENTER**] to enter the setting. The display prompts to confirm it with **OK** inside square brackets.

6) Press the [**ENTER**] key to confirm (or, to escape without changing the setting, follow the escape procedure - ➔3.5.b.1). The client name will be stored and shown at the next startup.

3.5.o   SW Update

This submenu allows to update the software of the equipment by connecting a PC (provided with the appropriate updating software) to the RS232 front port [1].

```
Setting
ame [SW Update] Freq
▲ ▼ ◄ ►
```
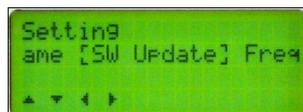
1) Set the equipment in standby mode as explained in par 3.5.a (otherwise the software update can't be performed).

2) Connect the PC (with the appropriate software) to the RS232 port [1] with the suitable cable.

3) Access the **SW update** option and use the ◄ and ► keys to select **YES** (or, to escape without updating the software, follow the escape procedure - ➔0).
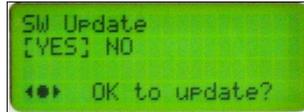
4) Press the [**ENTER**] key. The display prompts **OK** and asks to confirm the operation.

5) Press the [**ENTER**] key. The display shows the following message.

6) Activate the updating software on the PC (see details at par. 3.10). At the end of the update the equipment will restart showing the startup screens. Please note that all the settings/parameters might be restored to the default ones (see bottom note).

📄 *This submenu is provided with a timeout which automatically escapes the SW Update function after 10 minutes of inactivity. As alternative solution, should you need to escape the submenu before, you can switch the equipment off and on again.*

✋ **Don't switch off the equipment until the software update is completed.**

✋ **According to the kind of software update, all the settings/parameters (frequency, output power, etc.) might be restored to the default ones. For this reason, all the parameters must be checked and eventually set again.**

3.5.p LAN Restart

This submenu allows the restart in case of Network failure.

3.5.q SMS alarm

This menu allows to set ON or OFF the SMS alarm, Will be effect only in case of GSM Modem connection.
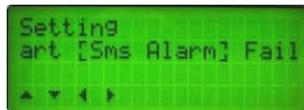
To activate this function select **[ON].**

3.5.r Failure Counter

All relevant alarm are counted and it's possible to set a maximum number that will cause a Unit permanent stopped. The possible value are 8 or 16.
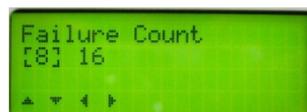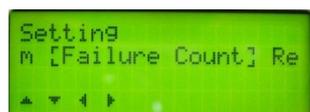
3.5.s Reset Mode

This menu allow the reset setting in case of permanent stop caused by the **Failure Counter** (➔3.5.r).

The available options are: **Never** / **Every 24 hour** / **At power on**:

3.5.t   Warning

This function allowed preventing the equipment lockout if the ambient temperature exceeds the working temperature range. If the heat sink reaches a temperature above 65°C, the power is limited and completely switched off once the temperature goes over 85°C. The output power will be switched ON again once the temperature will be lower than 75°C.
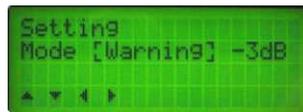
To set on this function select **[ON].**

3.5.u   -3dB mode (output power setting)

This function allows setting the output power at half power. This function can be set ON or OFF.
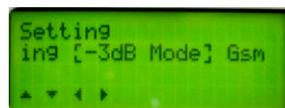
3.5.v   GSM Number setting

This menu allowed setting up 3 GSM numbers that will be used to send SMS messages in case of alarm. The following picture shows the menu to set the first GSM number:

🖐 **If the total number of characters is less than 13, ensure to leave blank the other characters (at the right of the number).**

☝ **Don't forget to set the not used memory locations to +000000000000, otherwise unwanted SMS messages might be sent (with the related cost charges).**

3.5.w   Swr Block

This menu allows to set the SWR protection behavior.

📄 *The protection starts its effect once the Reflected power will be over the 10% of the maximum power.*

```
Setting
N.3 [Swr Block] IP a
▲ ▼ ◄ ►
```

There are two options:

If SWR Block is ON the unit stops the power output and restarts after few second. This restart will be carried out for 4 times, and if for all these tests the VSWR alarm is confirmed, the unit will be stopped switching OFF the output power. In this case a permanent alarm will be displayed and a RESET will be requested to start again the on-air operation.

```
--- Main Menu ---
Freq. 98.00 MHz
Fwd 0W      Ref 0W
▼ <   Swr Block  > LOC
```
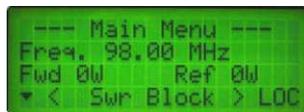
If SWR Block is set OFF the equipment will never switch off the output power. The protection will simply linearly reduce the R.F. output power. Even in case of open load or closed load, the reflected power will be maximum the 10% of the maximum power (see the following picture).

```
--- Main Menu ---
Freq. 98.00 MHz
Fwd 49W     Ref 49W
▼ <   Exc SWR    > LOC
```
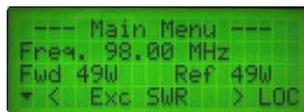
3.5.x   IP Address

