

MOZART Series FM Exciters/Transmitters

**User's Manual
Release 1.0.3**

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The constructor reserves the right to modify the information in this manual at any time without advising update.

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All specifications, characteristics and circuit descriptions indicated in this manual are subject to change without notice.

INDEX

1	GENERAL INFORMATION	8
1.1	SAFETY NOTICES	8
1.2	FIRST AID IN CASE OF ELECTROCUTION.....	9
1.3	WASTE ELECTRICAL AND ELECTRONIC EQUIPMENT (WEEE)	10
1.4	MANUFACTURE LABELS.....	10
1.5	IC RSS-GEN, SEC 7.1.2 WARNING STATEMENT- (REQUIRED FOR TRANSMITTERS)	11
1.6	IC RSS-102, SEC 2.6 WARNING STATEMENTS	11
2	FM EXCITER GENERAL DESCRIPTION	12
3	TECHNICAL SPECIFICATIONS.....	18
4	INSTALLATION AND ACTIVATION.....	21
4.1	INITIAL CHECK.....	21
4.2	CONNECTIONS.....	22
5	MENU DESCRIPTION.....	23
5.1	VISUALIZATION	23
5.1.1	START PAGE.....	23
5.1.2	Main menu	23
5.2	vMETERS AND INFO MENU	24
5.2.1	Output Modulation.....	25
5.2.2	Left and Right channels level.....	25
5.2.3	AES-EBU Left and Right channels level.....	25
5.2.4	Auxiliary channels level.....	26
5.2.5	Voltages and current.....	26
5.2.6	Heatsink temperature.....	27
5.2.7	Device information	27
5.3	SETTINGS MENU.....	28
5.3.1	Frequency Set menu.....	29
5.3.2	Power Set menu	29
5.3.3	Operative Mode menu.....	30
5.3.4	Audio Selection menu.....	32
5.3.5	Sensitivity menu	35
5.3.6	Presetting menu	36
5.3.7	Alarms menu	43
5.3.8	Memory menu	49
5.3.9	History menu.....	53
5.3.10	Generals menu	55
6	FRONT PANEL	59
6.1	FRONT PANEL KEYS	59
6.2	FRONT PANEL LEDS	61
6.2.1	Status leds	61
6.2.2	Audio leds	62
6.2.3	Control leds.....	63
6.2.4	Command leds.....	64
7	REMOTE I/O (OPTIONAL)	65
8	WEB SERVER (OPTIONAL)	66
8.1	WEB PAGES.....	67
8.1.1	Main page	67
8.1.2	Login page	68
8.1.3	Settings page.....	69
8.1.4	Presettings page.....	70
8.1.5	Log page	71

8.1.6	<i>Administration page.....</i>	72
8.1.7	<i>Modulator Upgrade page</i>	74
8.1.8	<i>Webserver Upgrade page</i>	75
8.2	UPGRADING PROCEDURES.....	76
8.2.1	<i>Upgrading the modulator firmware.....</i>	76
8.2.2	<i>Upgrading the webserver board firmware.....</i>	80
8.3	SNMP PROTOCOL	84
8.3.1	<i>Management Information Base MIB.....</i>	84
8.3.2	<i>Message trap and inform</i>	86
8.3.3	<i>Commands and State.....</i>	87

FIGURES INDEX

FIG. 1.1 - UNITS LABEL	10
FIG. 2.1 - MOZART 30 FRONT VIEW	14
FIG. 2.2 - MOZART 30 REAR VIEW	15
FIG. 2.3 - MOZART 50/120/300/500/1000 FRONT VIEW	16
FIG. 2.4 - MOZART 50/120/300/500/1000 REAR VIEW	17
FIG. 5.1 - START PAGE.....	23
FIG. 5.2 - MAIN MENU.....	23
FIG. 5.3 - VMETERS AND INFO MENUS FLOW GRAPH	24
FIG. 5.4 - OUTPUT TOTAL MODULATION PAGE	25
FIG. 5.5 - ANALOGIC LEFT AND RIGHT INPUT LEVELS.....	25
FIG. 5.6 - AES-EBU LEFT AND RIGHT INPUT LEVELS	25
FIG. 5.7 - AUXILIARY CHANNELS 1 INPUT LEVELS.....	26
FIG. 5.8 - AUXILIARY CHANNELS 2 INPUT LEVELS.....	26
FIG. 5.9 - VOLTAGES AND CURRENT PAGE.....	26
FIG. 5.10 - HEATSINK TEMPERATURE PAGE.....	27
FIG. 5.11 - DEVICE INFORMATION PAGE.....	27
FIG. 5.12 - SETTING MENU FLOW GRAPH	28
FIG. 5.13 - SET FREQUENCY MENU	29
FIG. 5.14 - SET POWER MENU	29
FIG. 5.15 - OPERATIVE MODE MONO	30
FIG. 5.16 - OPERATIVE MODE MONO CHANNEL SELECTION	30
FIG. 5.17 - OPERATIVE MODE STEREO OPTIONS	31
FIG. 5.18 - OPERATIVE MODE STEREO MPX.....	31
FIG. 5.19 - AUXILIARY CHANNELS OPTIONS	32
FIG. 5.20 - AUDIO SELECTION MENU OPTIONS.....	32
FIG. 5.21 - INPUT IMPEDANCE MENU	33
FIG. 5.22 - PRE-EMPHASIS MENU	33
FIG. 5.23 - ENABLE LIMITER MENU	34
FIG. 5.24 - LIMITER VALUE MENU	34
FIG. 5.25 - CHANNELS SENSITIVITY	35
FIG. 5.26 - PRESETTING MODE.....	36
FIG. 5.27 - PRESETTING MONO MODE MENU.....	37
FIG. 5.28 - PRESETTING STEREO MPX INT MODE MENU	38
FIG. 5.29 - PRESETTING TOTAL DEVIATION ADJUSTMENT.....	39
FIG. 5.30 - PRESETTING AUXILIARY CHANNELS DEVIATION ADJUSTMENT.....	39
FIG. 5.31 - PRESETTING 19KHz/MPX OUT MENU.....	40
FIG. 5.32 - PILOT TONE DEVIATION ADJUSTMENT.....	40
FIG. 5.33 - PILOT TONE PHASE ADJUSTMENT	41
FIG. 5.34 - AES-EBU INTERFACE ENABLE MENU	41
FIG. 5.35 - AES-EBU RATIO MENU	42
FIG. 5.36 - ALARMS/WARNINGS MENU FLOW GRAPH	43
FIG. 5.37 - FOLDBACK REFLECTED MENU	44
FIG. 5.38 - WARNING REFLECTED MENU.....	44
FIG. 5.39 - WARNING POWER LOW MENU.....	45
FIG. 5.40 - ALARM POWER LOW MENU.....	46
FIG. 5.41 - AUDIO LOW LEVEL MENU	46
FIG. 5.42 - AUDIO LOW TIMEOUT MENUS.....	47
FIG. 5.43 - AUDIO OVER LEVEL MENU	47
FIG. 5.44 - AUDIO OVER TIMEOUT MENUS	48
FIG. 5.45 - AUDIO EVENTS TYPE MENU.....	48
FIG. 5.46 - MEMORY MENU FLOW GRAPH.....	49
FIG. 5.47 - ACTIVE MEMORY MENU	50
FIG. 5.48 - EDIT MEMORY MENUS.....	50
FIG. 5.49 - ENABLE MEMORY EDITING PAGE.....	51
FIG. 5.50 - ENDING EDITING MEMORY PAGE	51
FIG. 5.51 - MEMORY MENU DURING EDITING	51
FIG. 5.52 - CONFIRMATION EDITING MEMORY PAGE.....	51

FIG. 5.53 – CLEAR ALL MEMORY MENU	52
FIG. 5.54 – CLEAR ALL MEMORY CONFIRMATION PAGE	52
FIG. 5.55 – HISTORY MENU.....	53
FIG. 5.56 – HISTORY MENU EVENT DETAIL PAGE	53
FIG. 5.57 – GENERALS MENU FLOW GRAPH.....	55
FIG. 5.58 – SET HOUR PAGE	56
FIG. 5.59 – SET MINUTE PAGE.....	56
FIG. 5.60 – SET SECOND PAGE.....	56
FIG. 5.61 – SET DAY PAGE	57
FIG. 5.62 – SET MONTH PAGE.....	57
FIG. 5.63 – SET YEAR PAGE.....	57
FIG. 5.64 – SET RS-485 ADDRESS PAGE.....	58
FIG. 5.65 – UNIT IP ADDRESS PAGE	58
FIG. 5.66 – UNIT NETMASK PAGE	58
FIG. 8.1 – WEBSERVER MAIN PAGE.....	67
FIG. 8.2 – WEBSERVER LOGIN PAGE.....	68
FIG. 8.3 – WEBSERVER SETTING PAGE.....	69
FIG. 8.4 – WEBSERVER PRESETTING PAGE.....	70
FIG. 8.5 – WEBSERVER LOG PAGE	71
FIG. 8.6 – WEBSERVER ADMINISTRATION PAGE	72
FIG. 8.7 – WEBSERVER MODULATOR UPGRADE PAGE	74
FIG. 8.8 – WEBSERVER UPGRADE PAGE.....	75
FIG. 8.9 – START IN BOOTLOADER MODE	76
FIG. 8.10 – MODULATOR UPGRADE PAGE.....	76
FIG. 8.11 – NEW FIRMWARE SELECTION	77
FIG. 8.12 – UPLOAD THE NEW FIRMWARE.....	77
FIG. 8.13 – CONFIRM THE UPLOAD.....	77
FIG. 8.14 – UPGRADE TO THE NEW FIRMWARE.....	78
FIG. 8.15 – ERASE THE FLASH BEFORE THE UPGRADE	78
FIG. 8.16 – UPGRADE IN WORKING	78
FIG. 8.17 – UPGRADE COMPLETE	79
FIG. 8.18 – WEBSERVER UPGRADE PAGE.....	80
FIG. 8.19 – SELECT THE NEW WEBSERVER BOARD FIRMWARE	80
FIG. 8.20 – UPLOAD THE FIRMWARE TO WEBSERVER.....	81
FIG. 8.21 – CONFIRM THE UPLOADING.....	81
FIG. 8.22 – BUSY STATE DURING UPLOAD PROCEDURE	81
FIG. 8.23 – NEW FIRMWARE READY TO UPGRADE	82
FIG. 8.24 – CONFIRMATIONS TO UPGRADE.....	82
FIG. 8.25 – UPGRADE IN WORKING	82
FIG. 8.26 – REBOOT THE WEBSERVER.....	83
FIG. 8.27 – CONFIRM THE REBOOT.....	83
FIG. 8.28 – WAIT UNTIL THE REBOOT IS COMPLETED	83
FIG. 8.29 – LIST OF FILE OF MIB PACKET	84
FIG. 8.30 – FM SINGLE TRANSMITTER MIB	85
FIG. 8.31 - TRAPS AND INFORMS CONFIGURATION	86

TABLES INDEX

TABLE 5.1 – FREQUENCY PERMITTED VALUES.....	29
TABLE 5.2 – SETTING POWER SPECIFICS	30
TABLE 5.3 – IMPEDANCE PERMITTED VALUES	33
TABLE 5.4 – PRE-EMPHASIS PERMITTED VALUES	33
TABLE 5.5 – LIMITER PERMITTED VALUES.....	34
TABLE 5.6 – SENSITIVITY PERMITTED VALUES	35
TABLE 5.7 - PRESETTING STEREO MPX EXT MODE MENU	38
TABLE 5.8 – TOTAL DEVIATION ADJUSTMENT PERMITTED VALUES	39
TABLE 5.9 – AUXILIARY CHANNELS DEVIATION ADJUSTMENT PERMITTED VALUE	39
TABLE 5.10 – PILOT TONE DEVIATION ADJUSTMENT PERMITTED VALUES.....	40
TABLE 5.11 – PILOT TONE PHASE ADJUSTMENT PERMITTED VALUES	41
TABLE 5.12 – AES-EBU RATIO PERMITTED VALUES	42
TABLE 5.13 – FOLDBACK REFLECTED PERMITTED VALUES	44
TABLE 5.14 – WARNING REFLECTED PERMITTED VALUES.....	45
TABLE 5.15 – WARNING POWER LOW PERMITTED VALUES.....	45
TABLE 5.16 – ALARM POWER LOW PERMITTED VALUES.....	46
TABLE 5.17 – AUDIO LOW LEVEL PERMITTED VALUES	47
TABLE 5.18 – AUDIO LOW TIMEOUTS PERMITTED VALUES	47
TABLE 5.19 – AUDIO OVER LEVEL PERMITTED VALUES	48
TABLE 5.20 – AUDIO OVER TIMEOUTS PERMITTED VALUES	48
TABLE 5.21 – AUDIO EVENTS PERMITTED TYPES	49
TABLE 5.22 – MEMORY AVAILABLE	50
TABLE 5.23 – EVENTS LIST.....	54
TABLE 7.1 – REMOTE I/O PINOUT.....	65
TABLE 8.1 – TRAPS AND INFORMS AVAILABLE.....	86

1 GENERAL INFORMATION

1.1 SAFETY NOTICES

To avoid risks of electrical shocks or fire, only qualified personnel should execute the procedures specified in this manual.

When the protective covers of any device or component connected to a 110 / 240 VAC source by a power cord are removed, voltages and currents dangerous to life may be exposed.

Contact with 110 / 240 Volts of alternating current and associated direct current and voltages can be fatal.

CAUTION

To reduce the risks of electrical shock, do not remove the cover (or the back). Refer, for servicing, to qualified service personnel. This installation should be done by a qualified person and should comply with to all local applicable laws.

Beryllium Oxide

It is dangerous component if inhaled, eaten or put into direct contact with skin, especially if the skin is cut or wounded.

Special care is required in handling beryllium material in order to NOT produce any dust, particles, fumes etc. etc. Whenever beryllium material is broken it is extremely important to collect all parts in a carefully sealed and marked container for discharging in a specific way through controlled channels. All above operations have to be affected using gloves and tongs, with special care taken not to produce dust.

After handling beryllium components it is essential to wash hands carefully.

Beryllium compounds are used in **RF Connectors**.

1.2 FIRST AID IN CASE OF ELECTROCUTION

Do not touch the victim until the electrical circuit has been interrupted to make sure the person is isolated. If this is not possible, move the victim away from the conductor by using insulated material.

If respiration is interrupted, artificial respiration must be applied (mouth-to-mouth respiration). Lay the patient on his back, feet elevated above the level of the head, chin up and head back.

Call a doctor urgently

In case of a mouth wound it may be necessary to apply mouth-to-nose respiration, blocking the patient's mouth.



In case of face wounds the need for manual artificial respiration may arise.

Push down on the chest of the prostrate patient whilst moving the patient's arms up and out.

If the victim has also suffered burns then, without obstructing breathing, proceed as follows:

- Do not remove clothing from burn wounds.
- If possible gently pour cold water over wounds to relieve pain.
- Do not use any medication.
- Call for urgent medical assistance.

1.3 WASTE ELECTRICAL AND ELECTRONIC EQUIPMENT (WEEE)



The purpose of the DIRECTIVE 2002/96/EC OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 27 January 2003 on waste electrical and electronic equipment (WEEE) is, as first priority, the prevention of waste electrical and electronic equipment and, in addition, the reuse, recycling and other forms of recovery of such wastes so as to reduce the disposal of waste.

To do this, remember to collect separately all the electronic material.

1.4 MANUFACTURE LABELS

All the units are identified by a black silver label:



Fig. 1.1 - Units Label

Label fields:

1. Product name

This field contains the model of the unit (part name).

2. Serial number

This field contains the serial number of the module or equipment (made by 8 digits).

3. Operating Frequency

This field contains the operating frequency (for FM units) or the channel and standard (for TV units) set by the factory. In case no indication is present, the unit is considered as broadband in its operating band.

4. Return Loss

FACTORY USE ONLY

5. Functional Test

A cross on this field indicates that the functional test of the unit has been done by the technician.

6. Mechanical Test

A cross on this field indicates that the functional test of the unit has been done by the technician.

7. Temp. Test

A cross on this field indicates that the functional test of the unit has been done by the technician.

1.5 RF EXPOSURE STATEMENTS

Antennas for broadcast transmitters should be mounted on outdoor permanent structures.
The FCC assesses RF exposure issues at the time of licensing of your station, with the required FCC Bureau(s), and this will include antenna co-location issues as required in 1.1307(b)(3).

Similarly Canada will also assess RF exposure at the time the station is licensed.

2 FM EXCITER GENERAL DESCRIPTION

The MOZART FM exciter/transmitter is the result of the development of the MSE (Magnetic Sound Enhancer) technology together with the improvements in the FM modulation and using high performances PFC filters for the AC/DC conversion. This unit is ideal as stand alone unit for low power transmissions or suitable as high performance exciter in modular transmitters.

This unit has been developed with the Green RF technology which increases the efficiency of the amplification part reducing the dimensions and power consumption without modifying the quality of the transmission.

The main advantages of this technology are:

- High RF efficiency
- Lower heating (lower necessity of air conditioning in the installation room)
- Higher devices safety
- Higher total reliability
- Lower AC power consumption

An user friendly interface with the combination of leds and LCD display offers a very easy method to control the MOZART main parameters with a metering accuracy that helps the user to install the unit and check its status even in case he doesn't have expensive test equipments.

In case of fault of the unit or antenna system, the protection system lowers automatically the output power, in order to bring back the operating conditions to a safe area without causing a system shut down, and it indicates on the front panel display the alarm message.

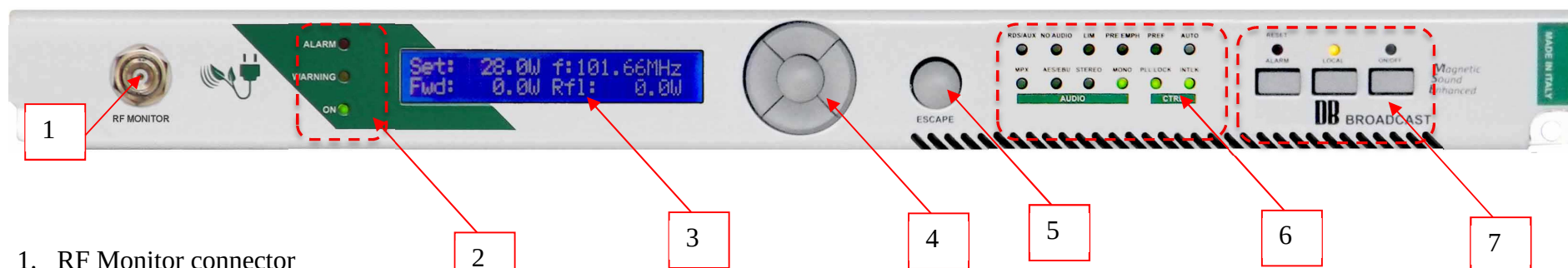
The protection system reduces or stops the output power in case of:

- V.S.W.R. too high.
- Heatsink temperature too high or cooling stop (OVER HEAT).
- Missing Enable command (in case of combination with external units like control logic units)

The switch-mode power supply is largely oversized and guarantees a regular operation even in the presence of wide main voltage fluctuations.