This menu allows checking/changing the IP address.

```
Setting
lock [IP addr] Subne
▲ ▼ ◄ ►
```

⬇

```
IP addr
 192.168.010.126
 ^
▲ ▼ ◄ ● ►
```

⬇

```
IP addr
[OK] Cancel
◄●►  OK to set?
```
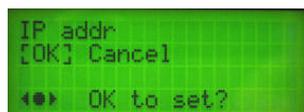
📄 *Changing of the parameter have effect only after the restart of the equipment (switching off/on through the power line switch 0) or via the **LAN Restart** function (➔ 3.5.p)*

3.5.y   Subnet Mask

This menu allows checking/changing the Subnet Mask address:

```
Setting
dr [Subnet Mask] Gat

▲ ▼ ◄ ►
```



```
Subnet Mask
 255.255.255.000
 ^
▲ ▼ ◄ ● ►
```



```
Subnet Mask
[OK] Cancel

◄●►   OK to set?
```

3.5.z   Gateway

This menu allows checking/changing the Gateway address.


```
Setting
Mask [Gateway] Stand

▲ ▼ ◄ ►
```



```
Gateway
 192.168.010.001
 ^
▲ ▼ ◄ ● ►
```



```
Gateway
[OK] Cancel

◄●►   OK to set?
```
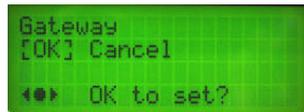
3.5.aa   Password On/Off

This menu allows enabling/disabling the authentication via password to access to the Setting menu.


```
Setting
way [Psw On/Off] Sta

▲ ▼ ◄ ►
```

3.6   EVENTLOG SUBMENU

This sub-menu provides a historical record of events (transmitter turned on, turned off, stand-by, etc.) and alarms (interlock, PLL unlock, etc.) that have been taking place during the operation. The full list of alarms is stated on par. (➔3.8).

The transmitter's memory can record up to 100 alarms/events, each of them marked with a progressive number. The oldest one is marked with **0** whilst the newest one is marked with an higher number up to **99**.

If the device already has 100 events/alarms stored, when a new event/alarm occurs, the memory will delete the event **0** and will shift the other ones one step down in order to make room for such the new event/alarm which is marked with the reference number **99** (First In First Out management).

3.6.a How to check the event log

1) The **EventLog** list is directly accessed from the **Main menu** simply by selecting **EventLog** and by pressing the ▼ key.

2) As soon as accessed, the event log shows the newest event/alarm (in the over stated example it has the reference number **n.22**).

3) These are the main information shown in each item (event or alarm) in the list.
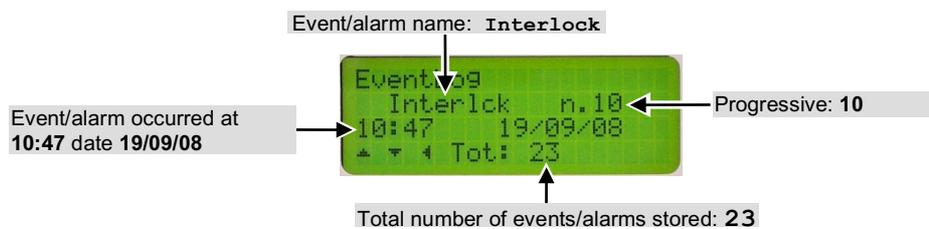
4) Use the ▼ and ▲ keys to scroll though the events/alarms as follows (see the following diagram):
   • To scroll toward the oldest event/alarm (i.e. the ones marked with **0**) press ▼.
   • To scroll toward the newest event/alarm (i.e. the one marked with the higher reference number, in the below stated example **n.22**) press ▲.

```
EventLog
 PLL Unlock   n.22
11:53    19/09/08
▲ ▼ ◄ Tot: 23
```

n.11-21
(events/alarms from 11 to 21)

```
EventLog
 Interlck    n.10
10:47    19/09/08
▲ ▼ ◄ Tot: 23
```

n.1-9
(events/alarms from 1 to 9)

```
EventLog
 Normal     n.0
10:38    19/09/08
▲ ▼ ◄ Tot: 23
```
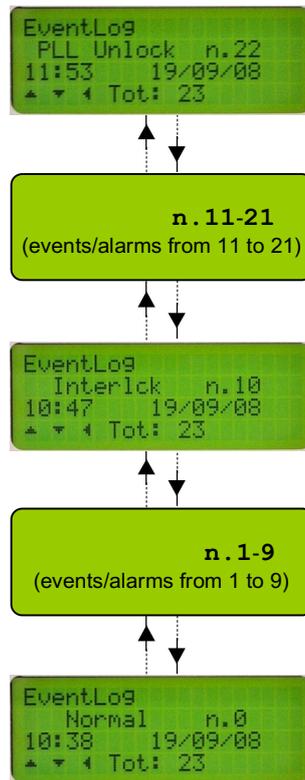
5) To escape the event log and go back to the main menu press the ◄ key.