The systems cooling grants a safe operation even in hard climatic conditions.

Fig. 2.1 - MOZART 30 FRONT VIEW



1. RF Monitor connector

2. Status leds

a. ALARM: in case of a temporary alarm (it returns automatically to the normal status at next attempt of the unit) – RED led

b. WARNING: in case of a warning is present - YELLOW led

c. ON: in case the unit is connected to the mains and switched on – GREEN led

3. LCD Display

4. Navigation keys (UP /DOWN / RIGHT / LEFT / OK)

5. Escape key

6. AUDIO and CONTROL leds

a. RDS/AUX: it is ON in case the RDS/SCA/AUX are on

c. NO AUDIO: it is ON in case of alarm/warning on audio signal

e. LIM: it is ON in case the limiter is set to on

g. PRE EMPH: it is ON in case the pre-emphasis is on

i. PREF: no actually available

k. AUTO: no actually available

b. MPX: it is ON in case the MPX EXT mode is selected

d. AES-EBU: it is ON in case the AES-EBU is on

f. STEREO: it is ON in case the MPX INT mode is selected

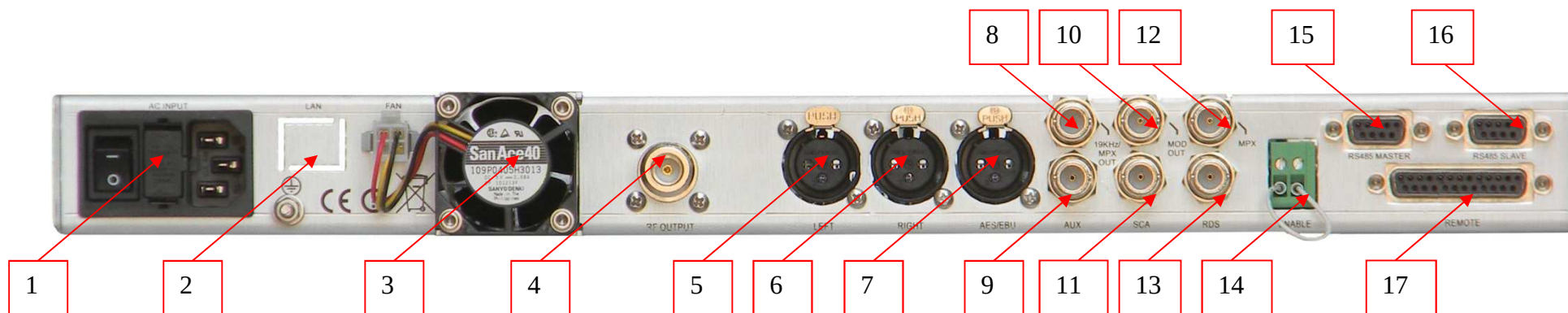
h. MONO: it is ON in case the MONO mode is selected

j. PLL LOCK: it is ON in case the PLL is correctly locked

l. INTLK: it is ON in case the ENABLE is closed

7. Command keys (Reset Alarms, Local/Remote, ON/OFF) and leds (Fault, Local, RF ON)

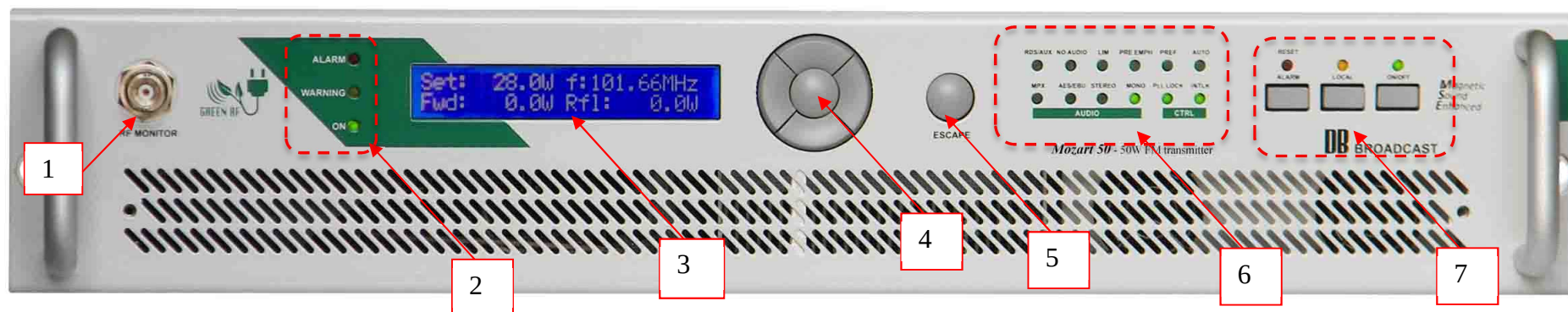
Fig. 2.2 - MOZART 30 REAR VIEW



1. AC input
2. LAN port
3. Cooling FAN
4. RF output connector (N)
5. Left XLR connector
6. Right XLR connector
7. AES/EBU XLR connector
8. 19kHz / MPX OUT BNC connector
9. AUX BNC connector

10. MOD OUT BNC connector
11. SCA BNC connector
12. MPX BNC connector
13. RDS BNC connector
14. ENABLE connector
15. RS 485 MASTER connector
16. RS 485 SLAVE connector
17. REMOTE connector

Fig. 2.3 – MOZART 50/120/300/500/1000 FRONT VIEW

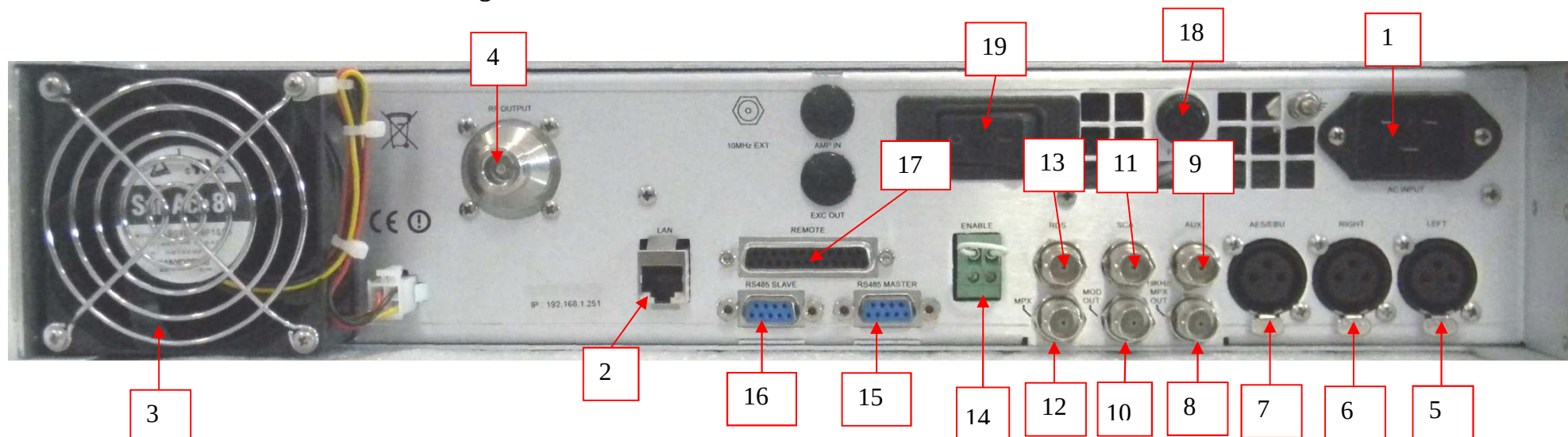


1. RF Monitor connector
2. Status leds
 - a. ALARM: in case of a temporary alarm (it returns automatically to the normal status at next attempt of the unit) – RED led
 - b. WARNING: in case of a warning is present - YELLOW led
 - c. ON: in case the unit is connected to the mains and switched on – GREEN led
3. LCD Display
4. Navigation keys (UP / DOWN / RIGHT / LEFT / OK)
5. ESCAPE key
6. AUDIO and CONTROL leds

a. RDS/AUX: it is ON in case the RDS/SCA/AUX are on	b. MPX: it is ON in case the MPX EXT mode is selected
c. NO AUDIO: it is ON in case of alarm/warning on audio signal	d. AES-EBU: it is ON in case the AES-EBU is on
e. LIM: it is ON in case the limiter is set to on	f. STEREO: it is ON in case the MPX INT mode is selected
g. PRE EMPH: it is ON in case the pre-emphasis is on	h. MONO: it is ON in case the MONO mode is selected
i. PREF: no actually available	j. PLL LOCK: it is ON in case the PLL is correctly locked
k. AUTO: no actually available	l. INTLK: it is ON in case the ENABLE is closed

7. Command keys (Reset Alarms, Local/Remote, ON/OFF) and leds (Fault, Local, RF ON)

Fig. 2.4 – MOZART 50/120/300/500/1000 REAR VIEW



1. AC input
2. LAN port
3. Cooling FAN
4. RF output connector (N)
5. Left XLR connector
6. Right XLR connector
7. AES/EBU XLR connector
8. 19kHz / MPX OUT BNC connector
9. AUX BNC connector

10. MOD OUT BNC connector
11. SCA BNC connector
12. MPX BNC connector
13. RDS BNC connector
14. ENABLE connector
15. RS 485 MASTER connector
16. RS 485 SLAVE connector
17. REMOTE connector
18. Fuse
19. Switching on button

3 TECHNICAL SPECIFICATIONS

RF FEATURES	
RF Output impedance	50 Ω unbalanced
Frequency range	87.5 to 108 MHz
Frequency control	Synthesizer μ processor controlled
Off-lock attenuation	> 75 dBc (typical -80 dB)
Type of modulation	F3E / F8E direct FM at the carrier frequency
Modulation mode	Mono, Stereo, Multiplex, SCA, RDS, AUX (input selected by front panel)
Frequency deviation	± 75 kHz =100 %, ± 150 kHz capability (others on request)
Reference	VCTCXO 10 MHz $\pm$ 1ppm or 10 MHz external (Optional)
Constancy of freq. dev.	± 1 % over six months
Variation of freq.	$\pm$ 1ppm/year
Short term stability	± 1 ppm from -5 to +45 °C
Instantaneous BW	>20 MHz
RF harmonics	Exceeds EBU/CCIR/FCC requirements > -75dBc
RF spurious	Exceeds EBU/CCIR/FCC requirements < -100 dBc @ ± 1 MHz min. out of carrier (typical -110dB)
Pre-emphasis	Flat/50/75 μ s selectable via front panel
Pre-emphasis precision	Nominal 1% (typical 0.4%)
Stereo operation	CCIR 450/S2 "pilot tone system"

STEREO OPERATION	
1. Audio response	± 0.3 dB da 20 Hz to 15 kHz
2. Audio filter attenuation	> 55 dB @ 19 kHz, >45dB 19 to 100kHz
3. Common mode rejection	20 Hz to 15 kHz > 45 dB
4. Stereo Separation	30-80Hz >53dB (typ. 56), 80Hz-15kHz >60 dB (typ.70)
5. Crosstalk attenuation (M / S)	> 40 dB 30 Hz to 15 kHz (typ. 52dB / 400Hz to 5kHz)
6. Spurious products	> 53 kHz > 50 dB
7. 38 kHz suppression	> 70 dB (Typ -85dB)
8. Subcarrier frequency	38 kHz $\pm$ 2 Hz
9. Subcarrier generation	Internal crystal
10. Pilot frequency	19 kHz $\pm$ 1 Hz
11. THD+N on encoded channels	< 0.03 % 30 Hz TO 15 kHz (typ -75dB)
12. Nominal pilot deviation	± 7 kHz

MONO OPERATION	
Audio response	± 0.3 dB 20 Hz to 15 kHz (+0/-2%)
THD+N on encoded channels	30 Hz to 15 kHz < 0.06% (typ. 0.03 %) typ. -78dB

MPX OPERATION (External coder)	
Audio response	30Hz - 100kHz ± 0.15 dB
THD+N on encoded channels	30 Hz to 15 kHz < 0.03% (typ. 0.02% , < -75dB)

AUDIO INPUTS						
Function	Input level / Adjustment range	BW	Impedance	Type	Conn.	N°
Composite	-0 ÷ +15 dBu	± 0.15 dB 30 Hz÷100kHz	>5 k Ω	Unbal.	BNC	1
SCA/RDS/AUX	-16 ÷ 0 dBu	± 0.15 dB 40kHz÷100kHz	~2 k Ω (other on request)	Unbal.	BNC	2
AES/EBU	-3 dBFS for ± 75 kHz 15 dBu (12.33 Vpp) -15 ... 0 dBFS 0 to 15 dBu (2.19 Vpp to 12.3 Vpp)	0.15 dB 40kHz÷100kHz	110 Ω	Unbal	XLR	3
L	-0 ÷ +15 dBu	± 0.15 dB 30Hz÷15kHz	10 k Ω 600 Ω	Unbal. Bal.	XLR	4
R	-0 ÷ +15 dBu	± 0.15 dB 30Hz÷15kHz	10 k Ω 600 Ω	Unbal. Bal.	XLR	5

AUDIO OUTPUTS	
RF connector	N female
Monitor RF output	-44dBc±2dB from 87.5 to 108 MHz
Pilot/MPX	BNC connector 19 kHz or MPX, level 1 Vpp, internally adjustable
Mod. Output	BNC Connector

MODEL	NOMINAL POWER	CONNECTOR	SIZE
MOZART 30	30 W	N	1U x 19"
MOZART 50	50 W	N	1U x 19"
MOZART 120	120 W	N	2 U x 19"
MOZART 300	300 W	N	2 U x 19"
MOZART 500	500 W	N	2 U x 19"
MOZART 1000	1000 W	DIN 7/16	2 U x 19"

ENVIRONMENT	
Storage temperature	-20°C TO + 60 °C
Operating temperature	0 °C TO + 50 °C
Guaranteed performance temperature	0 °C TO + 45 °C
Relative non-condensing humidity	90 % MA
Max operating altitude	3000 mt.
Max extraneous field strength	≤10 V/m; ≤ 4 A/m

SIZE & ELECTRICS	
Power supply	110/220V single phase AC (+10 / -15 %) 50-60Hz/ ± 5%
Display	Blue back panel; 2 raw 24 character LCD
Cooling	Forced air, with external long life brushless ball bearing fan

Features and specifications subject to change without notice.

4 INSTALLATION AND ACTIVATION

4.1 INITIAL CHECK

The equipment becomes the property of the customer when the equipment is delivered to the carrier. Carefully unpack the transmitter. Perform a visual inspection to determine that no apparent damage has been incurred during shipment. All shipping materials should be retained until it is determined that the unit has not been damaged. Claims for damaged equipment must be promptly filed with the carrier or the carrier may not accept the claim.

The contents of the shipment should be as indicated on the packing list. If the contents are incomplete, or if the unit is damaged electrically or mechanically, notify both the carrier and the supplier.

CAUTION: Before switch the equipment on, ensure that all RF Loads, RF cables and connectors are properly connected. To prevent damage to the amplifiers, it is essential that either the feeder and antenna system or the dummy load have a good in band return loss.

Failure to observe the above caution and also the installation instructions of this amplifier may cause damages to the amplifiers for which the supplier cannot be considered responsible.

❶ PREVENTION OF ACCIDENTS

When it is used in normal applications and within the parameters defined in the technical specifications, this equipment does not endanger health and safety, provided that normal operating and engineering safety practices are observed and that it is used only by authorized, trained and qualified personnel.

❷ THERMIC AND ENVIRONMENTAL CONDITIONS

- A too high environmental temperature (in any case not higher than 45°C) shall cause a non-adequate rack cooling putting the equipment in hard working conditions.
- An air conditioner should be installed to keep the room temperature constant even in case of external temperature variation.

4.2 CONNECTIONS

Install the transmitter so that the space over and under the equipment is sufficient for the cooling air to flow through.

Before installing the equipment always make sure that the transmitter is not powered. This has the purpose to prevent electrical shocks to the operators and damage to the equipment.

Before carrying out any other electrical connection, connect the rack to the station ground.

- Connect the transmitting antenna cable or the cable related to the connection of the output filter to the output connector of the unit (in the latest case connect the output of the filter to the transmitting antenna) using a 50 Ohms coaxial cable.
- In case the transmitter is not connected to an external control unit, check that the ENABLE connector on the back panel is correctly inserted.
- Connect the power cord to an operating source. Make sure that the power supply source provides the nominal voltage prescribed.

Note: the unit is designed to operate with the nominal voltage $\pm 15\%$. We suggest the installation of spike suppressors, line conditioners, isolation transformers, AVR and/or UPS or other devices useful to protect the equipment from eventual damages that can be caused by the mains fluctuations.

5 MENU DESCRIPTION

5.1 VISUALIZATION

The following pages are related to parameters that are visualized on the front panel: they are indications of the actual operating parameters of the unit.

5.1.1 START PAGE

After the unit power on, the first page in the display shows information about the internal hardware revision and supplier (first row), and about firmware revision and unit model (second row).

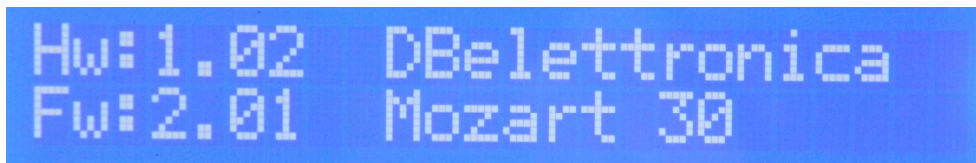


Fig. 5.1 – Start page

The page remains active for a few seconds before moving to the main menu.

5.1.2 MAIN MENU

This is the default page and it indicates the output power set by the customer (SET), the transmission frequency in MHz, the real forward power in Watt (that can be different from SET in case of an alarm, warning, failure or in case the unit is in OFF state), and the reflected power in Watt.

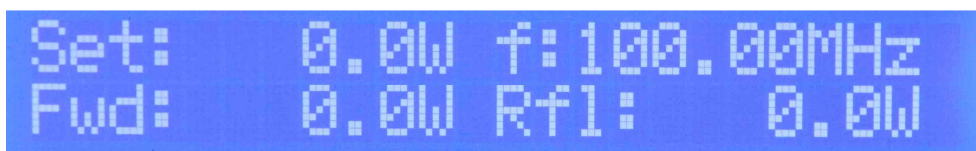


Fig. 5.2 – Main menu

The unit moves to this page in case no key is pressed for 60 seconds.

5.2 VMETERS AND INFO MENU

In these menus it is possible to find the levels of the input channels, the internal voltages, currents, temperatures and the software/hardware revisions.

In the Main Menu page press DOWN key to enter these pages and UP and DOWN keys to navigate in the sub-menus.