3.7   STATUS MENU

This menu allows to check the status of the equipment (A.F. Input, Preemphasis, LAN address, FW revision, etc.). Its purpose is to allow to check the said parameters even to people not owning the password to access the `Setting` submenu. In fact the major part of these options are the same of the `Setting` menu.

- **AF Input** – shows the A.F. input mode (mono, stereo, etc.) (➔3.7.a)
- **Preemphasis** – shows the pre-emphasis value (➔3.7.b)
- **AF Level** – shows the A.F. level (A.F. input attenuation or amplification (➔3.7.c)
- **AF Impedance** – checks the audio input impedance (➔3.7.d)
- **SMS Alarm**   – status of the `alarm messages sent through GSM network function` (➔3.7.e)
- **Failure Count**   – `alarms count` (➔3.7.f)
- **Reset Mode** (➔3.7.g)
- **Warning Mode** – `over temperature advance warning` (➔3.7.h)
- **SwrBlock Mode** – `block mode due to excessive SWR` (➔3.7.i)
- **-3dB Mode** – shows if the output power is set to half power (➔3.7.j)
- **485 Address** – shows the address of the RS485 interface (➔3.7.k)
- **Client Name** – shows the client name which appears on the startup screen (➔3.7.l)
- **FW revision** – shows the firmware of the equipment (➔3.7.m)
- **BF board info** – shows the firmware of the A.F. board (➔3.7.n)

Each of the above options is used just to view parameters (it doesn't allow any settings) and can be accessed simply by using the ▼ key. As such, they can't be changed by using the navigation keys (only the ▲ key to step back to the option list is available). To change them, use the appropriate option of the `Setting` submenu (➔3.5)

3.7.a   AF Input

This submenu shows the current setting the A.F. input mode (mono, stereo, etc.).

In the over stated example, the equipment is set to `Stereo`.

📄   *For further information about this setting, and to eventually change it, see par. 0.*

3.7.b   Preemphasis

This submenu shows the current setting of the preemphasis.
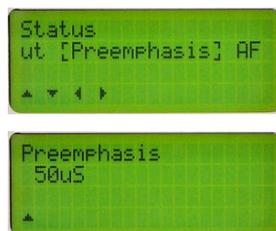
In the over stated example, the equipment is set to `50uS` (microseconds).

📄   *For further information about this setting, and to eventually change it, see par. 3.5.e.*

3.7.c   AF Level

This submenu shows the current attenuation of the modulation input.

In the over stated example, the equipment is set to **0dB** (no attenuation).

📄 *For further information about this setting, and to eventually change it, see par. 3.5.f.*

3.7.d   AF Impedance

This submenu shows the A.F. input impedance.
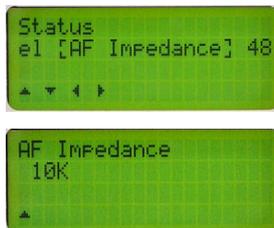
In the over stated example, the equipment is set to **10K** (10 Kohm).

📄 *For further information about this setting, and to eventually change it, see par. 3.5.g.*

3.7.e   SMS Alarm

This menu shows the status of the SMS alarm function (ON / OFF).

In the previous example the function has not been activated.

3.7.f   Failure Count

This menu shows the set Failure Count threshold (8 in this example).
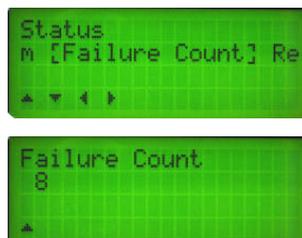
3.7.g   Reset Mode

This menu shows the set reset mode (every 24 hours in the example).

3.7.h   Warning Mode

This menu shows the status of the warning mode.

3.7.i   SwrBlock Mode

This menu shows the status of the block mode of the transmitter due to an excessive SWR power level.

3.7.j   -3dB Mode

This menu shows the status of the command to manually set the output power to half power.

3.7.k   485 Address

This submenu allows to check the address of the RS485 serial port.

In the example, the address of the equipment is **1** (address 1).

📄 *For further information about this setting, and to eventually change it, see par. 3.5.l.*

3.7.l   Client Name

This submenu allows to see the customer name appearing on the display at the initial startup (➔3.1).
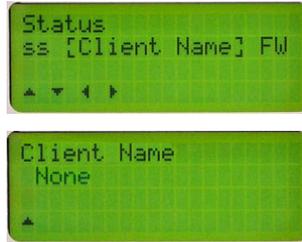
In the over stated example, the screen shows **None**, meaning that the customer name is the default one (i.e. it hasn't been set).

📄 *For further information about this setting, and to eventually change it, see par. 3.5.n.*

3.7.m   FW Revision

This submenu allows to check the firmware revision of the equipment.
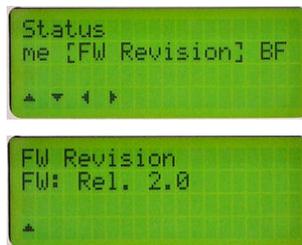
In the example, the screen shows **Rel. 2.0**.

📄 *For further information about this setting, and to eventually update the firmware, see par. 3.5.o.*

3.7.n   BF board info

This menu shows the firmware release of the A.F. board.

3.8   ALARM SECTION

As already explained on par. 3.1, the 4th line of the display shows in the center the current status of the equipment (between the symbols **<** and **>**) which is usually **Normal**. However, if an alarm occurs, it replaces the said caption with an appropriate message and stays there as long as the reason of the alarm is present. For example, the following screenshot is showing the **Interlck** (interlock) alarm.

When the normal conditions are restored (nothing is causing alarms), the display reverts to **Normal**.

The following table explains the meaning each alarms which might be shown.

Alarm	Meaning
Low Power	Poor R.F. output power (i.e. -3dB or less than the preset one)
EEprom Flt	An unrecoverable error in the non-volatile memory occurred (the equipment is forced and kept in standby mode for security reasons)
EEprom Wrn	A recoverable error in the non-volatile memory occurred (the software was able to correct it)
Interlck	Interlock contact opened (the equipment is forced to standby mode)
Exc SWR	The value of the reflected power reached 1/10 of the preset R.F. output power (or is higher). In this condition the R.F. output power is automatically reduced for security reasons
PS Overload	Overload of the power supply which supplies the R.F. power amplifier
Vaux Fail	Fault in the power supply which supplies the control logic unit
PLL Unlock	The PLL frequency synthesizer is unlocked
SWR Block	If **SWR Block is ON** the unit stops the power output after for 4 consecutive VSWR alarms. A reset command can be carried out: through the power line switch 0 or, in remote mode, through the pin 11 of the REMOTE 2 port (➔**Errore. L'origine riferimento non è stata trovata.**)
EXT Alarm	This alarm is caused by closing the pin 6 of the REMOTE 1 port. This connection is used with RX connection
Modulation Alarm	This alarm is active when the deviation is less than 10khz for more than 5 minutes. Not active for the preset F0-P0, or when the transmitter is in stand-by status, or when the ExtSquelch is active
Low Power	Active if the measured output power is less than the set output power
Over Temperature	Active for heat-sink over temperature (threshold: 80°C)
Unbal	Excessive unbalanced power in the R.F. power amplifier module
PA Overheat	Temperature of the R.F. power amplifier heatsink is greater than 85°C
Over Pwr	Excessive R.F. output power (higher than +20% of the set one)
PS Overheat	Overheating of the power supply which supplies the R.F. power amplifier
PS Fault	Fault in the power supply which supplies the R.F. power amplifier
EEprom Err	Hardware faults in managing the non-volatile memory
BF Error	Error during communication with the AF board

Every alarm (up to 100 alarms) is stored in the **EventLog** list, which can be checked with the appropriate menu, ➔0). The said list also stores the following events:

Event	Meaning
Power on	Equipment has been switched on (at the date shown in the relevant screenshot)
Normal	Normal operation of the equipment
Stand-By	Equipment locally set in stand-by mode by means of the dedicated menu command (➔3.5.a)
Ext Squelch	Command through pin 3 of the REMOTE 2 port which sets the power OFF. This connection is used for RX configurations

See below example of the event log txt file downloaded from the **RS232** port [1]:

```
Dev.TX1  SN:110011  Fw Rel.7.4


1    Interlck     16:43:00   01/03/13
2    Normal       16:43:00   01/03/13
3    Ext. Alarm   16:44:00   01/03/13
4    Normal       16:44:00   01/03/13
5    Stand-by     16:45:00   01/03/13
6    Normal       16:45:00   01/03/13
7    Ext. Squelch 16:45:00   01/03/13
8    Normal       16:45:00   01/03/13
9    Exc SWR      16:46:00   01/03/13
10   Low Power    16:46:00   01/03/13
11   Normal       16:46:00   01/03/13
12   Exc SWR      16:46:00   01/03/13
13   Normal       16:46:00   01/03/13
14   Exc SWR      16:46:00   01/03/13
15   Normal       16:46:00   01/03/13
16   Exc SWR      16:46:00   01/03/13
17   Swr Block    16:46:00   01/03/13
18   Normal       16:47:00   01/03/13
```