[0] Main Page	Set: 0.0W f:100.00MHz Fwd: 0.0W Rfl: 0.0W
[1] Output Modulation	TOTAL MODULATION TM: 0.0KHz
[2] Left and Right channels input level	L :-20.0dBu R :-20.0dBu
[3] Left and Right AES-EBU channels input level	AL:-33.0dBFS AR:-33.0dBFS
[4] MPX External, RDS External input levels	MPX:-20.0dBu RDS:-20.0dBu
[5] SCA and AUX input levels	SCA:-20.0dBu AUX:-20.0dBu
[6] Internal voltages and current	UPa: 0.0V UPu: 48.1V IPa: 0.0A UT : 5.7V
[7] Heatsink temperature	Heatsink: 28.2 °C
[8] Device information	Hw: 1.02 DBelettronica Fw: 2.01 Mozart 30

Fig. 5.3 – Vmeters and Info menus flow graph

5.2.1 OUTPUT MODULATION

In this page the Total Output modulation level is indicated in KHz.



Fig. 5.4 – Output Total Modulation page

Pressing the UP or DOWN buttons you can move inside this menu and see the different pages indicated here below.

5.2.2 LEFT AND RIGHT CHANNELS LEVEL

In this page the analogic Left and Right channels levels are indicated in dBu.



Fig. 5.5 – Analogic Left and Right input levels

5.2.3 AES-EBU LEFT AND RIGHT CHANNELS LEVEL

Pressing the DOWN button you can see the Left and Right levels for the AES-EBU input channels indicated in dBFS.



Fig. 5.6 – AES-EBU Left and Right input levels

5.2.4 AUXILIARY CHANNELS LEVEL

Pressing the DOWN button you can see the MPX External and RDS External levels indicated in dBu.



Fig. 5.7 – Auxiliary channels 1 input levels

Pressing the DOWN button you can see the SCA and AUX levels indicated in dBu.



Fig. 5.8 – Auxiliary channels 2 input levels

5.2.5 VOLTAGES AND CURRENT

This page allows the visualization of the unit analogic working values:

VPA = voltage that supplies the RF module in Volt.

IPA = current absorbed by the RF module in Ampere.

VPu = Main power supply voltage in Volt.

VT = Voltage Tuning (VCO working voltage) in Volt.

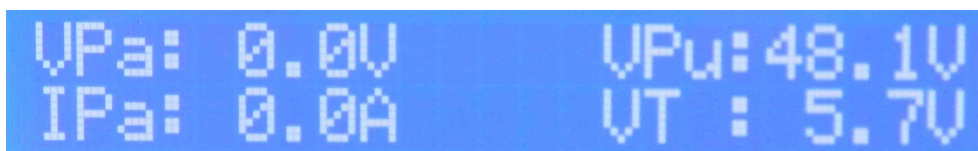


Fig. 5.9 – Voltages and Current page

5.2.6 HEATSINK TEMPERATURE

This page allows the visualization of the RF heatsink temperature in Celsius degrees.



Fig. 5.10 – Heatsink temperature page

5.2.7 DEVICE INFORMATION

This page allows the visualization of device model, manufacturer name, hardware and firmware revisions.



Fig. 5.11 – Device information page

5.3 SETTINGS MENU

The following pages are related to the unit main parameters. To navigate on **Setting** menu press LEFT or RIGHT key from Main Menu.

In case sub-menu is present, an arrow pointing downwards will be showed in the second row on the right, press DOWN or UP to navigate on sub-menus.

[0]	Set: 0.0W f:100.00MHz Fwd: 0.0W Rfl: 0.0W
Main Menu	
[1]	[01] Frequency 100.00MHz
Frequency	
[2]	[02] Power Fwd: 0.0W Set Pout: 0.0 W
Setting Power	
[3]	[03] Operat.Mode MONO MONO :Off
Operative Mode	
[4]	[04] Audio Selection Impedance :High=10K ▼
Audio Selection	
[5]	[05] Sensitivity Left : 6.00 dBu ▼
Sensitivity Set	
[6]	[06] Presettings Mode :MONO ▼
Presettings	
[7]	[07] Alarms Foldback REFL : 10% ▼
Alarms/Warnings	
[8]	[08] Memory Active : M0 ▼
Memory Manage	
[9]	[09] History 000>Switch OFF
History Log	
[10]	[10] Generals Hour :10 ▼
Generals	

Fig. 5.12 – Setting menu flow graph

5.3.1 FREQUENCY SET MENU

Press the LEFT or RIGHT keys to access the slide to program the frequency. Push the OK key to enter the menu (a blinking arrow will be showed in the second row on the right), press UP key to increase or DOWN key to decrease the frequency value. Confirm the new value pressing the OK key or ESC key to exit without saving.

During the frequency change the PLL LOCK led will be switched off until the PLL will be locked to the new frequency.

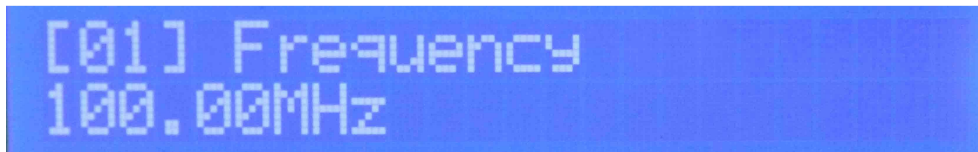


Fig. 5.13 – Set frequency menu

MIN value: 87.50 MHz	MAX value: 108.00 MHz	STEP: ± 0.01 MHz
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Table 5.1 – Frequency permitted values

5.3.2 POWER SET MENU

To program the RF Power output in Watt, press the LEFT or RIGHT key up to arrive to the slide here below. Press the OK key to enter the program mode (blinking arrow in second row on the right).

In the first row the forward power value indicates the actual output power, in the second row the Set Pout is the value that the customer is setting.



Fig. 5.14 – Set power menu

The value can be modified pressing UP and DOWN keys to increase or decrease the value. Confirm new value and exit routine pressing the OK button or press ESC key to exit without saving.

The new power value is applied in real time.

NOMINAL POWER	MIN POWER	MAX POWER	STEP
30 W	0 W	30 W	0.1 W
50 W	0 W	60 W	1 W
120 W	0 W	150 W	1 W
300 W	0 W	330 W	1 W
500 W	0 W	550 W	10 W
1000 W	0 W	1100 W	10 W

Table 5.2 – Setting power specifics

5.3.3 OPERATIVE MODE MENU

In the Operative Mode menu is possible activate/deactivate the various input channels depending on the configuration MONO/STEREO in the **Presettings** Menu.

5.3.3.1 MONO ACTIVE

In case the MONO is active, the page in the Operative Mode menu will be the one here below:



Fig. 5.15 – Operative Mode MONO

Starting condition in case the configuration is changed from STEREO to MONO is always **OFF**.

To activate the desired channel press the OK key to enter the program mode (blinking arrow in second row on the right).

To select Left or Right channel press UP or DOWN keys, press OK key to confirm the channel selected or ESC key to exit routine without saving.

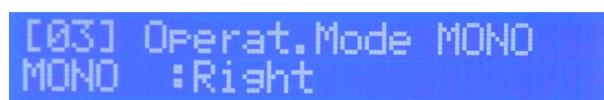
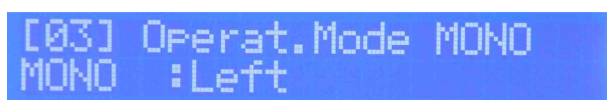


Fig. 5.16 – Operative Mode MONO channel selection

In case the AES-EBU is active (Presetting Menu), the enabled channel is relative to AES-EBU, please select **AES-EBU:Off** for using the analogic input channels.

5.3.3.2 STEREO ACTIVE

In case the STEREO is active, in the Operative Mode is present a sub menu due to the possibilities to activate the auxiliary channels:

[0]		[03] Operat.Mode STEREO Stereo:Off ▼
STEREO selection		
[1]		[03] Operat.Mode STEREO RDS :Off ⬆
Auxiliary channel RDS		
[2]		[03] Operat.Mode STEREO SCA :Off ⬆
Auxiliary channel SCA		
[3]		[03] Operat.Mode STEREO AUX :Off ▲
Auxiliary channel AUX		

Fig. 5.17 – Operative Mode STEREO options

Starting condition for STEREO selection and auxiliary channels, in case the mode is changed from MONO to STEREO, is always **OFF**.

In the STEREO selection can be selected the MPX External (rear connector) or the MPX Internal (if Stereo Coder card is available) mode.

[03] Operat.Mode STEREO Stereo:MPX Int ▼	[03] Operat.Mode STEREO Stereo:MPX Ext ▼
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Fig. 5.18 – Operative Mode STEREO MPX

To activate the desired mode press the OK key to enter the program mode (blinking arrow in second row on the right). Press UP or DOWN keys to select the desired mode. Press OK key to confirm or ESC key to exit routine without saving.

5.3.3.3 AUXILIARY CHANNELS

To enable the auxiliary channels (available only in STEREO mode) navigate in the sub-menu with the UP and DOWN keys until the channel desired and press the OK key to enter the program mode (blinking arrow in second row on the right). Press UP or DOWN keys to change the ON/OFF state. Press OK key to confirm or ESC key to exit routine without saving.



Fig. 5.19 – Auxiliary channels options

In case one auxiliary channel is enabled the led RDS/AUX in the frontal panel will be switched on.

5.3.4 AUDIO SELECTION MENU

In the Audio Selection sub-menu the regulations of input impedance, pre-emphasis and limiter are available.

To navigate in the sub-menu press UP or DOWN keys.



Fig. 5.20 – Audio Selection menu options

5.3.4.1 INPUT IMPEDANCE

In this sub-menu the impedance of analogic Left and Right channels can be selected.



Fig. 5.21 – Input Impedance menu

To change the input impedance, press the OK key to enter the program mode (blinking arrow in second row on the right). Press UP or DOWN keys to select the impedance value. Press OK key to confirm or ESC key to exit routine without saving.

Impedance value:	600, 10K
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Table 5.3 – Impedance permitted values

5.3.4.2 PRE-EMPHASIS REGULATION

In this sub-menu pre-emphasis value can be changed.



Fig. 5.22 – Pre-emphasis menu

To change the pre-emphasis value, press the OK key to enter the program mode (blinking arrow in second row on the right). Press UP or DOWN keys to select the new value. Press OK key to confirm or ESC key to exit routine without saving.

Pre-emphasis values:	Linear, 50us, 75us
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Table 5.4 – Pre-emphasis permitted values

In case the pre-emphasis is set different from Linear the led PRE EMPH on the frontal panel will be switched on.

5.3.4.3 LIMITER REGULATION

In these sub-menus an upper limit for the output signal deviation can be enabled and regulated.

The menu **Limiter** permits to enable or disable the limiter, if the limiter is enabled the value can be regulated in the next menu.



Fig. 5.23 – Enable limiter menu

To enable/disable the limiter press the OK key to enter the program mode (blinking arrow in second row on the right). Press UP or DOWN keys to select the on/off state. Press OK key to confirm or ESC key to exit routine without saving.

In case the Limiter is enabled the green led LIM on the frontal panel will switched on.

To adjust the limiter value, press DOWN key to select the Limiter value sub-menu.



Fig. 5.24 – Limiter value menu

To change the limiter value, press the OK key to enter the program mode (blinking arrow in second row on the right). Press UP or DOWN keys to select the new value. Press OK key to confirm or ESC key to exit routine without saving.

The limiter value is applied in real time and only if the limiter is enabled.

MIN value: 30 KHz	MAX value: 180 KHz	STEP: ± 1 KHz
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Table 5.5 – Limiter permitted values

5.3.5 SENSITIVITY MENU

In this menu it is possible to set the sensitivity value in of all available unit input channels, the sensitivity level will induce a regulation of channels internal attenuators.

A sensitivity value equal to the relative channel input level will cause an output signal deviation of 75 KHz in case of mono signal or 71 KHz in case of stereo signal.

To navigate in this sub-menu press UP or DOWN keys until the channel desired.

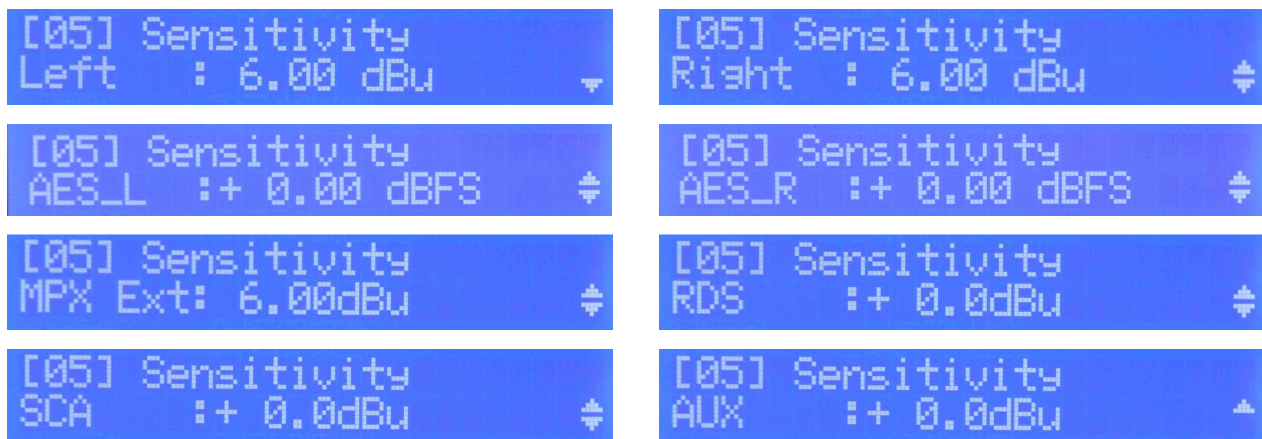


Fig. 5.25 – Channels Sensitivity

To change the sensitivity level, press the OK key to enter the program mode (blinking arrow in second row on the right). Press UP or DOWN keys to increase or decrease the value. Press OK key to confirm or ESC key to exit routine without saving.

The sensitivity value is applied in real time and only if the relative channel is in ON state (see menu **Operat.Mode**).

CHANNELS	MIN value	MAX value	STEP
LEFT, RIGHT	0 dBu	+15 dBu	±0.05 dB
AES-EBU LEFT, RIGHT	-10 dBFS	0 dBFS	±0.05 dB
MPX Ext	0 dBu	+15 dBu	±0.05 dB
RDS, SCA, AUX	-16 dBu	0 dBu	±0.5 dB

Table 5.6 – Sensitivity permitted values

5.3.6 PRESETTING MENU

In this menu it is possible to set the other main parameters of the unit: MONO/STEREO mode, channels deviation offset, pilot tone frequency and phase shift, AES-EBU and MPX/19KHz Out. The menu layout is different depending on MONO, STEREO (MPX Int or MPX Ext) mode.

5.3.6.1 MODE: MONO/STEREO

To change the operational mode, select the first entry in the **Presettings** menu and press the OK key to enter the program mode (blinking arrow in second row on the right).

Press UP or DOWN keys to select MONO or STEREO. Press OK key to confirm or ESC key to exit routine without saving.



Fig. 5.26 – Presetting mode

Note: Now in the menu **Operat.Mode** the channels or the configuration MPX Internal/MPX External (in case of STEREO mode) have to be activated.

Every change from MONO-to-STEREO or STEREO-to-MONO will set the channels and the MPX Int/Ext in OFF state so the configuration has to be set again in the menu **Operat.Mode**.

If MONO mode is enabled the led MONO in the frontal panel will be switched on, in case of STEREO MPX Internal is enabled the led STEREO will be switched on, in case of STEREO MPX External is enabled the led MPX will be switched on.

5.3.6.2 PRESETTINGS IN MONO MODE

[0] Mode Selection	[06] Presettings Mode : MONO ▾
[1] Total Deviation Adjustment	[06] Presettings Tot Dev 75KHz: + 0.00 dB ⇅
[2] AES-EBU Enable	[06] Presettings AES-EBU : Off ⇅
[3] AES-EBU Ratio	[06] Presettings AES-EBU Ratio: 128 ▲

Fig. 5.27 – Presetting MONO mode menu

In MONO mode the options available are the fine adjustment of output signal deviation and the AES-EBU controls. To navigate in these menus press UP or DOWN keys.

5.3.6.3 PRESETTINGS IN STEREO MPX INTERNAL MODE

[0] Mode Selection	[06] Presettings Mode : STEREO ▾
[1] Total Deviation Adjustment	[06] Presettings MainDev 71KHz: + 0.00 dB ⇅
[2] RDS Deviation Adjustment	[06] Presettings RDS Dev 4KHz: +0.0 dB ⇅
[3] SCA Deviation Adjustment	[06] Presettings SCA Dev 4KHz: +0.0 dB ⇅
[4] AUX Deviation Adjustment	[06] Presettings AUX Dev 4KHz: +0.0 dB ▲
[5] 19KHz/MPX Selection	[06] Presettings 19KHz/MPX Out: MPX ⇅
[6] Pilot Tone Deviation	[06] Presettings Pilot : 7.00 KHz ⇅

[7] Pilot Tone Phase Shift	[06] Presettinas Phase :+ 0
[8] AES-EBU Enable	[06] Presettinas AES-EBU :0ff
[9] AES-EBU Ratio	[06] Presettinas AES-EBU Ratio:128

Fig. 5.28 – Presetting STEREO MPX Int mode menu

In STEREO mode MPX Internal enabled, the options available are the fine adjustment of output signal and auxiliary channels deviation, 19KHz/MPX output selection, Pilot Tone regulation and AES-EBU controls.

To navigate in these menus press UP or DOWN keys.

5.3.6.4 PRESETTINGS IN STEREO MPX EXTERNAL MODE

[0] Mode Selection	[06] Presettinas Mode :STEREO
[1] Total Deviation Adjustment	[06] Presettinas MainDev 71KHz:+ 0.00 dB
[2] RDS Deviation Adjustment	[06] Presettinas RDS Dev 4KHz:+0.0 dB
[3] SCA Deviation Adjustment	[06] Presettinas SCA Dev 4KHz:+0.0 dB
[4] AUX Deviation Adjustment	[06] Presettinas AUX Dev 4KHz:+0.0 dB

Table 5.7 - Presetting STEREO MPX Ext mode menu

5.3.6.5 TOTAL DEVIATION ADJUSTMENT

In this menu it is possible to adjust an internal circuit offset (in dB) to set the total output signal deviation to 75KHz (in MONO mode) or 71KHz (in STEREO MODE) regardless the sensitivity level set in the **Sensitivity** menu.



Fig. 5.29 – Presetting total deviation adjustment

To change the offset value, press the OK key to enter the program mode (blinking arrow in second row on the right). Press UP or DOWN keys to increase or decrease the value. Press OK key to confirm or ESC key to exit routine without saving.

MIN value: -10 dB	MAX value: +10 dB	STEP: ± 0.05 dB
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Table 5.8 – Total deviation adjustment permitted values

5.3.6.6 RDS, SCA, AUX DEVIATION ADJUSTMENT

In this menu it is possible to adjust an internal circuit offset (in dB) to set the particular auxiliary channel deviation to 4KHz regardless the sensitivity level set in the **Sensitivity** menu.

This option is available only in STEREO mode.