3.9 MENU DIAGRAM

CTE-DigitalBroadcast

TX1-HE
FM TRANSMITTER

CTE-DigitalBroadcast
SN: 080008
CN: None
FW: Rel. 2.0

--- Main Menu ---
Freq. 98.00 MHz
Fwd 0W   Ref 0W
▼ <   Interlck   > LOC

STARTUP SCREENSHOTS

Set LOC/REM SYSTEM
[REM] LOC
▲ ▼ ◄ ►

ONLY IN LOCAL MODE

Main menu
atus [Measures] Sett
▲ ▼ ◄ ►

Main menu
ures [Setting] Event
▲ ▼ ◄ ►

Main menu
ting [EventLog] Stat
▲ ▼ ◄ ►

Main menu
ntLog [Status] Measu
▲ ▼ ◄ ►

Measures   Setting   EventLog   Status

EventLog

EventLog
PLL Unlock n.22
11:53   19/09/08
▲ ▼ ◄ Tot: 23

n.11-21
(events/alarms from 11 to 21)

EventLog
Interlck   n.10
10:47   19/09/08
▲ ▼ ◄ Tot: 23

n.1-9
(events/alarms from 1 to 9)

EventLog
Normal   n.0
10:38   19/09/08
▲ ▼ ◄ Tot: 23

Status
me [FW Revision] BF
▲ ▼ ◄ ►

Status
n [BF board info] AF
▲ ▼ ◄ ►

Status
info [AF Input] Pree
▲ ▼ ◄ ►

Status
ut [Preemphasis] AF
▲ ▼ ◄ ►

Status
asis [AF Level] AF I
▲ ▼ ◄ ►

Status
el [AF Impedance] 48
▲ ▼ ◄ ►

Status
nce [Sms Alarm] Fail
▲ ▼ ◄ ►

Status
m [Failure Count] Re
▲ ▼ ◄ ►

Status
unt [Reset Mode] War
▲ ▼ ◄ ►

Status
de [Warning Mode] Sw
▲ ▼ ◄ ►

Status
e [SwrBlock Mode] -3
▲ ▼ ◄ ►

Status
ode [-3dB Mode] 485
▲ ▼ ◄ ►

Status
ce [485 Address] LAN
▲ ▼ ◄ ►

Status
ss [LAN Address] Cli
▲ ▼ ◄ ►

Status
ss [Client Name] FW
▲ ▼ ◄ ►

Measures
ime [Modulation] Pow
▲ ▼ ◄ ►

Measures
ation [Power] PA Vol
▲ ▼ ◄ ►

Measures
wer [PA Voltage] PA
▲ ▼ ◄ ►

Measures
age [PA Current] PA
▲ ▼ ◄ ►

Measures
rent [PA Temp] Frequ
▲ ▼ ◄ ►

Measures
emp [Frequency] Time
▲ ▼ ◄ ►

Measures
quency [Time] Modula
▲ ▼ ◄ ►

Setting

Setting
word [StandBy] Clien
▲ ▼ ◄ ►

Setting
dBy [Freq Table] Pwr
▲ ▼ ◄ ►

Setting
le [PwrOut Table] AF
▲ ▼ ◄ ►

Setting
ower [AF Input] Pree
▲ ▼ ◄ ►

Setting
ut [Preemphasis] AF
▲ ▼ ◄ ►

Setting
asis [AF Level] AF I
▲ ▼ ◄ ►

Setting
el [AF Impedance] Ti
▲ ▼ ◄ ►

Setting
ance [Time Set] Fact
▲ ▼ ◄ ►

Setting
t [Factory Reset] Ev
▲ ▼ ◄ ►

Setting
et [Event Clear] Lan
▲ ▼ ◄ ►

Setting
lear [Language] Devi
▲ ▼ ◄ ►

Setting
ge [Device Addr.] Pa
▲ ▼ ◄ ►

Setting
ddr. [Password] Stan
▲ ▼ ◄ ►

Setting
By [Client Name] SW
▲ ▼ ◄ ►

Setting
ame [SW Update] Freq
▲ ▼ ◄ ►

Setting
te [LAN Restart] Sms
▲ ▼ ◄ ►

Setting
N.3 [Swr Block] Stan
▲ ▼ ◄ ►

Setting
N.2 [Gsm N.3] Swr B
▲ ▼ ◄ ►

Setting
Mode [Gsm N.1] Gsm N
▲ ▼ ◄ ►

Setting
ing [-3dB Mode] Gsm
▲ ▼ ◄ ►

Status
de [Warning Mode] Sw
▲ ▼ ◄ ►

Setting
unt [Reset Mode] War
▲ ▼ ◄ ►

Setting
m [Failure Count] Re
▲ ▼ ◄ ►

Setting
art [Sms Alarm] Fail
▲ ▼ ◄ ►

CTE
Digital Broadcast

3.10 FIRMWARE UPDATE

📄 *The firmware update is carried out using the RS232 communication port. If the PC has no such type of port, before starting the update process be sure having at disposal an USB/Serial cable, which will be used to connect the PC USB port to the **RS232 [1]** port located on the front side of the transmitter.*

3.10.a Installing the Meta System Programmer on the PC

The first operation for the firmware update is the installation of the MSP (Meta System Programmer) software on the PC.