Fig. 5.30 – Presetting auxiliary channels deviation adjustment

Press UP or DOWN key to select the channel desired. To change the offset value, press the OK key to enter the program mode (blinking arrow in second row on the right). Press UP or DOWN keys to increase or decrease the value. Press OK key to confirm or ESC key to exit routine without saving.

MIN value: -5 dB	MAX value: +5 dB	STEP: ± 0.5 dB
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Table 5.9 – Auxiliary channels deviation adjustment permitted value

5.3.6.7 19KHz/MPX OUTPUT SELECTION

In this menu it is possible to select the output signal at the **19KHz/MPX OUT** rear connector: the 19KHz signal or the MPX Internal signal.

This option is available only in STEREO MPX Internal mode.



Fig. 5.31 – Presetting 19KHz/MPX Out menu

To change the output, press the OK key to enter the program mode (blinking arrow in second row on the right). Press UP or DOWN keys to select the desired output. Press OK key to confirm or ESC key to exit routine without saving.

5.3.6.8 PILOT TONE DEVIATION

In this menu it is possible adjust the deviation of pilot tone, the standard value is 7 KHz (10% of stereo signal deviation of 71 KHz). The deviation change is obtained through an increment-decrement of the pilot tone level.

This option is available only in STEREO MPX Internal mode.

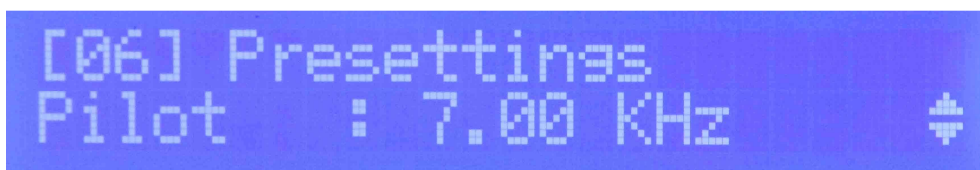


Fig. 5.32 – Pilot tone deviation adjustment

To change the deviation value, press the OK key to enter the program mode (blinking arrow in second row on the right). Press UP or DOWN keys to increase or decrease the deviation value. Press OK key to confirm or ESC key to exit routine without saving.

MIN value: 2 KHz	MAX value: 15KHz	STEP: ± 0.05 KHz
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Table 5.10 – Pilot tone deviation adjustment permitted values

5.3.6.9 PILOT TONE PHASE SHIFT

In this menu it is possible adjust the phase of 19KHz pilot tone. This option is available only in STEREO MPX Internal mode.

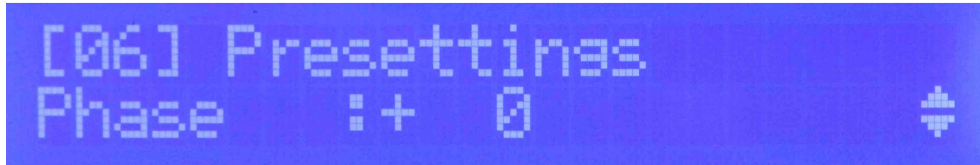


Fig. 5.33 – Pilot tone phase adjustment

To change the phase value, press the OK key to enter the program mode (blinking arrow in second row on the right). Press UP or DOWN keys to increase or decrease the value. Press OK key to confirm or ESC key to exit routine without saving.

MIN value: -100°	MAX value: +100°	STEP: ±1°
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Table 5.11 – Pilot tone phase adjustment permitted values

5.3.6.10 AES-EBU CONTROLS

In these menus it is possible enable/disable the AES-EBU interface. The menus are available in MONO and STEREO MPX Internal modes.



Fig. 5.34 – AES-EBU interface enable menu

To enable/disable the AES-EBU interface, press the OK key to enter the program mode (blinking arrow in second row on the right). Press UP or DOWN keys to select ON or OFF. Press OK key to confirm or ESC key to exit routine without saving.

If the interface is enabled, the internal switch will commutate from analogic Left/Right channels to digital Left/Right ones but the active channels set in the **Operat.Mode** menu will not change.

In case of interface enabled the AES-EBU led in the frontal panel will be switched on.

It is possible to change the AES-EBU interface Recovered Master Clock Frequency in the Ratio menu.



Fig. 5.35 – AES-EBU Ratio menu

To change the AES-EBU Ratio, press the OK key to enter the program mode (blinking arrow in second row on the right). Press UP or DOWN keys to select desired value. Press OK key to confirm or ESC key to exit routine without saving.

Values available:	128, 256
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Table 5.12 – AES-EBU Ratio permitted values

5.3.7 ALARMS MENU

In these menus it is possible to set the thresholds of intervention of alarms/warnings. In case an event is verified an info will be saved in the history log and the warning or alarm led (depending on event type) will be switched on.

To navigate in these menus press UP or DOWN keys.

[0] Foldback Reflected	[07] Alarms Foldback REFL : 10% ▾
[1] Warning Reflected	[07] Alarms REFL Warning : 10% ⬆⬇⬆
[2] Warning Power Low	[07] Alarms Warn.Power Low: 0% ⬆⬇⬆
[3] Alarm Power Low	[07] Alarms Alm. Power Low: 0% ⬆⬇⬆
[4] Audio Low Level	[07] Alarms Audio Low Lvl :+ 0.0dBu⬆⬇⬆
[5] Audio Low T1	[07] Alarms Audio Low T1 : 0 sec ⬆⬇⬆
[6] Audio Low T2	[07] Alarms Audio Low T2 : 0 sec ⬆⬇⬆
[7] Audio Over Level	[07] Alarms Audio Over Lvl:+ 0.0dBu⬆⬇⬆
[8] Audio Over T1	[07] Alarms Audio Over T1 : 0 sec ⬆⬇⬆
[9] Audio Over T2	[07] Alarms Audio Over T2 : 0 sec ⬆⬇⬆
[10] Audio Event Type	[07] Alarms Audio Alm/Warn:Alarm ⬆⬇⬆

Fig. 5.36 – Alarms/Warnings menu flow graph

5.3.7.1 WARNING FOLDBACK REFLECTED POWER

The unit is provided with a reflected power level proportional protection: in case the output reflected power exceeds the foldback threshold value the unit enters in warning mode and the output forward power is proportionally lowered to maintain the reflected power under the foldback threshold level.

The folbadck threshold is indicated as percentage of nominal unit power. **Standard factory calibration is 15% of nominal power.**



Fig. 5.37 – Foldback Reflected menu

To change the foldback threshold level, press the OK key to enter the program mode (blinking arrow in second row on the right). Press UP or DOWN keys to select desired value. Press OK key to confirm or ESC key to exit routine without saving.

MIN value: 0%	MAX value: 100%	STEP: $\pm 1\%$
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Table 5.13 – Foldback Reflected permitted values

5.3.7.2 WARNING REFLECTED POWER

In this menu it is possible to set a threshold value for a reflected power warning in similar way to the previous menu.

The presence of this warning does not alter in any way the output forward power unlike by the foldback reflected warning.

The Warning Reflected threshold is indicated as percentage of nominal unit power.

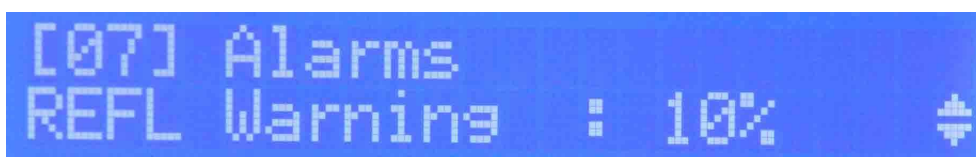


Fig. 5.38 – Warning Reflected menu

To change the Warning Reflected threshold level, press the OK key to enter the program mode (blinking arrow in second row on the right). Press UP or DOWN keys to select desired value. Press OK key to confirm or ESC key to exit routine without saving.

MIN value: 0%	MAX value: 100%	STEP: $\pm 1\%$
---------------	-----------------	-----------------

Table 5.14 – Warning Reflected permitted values

To disable this warning set the Warning Reflected to 0%.

5.3.7.3 WARNING POWER LOW

In this menu it is possible to set a warning in case the forward power level drops below a threshold. In case the forward power never exceeds the Warning Power Low threshold from the unit switch ON the warning is generated after 40 seconds otherwise after 4 seconds.

The Warning Power Low threshold is indicated as percentage of nominal unit power.

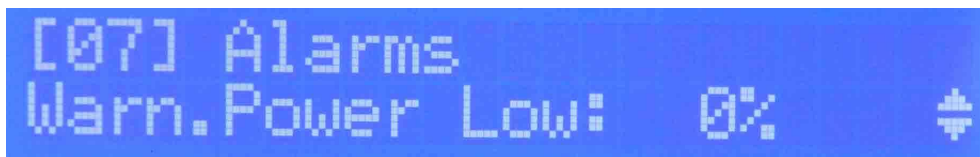


Fig. 5.39 – Warning power Low menu

To change the Warning Power Low threshold, press the OK key to enter the program mode (blinking arrow in second row on the right). Press UP or DOWN keys to select desired value. Press OK key to confirm or ESC key to exit routine without saving.

MIN value: 0%	MAX value: 100%	STEP: $\pm 1\%$
---------------	-----------------	-----------------

Table 5.15 – Warning power Low permitted values

To disable this warning set the Warning Power Low to 0%.

5.3.7.4 ALARM POWER LOW

In this menu it is possible to set an alarm in case the forward power level drops below a threshold in a similar mode as previous menu.

In case the forward power never exceeds the Alarm Power Low threshold from the unit switch ON the warning is generated after 40 seconds otherwise after 4 seconds.

The Alarm Power Low threshold is indicated as percentage of nominal unit power.



Fig. 5.40 – Alarm power Low menu

To change the Alarm Power Low threshold, press the OK key to enter the program mode (blinking arrow in second row on the right). Press UP or DOWN keys to select desired value. Press OK key to confirm or ESC key to exit routine without saving.

MIN value: 0%	MAX value: 100%	STEP: $\pm 1\%$
---------------	-----------------	-----------------

Table 5.16 – Alarm power Low permitted values

To disable this alarm set the Alarm Power Low to 0%.

5.3.7.5 AUDIO LOW EVENT

The Audio Low warning/alarm is generated if the audio level at an active input channel drops below a threshold set in the menu **Audio Low Level** for at least T1 seconds.

In presence of Audio Low warning/alarm in case the audio level exceeds the Audio Low threshold for at least T2 seconds the warning/alarm status is automatically ended. This warning/alarm is indicated also by the led NO AUDIO switched on in the frontal panel.

The timeouts T1 and T2 are set in the menus **Audio Low T1** and **Audio Low T2**.

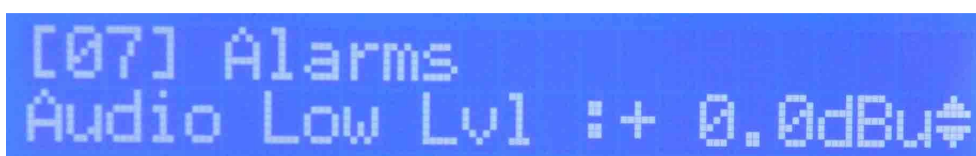


Fig. 5.41 – Audio Low Level menu

To change the Audio Low level, press the OK key to enter the program mode (blinking arrow in second row on the right). Press UP or DOWN keys to select desired value. Press OK key to confirm or ESC key to exit routine without saving.

MIN value: -20 dBu	MAX value: +20 dBu	STEP: ± 0.1 dB
--------------------	--------------------	--------------------

Table 5.17 – Audio Low Level permitted values

To setup the timeouts Audio Low T1 and T2 navigate to the relative menus with UP or DOWN keys.



Fig. 5.42 – Audio Low timeout menus

To change the Audio Low timeouts, press the OK key to enter the program mode (blinking arrow in second row on the right). Press UP or DOWN keys to select desired value. Press OK key to confirm or ESC key to exit routine without saving.

MIN value: 0 sec	MAX value: 1000 sec	STEP: ± 1 sec
------------------	---------------------	-------------------

Table 5.18 – Audio Low timeouts permitted values

To disable this warning/alarm set both the timeouts Audio Low T1 and T2 to 0 sec.

5.3.7.6 AUDIO OVER EVENT

The Audio Over warning/alarm is generated if the audio level at an active input channel exceeds a threshold set in the menu **Audio Over Level** for at least T1 seconds.

In presence of Audio Over warning/alarm in case the audio level drops below the Audio Over threshold for at least T2 seconds the warning/alarm status is automatically ended. This warning/alarm is indicated also by the led NO AUDIO switched on in the frontal panel.

The timeouts T1 and T2 are set in the menus **Audio Over T1** and **Audio Over T2**.



Fig. 5.43 – Audio Over Level menu

To change the Audio Over level, press the OK key to enter the program mode (blinking arrow in second row on the right). Press UP or DOWN keys to select desired value. Press OK key to confirm or ESC key to exit routine without saving.

MIN value: -20 dBu	MAX value: +20 dBu	STEP: ± 0.1 dB
--------------------	--------------------	--------------------

Table 5.19 – Audio Over Level permitted values

To setup the Audio Over timeouts navigate to the relative menus with UP or DOWN keys.



Fig. 5.44 – Audio Over timeout menus

To change the Audio Over timeouts, press the OK key to enter the program mode (blinking arrow in second row on the right). Press UP or DOWN keys to select desired value. Press OK key to confirm or ESC key to exit routine without saving.

MIN value: 0 sec	MAX value: 1000 sec	STEP: 1 sec
------------------	---------------------	-------------

Table 5.20 – Audio Over timeouts permitted values

To disable this warning/alarm set both the timeouts Audio Over T1 and T2 to 0 sec.

5.3.7.7 ALARMS MENU

In this menu it is possible to configure the type of audio event for both Audio Low and Audio Over. In case the audio event is configured as warning the yellow warning led will be switched on in the frontal panel and in the history log the event will be saved as warning.

In case the audio event is configured as alarm, the red alarm led will be switched on in the frontal panel and the event will be saved as alarm in the history log.



Fig. 5.45 – Audio events type menu

To change the Audio Event type, press the OK key to enter the program mode (blinking arrow in second row on the right). Press UP or DOWN keys to select type desired. Press OK key to confirm or ESC key to exit routine without saving.

TYPE AVAILABLE:	Warning, Alarm
-----------------	----------------

Table 5.21 – Audio events permitted types

5.3.8 MEMORY MENU

The unit can be completely configured in 6 different modes (Memories) and these configurations are stored in the internal unit memory.

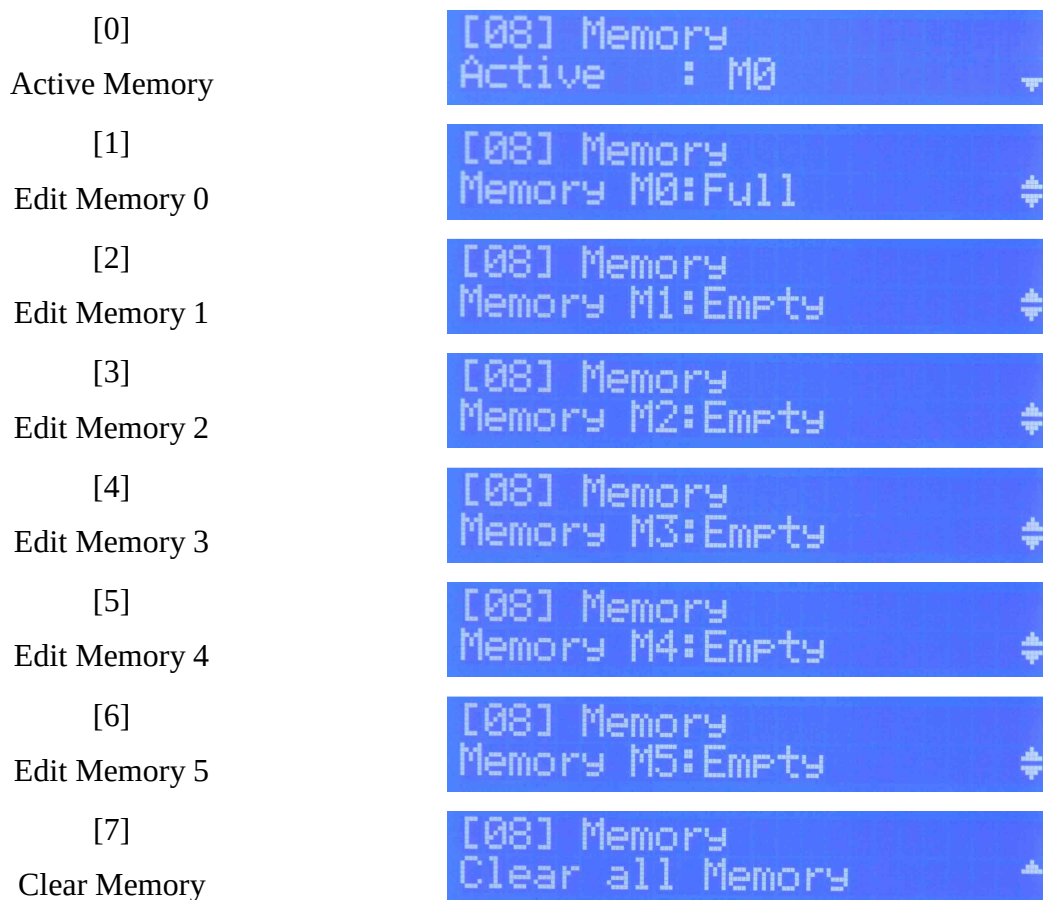


Fig. 5.46 – Memory menu flow graph

5.3.8.1 ACTIVE MEMORY

The active Memory is the current configuration applied to the unit. Any parameter changed during normal unit working mode is automatically applied and saved in the current active Memory.

The active Memory is indicated in the sub-menu **Active**.

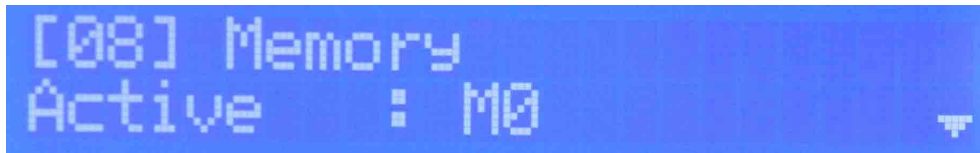


Fig. 5.47 – Active Memory menu

To change the active Memory, press the OK key to enter the program mode (blinking arrow in second row on the right). Press UP or DOWN keys to select Memory desired. Press OK key to confirm or ESC key to exit routine without saving.

MEMORY AVAILABLE:	M0, M1, M2, M3, M4, M5
-------------------	------------------------

Table 5.22 – Memory available

When a Memory is recalled the unit is reconfigured with the parameters saved in that particular Memory.

5.3.8.2 EDITING A MEMORY

In these menus it is possible enable the editing of a Memory parameters, the editing is not available for the Active Memory because for this particular Memory the parameters change is executed and saved in real time.



Fig. 5.48 – Edit Memory menus

A Memory already manually edited has Full state otherwise is Empty. It has no sense to recall an empty Memory but, if it is recalled, the empty Memory will be an exact copy of the last Active Memory.