📄 *The MSP works both with Windows XP and Windows 7 operating systems.*

6) Copy the executable file into a folder of the PC.

7) Launch the (auto installing) executable file. This will create on the desktop a link to the MSP program.

📄 *This program can be used to update the firmware of all the TX series transmitters (TX30, TX300, TX05, AXON).*

3.10.b Updating the firmware of the transmitter

8) Execute the MSP. This screenshot will be shown:


9) Set in **StandBy** the transmitter. Then, using the menu of the transmitter, enable the firmware updating: from the **Setting** menu select **SW Update** (➔3.5.o) and then [**YES**] to enable the function:
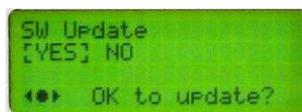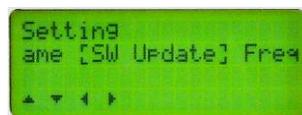
10) Press [**ENTER**] key to confirm this command. The **ALARM** and **ST-BY** LEDs will blink, and the display of the transmitter shows the following screen:
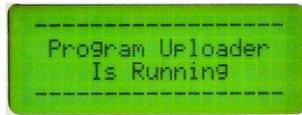
11) If the PC has not a RS232 port, connect an USB port to the **RS232** [1] serial port located on the front side of the transmitter.

12) From the MSP select **Opzioni** - **Porta COM**:
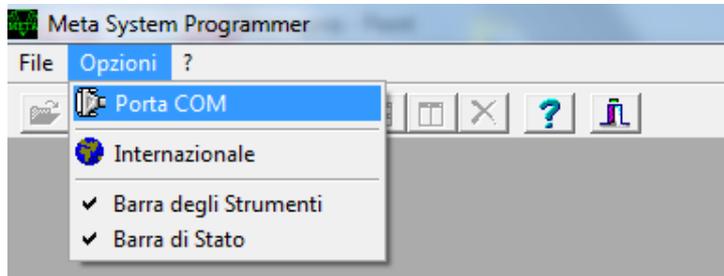
13) A screenshot like the following one is shown. This screen shows the used COM port:

14) Click on **Connettiti** and then on **Chiudi** to close the window.