To enable the editing of a Memory navigate with UP or DOWN keys in the sub-menus up to the desired Memory M, keep pressing OK key until the display shows the line

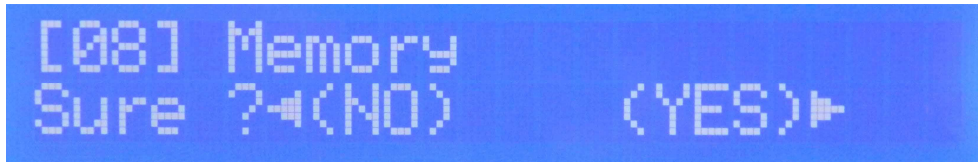


Fig. 5.49 – Enable Memory editing page

Press RIGHT key to enable the editing or LEFT key to exit, if the editing is confirmed the display shows the following line

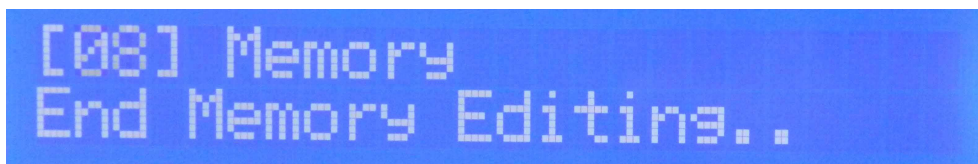


Fig. 5.50 – Ending Editing Memory page

If editing Memory is enabled, in the first row of every menu between the brackets the edited Memory number will be alternated with the menu ID. Changing parameters in this modality does not influence the unit on air working mode but the parameters are saved in the Memory edited.

Pressing ESC key will exit from editing Memory state without any change in that Memory.

To save the new parameters it is necessary return in the **Memory** menu

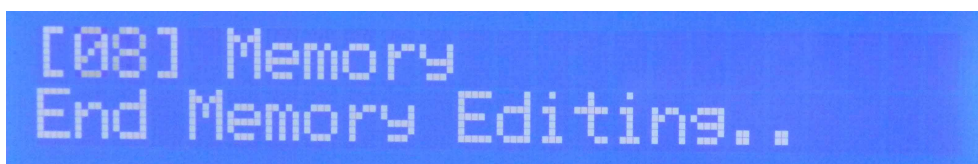


Fig. 5.51 - Memory menu during editing

And keep pressing the OK key until the display shows the line

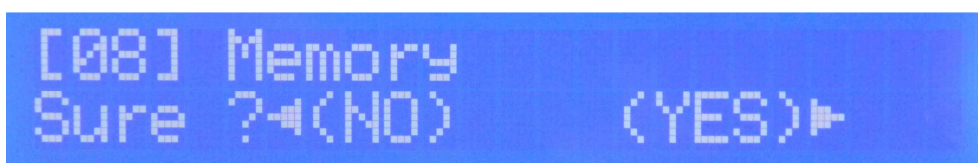


Fig. 5.52 – Confirmation editing Memory page

Press RIGHT key to confirm the saving procedure or LEFT key to discard the editing.

5.3.8.3 CLEAR ALL MEMORY

It is possible clear all Memory configurations with the exception of the Active Memory one. To clear all Memory navigate to the menu **Clear all Memory** with DOWN key.



Fig. 5.53 – Clear all Memory menu

Keep pressing the OK key until the display shows the line



Fig. 5.54 – Clear all Memory confirmation page

Press RIGHT key to confirm the cleaning operation, press LEFT key to exit without cleaning.

5.3.9 HISTORY MENU

In the History menu is present the list of events occurred during the unit operation. The events recorded can be grouped in three types: alarm, warning and info.

The alarm is an event type that can compromise the normal unit operation, the warning doesn't compromise the unit operation but have to be examined to prevent alarms. The info is an information about a unit change of state (for example passing in local mode, or exit from warning or alarm state).

The menu shows always the last event happened



Fig. 5.55 – History menu

In the second row on the left the numbers 000 identify the last event (there is the possibility to check the last 200 events), after the symbol “>” a brief event description is provided.

To see a total event information and the complete event list press OK key:



Fig. 5.56 – History menu event detail page

The first row shows the same message as the second row of previous menu, while in the second row the information showed are in order: date, hour and code of event recorded.

Press UP or DOWN keys to navigate the event list press OK or ESC key to exit.

Here below the complete list of events recognized is indicated:

EVENT	TYPE	CODE	
Max Current	ALARM	0001	
Max Environment Temp	ALARM	0002	
-	[Not used]	0003	[Not used]
Foldback Reflected	WARNING	0004	
Reset	INFO	0005	
Max Heatsink Temp	ALARM	0006	If Temperature > 68°C
Max Supply Temp	ALARM	0007	
-	[Not used]	0008	[Not used]
Interlock Open	WARNING	0009	
Power On	INFO	0010	
Max Hardware Reflected	ALARM	0011	
Fan Warning	WARNING	0012	
Frequency Change	INFO	0013	
Change to Local	INFO	0014	
Change to Remote	INFO	0015	
Audio Low	ALARM	0016	Alarm version
Power Low	ALARM	0017	Alarm version
Switch ON	INFO	0018	
Switch OFF	INFO	0019	
Fault too many Alarms	ALARM	0020	
End PLL Unlock	INFO	0021	
PLL Unlock	ALARM	0022	
Audio Over	ALARM	0023	Alarm version
End Foldback Reflected	INFO	0024	
End Hardware Reflected	INFO	0025	
End Power Low	INFO	0026	For Alarm version
End Audio Low	INFO	0027	For Alarm version
End Audio Over	INFO	0028	For Alarm version
End Fan Warning	INFO	0029	
End Max Heatsink Temp	INFO	0030	
Fault Hardware Reflected	ALARM	0031	Too many hardware reflected events
Power Low	WARNING	0032	Warning version
RDS Alarm	ALARM	0033	
End RDS Alarm	INFO	0034	
Alarms Present	ALARM	0035	At least 1 alarm present
Alarms Absent	INFO	0036	No alarm present
Warnings Present	INFO	0037	At least 1 warning present
Warnings Absent	INFO	0038	No warning present
RF Present	INFO	0039	If Pout > 10% of power set value
RF Absent	INFO	0040	If Pout < 10% of power set value
-	[Not used]	0041	[Not used]
-	[Not used]	0042	[Not used]
Audio Low	WARNING	0043	Warning version
End Audio Low	INFO	0044	For Warning version
End Power Low	INFO	0045	For Warning version
Audio Over	WARNING	0046	Warning version
End Audio Over	INFO	0047	For Warning version
NTP Synchronization	WARNING	0048	
End NTP Synchronization	INFO	0049	
Warning Reflected	WARNING	0050	
End Warning Reflected	INFO	0051	

Table 5.23 – Events list

Every Warning and Alarm event has the corresponding END info event to indicate the time instant of ending from that particular warning/alarm condition.

5.3.10 GENERALS MENU

The Generals menu contains options as time and date set, the RS-485 address, the IP address and netmask.

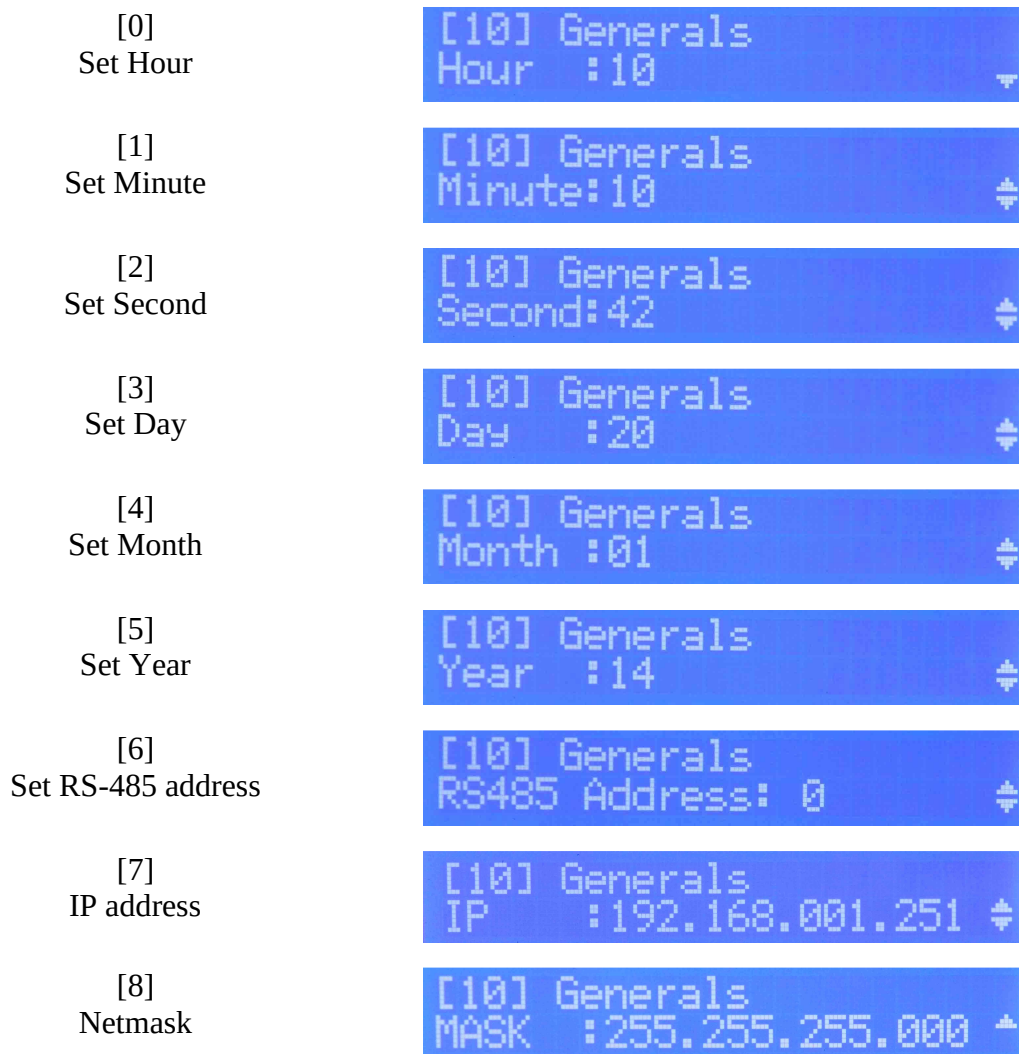


Fig. 5.57 – Generals menu flow graph

5.3.10.1 TIME SET

In these menus it is possible to set the time of day: this time is used in the history log menu during the events saving.

To adjust the hour localize the menu

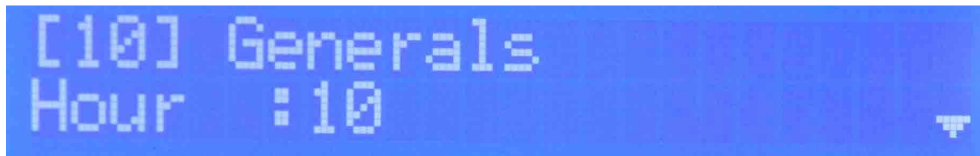


Fig. 5.58 – Set hour page

To change the hour, press the OK key to enter the program mode (blinking arrow in second row on the right). Press UP or DOWN keys to select right value. Press OK key to confirm or ESC key to exit routine without saving.

To adjust the minutes press UP or DOWN key

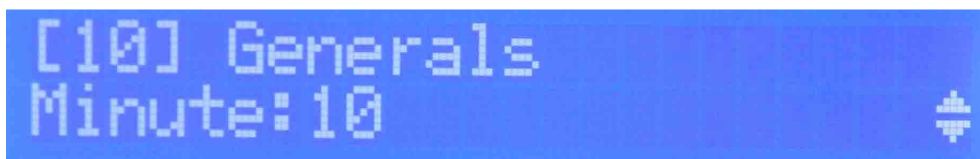


Fig. 5.59 – Set minute page

To change the minutes, press the OK key to enter the program mode (blinking arrow in second row on the right). Press UP or DOWN keys to select right value. Press OK key to confirm or ESC key to exit routine without saving.

To adjust the seconds press UP or DOWN key

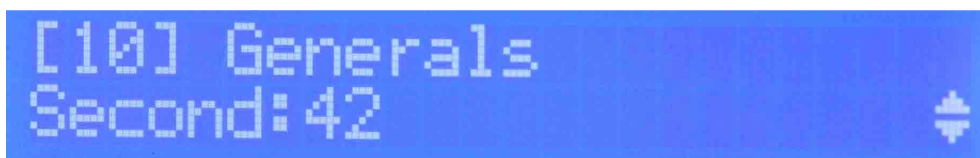


Fig. 5.60 – Set second page

To change the seconds, press the OK key to enter the program mode (blinking arrow in second row on the right). Press UP or DOWN keys to select right value. Press OK key to confirm or ESC key to exit routine without saving.

5.3.10.2 DATE SET

In these menus it is possible to set the date: the date is used in the history log menu during the events saving as the time of the day.

To adjust the day press UP or DOWN key

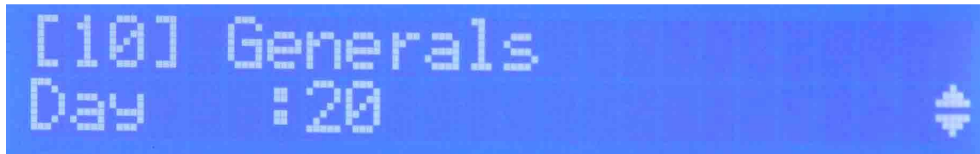


Fig. 5.61 – Set day page

To change the current day, press the OK key to enter the program mode (blinking arrow in second row on the right). Press UP or DOWN keys to select right value. Press OK key to confirm or ESC key to exit routine without saving.

To adjust the month press UP or DOWN key

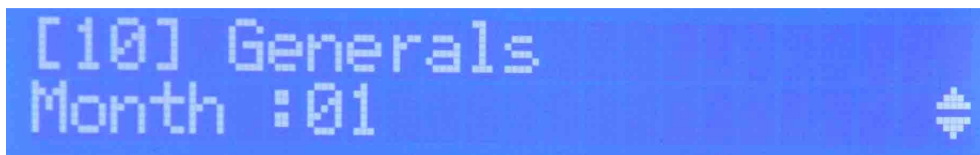


Fig. 5.62 – Set month page

To change the current month, press the OK key to enter the program mode (blinking arrow in second row on the right). Press UP or DOWN keys to select right value. Press OK key to confirm or ESC key to exit routine without saving.

To adjust the year press UP or DOWN key

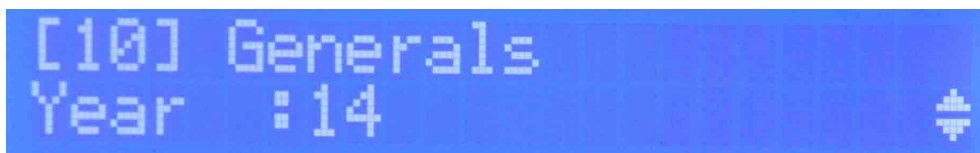


Fig. 5.63 – Set year page

To change the current year, press the OK key to enter the program mode (blinking arrow in second row on the right). Press UP or DOWN keys to select right value. Press OK key to confirm or ESC key to exit routine without saving.

5.3.10.3 RS-485 ADDRESS MENU

In this menu it is possible set the RS-485 address in case the unit is used as slave device in a bus system (for example a high power transmitter or a 1+1 system).

Navigate to the menu **RS485 Address** with UP or DOWN key.

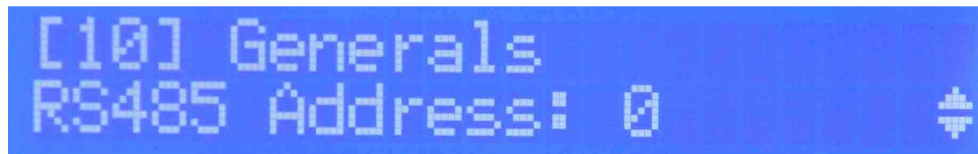


Fig. 5.64 – Set RS-485 address page

To change the RS-485 address, press the OK key to enter the program mode (blinking arrow in second row on the right). Press UP or DOWN keys to select the desired value. Press OK key to confirm or ESC key to exit routine without saving.

5.3.10.4 NETWORK PARAMETERS

These are read only menus, the IP address and Netmask are set directly from webpage if webserver option is available.



Fig. 5.65 – Unit IP address page

In this menu the actual unit IP address is showed.

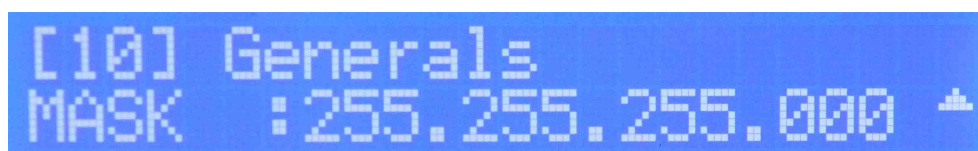


Fig. 5.66 – Unit netmask page

In this menu the actual netmask is showed.

6 FRONT PANEL

Not all the functions are available from the LCD display: the most important ones are available from the front panel keys and leds present on the unit front panel.

6.1 FRONT PANEL KEYS



➤ Reset

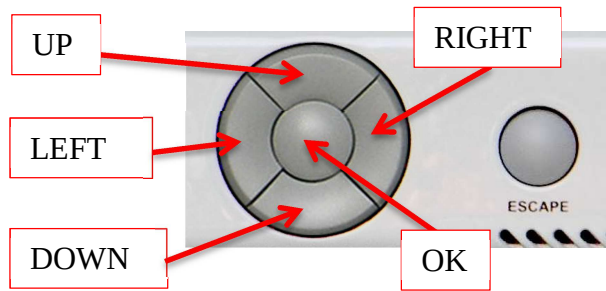
In case the unit is completely blocked (Fault status) due for example to the repetition of an alarm multiple times, the FAULT led will switch on and to restore the functioning of the unit it is sufficient to press this key (Reset of the alarm/warning/fault status).

➤ Local

In case the led LOCAL is switched on, the unit is in LOCAL mode and all the functions from the front panel are enabled. If the led is off the unit is in REMOTE mode and it will accept only the commands given by remote. To change the status of the led it is sufficient to press the key.

➤ ON/OFF

In case the led ON/OFF is switched on, the unit is in ON mode and the RF power is enabled. If the led is off the unit is in OFF mode (standby) and it is only powered but it will not give any output power. To change the status of the led it is sufficient to press the key.



➤ **UP/DOWN/LEFT/RIGHT**

The keys are available for the menus navigation and the parameter editing if the menu editing is enabled.

➤ **OK**

The key is available to enable the editing menu mode and to confirm the parameters change.

➤ **ESCAPE**

The key is available to exit from editing menu mode without any change or to return to main menu from any other menu.

6.2 FRONT PANEL LEDS

The frontal panel leds don't change depending on units model. For the leds name see the Fig.2.1 or Fig.2.3

6.2.1 STATUS LEDS



➤ **ALARM led**

This led is switched on in case an alarm event is recognized. It is automatically switched off at the end of the alarm event without the reset needed. It is still possible press reset key to clear the alarm condition.

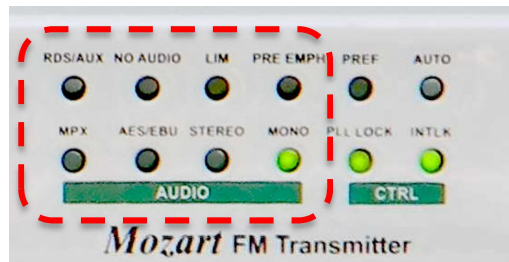
➤ **WARNING led**

This led is switched on in case a warning event is recognized or in case of a parameter is saved or read from unit internal Eeprom memory. It is automatically switched off at the end of the warning event or when the read/write operation on internal Eeprom memory is terminated.

➤ **ON led**

This led is switched on at the unit power on.

6.2.2 AUDIO LEDS



➤ RDS/AUX led

This led is switched on if an auxiliary channel (RDS, SCA, AUX) is enabled.

➤ MPX led

This led is switched on in case the STEREO MPX External mode is enabled.

➤ NO AUDIO led

This led is switched on in case of Audio Low or Audio Over alarm/warning events.

➤ AES EBU led

This led is switched on in case the AES-EBU interface is enabled.

➤ LIM led

This led is switched on in case the limiter is enabled.

➤ STEREO led

This led is switched on in case the STEREO MPX Internal mode is enabled.

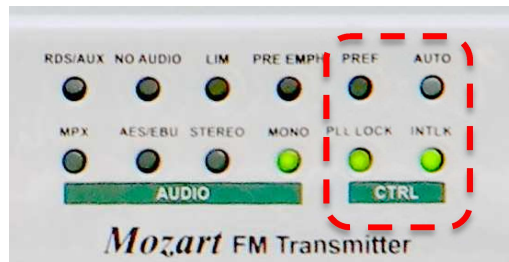
➤ PRE EMPH led

This led is switched on in case the preemphasis value set is different from Linear.

➤ MONO led

This led is switched on in case the MONO mode is enabled.

6.2.3 CONTROL LEDS



➤ **PREF led**

This led is reserved for future uses.

➤ **PLL LOCK led**

This led is switched on when the PLL is locked to the frequency set value.

➤ **AUTO led**

This led is reserved for future uses.

➤ **INTLK led**

This led is switched on in case the rear connector ENABLE is closed.

6.2.4 COMMAND LEDS



➤ ALARM RESET led

This led is switched on in case of unit fault. The unit enters in fault state when 5 alarm hardware reflected events are recognized in 2 minutes. In this case a reset is necessary.

➤ LOCAL led

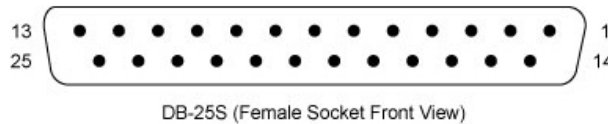
This led is switched on in case the unit is in local mode.

➤ RF ON led

This led is switched on in case the unit is switched on and the RF power is enabled. The output power level is set in the relative menu.

7 REMOTE I/O (OPTIONAL)

The Remote I/O is an optional interface that provides the DB25 connector **REMOTE** to monitor and control the unit through digital signals. The signals available are:



Pin	Name	I/O	Function
1	TC_1	Tele Command	-
2	TC_3	Tele Command	OFF
3	TC_5	Tele Command	Change to MEMORY 0
4	TC_7	Tele Command	Change to MEMORY 2
5	TC_9	Tele Command	Change to MEMORY 4
6	TC_11	Tele Command	-
7	VCC_FIELD	Vcc	+12V
8	TS_11_TM4	Tele Signal	ON
9	TS_9_TM2	Tele Signal	LOCAL
10	TS_7/OUT_ANA7	Tele Signal	AUDIO_OK
11	TS_5/OUT_ANA5	Tele Signal	MEMORY 1
12	TS_3/OUT_ANA3	Tele Signal	MEMORY 3
13	TS_1/OUT_ANA1	Tele Signal	MEMORY 5
14	TC_2	Tele Command	ON
15	TC_4	Tele Command	RESET
16	TC_6	Tele Command	Change to MEMORY 1
17	TC_8	Tele Command	Change to MEMORY 3
18	TC_10	Tele Command	Change to MEMORY 5
19	GND_OUT	GND	GND
20	TS_COM	COMMON	Tele Signals Common
21	TS_10_TM3	Tele Signal	NO_FAULT
22	TS_8_TM1/OUT_ANA8	Tele Signal	RF_OK
23	TS_6/OUT_ANA6	Tele Signal	MEMORY 0
24	TS_4/OUT_ANA4	Tele Signal	MEMORY 2
25	TS_2/OUT_ANA2	Tele Signal	MEMORY 4

Table 7.1 – Remote I/O pinout

The particular unit state is verified if there is a short-circuit between the relative Tele Signal pin and the Common pin (pin 20).

To send a command to the unit (only in remote state) is necessary a short-circuit between the particular Tele Command pin and GND for at least 100ms.

8 WEB SERVER (OPTIONAL)

As option it is possible to add a remote webserver system via TCP/IP and SNMP.

A webserver board is installed on the exciter and, through an Ethernet port, it is possible to read the main parameters of the transmitter and make all main settings.

NOTE: The WEB GUI commands work only if the unit is in REMOTE MODE.

Connect the unit to a LAN or directly to the computer using a cross cable. Enter the default address from an internet browser. This address is indicated in the **GENERALS** menu on the front panel of the unit.

8.1 WEB PAGES

8.1.1 MAIN PAGE

The default page is the MAIN page:

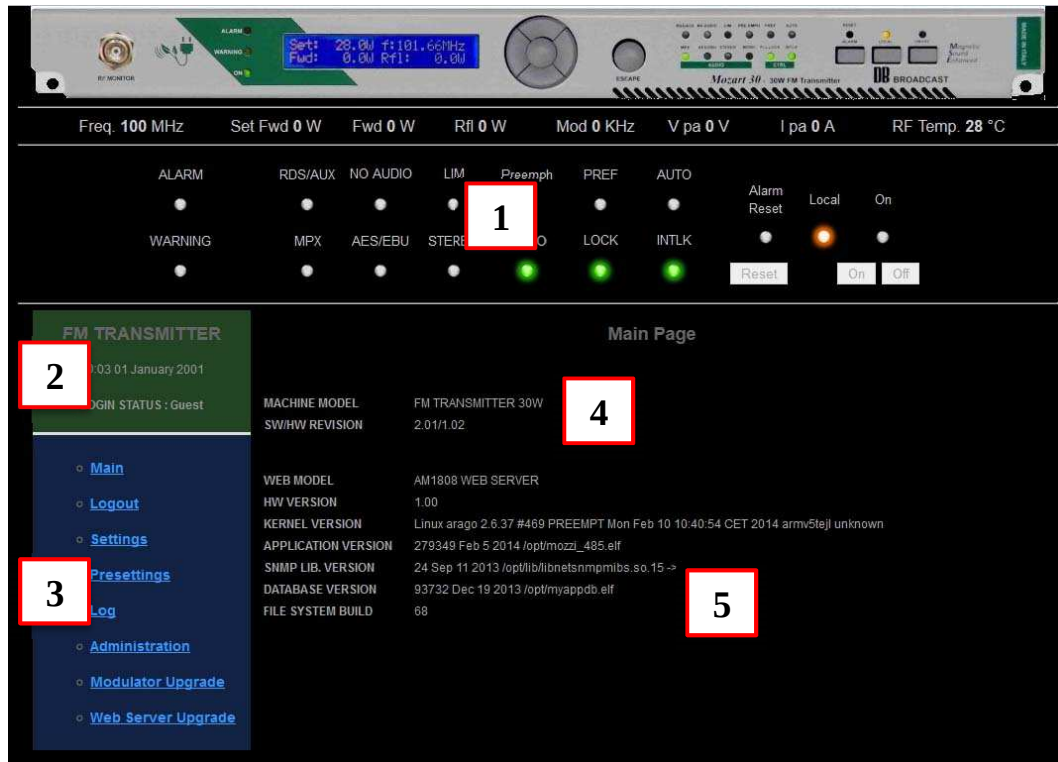


Fig. 8.1 – Webserver main page

Here all the information regarding the unit and the software are indicated:

1. Unit audio and RF state
2. Login Status: Administrator, Guest
3. Available web pages
4. Unit model and hardware/firmware revision
5. Webserver info and firmware build

8.1.2 LOGIN PAGE

To have the possibility to change the functioning parameters of the unit you need to enter as administrator.

Here the Login page:



The image shows a web browser window with a grey background. In the center is a white rectangular box titled "User Login". Inside this box, there are two input fields. The first is labeled "Username:" and contains the text "guest". The second is labeled "Password:" and contains six dots. Below these fields is a blue button with the text "LOG IN" in white capital letters.

Fig. 8.2 – Webserver Login page

The standard Administration username and password:

FACTORY ADMIN ID: admin
FACTORY ADMIN PASSWORD: admin
FACTORY IP ADDRESS: 192.168.1.251

8.1.3 SETTINGS PAGE

In this page is present a view of the status of unit parameters, as normally indicated in the front panel on the LCD display. If the login has been done it will be possible to change the values, otherwise it is possible only to see them.

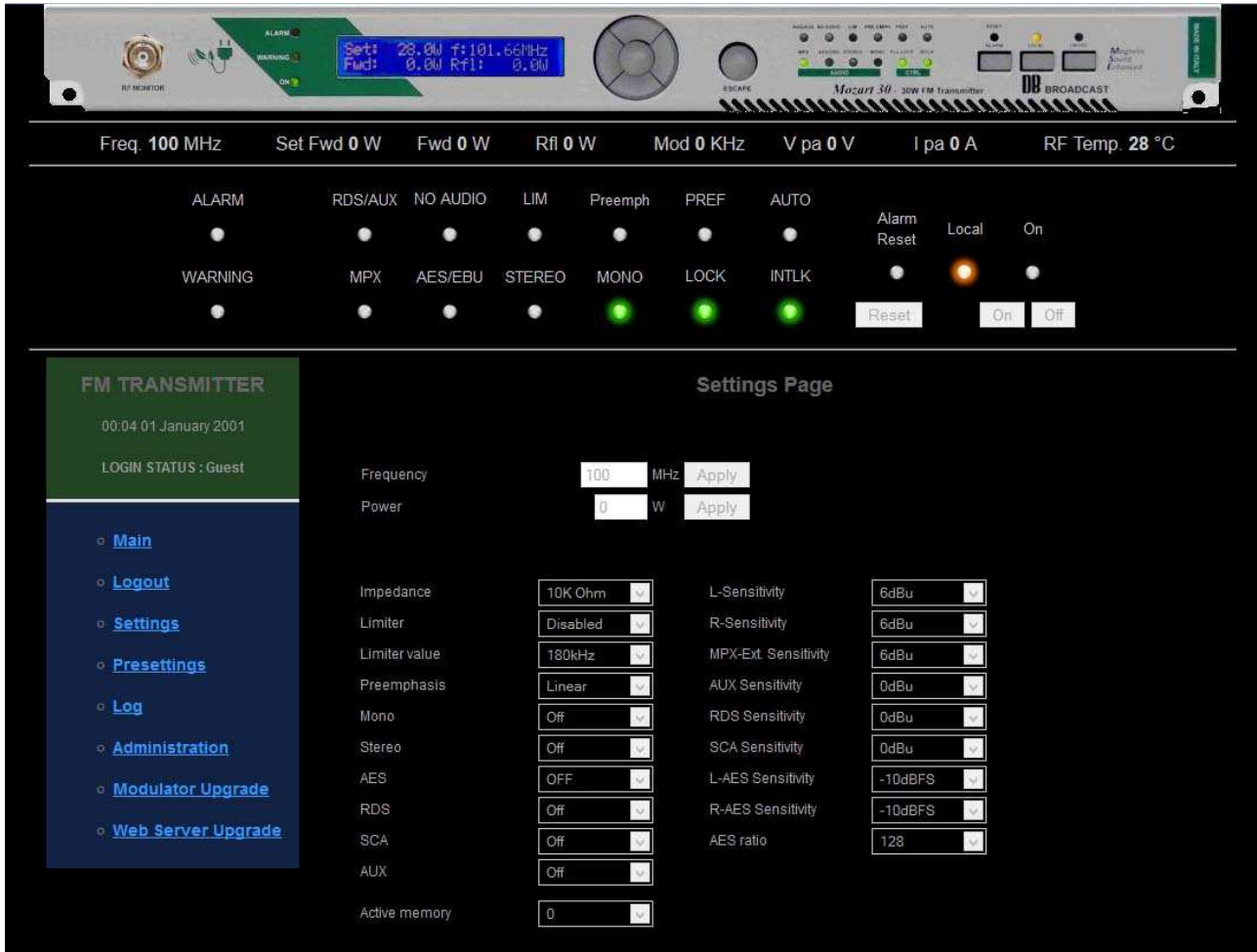


Fig. 8.3 – Webserver Setting page

The parameters available in this page are:

1. Frequency
2. Power Set
3. Audio options
4. Sensitivity option
5. AES-EBU options
6. Mono/Stereo and Auxiliary channels enable
7. Active Memory status

8.1.4 PRESETTINGS PAGE

In the Presettings page it is possible to see and change the status of all remains unit parameters. If the login has been done it will be possible to change the values, otherwise it is possible only to see them.

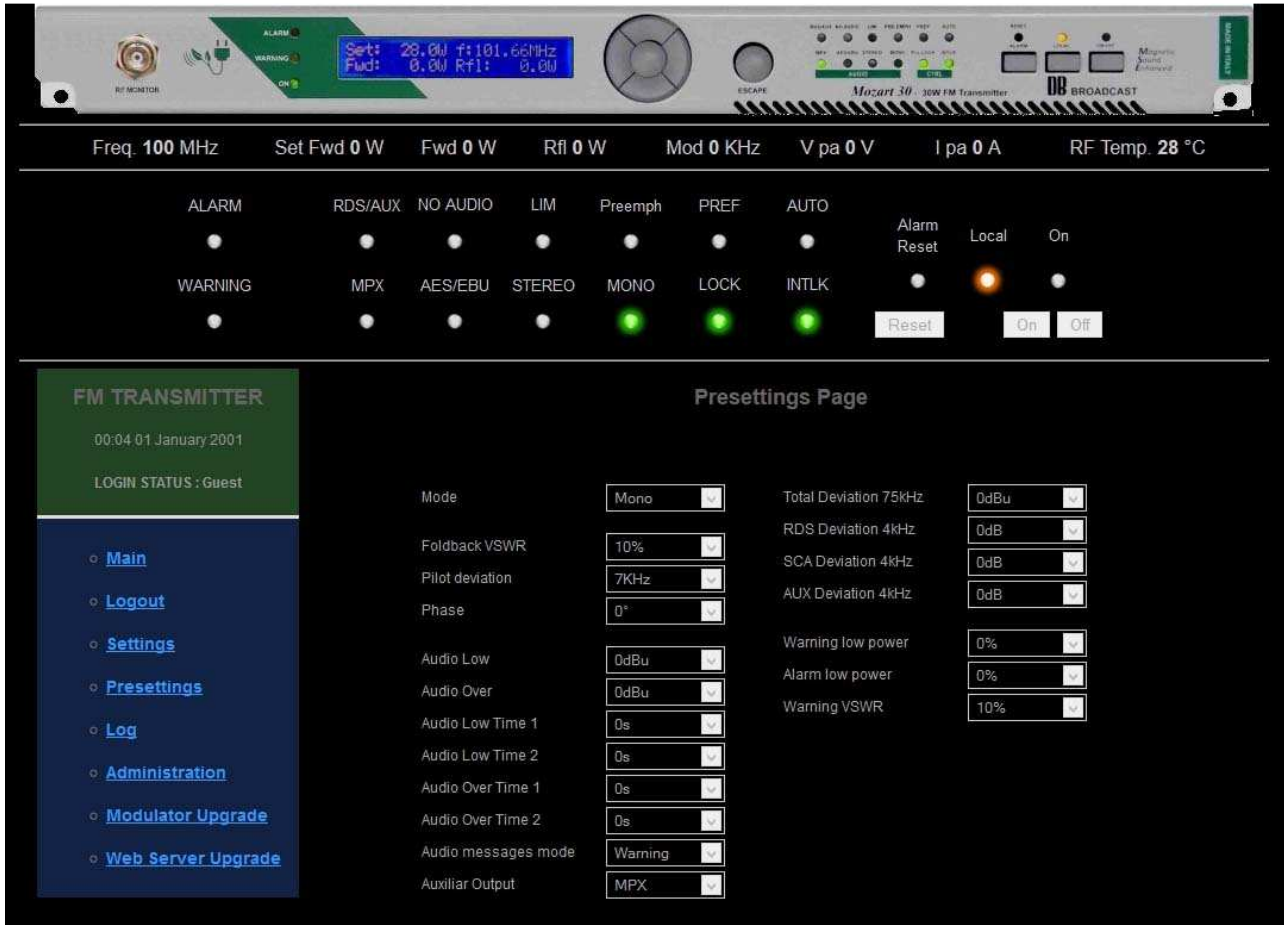


Fig. 8.4 – Webserver Presetting page

Parameters available are:

1. Mono/Stereo mode
2. Alarms and Warnings Settings
3. Deviation offsets adjustment

8.1.5 LOG PAGE

The LOG page allows the visualization and the download of the unit history (the register of all the events happened with date, hour and event code). If the login has been done it will be possible to download the file, otherwise it is possible only to see it.