15) Select **File** - **Connetti dispositivo target**.
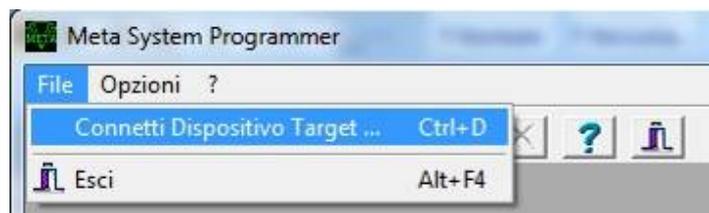
16) This window is shown:
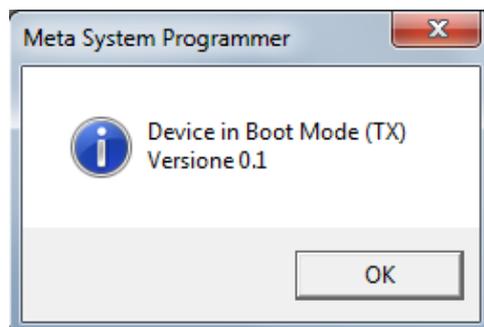
17) Click on **OK**. Select **Dispositivo** - **Aggiornamento Firmware**:
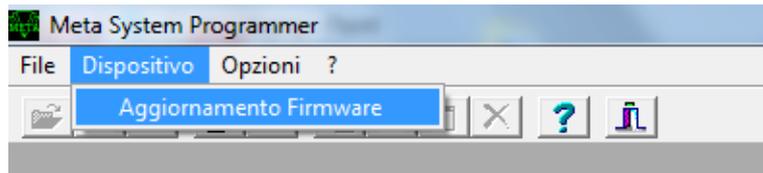
18) Select **File** – **Apri**, then select the .mot file which contains the new firmware release to be uploaded into the transmitter.
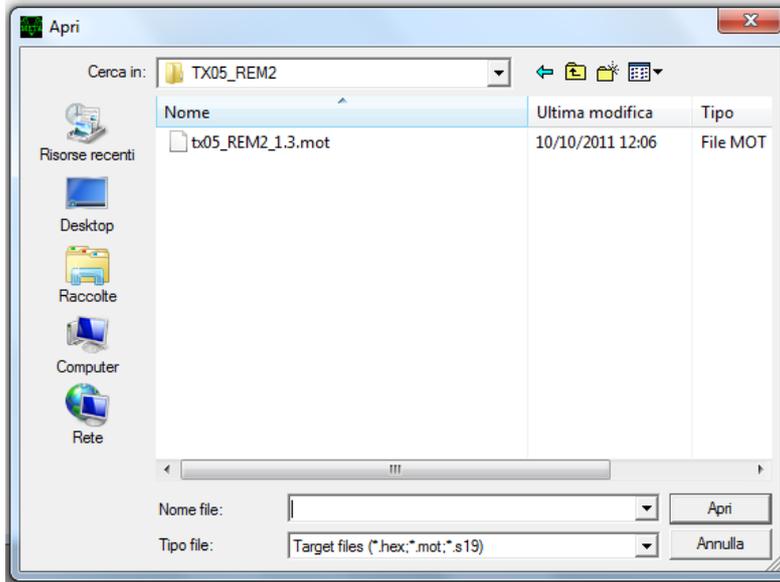
19) Click on **Apri** and then select **File** - **Download**.
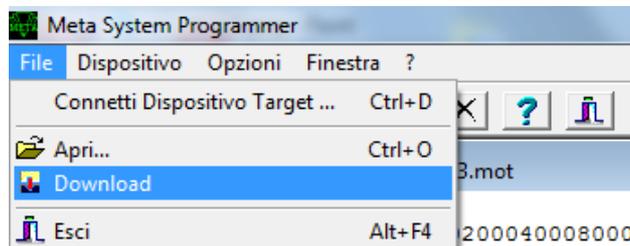
20) A window requesting the confirmation of the update will be shown.
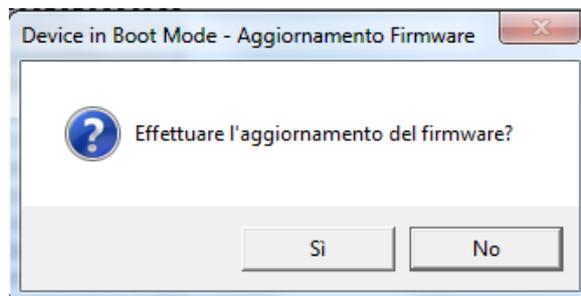
21) Click on **Sì** to proceed with the update.

22) When the firmware update is completed, the following window will be show:
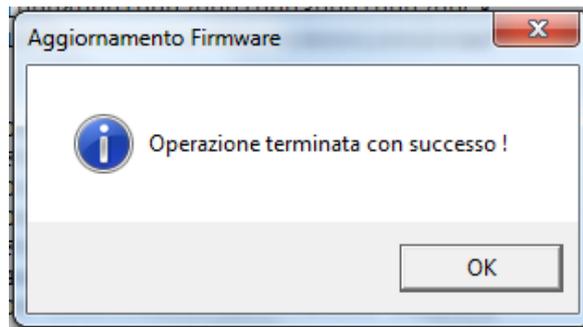
23) Click on **OK** to exit the program.

24) Restart the transmitter.

3.11 RESTRICTIONS FOR FM BROADCASTING AXON SERIES

ENGLISH

COUNTRY	FM Broadcasting introduced	Deviations from ERC Decisions and other comments
AUSTRIA	Yes	Individual license is required
BELGIUM	Yes	Individual license is required
DENMARK	Yes	Individual license is required
FINLAND	Yes	Individual license is required
FRANCE	Yes	Individual license is required
GERMANY	Yes	Individual license is required
GREECE	Yes	Individual license is required
IRELAND	Yes	Individual license is required
ITALY	Yes	Individual license is required

LUXEMBOURG	Yes	Individual license is required
NETHERLANDS	Yes	Individual license is required
NORWAY	Yes	Individual license is required
PORTUGAL	Yes	Individual license is required
SPAIN	Yes	Individual license is required
SWEDEN	Yes	Individual license is required
SWITZERLAND	Yes	Individual license is required
UNITED KINGDOM	Yes	Individual license is required

ITALIAN

STATO	Introduzione FM Broadcasting	Restrizioni all'uso
AUSTRIA	Sì	Richiesta la licenza individuale
BELGIO	Sì	Richiesta la licenza individuale
DANIMARCA	Sì	Richiesta la licenza individuale
FINLANDIA	Sì	Richiesta la licenza individuale
FRANCIA	Sì	Richiesta la licenza individuale
GERMANIA	Sì	Richiesta la licenza individuale
GRECIA	Sì	Richiesta la licenza individuale
IRLANDA	Sì	Richiesta la licenza individuale
ITALIA	Sì	Richiesta la licenza individuale
LUSSEMBURGO	Sì	Richiesta la licenza individuale
NORVEGIA	Sì	Richiesta la licenza individuale
OLANDA	Sì	Richiesta la licenza individuale
PORTOGALLO	Sì	Richiesta la licenza individuale
REGNO UNITO	Sì	Richiesta la licenza individuale
SPAGNA	Sì	Richiesta la licenza individuale
SVEZIA	Sì	Richiesta la licenza individuale
SVIZZERA	Sì	Richiesta la licenza individuale