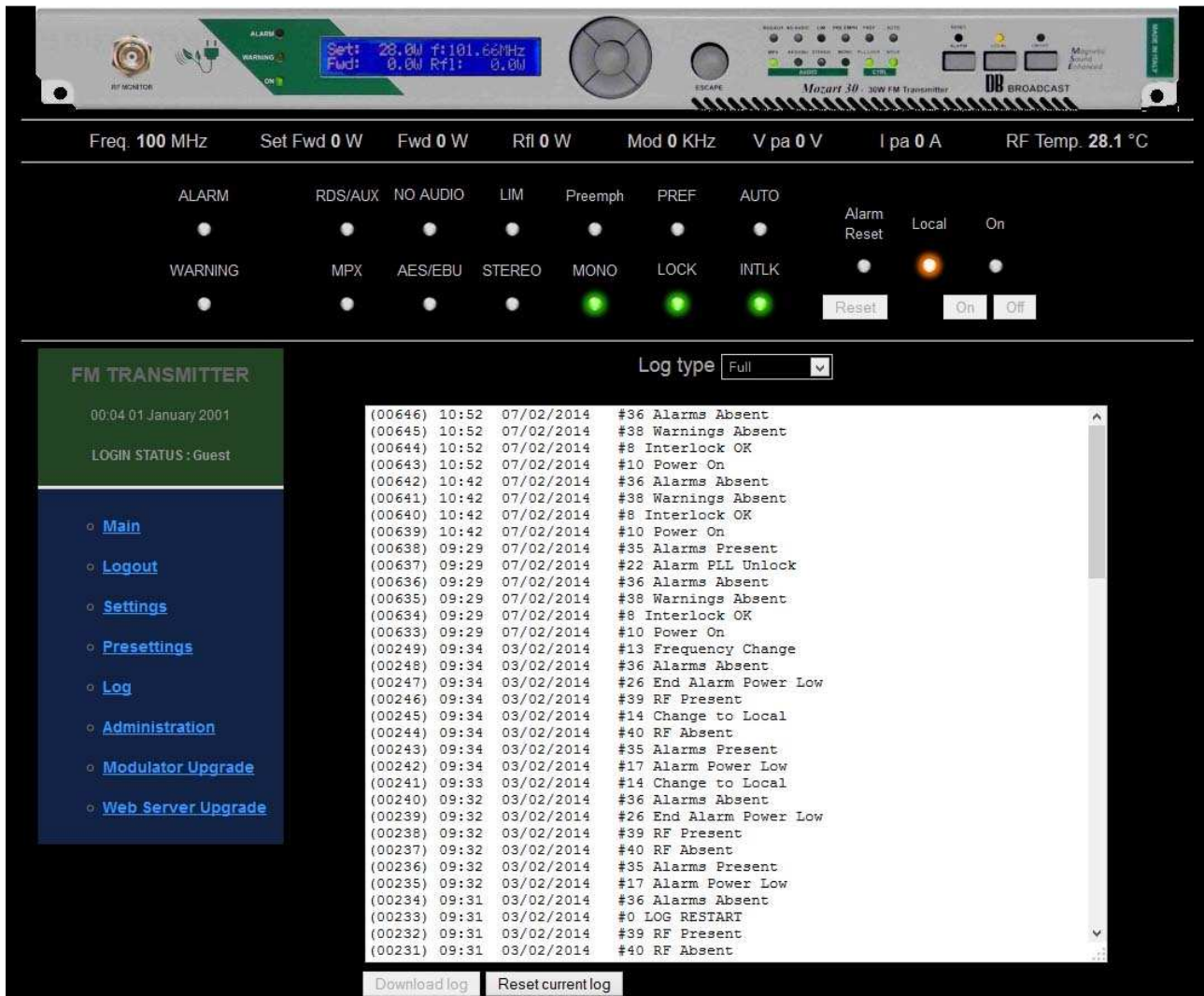


Fig. 8.5 – Webserver Log page

The Log type can be configured as FULL or RECENT.

In FULL mode it is possible see the unit complete list of event saved, in RECENT mode it is available a list of events starting from the selection of RECENT option.

The *Reset current log* button will restart only the RECENT mode of the Log. To restart the Log FULL mode it is necessary to go on Administration page.

8.1.6 ADMINISTRATION PAGE

If the user is logged as administrator it is possible change all parameters related to the connection of the unit to the network and the SNMP configuration.

FM TRANSMITTER
00:12:01 January 2001
LOGIN STATUS : Admin

- [Main](#)
- [Logout](#)
- [Settings](#)
- [Presettings](#)
- [Log](#)
- [Administration](#)
- [Modulator Upgrade](#)
- [Web Server Upgrade](#)

Administration Page

NETWORK

MAC ADDRESS	00:04:a3:90:b9:8a
IP ADDRESS	192.168.1.250
SUBNET MASK	255.255.255.0
GATEWAY	192.168.1.1

SNMP

TRAP IP ADDRESS 1	192.168.1.254	170
TRAP IP ADDRESS 2	192.168.1.233	162
READ COMMUNITY 1	public	
READ COMMUNITY 2	public2	
WRITE COMMUNITY 1	private	
WRITE COMMUNITY 2	private2	
TRAP TYPE	Inform	
INFORMS TIMEOUT [S]	3	
INFORMS RETRIES	2	
SYSNAME		
SYSLOCATION		

ACCESS

GUEST PASSWORD	guest
ADMIN USERNAME	admin
ADMIN PASSWORD	•••••
RETYPE ADMIN PASSWORD	•••••

NTP

PREFERRED SERVER	ntp.ubuntu.com
BACKUP SERVER	it.pool.ntp.org
UPDATE INTERVAL [s]	15
STATUS	disabled

TIME

TIME	24	12	05
DATE (GG:MM:YY)	31	12	20 00

Save Discard

Reboot Restart log

Settime

Fig. 8.6 – Webserver Administration page

The parameters available are:

1. Network parameters: IP address, netmask and Gateway address.
2. SNMP configuration.
3. Username and password for both administrator and guest users.
4. NTP configuration
5. Buttons necessary to reconfigure the webserver board.

To save a new network or SNMP configuration press SAVE button after the new parameters are set.

To apply the new configuration press REBOOT button to restart the webserver board.

The RESTART LOG button will restart the FULL mode of webserver Log.

8.1.7 MODULATOR UPGRADE PAGE

If the login has been done it is possible to upgrade the firmware of the unit uploading the file from this page. The upgrade will be automatically done once the file has been uploaded. The upload is done in 2 steps:

- The software is uploaded into the web server board (web module) and stored in it
- The software is passed from the web module to the microprocessor of the unit

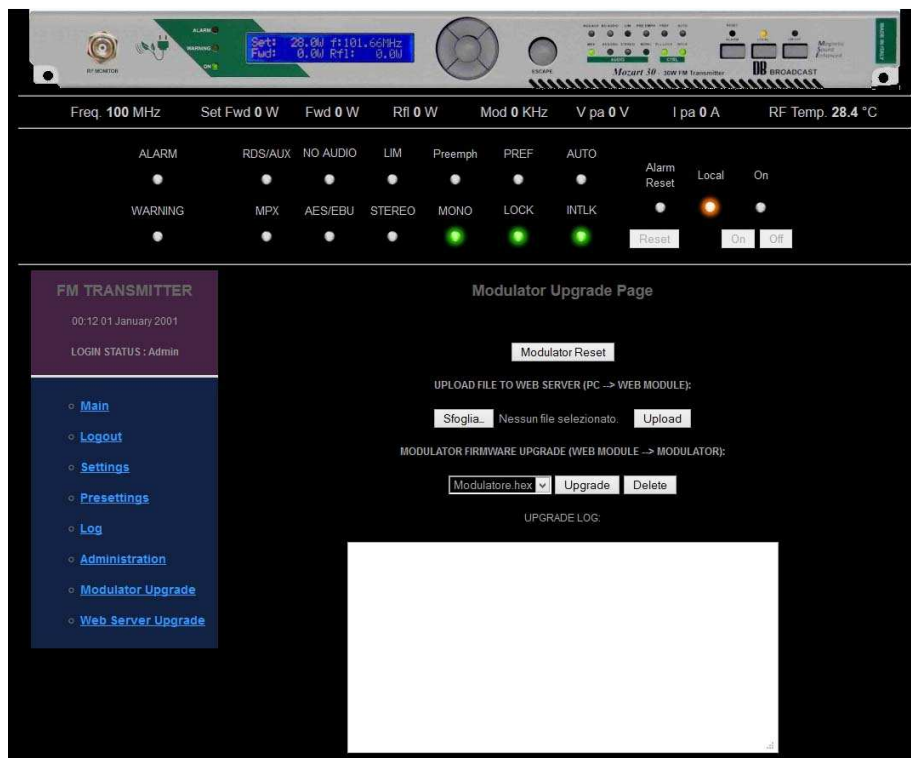


Fig. 8.7 – Webserver Modulator Upgrade page

To upgrade the modulator refer to the upgrading procedure.

8.1.8 WEBSERVER UPGRADE PAGE

If the login has been done it will be possible to upgrade the firmware of the webserver board uploading the file from this page. The upgrade will be automatically done once the file has been uploaded. The upgrade will be automatically done once the file has been uploaded. The upload is done in 2 steps:

- The software is uploaded into the webserver board (web module) and stored in it
- The software is applied to the web server

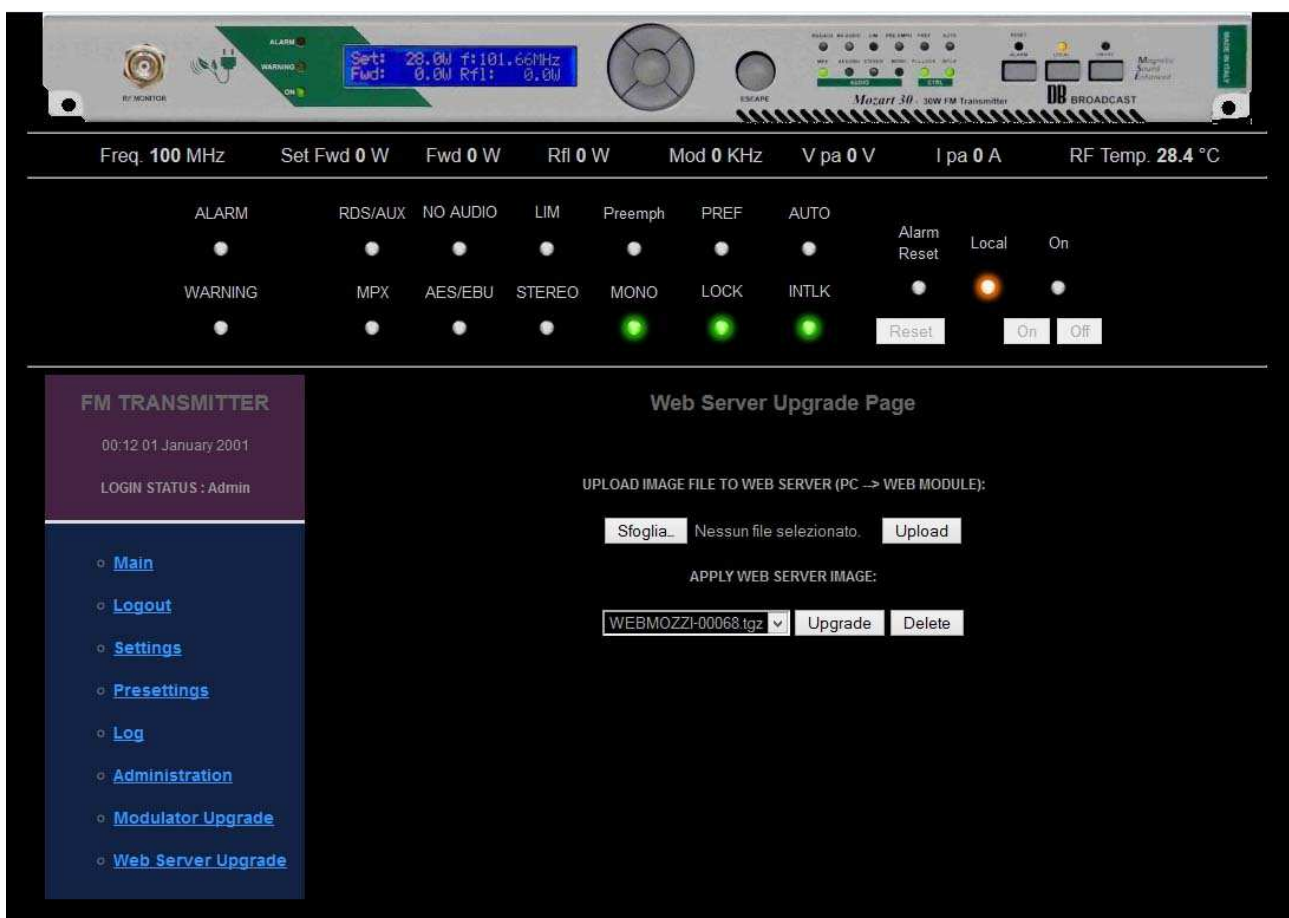


Fig. 8.8 – Webserver Upgrade page

To upgrade the webserver board refer to the upgrading procedure.

8.2 UPGRADING PROCEDURES

8.2.1 UPGRADING THE MODULATOR FIRMWARE

The modulator firmware upgrade is available only with the webserver board installed.

The copies of modulator firmwares are always stored in the webserver board so it is possible the downgrade in case of failed upgrading attempts.

To start the procedure please follow these points:

1. Power on the unit maintaining pressed the OK key to start the unit in bootloader mode.

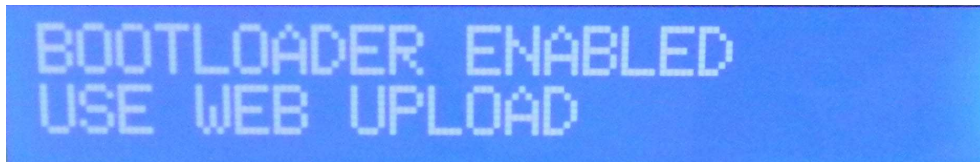


Fig. 8.9 – Start in bootloader mode

2. Connect a PC to the unit using a crossover LAN cable. Open a browser and type the IP address of the unit. Usually the boot time of webserver loading is 1 minute, after that the webpage will be active.
3. Login as administrator.
4. Go to the “Modulator Upgrade” menu and press the “Sfoglia” button to select the new firmware.

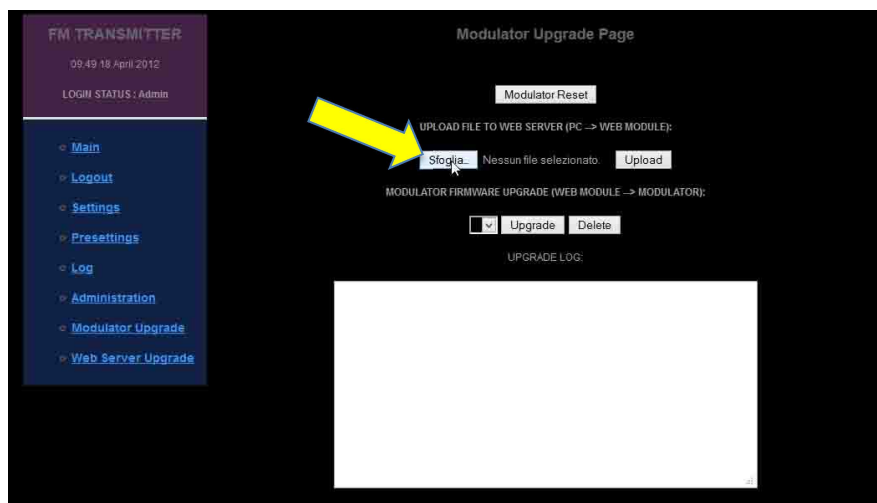


Fig. 8.10 – Modulator Upgrade page

5. Select the latest firmware *.hex* file and click “OPEN” (The file below is just an example, please use the firmware provided by DB Elettronica).

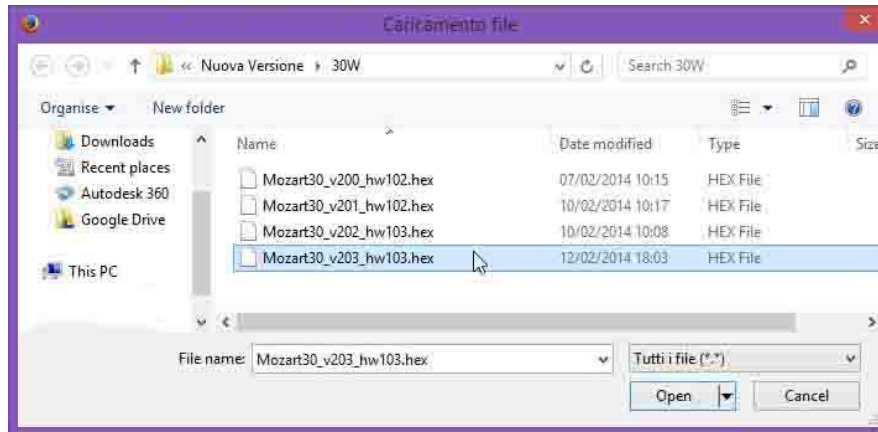


Fig. 8.11 – New firmware selection

6. Click on “Upload” button and confirm the operation pressing “OK” button on the popup window.



Fig. 8.12 – Upload the new firmware

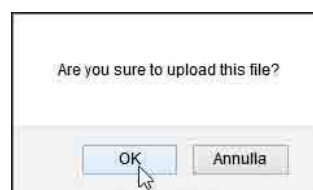


Fig. 8.13 – Confirm the upload

7. The new firmware will be added on the list. Select it from the list and click on “Upgrade” button.

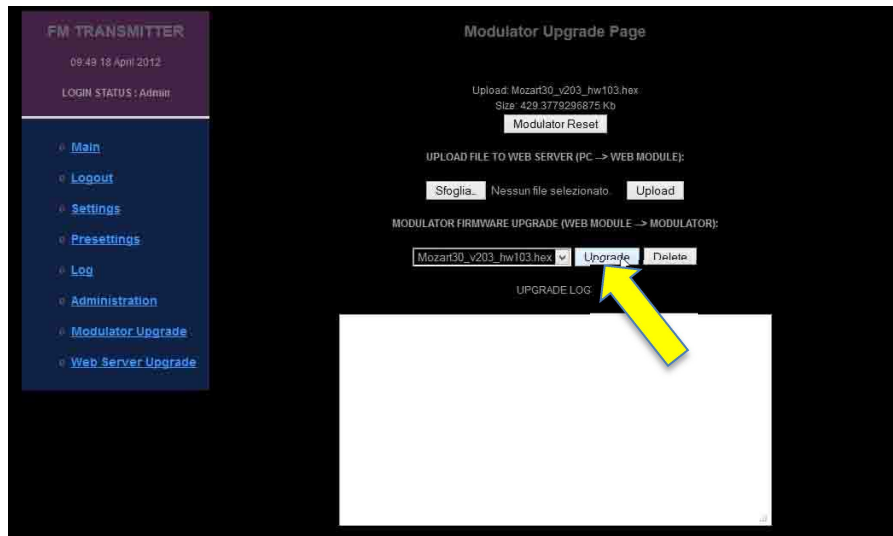


Fig. 8.14 – Upgrade to the new firmware

8. The procedure starts erasing the flash, on the display of the transmitter the text “ERASE FLASH” will show on.

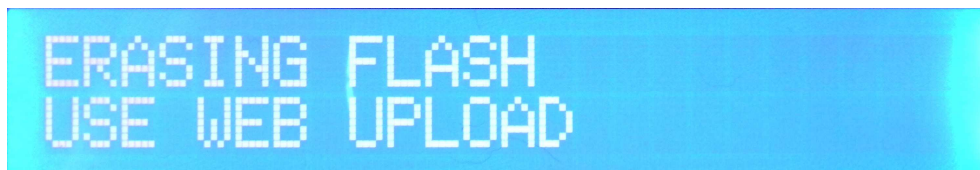


Fig. 8.15 – Erase the flash before the upgrade

9. During the firmware upgrade on the display of the transmitter the text “upgrading ...” will show on.



Fig. 8.16 – Upgrade in working

10. The Control Board will be upgraded with the new firmware. The operation process will take about 5 minutes. When the process is finished the text “END” will be shown at the end of the log report.

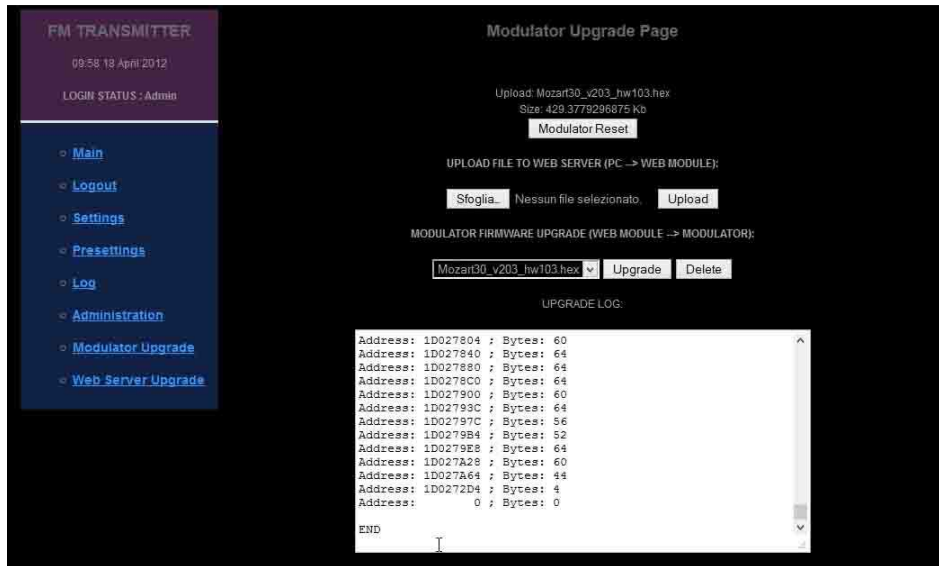


Fig. 8.17 – Upgrade complete

When the upgrade is complete, the transmitter will be restarted automatically. In case of procedure failed, power off the unit, wait some seconds and power on the unit. Now retry the upgrade procedure again.

In case of new upgrading failed contact the assistance.

8.2.2 UPGRADING THE WEBSERVER BOARD FIRMWARE

To upgrade the webserver board please follow the next steps:

1. Connect a PC to the Mozart transmitter using a crossover LAN cable. Open a browser and type the IP Address of transmitter.
2. Login as administrator.
3. Go to the “Webserver Upgrade” menu and click on “Sfoggia” button.

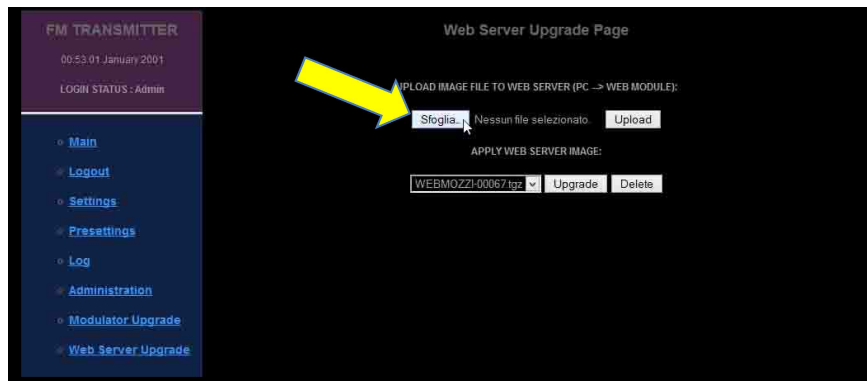


Fig. 8.18 – Webserver Upgrade page

4. Select the latest firmware .tgz file and click “OPEN”. (The file below is just an example, please use the firmware provided by DB Elettronica).

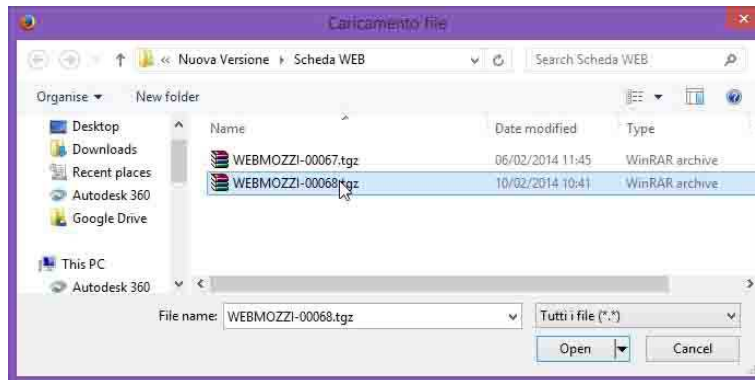


Fig. 8.19 – Select the new webserver board firmware

5. Click on “Upload” button and confirm the operation pressing “OK” button.



Fig. 8.20 – Upload the firmware to webserver



Fig. 8.21 – Confirm the uploading

6. The following screen will be shown on while the process is running.

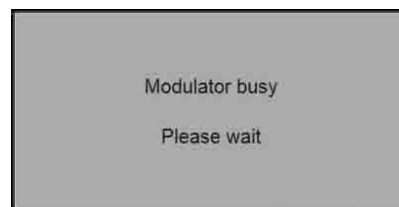


Fig. 8.22 – Busy state during upload procedure

- The new firmware will be added on the list. Select it and click on “Upgrade” button.

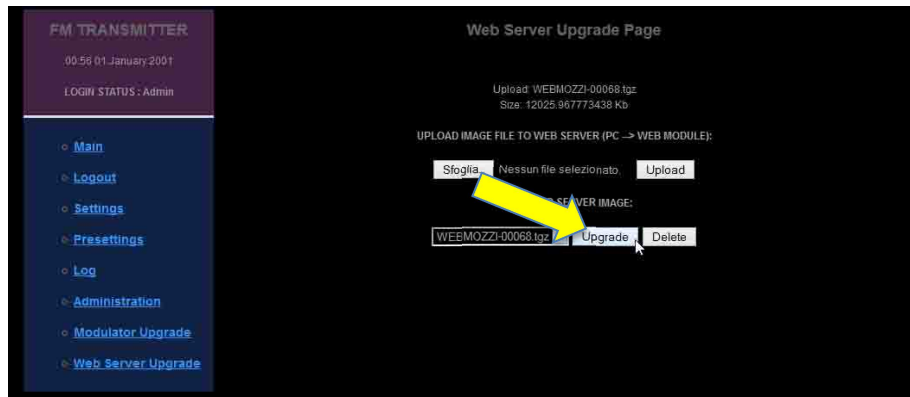


Fig. 8.23 – New firmware ready to upgrade

- Select “OK” to confirm the operation and “OK” after the message was read.

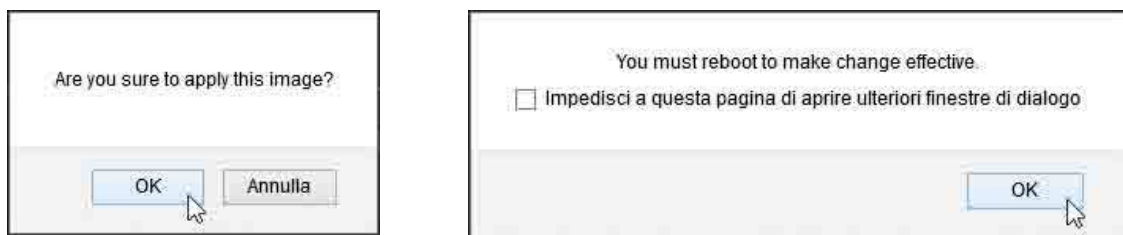


Fig. 8.24 – Confirmations to upgrade

- Wait until the following screen will disappear

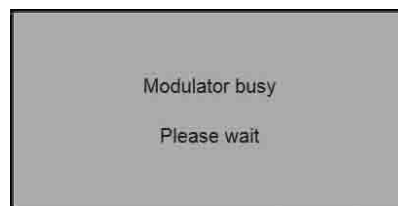


Fig. 8.25 – Upgrade in working

10. The webserver is ready to be upgraded. Go to “Administration” menu and click on the “REBOOT” button. Confirm the operation pressing “OK” button. The webserver will be restarted with the new firmware.

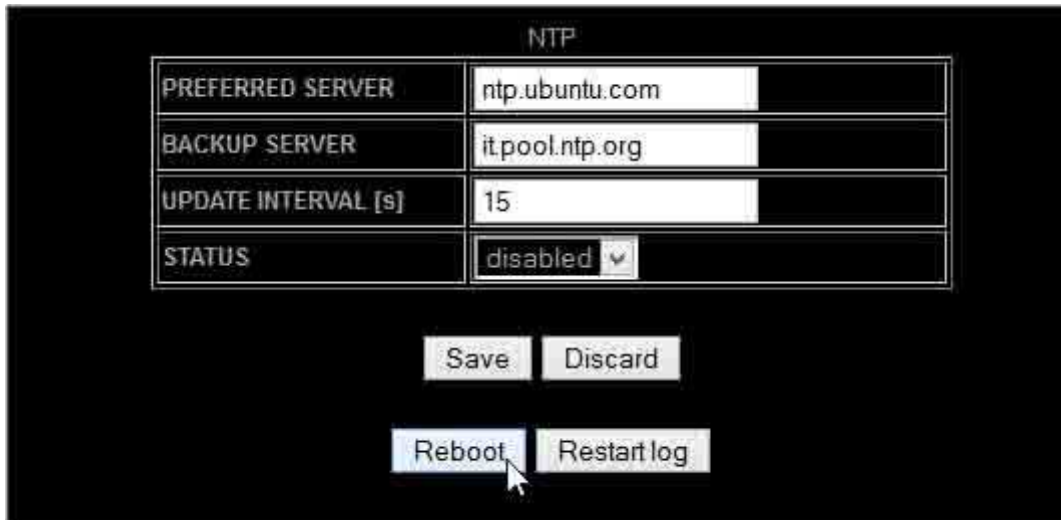


Fig. 8.26 – Reboot the webserver

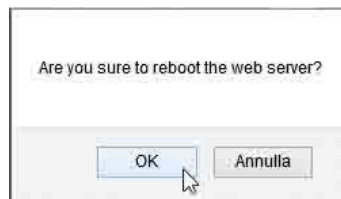


Fig. 8.27 – Confirm the reboot

11. Wait until the process is finished. The operation process will take about 90 seconds.

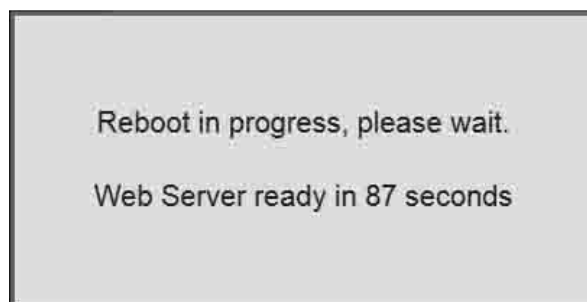


Fig. 8.28 – Wait until the reboot is completed

8.3 SNMP PROTOCOL

SNMP (Simple Network Management Protocol) is used for monitoring and controlling a wide variety of different units in a network.

A description of the unit - the MIB (Management Information Base) - must be loaded in the central unit ("manager") from which the unit is monitored.

A monitored unit contains a program ("agent") which can answer queries from the manager and execute commands. Furthermore, the agent may of its own accord generate a message ("trap" or "inform") and send it to the manager. In this way, the central unit can be informed of a fault.

8.3.1 MANAGEMENT INFORMATION BASE MIB

The MIBs required for monitoring and controlling the unit can be requested to assistance. The packet **IRT-TC-MIB.04.05.2007** contains a group of files:



Fig. 8.29 – List of file of MIB packet

Select and open the FM folder and load the file **IRT-FM-SINGLETRANSMITTER-MIB** in the MIB browser of manager unit.

The supported protocol is SNMPv2c.

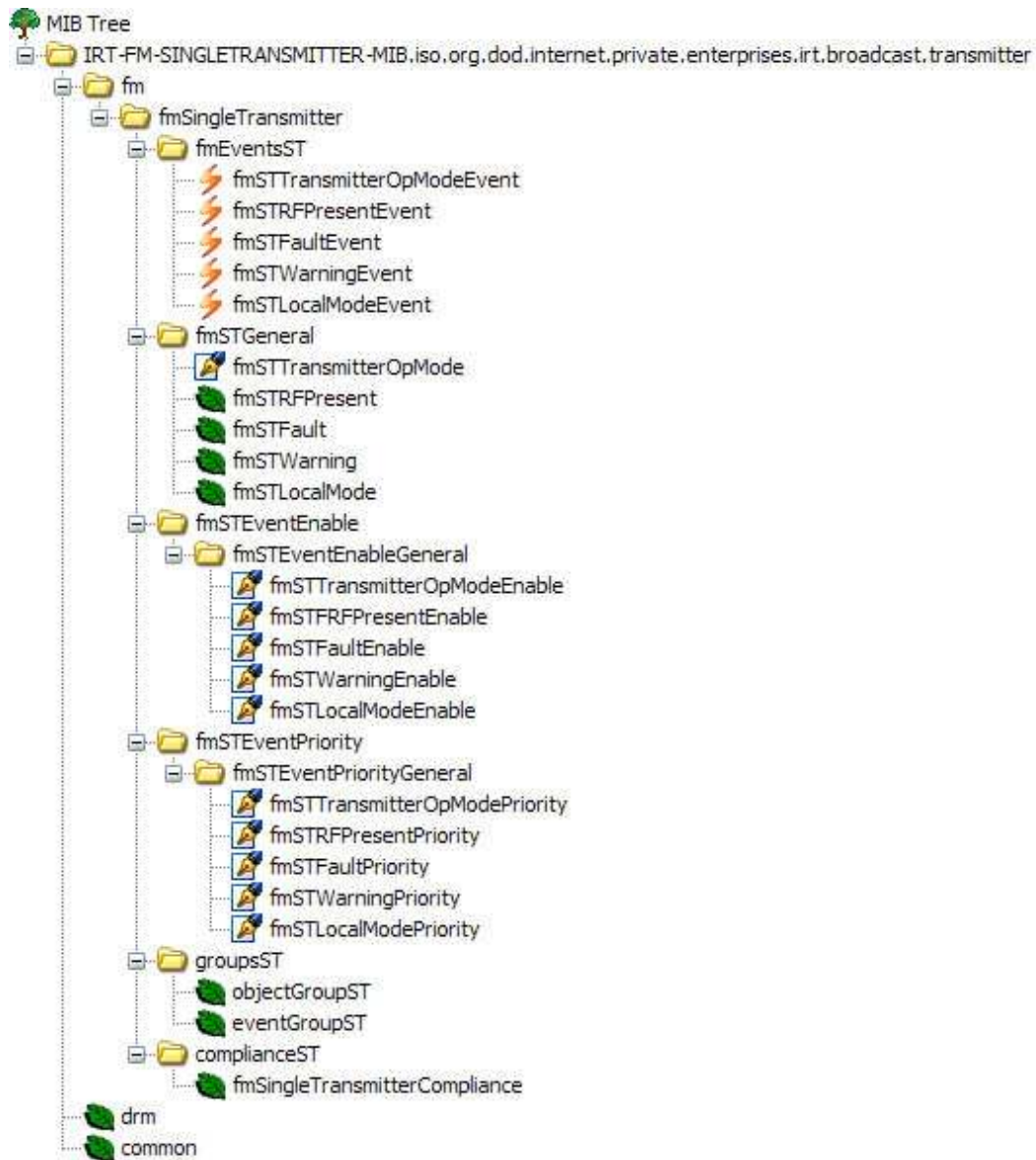


Fig. 8.30 – FM Single Transmitter MIB

8.3.2 MESSAGE TRAP AND INFORM

The events that can generate a trap or inform (depending on user configuration) are grouped in the **fmEventsST** folder:

EVENT	OID	DESCRIPTION
fmSTTransmitterOpModeEvent	.1.3.6.1.4.1.19831.1.1.3.1.0.1	Unit in ON state
fmSTRFPresentEvent	.1.3.6.1.4.1.19831.1.1.3.1.0.2	RF present event recognized
fmSTFaultEvent	.1.3.6.1.4.1.19831.1.1.3.1.0.3	Presence of alarms
fwSTWarningEvent	.1.3.6.1.4.1.19831.1.1.3.1.0.4	Presence of Warnings
fmSTLocalModeEvent	.1.3.6.1.4.1.19831.1.1.3.1.0.5	Unit in Local mode

Table 8.1 – Traps and Informs available

The Traps/Informs can be configured in the webpage on Administration menu.

SNMP

TRAP IP ADDRESS 1	192.168.1.254	:	170	
TRAP IP ADDRESS 2	192.168.1.233	:	162	
READ COMMUNITY 1	public			
READ COMMUNITY 2	public2			
WRITE COMMUNITY 1	private			
WRITE COMMUNITY 2	private2			
TRAP TYPE	inform			
INFORMS TIMEOUT [S]	3			
INFORMS RETRIES	2			
SYSNAME				
SYSLOCATION				

Fig. 8.31 - Traps and Informs configuration

The trap/inform messages can be sent to 2 different IP address set in TRAP IP ADDRESS box with the relative port.

In the TRAP TYPE box select the message type desired, trap or inform. If inform is selected, the timeout the agent waits (if no answer from the manager) before re-send the inform message can be set in the INFORMS TIMEOUT box, the number of inform retransmission can be set in INFORMS RETRIES box.

The messages trap/inform have to be enable and can be enable singly. The enable is provided to the OIDs (**fmSTEventEnable** folder):

EVENT	OID	DESCRIPTION
fmSTTransmitterOpModeEventEnable	.1.3.6.1.4.1.19831.1.1.3.1.2.1.1	1=Enable, 2=Disable
fmSTRFPresentEventEnable	.1.3.6.1.4.1.19831.1.1.3.1.2.1.2	1=Enable, 2=Disable
fmSTFaultEventEnable	.1.3.6.1.4.1.19831.1.1.3.1.2.1.3	1=Enable, 2=Disable
fwSTWarningEventEnable	.1.3.6.1.4.1.19831.1.1.3.1.2.1.4	1=Enable, 2=Disable
fmSTLocalModeEventEnable	.1.3.6.1.4.1.19831.1.1.3.1.2.1.5	1=Enable, 2=Disable

8.3.3 COMMANDS AND STATE

Commands and State available through SNMP are summed in the following table:

EVENT	OID	TYPE	DESCRIPTION
fmSTTransmitterOpMode	.1.3.6.1.4.1.19831.1.1.3.1.1.1	Read and Write	1=ON, 2=OFF
fmSTRFPresent	.1.3.6.1.4.1.19831.1.1.3.1.1.2	Read only	1=Present, 2=Not Present
fmSTFault	.1.3.6.1.4.1.19831.1.1.3.1.1.3	Read only	1=Fault, 2=No Fault
fwSTWarning	.1.3.6.1.4.1.19831.1.1.3.1.1.4	Read only	1=Warning, 2=No Warning
fmSTLocalMode	.1.3.6.1.4.1.19831.1.1.3.1.1.5	Read only	1=Local, 2=Remote

The commands are accepted by the unit only in remote mode and if the community strings are correctly set for both read and write operations.

The community read/write strings have to be set both to the agent and manager units. In the webpage can be set in the Administration menu.