FRANCE

PAYS	FM Broadcasting presentè	Correction de la directive ERC et autre commentaires
ALLEMAGNE	Oui	Licence individuelle demandée
ANGLETERRE	Oui	Licence individuelle demandée
AUTRICHE	Oui	Licence individuelle demandée
BELGIQUE	Oui	Licence individuelle demandée
DANEMARK	Oui	Licence individuelle demandée
ESPAGNE	Oui	Licence individuelle demandée
FINLANDE	Oui	Licence individuelle demandée
FRANCE	Oui	Licence individuelle demandée
GRECE	Oui	Licence individuelle demandée
IRLANDE	Oui	Licence individuelle demandée
ITALIE	Oui	Licence individuelle demandée
LUXEMBOURG	Oui	Licence individuelle demandée
NORVEGE	Oui	Licence individuelle demandée
PAY-BAS	Oui	Licence individuelle demandée
PORTUGAL	Oui	Licence individuelle demandée
SUEDE	Oui	Licence individuelle demandée
SUISSE	Oui	Licence individuelle demandée

ESPAÑOL

PAIS	FM Broadcasting introducida	Restricciones al uso y otros comentarios
ALEMANIA	Si	Requiere licencia individual
AUSTRIA	Si	Requiere licencia individual
BÉLGICA	Si	Requiere licencia individual
DINAMARCA	Si	Requiere licencia individual
ESPAÑA	Si	Requiere licencia individual
FINLANDIA	Si	Requiere licencia individual
FRANCIA	Si	Requiere licencia individual
GRAN BRETAÑA	Si	Requiere licencia individual
GRECIA	Si	Requiere licencia individual
HOLANDA	Si	Requiere licencia individual
IRLANDA	Si	Requiere licencia individual
ITALIA	Si	Requiere licencia individual
LUXEMBURGO	Si	Requiere licencia individual
NORUEGA	Si	Requiere licencia individual
PORTUGAL	Si	Requiere licencia individual
SUECIA	Si	Requiere licencia individual
SUIZA	Si	Requiere licencia individual

GERMAN

LAND	FM Broadcasting eingeführt	Abweichungen von ERC Vorschriften und Kommentare
BELGIEN	Ja	Individuelle Lizenz erforderlich
DÄNEMARK	Ja	Individuelle Lizenz erforderlich
DEUTSCHLAND	Ja	Individuelle Lizenz erforderlich
FINNLAND	Ja	Individuelle Lizenz erforderlich
FRANKREICH	Ja	Individuelle Lizenz erforderlich
GRIECHENLAND	Ja	Individuelle Lizenz erforderlich
GROßBRITANNIEN	Ja	Individuelle Lizenz erforderlich
IRLAND	Ja	Individuelle Lizenz erforderlich
ITALIEN	Ja	Individuelle Lizenz erforderlich
LUXEMBURG	Ja	Individuelle Lizenz erforderlich
NIEDERLANDE	Ja	Individuelle Lizenz erforderlich
NORWEGEN	Ja	Individuelle Lizenz erforderlich
ÖSTERREICH	Ja	Individuelle Lizenz erforderlich
PORTUGAL	Ja	Individuelle Lizenz erforderlich
SPANIEN	Ja	Individuelle Lizenz erforderlich
SCHWEDEN	Ja	Individuelle Lizenz erforderlich
SCHWEIZ	Ja	Individuelle Lizenz erforderlich

LATIN AMERICANO

PAÍS	FM Broadcasting introduzido	Desvios estabelecidos pelo ERC e outras notas
ALEMANHA	Sim	Exigida licença individual
AUSTRIA	Sim	Exigida licença individual
BÉLGICA	Sim	Exigida licença individual
DINAMARCA	Sim	Exigida licença individual
ESPANHA	Sim	Exigida licença individual
FINLÂNDIA	Sim	Exigida licença individual
FRANÇA	Sim	Exigida licença individual
GRÉCIA	Sim	Exigida licença individual
HOLANDA	Sim	Exigida licença individual
IRLANDA	Sim	Exigida licença individual
ITALIA	Sim	Exigida licença individual
LUXEMBURGO	Sim	Exigida licença individual
NORUEGA	Sim	Exigida licença individual
PORTUGAL	Sim	Exigida licença individual
REINO UNIDO	Sim	Exigida licença individual
SUÉCIA	Sim	Exigida licença individual
SUÍÇA	Sim	Exigida licença individual